CALIDRIS Ecological SERVICES
wildlife - ecology - restoration

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June 7, 2022 Project No. 2022-050

Mark Hart
Comox Valley Regional District
770 Harmston Road
Courtenay, BC
V9N 0G8

RE: BIOPHYSICAL OVERVIEW OF MARIS ESTATES LTD. PROPERTIES ON EAGLES DRIVE, MERVILLE, BC

Dear Mr. Hart,

1.0 Introduction

Calidris Ecological Services Ltd. (Calidris) has been retained by the Comox Valley Regional District (CVRD) to provide an overview biophysical assessment of two waterfront parcels (herein referred to as 'the site') totaling 40 acres between Eagles Drive and Tasman Road in Merville, BC.

2.0 Methods

A background review of readily available information for the site was conducted prior to the field assessment. The following information sources were reviewed:

- BC Conservation Data Centre iMap application for known occurrence records of species and ecosystems at risk (BC CDC 2022);
- Habitat Wizard (2022) for provincial watercourse mapping and fish presence;
- Background information provided by the CVRD.

An assessment of the site was conducted on June 1, 2022 by Kim Poupard, R.P.Bio. The site was accessed via Tasman Road from the north then traversed on foot using the access road, the Eagles Greenway Trail along the west side of the site and an old trail just inside of the foreshore vegetation along the east side the site. A number of east-west transects between the trails were conducted to assess vegetation communities and to further investigate noteworthy observations. Binoculars were used to visually verify ecological conditions from vantage points along the foot transects.

During the field reconnaissance, specific attention was paid to potential occurrences of the following:

- Habitats likely to support species at risk (e.g., wetlands, rock outcrops, riparian, old growth forest);
- Ecosystems at risk;
- Species at risk;

- Invasive plants;
- Wildlife habitat features (e.g., wildlife trees, stick nests, dens and burrows);
- Important wildlife habitat (.g., wetlands, riparian, old growth forest); and
- Watercourses.

Noteworthy observations were documented on a georeferenced PDF of the properties uploaded to a GPS enabled device. Vegetation and ecosystem information was recorded on a BC Ground Inspection Form. Slopes were measured with a Sunto© clinometer. Distances were estimated using the measuring tool on a georeferenced PDF map.

A general description of the vegetation communities within the site was compiled. Note that the field reconnaissance was limited to chance encounters and general descriptions of land cover types; no species-specific surveys were conducted.

3.0 Results

3.1 Information Review

There are no known occurrence records of species or ecosystems at risk within the site according to the BC Conservation Data Centre database. The nearest occurrence record is a blue-listed ecosystem: Labrador-Tea/Western Bog-laurel/peat-mosses located approximately 2.4 km west of the site (BC CDC 2022).

There are no mapped watercourses on the property according to the BC Habitat Wizard database (Habitat wizard 2022). However, mapping provided by the CVRD indicated a total of four, first order watercourses within the two properties.

3.2 Field Assessment

There are no developments on the site aside from a rough trail along the lowlands beside the foreshore. There is also a small cleared trail along the southern boundary that leads from the Eagles Greenway to a viewpoint on the slope break at the southeast corner of the site. Remnants of historic forest activity (i.e., large stumps and long overgrown access trails) are evident throughout the upland and slope break areas (described in the next section).

3.2.1 Vegetation and Ecosystems

The site is located within the Coastal Western Hemlock Very Dry Maritime (CWHxm1) biogeoclimatic zone (BC iMap 2022). The site can be broadly delineated into three ecosystem units based on the topography and vegetation assemblage:

- High bench: from the access road and Eagles Greenway to the steep slope break, this unit makes up the majority of the site and contains gently sloping (5-10 %) high bench with a northeast aspect.

- Slope break: a steep, approximately 40 m (horizontal distance) slope break that runs parallel to the shoreline approximately 40 m from marine natural boundary. This break ranges from 50 to 70% slope.

- Shoreline: vegetated area just landward of the foreshore and marine natural boundary. This unit is strongly modified by the marine ecosystem (wind-shear and salt).

Soils across the site appear to be moderately to well-drained marine sediments with medium to rich nutrient regimes.

