Attachment D

sartori
ASSESSMENT | PLANNING | COMPLIANCE

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2180 Shawnigan Lake Road – Easter Seals Camp

Environmental Overview Assessment Report

Prepared for:
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1 Introduction

Sartori Environmental Inc. (SEI) has been retained by Easter Seals BC/Yukon (the "Owner"), property owner of 2180 Shawnigan Lake Road, in Shawnigan Lake, BC (the "Subject Property" and the "Site") to provide this an Environmental Overview Assessment Report (EOA Report). This report sets out to assess environmental values on the Site and identify potential environmental constraints linked to redevelopment.

The purpose of this report is to:

- Provide an assessment of valuable environmental features and conditions found on the Site;
- Identify wildlife, ecosystems, and plants of special management concern potentially present on the Subject Property; and
- Outline potential development constraints related to the identified environmental components and applicable bylaw regulations.

2 Subject Property Location and Description

The Subject Property is located on the east shore of Shawnigan Lake and extends from the lake foreshore west to the Esquimalt & Nanaimo Railway rail line and Old Baldy Mountain Park (Figure 1). The Subject Property has a total area of 6.64 ha. Due to the size of the Subject Property and distinctive landscape features, the assessment was separated into two components as follows:

- The "Lakeside Area":
    - Extends from the Shawnigan Lake foreshore east to Shawnigan Lake Road.
    - Is comprised of two legal lots with an area of 1.67 ha.
    - Contains the buildings and infrastructure that make up the Easter Seals Camp.
- The "Upland Area":
    - Extends from Shawnigan Lake Road east to the Esquimalt & Nanaimo Railway rail line.
    - Is comprised of seven legal lots with an area of 4.97 ha.
    - Primarily contains sports fields and undeveloped forested areas.

Figure 1: Subject Property with Lakeside Area west of Shawnigan Lake Road and Upland Area to the east (Source: Imap BC, Accessed November 2021).

3 Regulatory Background

3.1 Development Permit Areas

The Subject Property lies within the following Cowichan Valley Regional District (CVRD) Development Permit Areas (DPAs):

- Riparian Protection (DPA 1).
- Sensitive Ecosystem Protection (DPA 2).
- Aquifer Protection (DPA 4).
- Wildfire Hazard (DPA 5).

This EOA Report sets out to determine the potential constraints as imposed by the Riparian Protection and Sensitive Ecosystem Protections DPAs. Additional QEP assessment will be required to satisfy the requirements of the Aquifer Protection and Wildfire Hazard DPAs.

3.1.1 Riparian Protection DPA

The primary purpose of the Riparian Protection DPA is to protect riparian areas from development so that those areas can provide the natural features, functions and conditions that support fish life processes.

The area included in the Riparian Protection DPA is the Riparian Assessment Area (RAA) as defined by the *Riparian Areas Protection Regulation* under the Riparian Areas Protection Act (RAPR). The RAA consists of 30-m setback from stream boundary (or highwater mark) of a stream as defined in the RAPR.

Under the DPA, a QEP is required to conduct a RAPR Detailed Assessment to assess aquatic resources on the Site. Once a stream is identified, a Streamside Protection and Enhancement Area (SPEA) is established and protected from development. The RAPR process prescribes measures to protect the SPEA during and following development. The QEP provides a RAPR Detailed Assessment Report which is submitted to BC's Ministry of Forests, Lands, Natural Resource Operations and Rural Development for review.

This EOA Report sets out to identify streams under RAPR on the Subject Property and estimate the applicable SPEAs.

3.1.2 Sensitive Ecosystem Protection DPA

The objective the Sensitive Ecosystem Protection DPA is to protect rare and fragile ecosystems from development. Maintaining the natural diversity of a region's ecosystems is vital to slowing or preventing species extirpations and extinctions and to maintaining natural resilience for the future.

The area included in the Sensitive Ecosystem Protection DPA is identified in sensitive ecosystem mapping carried out by the Province and Madrone Environmental Services as detailed in the CVRD's Schedule C – Development Permit Areas (July 2021) document.

3.2 Zoning Bylaw No. 985

In addition to the DPA requirements, the following applies to watercourses as per CVRD Zoning Bylaw No. 985:

- No dwelling shall be located within 15 metres of the highwater mark of a watercourse or a lake.

As defined in the bylaw:

- "Watercourse" means a depression with a bed 0.6 metres or more below the natural elevation of surrounding land: serving to give direction to a current of water for an average of at least six months of a year according to records kept by the Government of British Columbia; or having a drainage area of two square kilometers or more.

3.3 Invasive Species Bylaw

The CVRD has a strategy for invasive plant management including a bylaw, inventory, removal strategy for key species and a public awareness campaign.

CVRD Bylaw No. 3966 "Bylaw to Control Specified Noxious Weeds", to enforce the removal and prohibit the spread of specified invasive plants. Currently, giant hogweed (*Heracleum mantegazzianum*) is prohibited under the bylaw. In addition to giant hogweed, spurge laurel (*Daphne laureola*) and poison hemlock (*Conium maculatum*) are identified as key invasive plants for control within the region.

