Terrestrial Ecosystem Mapping and Wildlife Tree Assessment on Galiano Island

Courtney Cameron • November 2021
For UVic RNS ER 312B Field Study in Ecological Restoration II, Dr. Richard Hebda

Abstract

The purpose of this project was to perform ground inspection and wildlife tree assessment that could potentially form the basis for a future restoration prescription of a small site on Galiano Island, British Columbia. Field work was conducted on an approximately 2 hectare site within the Moist Maritime Coastal Douglas-fir (CDFmm) biogeoclimatic zone in the Chrystal Creek watershed at the Millard Learning Centre, home of the Galiano Conservancy Association (GCA). Ground-truthing, Terrestrial Ecosystem Mapping (TEM) of two plots, a bird survey, and wildlife tree assessment were carried out in early November, 2021. Ten small ecological communities were described. Site disturbance and complexity are high, likely due to historical grazing and logging: in addition to areas of compaction, introduced and invasive species, including reed canary grass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus armeniacus*) comprise a large percentage of the shrub and herb layers for several communities, while mats of agronomic grass hinder succession towards forested plant communities. Soil pit and vegetation analysis suggest site series 06 Western red cedar (Cw)/Grand fir (Bg)-Foamflower for a plot in the damp flats, while analysis of a plot along a north-facing slope suggests 05 Western red cedar (Cw)/ Douglas fir (Fd)-Kindbergia. Wildlife trees are abundant; four trees in varying states of decay, including two western red cedar (*Thuja plicata*), one red alder (*Alnus rubra*), and one Douglas-fir (*Pseudotsuga menziesii*), were assessed and found to offer cavity nesting, feeding, and perching or roosting functions for wildlife. Nineteen bird species were observed on site, including several that depend on wildlife trees for nesting. It is recommended that more site series be determined on site to gain a broader understanding of the soils and moisture regime. A comprehensive plant survey should also be conducted during spring or summer seasons to determine whether vulnerable species are present. Likewise, a bird survey during the summer could enrich wildlife tree data with direct observations of nesting and other tree uses.

Introduction

Background and site location

The Galiano Conservancy Association stewards land on Galiano Island, British Columbia. Its Millard Learning Centre property is an important link in the Mid-Island Protected Areas Network (Galiano Conservancy Association, 2021) and holds opportunities for restoration and field study. The Chrystal Creek watershed restoration is among the GCA's ongoing projects (A. Huggins, personal communication, October, 2021). Baseline data and ecological assessment of a formerly grazed and logged area within the watershed are needed to help inform the next phase of restoration. The study site for this report falls within that area. Approximately 2 hectares in size (Fig. 1), the site is situated in a valley between ridges. It slopes gently down from southeast to northwest as it drains. The previous landowner grazed and logged the land as recent as the early 2000's (A. Huggins, personal communication, November, 2021), leaving behind a degraded landscape bearing little resemblance to the previous older cedar forests depicted in early air photos (Galiano Conservancy Association, 2020). On site is a small pond, created for agriculture, and its dam, a built up lump of land to the west of the pond.

Figure 1 - Study site on Galiano Conservancy Association Millard Learning Centre property. Adapted from Google Maps.

Ecological context

Galiano Island lies within the Moist Maritime Coastal Douglas-fir (CDFmm) biogeoclimatic zone of the Southern Gulf Islands (SGI) Ecosection (Forest Service British Columbia, 2021). Narrow parallel ridges of sandstone run the length of the island; drainage is controlled by these formations (Madrone Environmental Services, 2008). Surficial material is composed of glacial till or fluvial sands; valleys contain fine-textured glaciomarine deposits. An ecologist with Islands Trust previously assessed the study site for this report on a coarse scale as site series 14 Western red cedar-Slough sedge. Another TEM study conducted in the same valley just to the southeast of the present study site found soils supportive of western red cedar ecosystems, including series 05, 06, and 11 (Cw-Skunk cabbage) (Huggins, 2018). According to a previous TEM study of Galiano Island, the valleys host productive and rich, moist western red cedar (*Thuja plicata*) and bigleaf maple (*Acer macrophyllum*) systems, encompassing site series 06, in combination with forests typical of CDFmm, zonal site series 01 Fd-Salal (Madrone Environmental Services, 2008).

Project Objectives

- Objective 1: Characterize the ecosystems of the study site and conduct Terrestrial Ecosystem Mapping surveys for two plots

Terrestrial Ecosystem Mapping (TEM) is a process of classifying ecological units according to landscape and climate context (Standard for terrestrial ecosystem mapping in British Columbia, 1998) by determining site series—that is, specific climax vegetation able to be supported in that unit. As a considered restoration prescription begins with the collection of inventory, TEM provides the framework from which restoration goals and objectives can be drawn.

- Objective 2: Assess wildlife trees on site

Wildlife trees—standing dead and decaying trees—furnish opportunities for mammals and birds to forage, nest, and perch or rest.