Vegetation cover is dominated by maturing mixed, second growth forest dominated by big leaf maple (*Acer macrophyllum*) and Douglas-fir (*Pseudotsuga menziesii*) with a lesser component of western hemlock (*Tsuga heterophylla*). Red alder (*Alnus rubra*), Sitka spruce (*Picea sitchensis*) and grand fir (*Abies grandis*) are also present occasionally across the site. Dominant understory species include sword fern (*Polystichum munitum*), dull Oregon grape (*Berberis nervosa*), red huckleberry (*Vaccinium parvifolium*), salmonberry (*Rubus spectabilis*), and traces of Salal (*Gaultheria shallon*). Trailing blackberry (*Rubus ursinus*) and bracken fern (*Pteridium aquilinum*) are present along the roadside and where there is historic disturbance.

Based on the vegetation and age classes of the upper bench and slope break, the climax ecosystem is assumed to be Douglas-fir / sword fern (Site Series 04) which is provincially red-listed (BC CDC 2019). Good examples of this ecosystem occur across the site (Attachment 2: Photo 1). The veteran trees are currently bigleaf maple; however, they are reaching late-stage development and are expected to be replaced by Douglas-fir over the coming decades. Two veteran old-growth (>250 years) Douglas-fir trees are present on the north end of the site (Figure 1, Attachment 2: Photo 2). These are likely remnants from the primary ecosystem and indicative of the natural climax species. Both trees are alive and have diameter-breast-heights (DBH) of approximately 2 m, one has a broken top at approximately 30 m height. These provide excellent potential nesting habitat and perches for raptors and sea birds.

The Douglas-fir / sword fern ecosystem is restricted to the south coastal areas of BC where the primary threats are resource extraction and rural development (BC CDC 2019). Recovery from timber harvesting is anticipated to require over 100 years and may be prolonged during extended dry periods, which may be exasperated by climate change (BC CDC 2019).

Vegetation along the foreshore is modified by the marine environment and wind exposure. There is a higher proportion of Sitka spruce as well as tall shrub understory along the natural boundary. Species dominant in the tall shrub layer include Oceanspray (*Holodiscus discolor* var. *discolor*), Pacific ninebark (*Physocarpus capitatus*), Scouler's willow (*Salix scouleriana*) and Nootka rose (*Rosa nutkana*).

A list of the vegetation observed during the field assessment is provided in Attachment 2: Table 1. Note that these are chance observations of dominant species, complete vegetation profiles or species-specific surveys were not conducted.

A few invasive species were noted along the access road on the west side of the northern property (Figure 1, Attachment 1: Photo 3). These included bull thistle (*Cirsium vulgare*), common tansy (*Tanacetum vulgare*), cutleaf blackberry (*Rubus laciniatus*), Himalayan blackberry (*Rubus armeniacus*), Scotch broom (*Cytisus scoparius*) and oxeye daisy (*Leucanthemum vulgare*). There were no major infestations and the weeds appear to be limited to the road edge. None of the species identified are listed under Schedule A of the BC Weed Control Regulation, though the species observed can be nuisance pioneering species and may have an adverse effect to native ecosystems.

3.1.2 Wildlife

The site hosts habitat suitable to support a wide array of wildlife species. The complex (multi-layered) canopy and mixed forest habitat is excellent for breeding migratory birds. The field assessment was conducted outside of ideal timing for detecting breeding species (typically just after sunrise); however, a total of 25 species were detected (Attachment 3: Table 2) including one species at risk. This suggests the site supports an abundant and diverse avian community. Behavioral indications of nesting (e.g., singing males, birds carrying nesting materials or food) were noted during the field assessment.

One Great Blue Heron (*Ardea herodias fannini*) was noted along the foreshore. This species is provincially blue-listed and listed as 'Special Concern' under Schedule 1 of the federal *Species at Risk Act*. Though observed just outside of the site along the foreshore, habitat within the site may provide suitable nesting for this species.

Pileated woodpecker (*Dryocopus pileatus*) excavations were abundant throughout the site. These excavations provide nesting habitat for a range of species including passerines, owls and ducks. A number of natural arboreal cavities were also noted that were suitable for larger ducks and owls (Attachment 2: Photo 4).