4 Existing Conditions

The existing conditions component of this document provides an assessment of aquatic and terrestrial habitats, and an overview of publicly available environmental information, focusing on potentially present, or documented presence of species of management concern.

4.1 Methodology

SEI conducted field investigations on October 12 and 13, 2021. The purpose of these investigations was not to provide an exhaustive list of all the plant and wildlife species present, but rather to gain an understanding of the habitat conditions and potential species of management concerns present in the area.

Vegetation present on site was identified through direct observation of plant features. Pictures of specimens requiring further identification were taken, as necessary. Dominant tree, shrub, and flowering plant species were recorded along with the stage of ecological succession and potential presence of invasive and noxious weeds.

The presence of potential nesting cavities, bat roosting areas, and small and large mammal dens in living or dead trees was assessed. Bird species were identified through direct visual (i.e., with binoculars) and auditory surveys, and the presence of old nests was recorded as evidence of bird use of the area. Potential presence of other wildlife, such as mammals and amphibians, was recorded through visual observation of adult or juvenile specimens, identification of animal tracks, grazing evidence, feces, or old egg masses

Field investigations were supplemented by a desktop assessment consisting of an area-based literature search of the following databases and information resources:

- Province of BC Conservation Data Centre (BCCDC) *Species and Ecosystems Explorer* (SEE) and *iMap*;
- Province of BC *Habitat Wizard*;
- *E-Flora BC* and *E-Fauna BC*;
- *Google Earth*; and
- Cowichan Valley Regional District *Web Map* tool.

4.2 Biophysical Description

The Subject Property is located on the shore of Shawnigan Lake, between 120 to 155 m of elevation, and lies within the Georgia Depression Ecoprovince, Eastern Vancouver Island Ecoregion, the Nanaimo Lowland Ecosection, and the Coastal Western Hemlock very dry maritime biogeoclimatic zone – Eastern Variant (CWHxm1). On Vancouver Island, the CWHxm1 subzone occurs along major valleys from Nimpkish Valley to Cowichan Valley. Climate is characterized by warm, dry summers and moist, mild winters with relatively little snowfall. The growing season is long and typically features water deficits. Undisturbed forests are dominated by Douglas fir (*Pseudotsuga douglasii*) and western hemlock (*Tsuga heterophylla*), with minimal presence of western redcedar (*Thuja plicata*). The understorey is generally dominated by salal (*Gaultheria shallon*), dull Oregon-grape (*Mahonia nervosa*), and red huckleberry (*Vaccinium*

parvifolium), with vanilla-leaf (*Achlys triphylla*), sword fern (*Polystichum munitum*) twinflower (*Linnaea borealis*), and bracken fern (*Pteridium aquilinum*) less commonly present[1].

4.3 Native Vegetation

Native vegetation found in the Lakeside Area is summarized as follows:

- Landscaped areas, shrubs and sparse mature tress dominate the area. Naturally vegetated areas are sparse and dispersed due to the footprint of the existing Easter Seals Camp building and infrastructure.
- Partially vegetated rocky outcrop areas are found in the central and south potion of the Lake Side Area. The rocky outcrop areas primarily contain bracken fern, snowberry (*Symphoricarpos albus*) and bigleaf maple (*Acer macrophyllum*).
- Mature trees; bigleaf maples, black cottonwoods (*Populus trichocarpa*), western redcedars and Douglas firs, are present along the northern and southern extents of the Lakeside Area. These tree species are also found throughout the central portion of the area, along with shore pine (*Pinus contorta ssp. contorta*), but in small isolated groups or standing alone.
- Vegetation along the Shawnigan Lake foreshore is comprised of a maintained lawn area with patches of sweet gale (*Myrica gale*), sedge (*Carex* spp.) and immature black cottonwood trees.

Native vegetation found in the Upland Area is summarized as follows:

- The north and east portions of the area contain mature deciduous forest heavily dominated by bigleaf maple with an understory of sword fern. In these forested areas, less common species include, western redcedar, salal, dull Oregon-grape and vanilla-leaf.
- The west and central portions of the area contain large sports fields with maintained grass bordered by shrubs and some mature trees.

4.4 Invasive Plants

Invasive plants found in the Lakeside Area include Scotch broom (*Cytisus scoparius*), English ivy (*Hedera helix*), and Himalayan blackberry (*Rubus armeniacus*). Infestations were primarily observed along the northern extent of the Lakeside Area, around the arts building, and on some rocky outcrops in the west portion of the area. A variety of ornamental plant species were also present in the landscaped areas.

Invasive plants were found in the Upland Area. Northeast of the north sports field, a historically cleared area has been revegetated with a large patch of Himalayan blackberry. Additional occurrences of Himalayan blackberry were found west and southeast of the clearing concentrated on the banks of the nearby watercourse. Several English holly (*Ilex aquifolium*) plants and one spurge laurel plant were identified in the forested areas. Cutleaf evergreen blackberry (*Rubus laciniatus*), wall lettuce (*Mycelis muralis*), common periwinkle (*Vinca minor*) and Robert's geranium (*Geranium robertianum*) were observed in patches of ground cover east of the sports fields.