Methods

Prior to field work, I consulted topographic, aerial and satellite images (Google, n.d) of the site—the most recent from 2016—and drew polygons to delineate vegetation boundaries for ground comparison. Field work was conducted November 1 & 2, 2021 and constituted ground-truthing, wildlife tree assessment, a bird survey, and TEM assessment for two plots.

Ground-truthing

I surveyed the 2 hectare area, initially traversing the perimeter, then walking north-south transects spanning the site interior while observing and recording plants, wildlife, slope, aspect, ground conditions, and vegetation boundaries. A handheld GPS was used to find elevation and mark points of interest. Aspect and slope were determined by compass and clinometer. Certain plants were identified using *Plants of Coastal British Columbia* (Pojar & Mackinnon, 1994) and the E-flora B.C. Atlas (Klinkenberg, 2020).

Wildlife tree assessment

Based on observations made during the initial site survey, I selected four standing, decaying trees for wildlife tree data collection. Following protocol in B.C. Ministry of Forests *Field Manual for Describing Terrestrial Ecosystems 2nd Edition* (2010), I took physical measurements, including diameter at breast height (DBH) using a DBH tape, and estimated tree height, making calculations from measured distance to the tree and clinometer angle to the treetop. Wildlife code observations were also made, including tree appearance, crown condition, state of the bark and wood, lichen, and potential wildlife uses. Photos were taken.

Bird survey

All bird species seen or heard during field work on the first day were recorded. The number of individuals of each species was estimated, and behavioural observations were made, including noting bird interactions with plants, such as whether birds were foraging on trees or skulking in shrubs.

Terrestrial Ecosystem Mapping

I inspected two plots in detail, completing the Ground Inspection Form insert to the *Field Manual for Describing Terrestrial Ecosystems* (tree mensuration omitted), and using codes and descriptions from *Standard for Terrestrial Ecosystem Mapping in British Columbia* (1998). I selected plots to represent different polygons: one in the damp flats, and one mid-slope. A soil pit was dug in the centre of each plot. An area approximately 20m x 20m surrounding each pit was surveyed for crown closure, plant species, and the composition of vegetation layers. Soil strata and material were observed: soil was hand-textured according to the *Field Manual*; soil moisture and nutrient regimes (SMR, SNR) were determined by following the flow chart. The composite information was used to determine site series according to *A Field Guide for Site Identification and Interpretation for the Vancouver Forest Region* (Green & Klinka, 1994). I took photos and made sketches of soil pits and vegetation for each plot.

Results

Vegetation & Structure

The site illustrates a patchwork of structural stages, from 2b herb, Graminoid-dominated - 5 Young Forest; highly disturbed, it shows little uniformity or standard forest structure. Ten plant communities, each comprising small areas of about 0.1 hectares, fall into three categories based on their location within the site (Fig. 2): (1) those in the valley bottom (flats and depression areas), which experiences damp, wet, conditions with poor drainage; (2) those near the base of the slope running approximately along the north of the site, which experiences southern exposure and drier conditions; and (3) those along the base and mid-slope of the southern border rise, which may be influenced by its cooler aspect. For a full plant list, see Appendix 1.