Mammals noted on the site included raccoon (*Procyon lotor*), mule deer (*Odocoileus hemionus*) and American black bear (*Ursus americanus*). One small den was observed (Figure 1), based on the size and location of the den, it is likely that of an American mink (*Neovision vision*).

The site hosts suitable denning, refuge and foraging for a range of wildlife as well as habitat connectivity to other greenways and protected areas to the north and south. The site also has a high likelihood of supporting species at risk based on the habitat requisites. Species considered to have a high likelihood of occurrence based on the habitat and professional knowledge of the area include: Northern Red-legged Frog (*Rana aurora*), Evening Grosbeak (*Coccothraustes vespertinus*), Band-tailed Pigeon (*Patagioenas fasciata*), Western Screech-owl

(*Megascops kennicotti kennicotti*), little brown myotis (*Myotis lucifugus*) and Townsend's big-eared bat (*Corynorhinus townsendii*).

3.2.3 Fish and Aquatic Habitat

The entire foreshore of the site was traversed and no streams were noted. However, one watercourse was observed originating from a culvert under the access road along west side of the northern property (Figure 1). A 600 mm culvert drains the road ditch on the landward side of the road and a channel is formed out of the culvert on the east side (Attachment 2: Photo 5).

The stream channel was only present for approximately 30 m then gradually degraded into a wide swath of uncontained surface flow. The water appears to infiltrate entirely and no channel was observed downslope.

It should be noted that the culvert is poorly installed, the downstream end is somewhat damaged and is hanging about 30 cm above the channel on the downstream side. It appears that the access road has altered the natural hydrology of the area.

No other wetlands or watercourses were observed during the field reconnaissance. There is a substantial stream along the southern boundary of the property (Figure 1) that is also not shown on the Habitat Wizard database.

4.0 Closure

The site hosts a red-listed ecosystem maturing coastal forest that has considerable value to wildlife as well as recreational opportunities. These values are accentuated by existing connectivity to other protected areas and green spaces including the Eagles Greenway and Eagles Drive Park to the west and south, respectively, and McLoughlin Park to the north. Habitat on the site appears to support an abundant and diverse community of breeding migratory birds. The habitat is also likely to support medium and large-bodied mammals for denning, refuge and forage as well as provide a travel corridor between other green spaces in the area.

We trust that the above meets your current requirements, should you have any questions or comments, please contact the undersigned.

Kim Poupard, R.P.Bio.
Calidris Ecological Services

Attachments: Attachment 1: Site overview
Attachment 2: Photo plates
Attachment 3: Data tables