[1] Field guide to site identification and interpretation for the Vancouver Forest Region. Research Branch, Ministry of Forests. Available from: https://www.for.gov.bc.ca/hfd/pubs/docs/lmh/lmh28.pdf

4.5 Wildlife and Wildlife Habitat

The eastern shore of Shawnigan Lake is mostly comprised of rural residential properties, within a second-growth forest setting. Two large, forested areas remain on the west slopes of Old Baldy Mountain and Mount Wood, which provide cover and space for a variety of wildlife. The following sections summarize the habitat values observed on the Site.

4.5.1 Lakeside Area

Wildlife habitat in the Lakeside Area is summarized as follows:

- The dense shrubs offer suitable cover and foraging for a variety of passerine birds, but also amphibious mammals such as American minks and river otters, which have been observed in the past by the residents (Dave Thibault pers. comm.). The presence of large voids and deck overhang on the currently occupied dwelling, closest to the water, offers some potential cover and denning opportunity for these members of the weasel family.
- A small sandy beach area is present in the north-western corner of the Lakeside Area, which is used as a boat launch. The substrate could potentially be suitable for turtles but the surrounding disturbance and deep water make turtle presence unlikely.
- A large opening in the floor of the tower, associated with little use due to the dilapidated state of the structure, represents a suitable roosting opportunity for a variety of bat species, including the little brown myotis, (building roosters). Most other buildings were observed to have screens on openings or lacked access to suitable roosting sites (e. g., attics). Full-time residents of the Subject Property confirmed the presence of unidentified bat species seen flying above the water during summer nights (Dave Thibault, pers. comm.).
- Evidence of rabbit and ungulate presence in the area was confirmed in the area through the observation of droppings and a deer carcass found during field investigations.
- No raptor nests or obvious cavities in trees were observed during field investigations as most mature trees were in good health. Tree height and dense canopy did not allow for a thorough assessment of cavities or smaller stick nests.
- Several crevices were identified within the undeveloped areas and rocky outcrops throughout the site, offering some potential denning opportunity for a variety of small mammals such as mice and voles.

4.5.2 Upland Area

Wildlife habitat in the Upland Area is summarized as follows:

- The mature deciduous forested areas north and east of the sports fields provide wildlife habitat, these areas:
    - Contain suitable cover, security and food for both small and large mammals. No evidence of mammal activity was observed in the forested areas.
    - Offer suitable habitat for songbirds and but limited nesting opportunities for raptors.
    - Contain several western redcedar trees with evidence of woodpecker use (feeding cavities).

  - Have a limited amount of coniferous trees and trees with loose bark resulting in few suitable roosting sites for bats. One split bigleaf maple tree was observed with the potential for bat roosting.
  - Do not contain an abundance of large woody debris but contain adequate cover for amphibian species such as the western red-backed salamander (*Plethodon vehiculum*).
- A pond (the "Upland Area Pond") was identified at the north extent of the Upland Area. The pond offers suitable breeding habitat for amphibians.
- No raptor nests or obvious cavities in trees were observed during field investigations as most mature trees were in good health. Tree height and dense canopy did not allow for a thorough assessment of cavities or smaller stick nests.
- Ample foraging habitat for black-tailed deer (*Odocoileus hemionug columbianus*) exists in the Upland Area.

4.6 Aquatic Resources

The Subject Property is situated on the east shore of Shawnigan Lake. The lake is approximately 7.2 km long and 1.4 km across and outflows to Shawnigan Creek at the north end of the lake. The Site is not situated near to any of the prominent lake tributaries or other large streams. The following sections describe aquatic resources observed during the field assessments.

4.6.1 Lakeside Area

- Natural drainage patterns in the Lakeside Area have been historically altered with the development of the Easter Seals Camp. The area contains a rudimentary stormwater system.
- One watercourse (the "Lakeside Area Watercourse") was observed in the central portion of the north boundary of the Lakeside Area. The Lakeside Area Watercourse was observed to be fed by a stormwater system on the Site and flow to the north-adjacent property. The channel was observed to be flowing during the site inspections and SEI followed the channel north where flow was observed to infiltrate to ground approximately 30m from the Site boundary. In SEI's opinion, the Lakeside Area watercourse does not have surface connection to nearby watercourses to the north or to Shawnigan Lake.
- The Shawnigan Lake foreshore provides fish cover habitat with three areas offering overhanging shrubs. The remaining foreshore is rock and small sandy beach. Limited potential spawning habitat was observed.