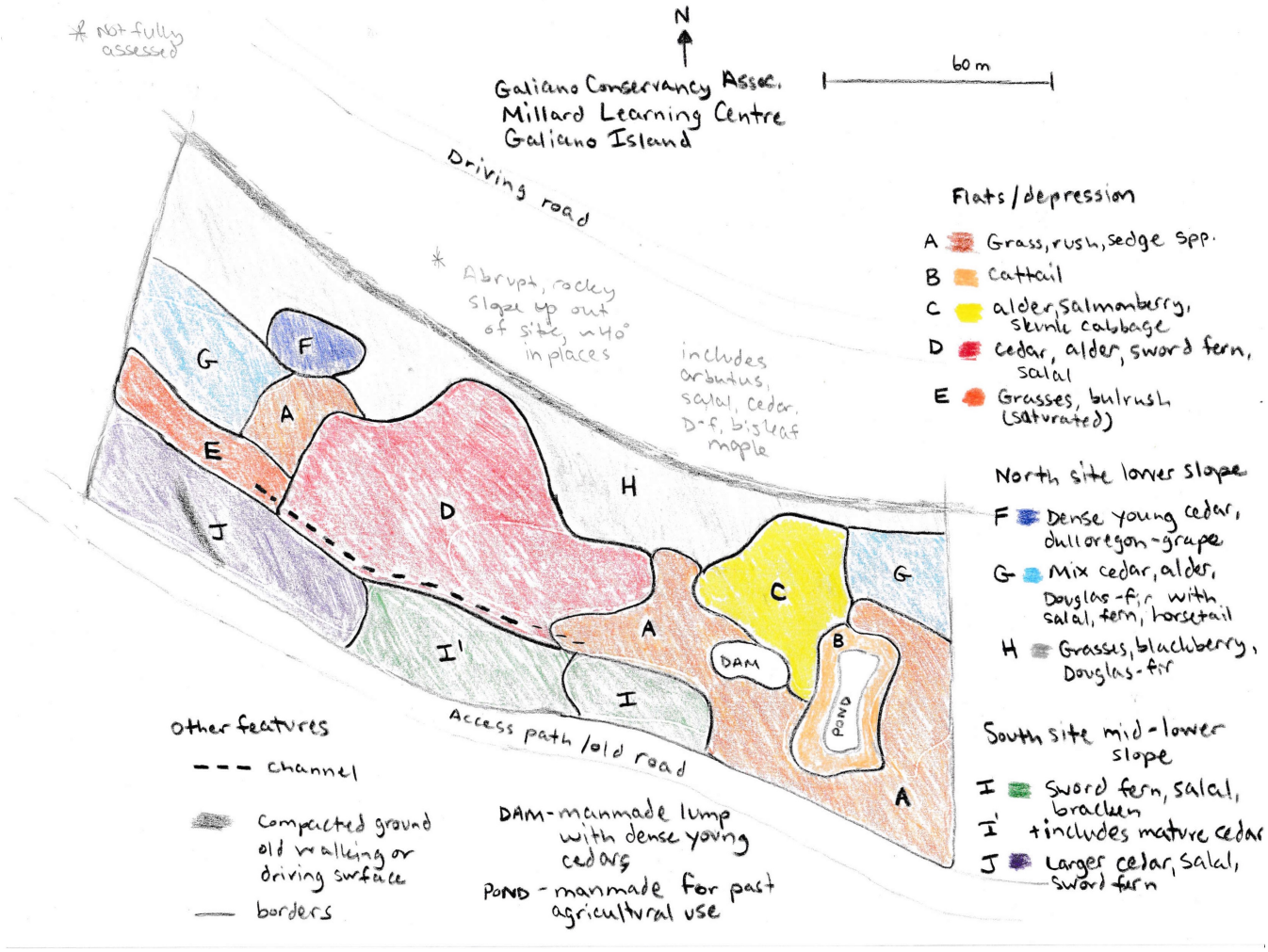

Figure 2 - Vegetation polygons in three overarching categories

(1) Flats/depression

A: *Agrostis-Phalaris arundinacea-Juncus-Carex*

B: *Typha latifolia*

C: *Alnus rubra-Rubus spectabilis*

D: *Thuja plicata-Alnus rubra-Polystichum munitum-Gaultheria shallon*

E: *Agrostis-Scirpus microcarpus*

Plant communities in this area seem to be under arrested development due to invasive or matted grasses, including reed canary grass, as the foundation of the herb layer. Intermittent mature trees left from selective logging are not dense enough to form a tall canopy; instead, areas of new cedar regrowth with alder form only small pockets of forest, while shrub and herb layers are not continuous or consistent. Small water-filled channels weave through the flats, especially at the base of the south slope.

(2) North edge

F: *Thuja plicata-Mahonia nervosa*

G: *Thuja plicata-Alnus rubra-Pseudotsuga menziesii-Gaultheria shallon*

H: *Pseudotsuga menziesii-Rubus armeniacus, laciniatus, & ursinus*-unclassified grasses

This area transitions between the flats and the abrupt rocky slope bordering the site. Cedar, alder, and Douglas-fir are present, along with a cohort of shrubs and grasses; like the flats, typical forest structure is deficient. Coarse woody debris (CWD) is entangled with several blackberry species, including invasive Himalayan blackberry. One Scotch broom (*Cytisus scoparius*) bush and introduced grasses grow along an old, compacted path, which maintains the openness of the area.

(3) South edge

I/J: *Thuja plicata-Gaultheria shallon-Polystichum munitum*

Native plant communities appear more intact: the moss, herb and shrub layers are distinct and contain vegetation appropriate for the site series. The shrub layer is quite dense in places, but young cedars (as well as a few mature) form a tree layer along part of the slope.

Wildlife Trees

The site contains several trees suitable for the needs of wildlife. The four trees observed for this study include two western red cedar (coded Cw), one red alder (Dr), and one Douglas-fir (Fd) (tree images in Fig. 3; tree locations in Fig. 4; data summarized in Table 1;).

Figure 3 - Wildlife trees #1-4 left to right: Cw, Cw, Dr, Fd

Tree #1
- Western red cedar in a complex with several other dead cedars in similar state of decay
- Located on the edge of a clearing; rises high above the site, indicating perching opportunities; sapsucker holes indicate feeding; cavities are possible but not confirmed

Tree #2
- Western red cedar in an area with dense young cedars
- One major branch retains life and curves up higher than the broken top
- Dense foliage on the live side of the tree may provide sheltered roosting sites, while missing bark may provide feeding and cavities on the more decayed side

Tree #3
- Red alder on the edge of a clearing; appropriate for perching
- Peeling bark allows ample cavity nesting and feeding

Tree #4
- Douglas-fir without branches; bark intact and strong
- Many cavities present; possible woodpecker nesting