References

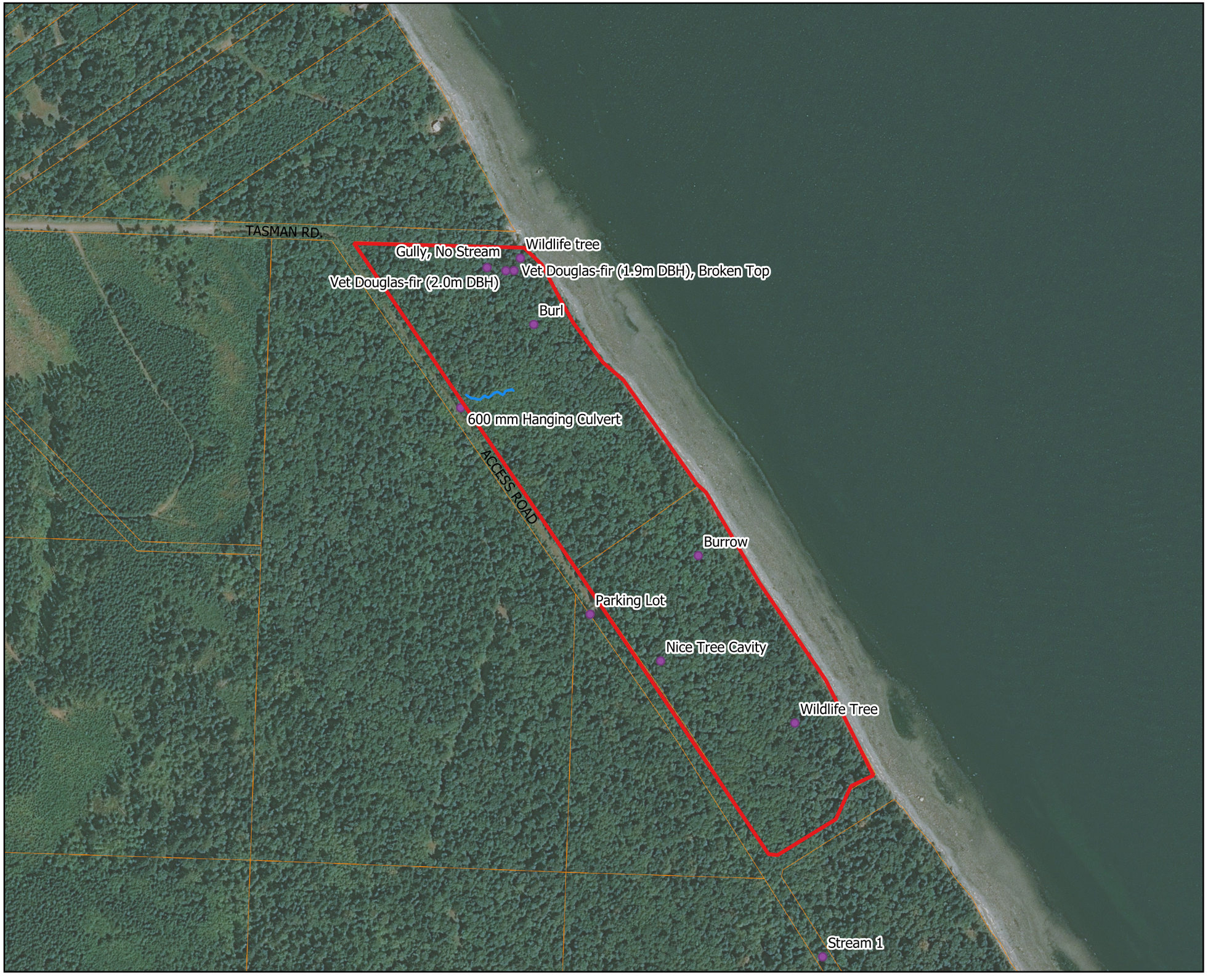
B.C. CDC (Conservation Data Centre). 2019. Conservation Status Report: Pseudotsuga menziesii / Polystichum munitum. B.C. Minist. of Environment. Available: https://a100.gov.bc.ca/pub/eswp/ (accessed Jun 6, 2022).

B.C. CDC (Conservation Data Centre). 2022. CDC iMap. Online database managed by the province of BC. Available at: http://maps.gov.bc.ca/ess/hm/cdc/ (accessed June 1, 2022).

iMap BC. 2022. Online mapping application managed by the province of BC. Available at: https://maps.gov.bc.ca/ess/hm/imap4m/ (accessed June 1, 2022).

Habitat Wizard. 2022. Online database maintained by the province of BC. Available online: https://www2.gov.bc.ca/gov/content/environment/plants-animals-ecosystems/ecosystems/habitatwizard (accessed June 1, 2022).

ATTACHMENT 1:
Site Overview Figure



LEGEND

- Assessment Area
- Stream Channel
- Observation

N

100 0 100 m

CALIDRIS Ecological SERVICES
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COMOX VALLEY REGIONAL DISTRICT

Project

ECOLOGICAL ASSESSMENT

Title

SITE OVERVIEW

Drawn: BL 22-06-07	Scale: 1:5000
Checked:	PROJECT: 2022-050
Approved:	**FIGURE: 1**