4.6.2 Upland Area

- A search of *Habitat Wizard* did not reveal any watercourses on or near the Upland Area. The CVRD *Web Map* displays a watercourse originating in Old Baldy Mountain Park, flowing west through the northeast portion of the Upland Area and ending in Shawnigan Lake on the north of the Site. The mapping shows a branch of this watercourse flowing south and then west through the Upland Area and on to the south adjacent properties. SEI was not able to locate the watercourses as shown on CVRD *Web Map.*
- A watercourse ("the Unnamed Watercourse") was identified in the Upland Area. Characteristics of the Unnamed Watercourse are summarized as follows:

  - The watercourse originates at a culvert under the rail line at the east boundary of the Upland Area. The Unnamed Watercourse flows west to the perimeter of the sports fields, then northwest to a culvert passing under Shawnigan Lake Road. SEI was not able to follow the watercourse downstream due to restricted access to private property, it is assumed the Unnamed Watercourse discharges to Shawnigan Lake.
  - The Unnamed Watercourse has a length of approximately 225 m. The channel has an average width of 1.7m. Where the watercourse leads down from the rail line culvert to the sports fields it has a steep gradient of 16% to 40%. From the sports fields to the west culvert, the gradient is generally low, approximately 2%, and then steepens to between 9% and 10% as it nears Shawnigan Lake Road.
  - The Unnamed Watercourse has variable substrate with angular rock and gravel found in its upstream portion neat the rail line, organic material, sand and gravel in the low-gradient sections near the sports fields and cobble and gravel in the downstream section near Shawnigan Lake Road.
  - No aquatic fauna was observed in the Unnamed Watercourse. Based on professional opinion, the watercourse is not likely to be fish-bearing due to the low quality of instream habitat and likely seasonal flow, however, the watercourse provides food/nutrients to downstream fish habitat.
- A tributary ("Tributary 1") to the Unnamed Watercourse was identified with headwaters at the Upland Area Pond and slope in the northeast corner of the Upland Area. Tributary 1 has a length of approximately 62 m, an average channel width of 1.5m and an average gradient of 6.5%. The substrate was observed to be primarily gravel and organic material.
- A headwater area at the base of a steep forested slope was observed in the east central portion of the Upland Area that feeds a channel (the "Perimeter Channel") that then connects to the Unnamed Watercourse. The headwater area is approximately 1100m2 in area and the Perimeter Ditch is approximately 75 m long with an average gradient of 3%.
- A ditch (the "Roadside Ditch") runs south to north between the Upland Area and Shawnigan Lake Road for approximately 90 m. The Roadside Ditch connects to the Unnamed Watercourse at the Shawnigan Lake Road culvert crossing. The ditch was observed to be dry during the Site inspection and not contain significant headwaters.

5 Species of Management Concern

5.1 Background

For this assessment, species of management concern are considered:

- Schedule 1-listed endangered and threatened species under the *Canada Species at Risk Act* (SARA) and the Committee on the Status of Endangered Wildlife in Canada (COSEWIC);
- Red- and blue-listed species under the *BC Wildlife Act*, and
- Identified Wildlife listed on the Order – Category of Species at Risk of the Identified Wildlife Management Strategy under provisions of the Province of BC *Forest and Range Practices Act*.

The potential for these listed species to be present on the Site is based on whether the Site provides suitable habitat that fulfils any needs of the species' life stages. Potential presence is based on SEI's professional opinion and publicly available sources of species-specific information.

Under the *BC Wildlife Act*, all non-exempted vertebrate species are protected, and under SARA, all listed wildlife and vegetation species are protected. Legislated Critical Habitats, deemed to be necessary for the survival or recovery of listed extirpated, endangered, or threatened species, and identified as Critical Habitat in a recovery strategy or action plan, is protected on Federal lands. It is the responsibility of provinces to enact legislative protection for Critical Habitats, such as establishing Wildlife Habitat Areas. The Accord for the Protection of Species at Risk (1996) and the Canada-British Columbia Agreement on Species at Risk (2005) empowers the province and local governments to prevent the up-listing of any species listed in the SARA through specific protections and the establishment of DPAs

5.2 Methodology

An area-based search for known occurrence of fish, wildlife, plant species, and habitat of management concern listed under the Canada *Species at Risk Act* (SARA), the *Committee on the Status of Endangered Wildlife in Canada* (COSEWIC) as *Special Concern* (SC), *Threatened* (T), or *Endangered* (E), and by the province of British Columbia, as *red-* or *blue-listed*, was conducted for a study area within a 2 km radius of the Site, using the *BC Conservation Data Centre (BCCDC) iMap* tool (Figure 2).

A more general query of the species of management concern potentially present within the study area was conducted by an area-based search using the BC Ministry of Environment's *BC Species and Ecosystems Explorer* (BCSEE). Subsequently, the potential presence of these listed species within the Subject Property was determined based on a desktop review of available data regarding species distribution range, known breeding sites, ecological and biological requirements, and QEP's professional judgement based on the information collected during the field assessment.

CVRD *Web Map* was reviewed with the "Development Permit Areas (Schedule U)" layer enabled.

5.3 Results

The sections below summarize the results of the species of management concern assessment.

5.3.1 Wildlife

A query of the BC CDC iMap tool did not return any gazetted species of management concern or their Critical Habitat within 2 km of the Subject Property (Figure 2).