Figure 4 - Site with approximate wildlife tree (WLT, red markers) and soil pit/plot (yellow markers) locations indicated

Tree Attributes for Wildlife

Tree#	Species	Location	DBH (cm)	Rem. Bark at BH (%)	Height (m)	Crown Class
1	Cw - Western red cedar	N 48°55.758' W 123°28.243'	107.2	100	53.6	Dominant
2	Cw - Western red cedar	N 48°55.775' W 123°28.238'	97.0	75	14.5	Supressed
3	Dr - Red alder	N 48°55.773' W 123°28.279'	49.0	90	27.3	Intermediate
4	Fd - Douglas fir	N 48°55.790' W 123°28.365'	50.9	100	10.7	Codominant

Tree#	Appearance	Crown	Bark	Wood	Lichen	Wildlife use	Comments
1	4	3	2	3	3	(F,P) Feeding, Perching	Branches, bark & tip intact; no live foliage; sapsucker holes
2	2	2	4	3	1	(F, P) Feeding, Perching	Decaying/bark gone on one side, branch regrowth on the opposite side
3	4	3	4 (-5)	5	1	(C,F,P) Cavity, Feeding, Perching	Bark peeling, especially mid-upper tree; no live branches
4	6	6	2	3	1	(C, F) Cavity, Feeding	Bark intact; no branches, just nubs; many cavities/ holes; split at the top

Table 1 - Based on Tree Attributes for Wildlife form in Field Manual for Describing Terrestrial Ecosystems

Birds

Nineteen species of bird were detected during field work. See Appendix 2 for full species list. Of note were four species of woodpecker, including Pileated Woodpecker and Northern Flicker, and other species that may interact with wildlife trees, including Brown Creeper and Golden-crowned Kinglet, which were observed gleaning insects from peeling bark of the Red Alder wildlife tree. Many Pacific Wrens and Song Sparrows occupied the sword ferns, other dense shrubs, and stick piles. Varied Thrush called from the trees. No unusual birds were detected.

Terrestrial Ecosystem Mapping

Ground Inspection Forms can be found in Appendix 3; TEM of plots #1 & 2 depicted in Figure 5.