ATTACHMENT 2:
Photo Plates

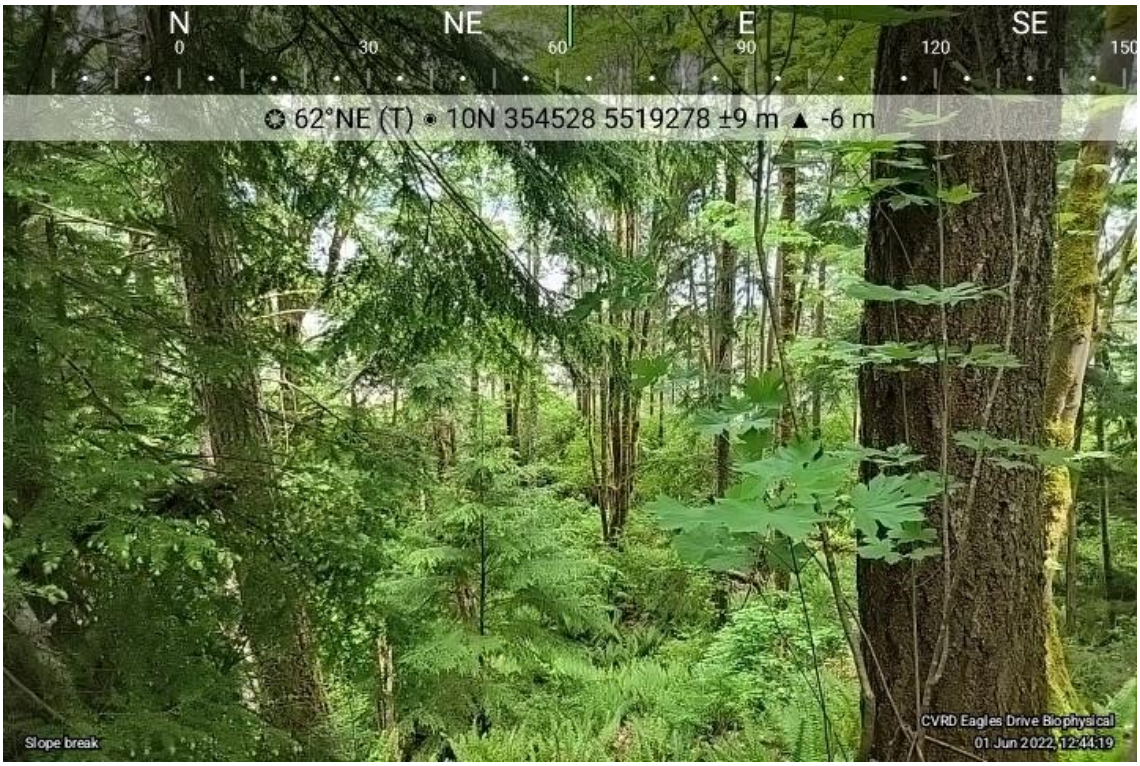

Photo 1. Showing representative habitat along the slope break (note the foreshore in the background). Note maturing Douglas-fir (right foreground), western hemlock (left) and sword fern understory.

Photo 2. Veteran old-growth Douglas-fir along the shoreline. Note the one in the foreground has a broken top, the one in the background (at center with a pistol-butted bole) appears to be intact. Both trees have DBHs of approximately 2 m.

Photo 3. Showing access road from the north of the properties. Note that a few weeds are present along the margins of this access and water is impounded in a ditch on the west (left) side.

Photo 4. Showing old wildlife tree with woodpecker excavations. This one is a bit decadent for current use, but a number of highly suitable wildlife trees and nest cavities were noted throughout the site.