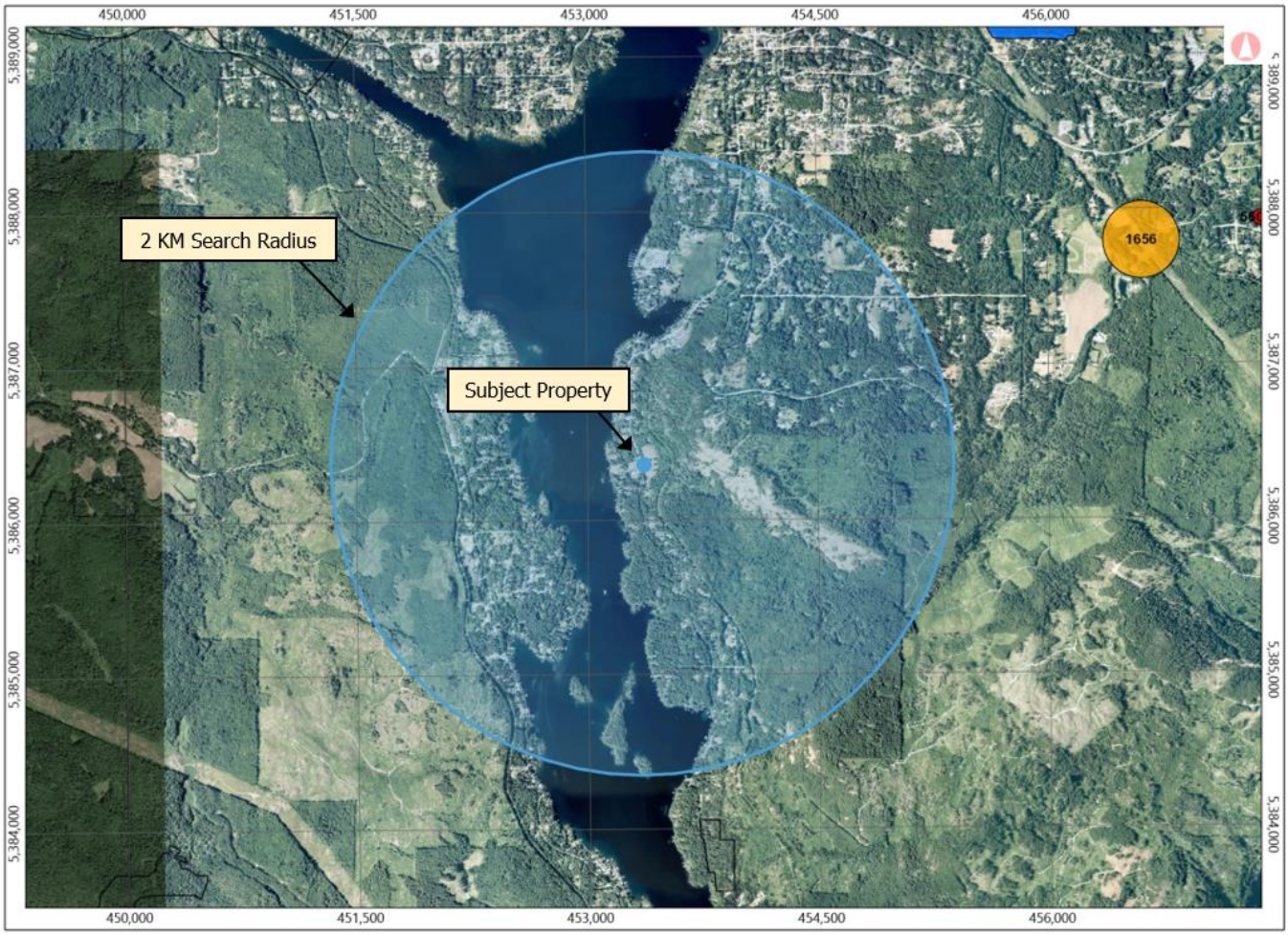

Figure 2. BC CDC search area for the Subject Property and publicly available data (Source: BCCDC iMap; accessed 30 November 2021).

A habitat-based search using the BCCDC SEE database was conducted to determine wildlife species potentially present at the Site; results are provided in Table 1 below. Species identified as having a moderate to high potential of presence on the Site are further discussed in the **Potential Occurrences** section below. Species with a negligible potential presence rating (*e.g.,* fish species on strictly terrestrial habitat) were omitted from the list.

Table 1: Federally and Provincially listed wildlife species potentially present within the Subject Property (Source: BC Species and Ecosystems Explorer, Accessed December 3, 2021).

		Classification			
Common Name	**Scientific Name**	**Provincial ***	**COSEWIC ****	**SARA ****	**Potential Presence Rating*****
Northern Goshawk, *laingi* subspecies	*Accipiter gentilis laingi*	Red	T (2013)	1-T (2003)	Low
Western Grebe	*Aechmophorus occidentalis*	Red	SC (2014)	1-SC (2017)	Low
Oregon Forestsnail	*Allogona townsendiana*	Red	E	1-E (2005)	Moderate
Western Toad	*Anaxyrus boreas*	Yellow	SC (2012)	1-SC (2018)	Moderate
Wandering Salamander	*Aneides vagrans*	Blue	SC (2014)	SC (2018)	Moderate