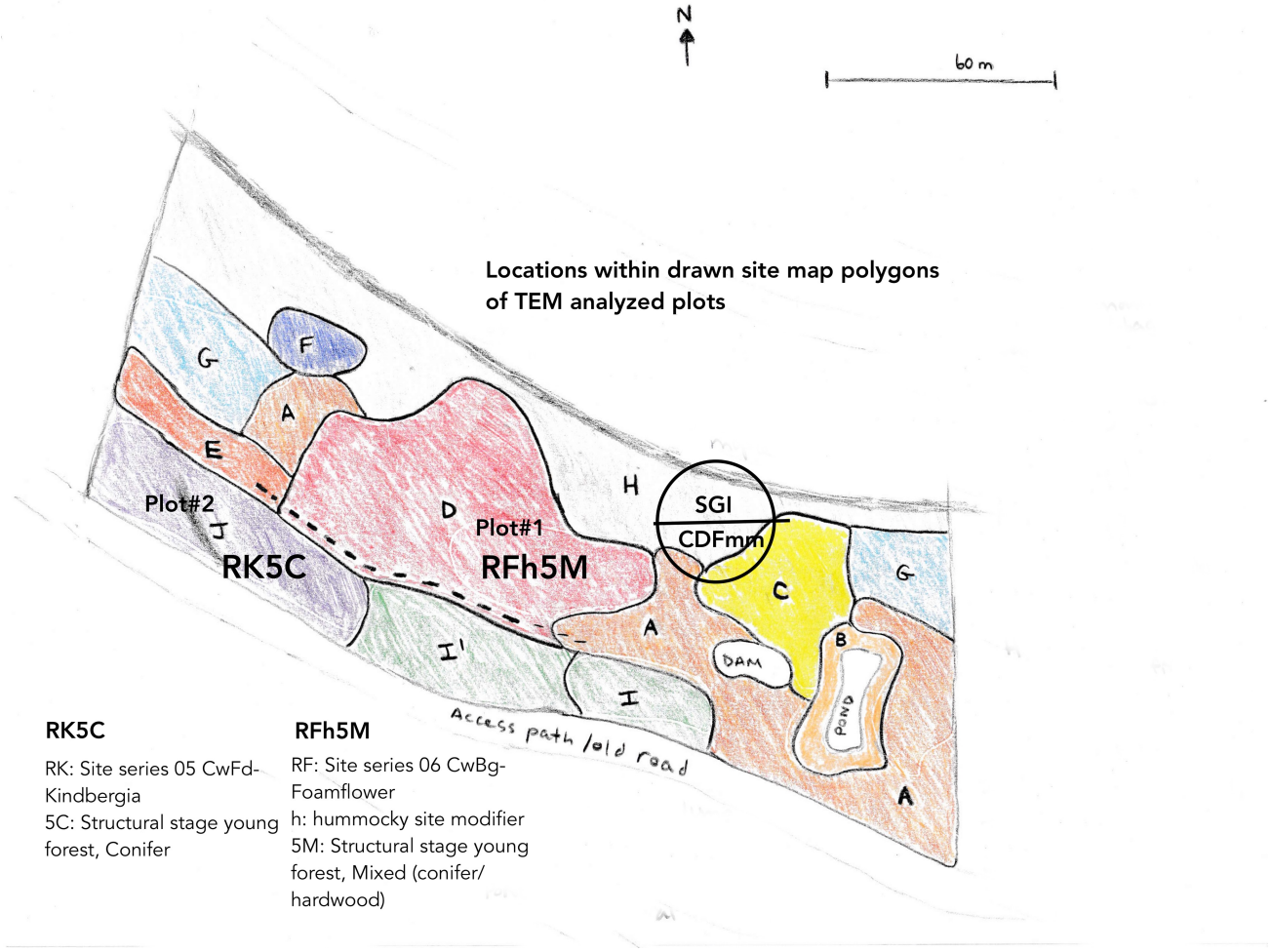

Figure 5 - TEM analyzed plots

Plot #1

Soil pit and vegetation analysis suggest site series 06 Western red cedar/Grand fir-Foamflower. Soil (Fig. 6, left) contained enough clay to hold together in the hand, indicating poor drainage. Gleying indicative of seepage was present, and a few millimetres of water seeped into the 70cm deep hole after digging. Also present were patches of rusty-coloured soil, implying possible oxidation, and a small amount of charcoal, suggesting a past burn. The hummocky ground supports large sword ferns, medium-sized alders, and patches of young dense cedar regrowth. The eastern edge of the plot transitions to an open, grasses-sedges system (a second ecosystem polygon for the plot was not mapped, however).

Figure 6 - Soil pit for plot #1 showing seepage, left; soil pit for plot #2 showing sand, right

Plot #2
Analysis of the soil pit and vegetation suggest site series 05 Western red cedar/Douglas-fir-Kindbergia. Soil (Fig. 6, right) has a gritty texture, characteristic of sandy soil. A few coarse fragments were present, comprising <5%. A layer of gray soil with higher clay content was reached in the last few cm at the bottom of the hole, from about 60-65 cm. Drainage was moderately well, but moisture content remains due in part to the north-facing aspect. A defined moss and shrub layer, with dense salal and dense sword fern, were present, with a few mature cedars in addition to young cedar in the tree canopy. An old access road nearly borders the south edge of the plot, allowing vegetation to be influenced by the gap in trees.

Discussion

Based on this report and results from previous surveys of varying scope, it can be inferred that the majority of the valley supports cedar-dominated site series 05, 06, and 11. The flats and depressions accommodate damp conditions with potential areas of seepage and fluctuating water tables, which may also include site series 12, 13, and 14 (Western red cedar-Vanilla-leaf, Cw-Indian-plum, Cw-Slough sedge). This limited-scope study did not investigate hydrology, which may play a role in the future Chrystal Creek watershed restoration effort.

Lingering impacts of land degradation from logging, compaction, and grazing have created a mosaic with fragmented pockets of vegetation in a range of structural stages, from 2b herb, Graminoid-dominated - 5 Young Forest interspersed through the site. Because of this patchiness, for this project, polygons each represented only a tiny land area; typically, TEM represents a larger-scale plant community pattern, which may be more useful in providing landscape context.

The wildlife trees may be of high value for birds and other wildlife in the valley. Tree attribute data gathered in this report can help determine which snags should be retained during a restoration, and how they may be incorporated into a forest mosaic. Considering the possibility of human error, tree measurements could be taken again for accuracy.

Plant identification was limited for this survey partly because of the season, and partly because of the presence of many “weedy” plants not found in the field guide used. During future surveys, experts should search for possible overlooked vulnerable species.

Recommendations:
1. Expand the scope of TEM assessment and ecological surveys; dig more soil pits
2. Conduct plant surveys during the summer
3. Explore site hydrology and compaction
4. Re-measure wildlife trees
5. Conduct wildlife tree assessment during nesting season to observe active nesting behaviour

Acknowledgements

I would like to thank Richard Hebda for imparting wisdom and inspiration for this project; the Galiano Conservancy Association and especially Adam Huggins, restoration coordinator for the GCA, for facilitating access and providing tools for the field work; and Sara Yeomann for field assistance. As I am a guest, I would like to gratefully acknowledge that Galiano Island lies within the traditional territories of Penelakut, Hwlitsum, and Tsawwassen First Nations, the Hul’qumi’num-speaking peoples.