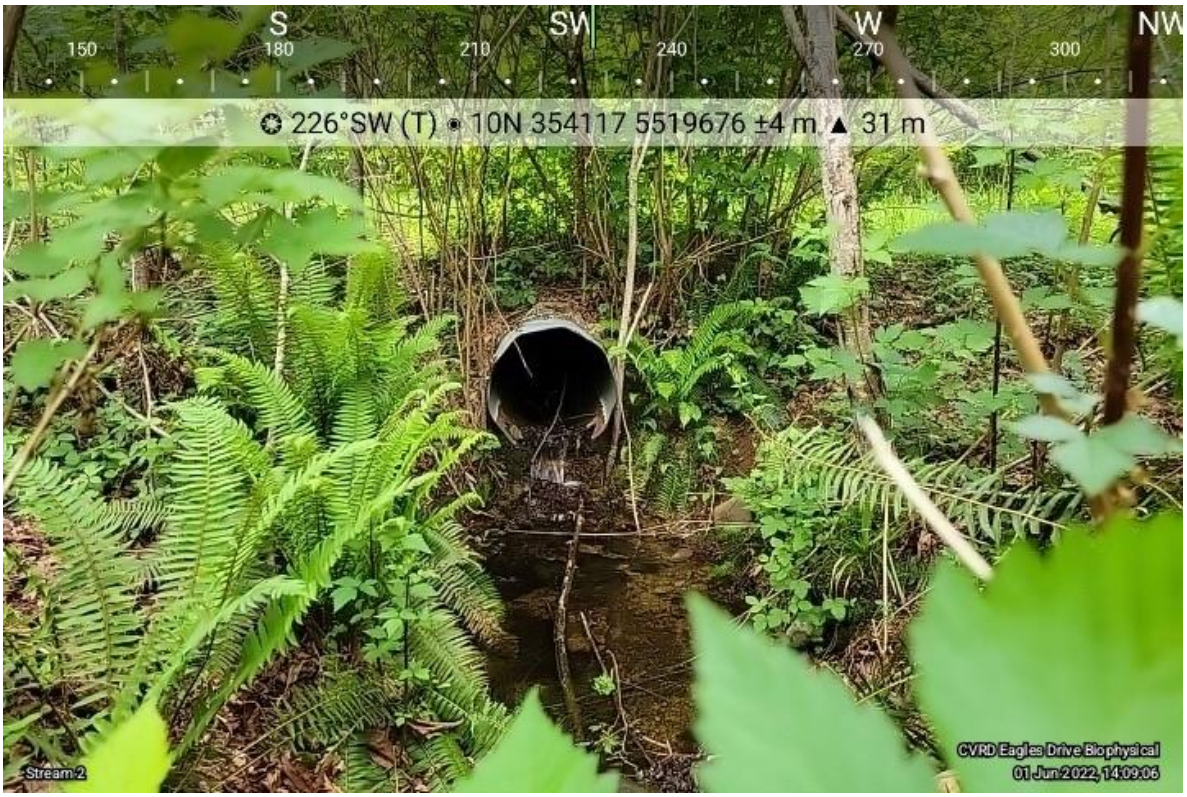

Photo 5. Hanging culvert that drains the road ditch. The channel is disconnected downstream and flows appear to entirely infiltrate into the ground.