Common Name	Scientific Name	Classification			Potential Presence Rating***
		Provincial *	COSEWIC **	SARA **	
Great Blue Heron, *fannini* subspecies	*Ardea herodias fannini*	Blue	SC (2008)	1-SC (2010)	Moderate
Rough-legged Hawk	*Buteo lagopus*	Blue	NAR (1995)	-	Low
Marbled murrelet	*Brachyramphus marmoratus*	Blue	T (2012)	1-T (2003)	Low
Brant	*Branta bernicla*	Blue	-	-	Low
Roosevelt Elk	*Cervus elaphus roosevelti*	Blue	-	-	Low
Common Nighthawk	*Chordeiles minor*	Yellow	SC (2018)	1-T (2010)	Moderate
Painted Turtle – Pacific Coast Population	*Chrysemys picta* pop. 1	-	E/SC	1-E/SC (2007)	Low-Moderate
Evening Grosbeak	*Coccothraustes vespertinus*	Yellow	SC (2016)	1-SC (2019)	Moderate
Sharp-tailed Snake	*Contia tenuis*	Red	E (2009)	1-E (2003)	Low
Olive-sided Flycatcher	*Contopus cooperi*	Blue	SC (2018)	1-T (2010)	Moderate
Townsend's Big-eared Bat	*Corynorhinus townsendii*	Blue	-	-	Moderate
Peregrine falcon	*Falco peregrinus*	-	NAR	-	Low
Northern Pygmy-owl *swarthi* subspecies	*Glaucidium gnoma swarthi*	Blue	-	-	Moderate
Western Screech-Owl, *kennicottii* subspecies	*Megascops kennicottii kennicottii*	Blue	T (2012)	1-T (2005)	Moderate
Ermine, *anguinae* subspecies	*Mustela erminea anguinae*	Blue	-	-	Low
Little Brown Myotis	*Myotis lucifugus*	Yellow	E (2013)	1-E (2014)	Moderate
Band-tailed Pigeon	*Patagioenas fasciata*	Blue	SC (2008)	1-SC (2011)	Low
Vesper Sparrow, *affinis* subspecies	*Pooecetes gramineus affinis*	Red	E (2018)	1-E (2007)	Low
Northern Red-legged Frog	*Rana aurora*	Blue	SC (2015)	1-SC (2005)	Moderate
Western Water Shrew, brooksi subspecies	*Sorex navigator brooksi*	Blue	-	-	Moderate

* Red: Endangered or Threatened; Blue: Special Concern; Yellow: Least Risk.
** E: Endangered; T: Threatened; SC: Special Concern; NAR: Not at Risk.
*** Potential presence rating given by endorsing Professional Biologist.

5.3.2 Vegetation

No documented occurrences of plant species of management concern are reported by the BC CDC iMap at or near the Subject Property. A habitat-based search using the BCCDC SEE database was conducted to determine plant species potentially present at the Site; results are provided in Table 2 below:

Table 2: Federally and provincially listed plant species potentially present within the Subject Property (Source: BC Species and Ecosystems Explorer, Accessed December 3, 2021).

Common Name	Scientific Name	Classification			Potential Presence Rating***
		Provincial *	COSEWIC **	SARA **	
slimleaf onion	*Allium amplectens*	Blue	-	-	Low-moderate
deltoid balsamroot	*Balsamorhiza deltoidea*	Red	E	1-E (2003)	Low-moderate

Common Name	Scientific Name	Classification			Potential Presence Rating***
		Provincial *	COSEWIC **	SARA **	
Vancouver Island beggarticks	*Bidens amplissima*	Blue	SC	1-SC (2003)	Low-moderate
wine-cup clarkia	*Clarkia purpurea* ssp. *quadrivulnera*	Red	-	-	
Washington springbeauty	*Claytonia washingtoniana*	Red	-	-	Low-moderate
rough-leaved aster	*Eurybia radulina*	Red	-	-	Low-moderate
common blue cup	*Githopsis specularioides*	Blue	-	-	Low-moderate
Macoun's meadow-foam	*Limnanthes macounii*	Red	T	1-T (2006)	Low-moderate
white meconella	*Meconella oregana*	Red	E	1-E (2006)	Low-moderate
white-lip rein orchid	*Platanthera ephemerantha*	Blue	-	-	Low-moderate
leafless wintergreen	*Pyrola aphylla*	Blue	-	-	Low-moderate
purple sanicle	*Sanicula bipinnatifida*	Red	T	1-T (2003)	Low-moderate
white-top aster	*Sericocarpus rigidus*	Blue	SC	1-SC (2003)	Low-moderate
small-flowered tonella	*Tonella tenella*	Blue	E	1-E (2005)	Low-moderate
Howell's triteleia	*Triteleia howellii*	Red	E	1-E (2005)	Low-moderate
Lindley's microseris	*Uropappus lindleyi*	Red	E	1-E (2010)	Low-moderate
Howell's violet	*Viola howellii*	Red	-	-	Low-moderate
giant chain fern	*Woodwardia fimbriata*	Blue	-	-	Low-moderate

* Red: Endangered or Threatened; Blue: Special Concern; Yellow: Least Risk.
** E: Endangered; T: Threatened; SC: Special Concern; NAR: Not at Risk.
*** Potential presence rating given by endorsing Professional Biologist.