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Appendix 1: Plants found on site

Trees/shrubs	
Western red cedar	*Thuja plicata*
Red alder	*Alnus rubra*
Douglas-fir	*Pseudotsuga menziesii*
Grand fir	*Abies grandis*
Bigleaf maple	*Acer macrophyllum*
Salal	*Gaultheria shallon*
Red huckleberry	*Vaccinium parvifolium*
Pink honeysuckle	*Lonicera hispidula*
Oceanspray	*Holodiscus discolor*
Common Hawthorn	*Crataegus monogyna*
Baldhip rose	*Rosa gymnocarpa*
Salmonberry	*Rubus spectabilis*
Himalayan blackberry	*Rubus armeniacus*
Cutleaf blackberry	*Rubus laciniatus*
Trailing blackberry	*Rubus ursinus*
English holly	*Ilex aquifolium*
Scotch broom	*Cytisus scoparius*
Dull oregon-grape	*Mahonia nervosa*
Bracken fern	*Pteridium aquilinum*
Sword fern	*Polystichum munitum*
Herb/Moss	
Dock spp.	*Rumex*
Miner's lettuce	*Claytonia perfoliata*
Creeping buttercup	*Ranunculus repens*
(Pea species)	*Vicia* (?)
Pearly everlasting	*Anaphalis margaritacea*

Herb/Moss	
Thistle spp.	*Cirsium*
Stinging nettle	*Urtica dioica*
Vanilla-leaf	*Achlys triphylla*
Bedstraw spp.	*Galium*
Skunk Cabbage	*Symplocarpus foetidus*
Cattail	*Typha latifolia*
Bentgrass spp.	*Agrostis*
Reed canary grass	*Phalaris arundinacea*
Slough sedge	*Carex obnupta*
Small-flowered Bulrush	*Scirpus microcarpus*
Common Rush	*Juncus effusus*
Rush spp.	*Juncus*
Giant horsetail	*Equisetum telmatiea*
Haircap moss sp	*Polytrichum sp.*
Yellow moss	*Homalothecium fulgescens*
Oregon beaked moss	*Kindbergia oregana*

Appendix 2: Birds seen and heard during field work; other wildlife observed

Birds and other wildlife observed	
Downy Woodpecker	*Dryobates pubescens*
Hairy Woodpecker	*Dryobates villosus*
Pileated Woodpecker	*Dryocopus pileatus*
Northern Flicker	*Colaptes auratus*
Common Raven	*Corvus corax*
Chestnut-backed Chickadee	*Poecile rufescens*
Ruby-crowned Kinglet	*Regulus calendula*
Golden-crowned Kinglet	*Regulus satrapa*
Red-breasted Nuthatch	*Sitta canadensis*
Brown Creeper	*Certhia americana*
Pacific Wren	*Troglodytes pacificus*
Bewick's Wren	*Thryomanes bewickii*
Varied Thrush	*Ixoreus naevius*
American Robin	*Turdus migratorius*
Purple Finch	*Haemorhous purpureus*
Pine Siskin	*Spinus pinus*
Dark-eyed Junco	*Junco hyemalis*
Song Sparrow	*Melospiza melodia*
Spotted Towhee	*Pipilo maculatus*
Pacific chorus frog	*Pseudacris regilla*
Red squirrel	*Tamiasciurus hudsonicus*

Appendix 3: Ground Inspection Forms for Plots 1 & 2

Millard Learning Centre - Galiano Island

BRITISH COLUMBIA — GROUND INSPECTION FORM

G ☒ vs V ☐	Photo Google sat.	X:	Y:	Date Nov 2, 2021
Project Id. ER312B final IGCA		Surv. Courtney Cameron		
Map Sheet 092B14		Plot # 1		Poly.# D (red)
UTM Zone 10U	Lat. / North 48° 55.782'		Long. / East 123° 28.305'	
Aspect 210 (SSW) °		Elevation 45 m		
Slope 8° = 14%	SMR 6		SNR D	

Meso Slope Postion	☐ Crest	☐ Mid slope	☒ Depression	
	☐ Upper slope	☐ Lower slope	☐ Level	
		☐ Toe		
Drainage - Mineral Soils	☐ Very rapidly	☐ Well	☒ Poorly	
	☐ Rapidly	☐ Mod. well	☐ Very poorly	
		☐ Imperfectly		
Moisture Subclasses - Organic Soils N/A	☐ Aqueous	☐ Aquic	☐ Perhumid	
	☐ Peraquic	☐ Subaquic	☐ Humid	
Mineral Soil Texture	☐ Sandy (LS,S)	☐ Silty (SiL,Si)		
	☐ Loamy (SL,L,SCL,FSL)	☒ Clayey (SiCL,CL,SC,SiC,C)		

Organic Soil Texture: ☐ Fibric ☐ Mesic ☐ Humic	Surf. Organic Horizon Thickness: ☒ 0–40 cm ☐ > 40 cm
Humus Form: ☐ Mor ☐ Moder ☐ Mull	Root Restricting Layer N/A; Depth _____ cm Type _____
Coarse Fragment Content: ☒ < 20% ☐ 20–35% ☐ 35–70% ☐ > 70%	

TERRAIN — COMPONENT: TC1 ☒ TC2 ☐ TC3 ☐

Terrain Texture	Surficial Material	Surface Expression	Geomorph Process
1 Z, C	1 WG	1 P, h	1 —
2	2	2	2