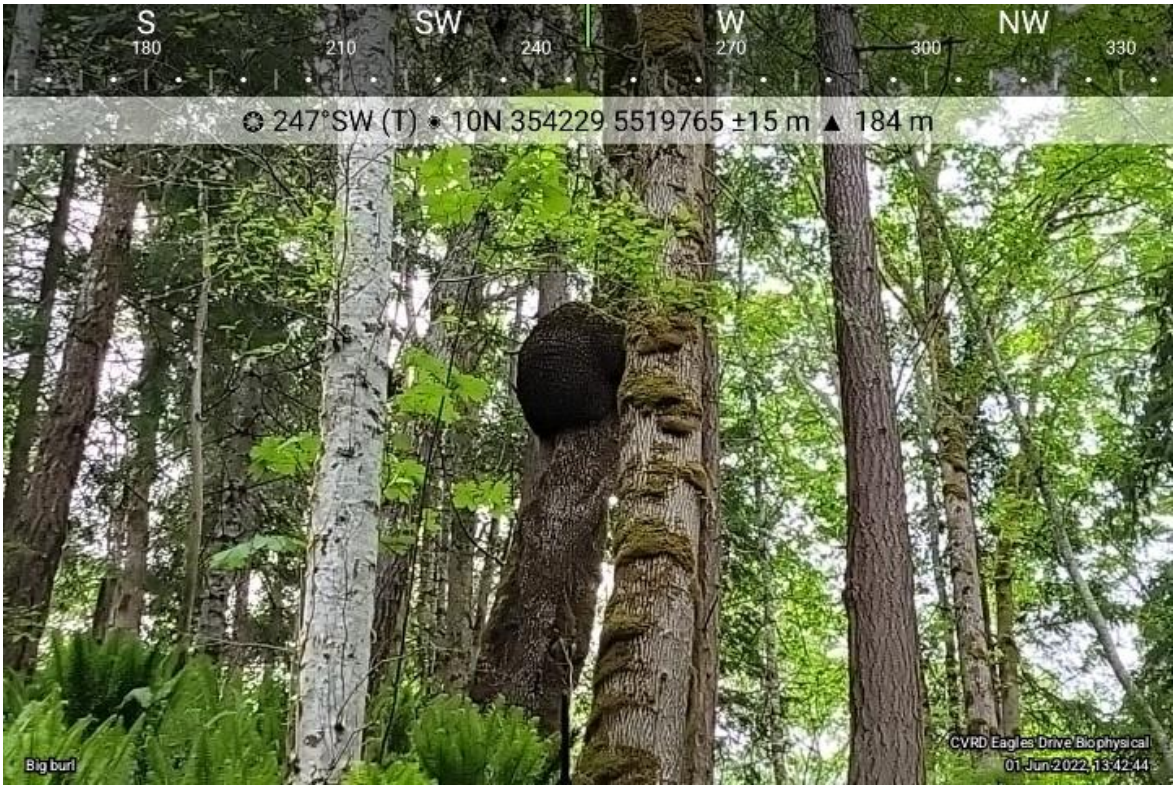

Photo 6. Large burl noted along the top of the slope break.

ATTACHMENT 3:
Data Tables

Table 1. Vegetation species observations on the site.

Layer	Common Name	Scientific Name	Designation		Ecosystem Unit		
			BC List	SARA	High Bench	Slope Break	Shoreline
Tree	Bigleaf maple	*Acer macrophyllum*	Yellow	-	✓	✓	✓
Tree	Red alder	*Alnus rubra*	Yellow	-	✓	✓	✓
Tree	Coast Douglas-fir	*Pseudotsuga menzesii*	Yellow	-	✓	✓	✓
Tree	Western hemlock	*Tsuga heterophylla*	Yellow	-	✓	✓	✓
Tree	Sitka spruce	*Picea sitchensis*	Yellow	-		✓	✓
Shrub	Salmonberry	*Rubus spectabilis*	Yellow	-	✓	✓	✓
Shrub	Red huckleberry	*Vaccinium parvifolium*	Yellow	-	✓	✓	✓
Shrub	Scouler's willow	*Salix scouleriana*	Yellow	-			✓
Shrub	Nootka rose	*Rosa nutkana*	Yellow	-			✓
Shrub	Oceanspray	*Holodiscus discolor var. discolor*	Yellow	-			✓
Shrub	Pacific ninebark	*Physocarpus capitatus*	Yellow	-			✓
Shrub	Coastal red elderberry	*Sambucus racemosa var. arborescens*	Yellow	-	✓	✓	✓
Shrub	snowberry	*Symphoricarpos albus*	Yellow	-			✓
Shrub	Salal	*Gaultheria shallon*	Yellow	-	✓	✓	✓
Shrub	Black gooseberry	*Ribes lacustre*	Yellow	-			✓
Shrub	Himalayan blackberry	*Rubus armeniacus*	Exotic	-	✓		✓
Shrub	Dull Oregon-grape	*Mahonia nervosa*	Yellow	-	✓	✓	
Shrub	English holly	*Ilex aquifolium*	Exotic	-	✓	✓	
Shrub	Cutleaf evergreen Blackberry	*Rubus laciniatus*	Exotic	-	✓		
Shrub	Scotch broom	*Cytisus scoparius*	Exotic	-	✓		
Herb	Miner's lettuce	*Claytonia perfoliata*	Yellow	-	✓		
Herb	Oxeye daisy	*Leucanthemum vulgare*	Exotic	-	✓		
Herb	Common tansy	*Tanacetum vulgare*	Exotic	-	✓		
Herb	Bull thistle	*Cirsium vulgare*	Exotic	-	✓		
Herb	Common comfrey	*Symphytum officinale*	Exotic	-	✓		
Herb	Sword fern	*Polystichum munitum*	Yellow	-	✓	✓	
Herb	Giant Vetch	*Vicia nigricans var. gigantea*	Yellow	-			✓