No listed plant species or plant communities were observed on the Site during the field assessments.

5.4 Potential Occurrences

Certain wildlife species have a moderate to high potential presence rating and deserve further consideration. All of the at risk plant species have been assigned a low to moderate potential presence rating. None of the plants listed were observed during the site assessments.

The following sections discuss the wildlife species assigned a moderate to high potential presence rating for the Site. The scope of potential development/redevelopment on the Site is unknown at this time; therefore, specific mitigation measures for the protection of the at-risk species are not addressed in this EOA Report. Further at-risk species potential presence assessment and mitigation measures will be required in subsequent reporting once development details are known.

5.4.1 Little brown myotis and Townsend's big-eared bat

Little brown myotis (*Myotis lucifugus*) is yellow-listed provincially and listed as Endangered under Schedule 1 of SARA. The little brown myotis is one of the most widespread and abundant bat species in Canada and has been observed in most provinces and territories south of the tree line. This species uses a variety of natural and man-made features to roost, including buildings, bat boxes, tree cavities, loose bark, and crevices in cliffs and talus slopes (BC Ministry of Environment and Climate Change Strategy, 2019). Minimum crevice opening of 1-2cm and depth of 15cm are required for summer rock roosts. Males and

females typically roost separately outside of the mating season and the females raise their young in sometimes large maternity roosts while males typically roost individually or in small groups. Although most bat species are known to typically overwinter in caves, old mines or buildings, smaller colonies have been shown to use rock crevices in cliffs or talus slopes, including the little brown myotis (Neubaum, 2018).

Townsend's big-eared bat (*Corynorhinus townsendii*) is blue-listed provincially but it is not listed under SARA. This species is sparsely distributed throughout southern BC, from Vancouver Island to Cranbrook, BC, and as far north as Williams Lake (Nagorsen, 1993; E-Fauna BC, 2021). Females commonly form nursery colonies of up to 200 individuals, but solidary pregnant females have also been recorded additionally, they can hibernate alone or in groups. Summer maternity colonies are typically within old building where winter hibernacula are typically in caved and/ or mines (BC MOE, 1998). The sheds and garage structures on the Subject Property may provide summer roost sites. No work will occur at night and therefore interference with foraging is unlikely. Mitigation around the potential for roosting habitat is discussed in the Construction Mitigation Section of this report.

The mature trees and buildings on and around the Subject Property have the potential to provide summer bat roosting habitat. In particular, the abandoned fire watch tower in the northwest portion of the Lakeside Area was observed to have a large opening and have the potential to support roosting bats. Shawnigan Lake provides opportunities for bat foraging.

5.4.2 Western water shrew

Western water shrews prefer habitat in coniferous forests, particularly in or under overhanging banks or crevices and in voids found in coarse woody debris. This species is semi-aquatic and uses slow-moving creeks and/or wetlands, whether permanent or temporary, to support foraging activities. Specimens are usually captured within 25 m of waterbodies.

The forest on Site is primarily deciduous and cover structures and suitable habitat are limited. Western water shrews have been given a moderate potential presence rating.

5.4.3 Great Blue Heron, fannini subspecies

The Great Blue Heron fannini subspecies forages along the seacoast, in fresh and saltwater marshes, along rivers and in grasslands. Smaller numbers of herons forage in kelp forests, from wharves and at anthropogenic waterbodies, such as ornamental ponds and fish farms. Most herons nest in woodlands near foraging areas.

No heron rookeries are documented near the Site and SEI did not observed evidence of a rookery during the Site visits. This species has been assigned a moderate potential presence rating.

5.4.4 Western screech-owl, kennicottii ssp. and northern pygmy-owl, swarthi ssp.

The Western screech owl *kennicotti* subspecies (*Megascops kennicotti kennicotti*) is provincially blue-listed and listed as Threatened under Schedule 1 of SARA. This year-round resident subspecies is primarily distributed from the Pacific coast to the crest of the Cascade and Coast Mountains to the east (BC MOE, 2013). It is generally found in a variety of low elevation (<1000 m) mixed old-growth or mature second-growth forests, within or near riparian habitats along watercourses, lakes, or wetlands (COSEWIC, 2012). Suitable habitats are characterized by moderate ground cover, low understory, and relatively open canopy

cover. Tree cavities are used as nesting and roosting sites, usually those excavated by woodpecker species, preferably in large diameter deciduous trees but coniferous trees are also used.

Threats to the species described in the Recovery Plan for the Western Screech Owl, kennicottii subspecies in BC (BC MOE, 2013) habitat degradation and fragmentation, mainly from logging activities and urban development. Increasing competition with barred owls (*Strix varia*) may also be a factor in recent population declines.

The northern pygmy-owl *swarthi* subspecies (*Glaucidium gnoma swarthi*) is more of a generalist than other owl species and will utilize interior forest areas, riparian zones and open stands as well as clearings with lower structural diversity. These owls live in mature forests and nest in natural cavities and cavities excavated and abandoned by woodpeckers.