ECOSYSTEM — COMPONENT: EC1 ☒ EC2 ☐ EC3 ☐

BGC Unit CDFmm	Ecosection SG-I
Site Series RF	Site Modifiers h (hummocky)
Structural Stage 5M	Crown Closure 20 %

ECOSYSTEM POLYGON SUMMARY					TERRAIN POLYGON SUMMARY		
	%	SS	SM	ST		%	Classification
EC1					TC1		
EC2					TC2		
EC3					TC3		

PLOT #1 p.1

DOMINANT / INDICATOR PLANT SPECIES (+ = present, < 1%)

TOTAL %	A: Tree 20%	B: Shrub 70%	C: Herb 50%	D: Moss +

L.	SPECIES	%	L.	SPECIES	%	L.	SPECIES	%
A	Thuja plicata	10	C	Agrostis & other grasses	40			
A	Alnus rubra	10	C	Vicia sp	1			
B	Polystichum munitum	50	C	Equisetum telmateia	1			
B	Gaultheria shallon	10	C	Ranunculus repens	1			
B	Rubus armeniacus	2	C	Cirsium sp.	1			
B	Rubus laciniatus	1	C	Scirpus microcarpus	2			
B	Rubus ursinus	1	C	Juncus sp.	3			
B	Mahonia nervosa	2	C	Galium sp.	+			
B	Pteridium aquilinum	2	D	Kindbergia oregana	+			
B	Ilex aquifolium	1						
B	Rosa gymnocarpa	1						
C	Lonicera hispidula	1						

COMPLETE ☒ PARTIAL ☐

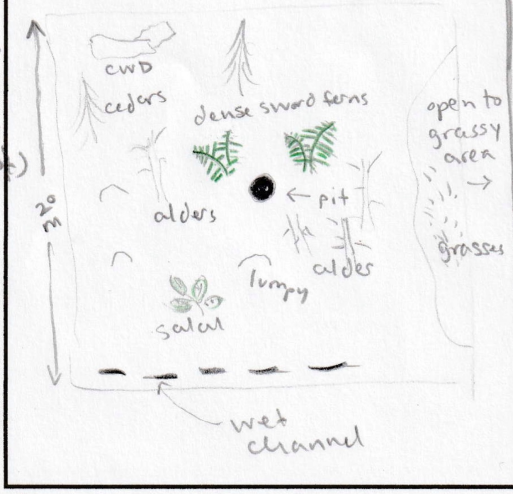
Tree Mensuration

Spp.	DBH	Ht. Calculation to DBH						Ht. to DBH	Total HT	BH Age	Path Y/N
		Top	Bot	SD	SL	HD	HT				

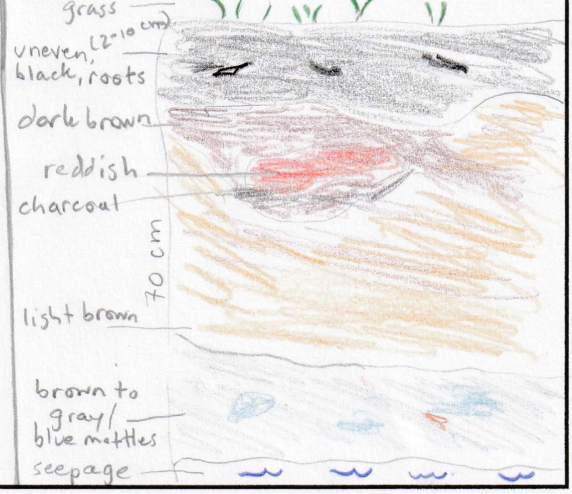
NOTES (site diagram, exposure, gleying, etc.)

Site disturbed by Forest harvesting (late 1990's into early 2000's)
- land clearing / abandoned agriculture & grazing

site diagram



Soil pit layers



other notes:
- shoulder-high sword ferns
- Douglas fir just outside plot (D-# stump in plot)
- 2 tall cedars
- 2 tall alders
- a couple small wildlife trees
- lumpy ground
- ditches, channels w/ standing water
- disturbed, likely highly varied soil thru plot

Note: layers uneven around the hole

Texture: slightly grainy, but sticky with higher clay content

clay loam?