Herb	common foxglove	*Digitalis purpurea*	Exotic	-		✓
Herb	Broad-leaved starflower	*Lysimachia latifolia*	Yellow	-		✓
Herb	Siberian miner's-lettuce	*Claytonia sibirica*	Yellow	-	✓	✓
Herb	Little buttercup	*Ranunculus uncinatus*	Yellow	-		✓
Herb	Trailing blackberry	*Rubus ursinus*	Yellow	-	✓	✓
Herb	Bracken fern	*Pteridium aquilinum*	Yellow	-	✓	✓
Herb	Pathfinder	*Adenocaulon bicolor*	Yellow	-	✓	
Herb	Piggy-back plant	*Tolmiea menziesii*	Yellow	-		✓
Herb	Vanilla-leaf	*Achlys triphylla*	Yellow	-	✓	✓
Herb	Starwort	*Stellaria sp.*	n/a	-		✓
Herb	Sweet-scented bedstraw	*Galium triflorum*	Yellow	-		✓
Herb	Cleavers	*Galium aparine*	yellow	-		✓
Herb	Three-leaved foamflower	*Tiarella trifoliata*	Yellow	-		✓
Bryophyte	Knight's plume	*Ptilium crista-castrensis*	Yellow	-	✓	

Notes: SARA = Species at Risk Act

Table 2. Wildlife observations

Group	Common Name	Scientific Name	BC List	SARA	Method of Detection
Bird	American Robin	*Turdus migratorius*	Yellow	-	Observed
Bird	Anna's Hummingbird	*Calypte anna*	Yellow	-	Observed
Bird	Bald Eagle	*Haliaeetus leucocephalus*	Yellow	-	Observed
Bird	Bewick's Wren	*Thryomanes bewickii*	Yellow	-	Song
Bird	Chestnut-backed Chickadee	*Poecile rufescens*	Yellow	-	Song
Bird	Common Raven	*Corvus corax*	Yellow	-	Observed
Bird	Common Yellowthroat	*Geothlypis trichas*	Yellow	-	Song
Bird	Dark-eyed Junco	*Junco hyemalis*	Yellow	-	Song
Bird	Glaucous-winged Gull	*Larus glaucescens*	Yellow	-	Observed
Bird	Golden-crowned Kinglet	*Regulus satrapa*	Yellow	-	Song
Bird	Great blue heron	*Ardea herodias fannini*	Blue	SC	Observed
Bird	Hairy Woodpecker	*Dryobates villosus*	Yellow	-	Song
Bird	Hammond's Flycatcher	*Empidonax hammondii*	Yellow	-	Song
Bird	Killdeer	*Charadrius vociferus*	Yellow	-	Song
Bird	Northwestern Crow	*Corvus brachyrhynchos*	Yellow	-	Observed
Bird	Pacific Wren	*Troglodytes pacificus*	Yellow	-	Song
Bird	Pileated Woodpecker	*Dryocopus pileatus*	Yellow	-	Sign
Bird	Pine Siskin	*Spinus pinus*	Yellow	-	Song
Bird	Spotted Towhee	*Pipilo maculatus*	Yellow	-	Song
Bird	Swainson's Thrush	*Catharus ustulatus*	Yellow	-	Observed
Bird	Townsend's Warbler	*Setophaga townsendi*	Yellow	-	Song
Bird	Varied Thrush	*Ixoreus naevius*	Yellow	-	Song
Bird	Warbling Vireo	*Vireo gilvus*	Yellow	-	Song
Bird	White-crowned Sparrow	*Zonotrichia leucophrys*	Yellow	-	Song
Bird	Yellow-rumped Warbler	*Setophaga coronata*	Yellow	-	Song
Invert	Arion sp.	*Arion sp.*	Exotic	-	Observed
Invert	Brown Gardensnail	*Helix aspersa*	Exotic	-	Observed
Invert	Pacific bananaslug	*Ariolimax columbianus*	Yellow	-	Observed
Mammal	American Black Bear	*Ursus americanus*	Yellow	-	Scat
Mammal	Garter Snake	*Thamnophis*	Yellow	-	Observed
Mammal	Mule Deer	*Odocoileus hemionus*	Yellow	-	Track
Mammal	Raccoon	*Procyon lotor*	Yellow	-	Observed

Notes: SARA = Species at Risk Act, SC = Special Concern