PLOT #1 p.2

Millard Learning Centre - Galiano Island

BRITISH COLUMBIA — GROUND INSPECTION FORM

G ☒ vs V ☐	PHOTO Google sat.	X:	Y:	DATE Nov 2, 2021
PROJECT ID. ER312B final / GCH		SURV. Courtney Cameron		
MAP SHEET 092B14		PLOT # 2		POLY. # J
UTM ZONE 10 U	LAT. / NORTH		LONG. / EAST	
ASPECT 26 (NNE) °		ELEVATION 43 m		
SLOPE 18° | 32 %	SMR (4-)5 likely moister due to N aspect		SNR C(-D)	

MESO SLOPE POSTION
☐ Crest ☐ Upper slope ☒ Mid slope ☐ Lower slope ☐ Toe ☐ Depression ☐ Level

DRAINAGE - MINERAL SOILS
☐ Very rapidly ☐ Rapidly ☐ Well ☐ Mod. well ☐ Imperfectly ☐ Poorly ☐ Very poorly

MOISTURE SUBCLASSES - ORGANIC SOILS NA
☐ Aqueous ☐ Peraquic ☐ Aquic ☐ Subaquic ☐ Perhumid ☐ Humid

MINERAL SOIL TEXTURE
☒ Sandy (LS,S) ☐ Loamy (SL,L,SCL,FSL) ☐ Silty (SiL,Si) ☐ Clayey (SiCL,CL,SC,SiC,C)

ORGANIC SOIL TEXTURE NA
☐ Fibric ☐ Mesic ☐ Humic

SURF. ORGANIC HORIZON THICKNESS
☒ 0–40 cm ☐ > 40 cm

HUMUS FORM
☐ Mor ☒ Moder ☐ Mull

ROOT RESTRICTING LAYER —
Depth _____ cm Type _____

COARSE FRAGMENT CONTENT
☒ < 20% ☐ 20–35% ☐ 35–70% ☐ > 70%

TERRAIN

COMPONENT: TC1 ☒ TC2 ☐ TC3 ☐

TERRAIN TEXTURE	SURFICIAL MATERIAL	SURFACE EXPRESSION	GEOMORPH PROCESS
1 S	1 WG	1 a (moderate slope)	1 —
2	2	2	2

ECOSYSTEM

COMPONENT: EC1 ☒ EC2 ☐ EC3 ☐

BGC UNIT CDFmm	ECOSECTION SGI
SITE SERIES RK	SITE MODIFIERS —
STRUCTURAL STAGE 5C	CROWN CLOSURE 50 %

ECOSYSTEM POLYGON SUMMARY

	%	SS	SM	ST
EC1				
EC2				
EC3				

TERRAIN POLYGON SUMMARY

	%	Classification
TC1		
TC2		
TC3		

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DOMINANT / INDICATOR PLANT SPECIES

TOTAL %	A: Tree 50%	B: Shrub 80%	C: Herb 3%	D: Moss 20%

L.	SPECIES	%	L.	SPECIES	%	L.	SPECIES	%
A	Thuja plicata	45	D	Kindbergia oregana	20			
A	Alnus rubra	4						
A	Acer macrophyllum	1						
B	Polystichum munitum	40						
B	Gaultheria shallon	35						
B	Pteridium aquilinum	3						
B	Rubus spectabilis	+						
B	Rubus ursinus	+						
B	Ilex aquifolium	+						
C	Lonicera hispidula	1						
C	Achlys triphylla	2						
C	Galium sp.	+						

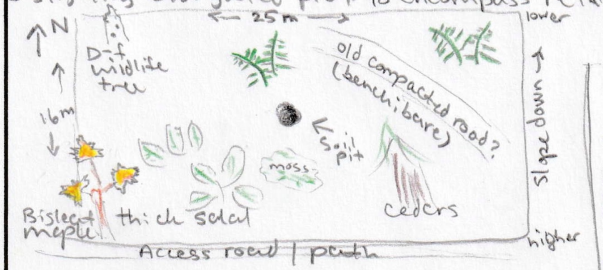
COMPLETE ☒ PARTIAL ☐

Tree Mensuration

Spp.	DBH	Ht. Calculation to DBH						Ht. to DBH	Total HT	BH Age	Path Y/N
		Top	Bot	SD	SL	HD	HT				

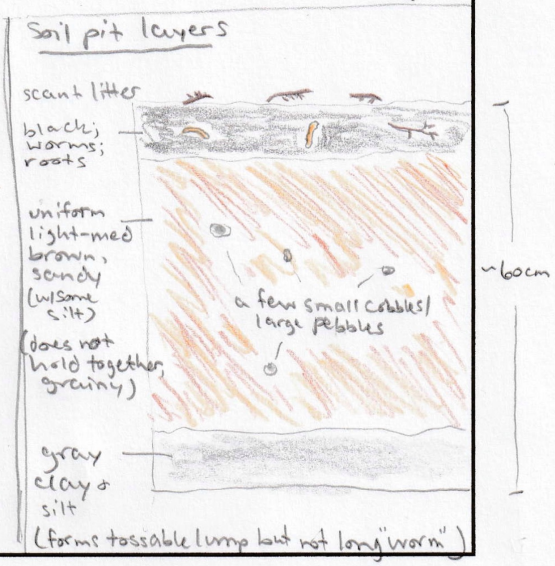
NOTES (site diagram, exposure, gleying, etc.)

- slightly elongated plot to encompass relative uniformity along site south slope.



- cedar showing recurve from slope creep

- access path close to south edge of site; allows sunlight & other plants/conditions nearby (bracken fern, Douglas-fir saplings, pearly everlasting, other
- compaction of path may alter moisture regime



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