The western screech owl and northern pygmy owl have been assigned a moderate potential of presence at the Project site due to the on-Site and surrounding forest habitat.

5.4.5 Olive-sided flycatcher

The olive-sided flycatcher species breeds in Northern America, including British Columbia, and migrates to South America for winter. The olive-sided flycatcher forages on flying insects from treetop perches and nests among conifer tree species adjacent to clearings such as burned areas or the edges of bogs or lakes and utilises forest stands adjacent to human-created openings. This species has been assigned a moderate potential presence rating.

5.5 Painted Turtle – Pacific Coast Population

Painted Turtles are dormant in the winter and active from around April to late September or October. They overwinter at the bottom of ponds or under submerged undercut banks. During the active season Painted Turtles inhabit shallow aquatic habitats with slow-moving water, soft bottoms, abundant vegetation, and plenty of basking sites. They can be found in a variety of habitat types with these features, including swamps, marshes, permanent and temporary ponds, creeks, rivers, and lakes.

A small sandy beach area is present in the north-western corner of the Lakeside Area, which is used as a boat launch. The substrate could potentially be suitable for western painted turtle breeding, but the surrounding disturbance and the distance from known species occurrences yields a low to moderate potential presence of turtles.

5.6 Oregon Forestsnail

Oregon forestsnail habitat is low elevation (<360 m above sea level) and has a site context that promotes persistent high moisture. This can include ravines, gullies and depressions with both permanent and ephemeral watercourses; the edges of streams, wetlands, seasonally flooded areas or wet lowlands; moist forest interfaces and moist, densely-vegetated meadows (Environment Canada, 2016).

The Upland Area contain suitable Oregon forestsnail habitat and the species has been assigned a medium potential presence rating.

5.6.1 At Risk Amphibians

Northern red-legged frogs, western toads and wandering salamanders have been assigned a 'moderate' potential presence rating within the Site. The Assessment area contains terrestrial and aquatic amphibian habitat. A pond and permanent and ephemeral wetted areas were observed on the Site. The forested portion of the Upland Area was observed to be cool and moist with a low but adequate amount of coarse woody debris and leaf litter to provide terrestrial amphibian habitat.

5.7 Garry Oak Ecosystems

Two Garry oaks (Quercus garryana) were identified west of the pool and changing room building in the Lakeside Area. Although the Garry oak ecosystems are endangered and have suffered a drastic reduction over recent years the biophysical attributes of this ecosystem is not present on the Subject Property and the Site is not located within the suitable biogeoclimatic zone - typically the drier Coastal Doulas Fir zone.

6 Development Considerations

The following sections outline considerations for potential development on the Site.

6.1 Municipal Development Permit Area Constraints

The following sections consider Cowichan Valley Regional District's DPA constraints for potential development in consideration of the observed environmental features and values on the Site.

6.1.1 Development Permit Area 1 – Riparian Protection

The following watercourses, as described in the **Aquatic Resources** section above, are streams as defined by the RAPR and subject to protection under the CVRD Riparian Protection DPA:

- Unnamed Watercourse
- Tributary 1
- Perimeter Ditch
- Shawnigan Lake

The drainage channel identified on the north boundary of the Lakeside Area was not assessed to be connected to downstream fish habitat and is not considered a stream under RAPR.

6.1.1.1 Upland Area Watercourses

If development is proposed in the Upland Area, a RAPR Detailed Assessment will be required to establish SPEA setbacks for the identified watercourses. For the purpose of this report and preliminary development planning, the estimated SPEA for the watercourses is provided in the Table 3 below. The estimated SPEA calculations are based on measurements collected during the Site assessment.

Table 3: Channel morphology metrics and estimated SPEAs for Site watercourses.

Channel Morphology	Unnamed Watercourse	Tributary 1	Perimiter Channel	Roadside Ditch
Type	Stream	Stream	Channelized Stream	Ditch

Average Bankfull Width (m)		1.7	1.5	1.1	1.8
Average Slope		9%	6%	3%	1%
Channel-Type		Riffle-pool	Riffle-pool	Riffle-pool	Riffle-pool
Site Potential Vegetation Type (SPVT)		Tree	Tree	Tree	Tree
Zones of Sensitivity	Large Woody Debris, Bank & Channel Stability	10 m	10m	10m	n/a
	Litter Fall/Insect Drop	10 m	10m	10m	2m
	Shade	10 m (South)	10 m (South)	10m (South)	2m (South)
Estimated Minimum SPEA (from stream boundary)		10 m	10 m	10m	2m

6.1.1.2 Shawnigan Lake and Upland Area Pond

Shawnigan Lake and the Upland Area Pond are subject to protection under RAPR and an estimated SPEA of 15m is calculated as shown in Table 4 below:

Wetland/Pond Attributes		Shawnigan Lake	Upland Area Pond
Type		Lake	Wetland
Site Potential Vegetation Type (SPVT)		Tree	Tree
Zones of Sensitivity	Large Woody Debris, Bank & Channel Stability	15 m	15 m
	Litter Fall/Insect Drop	15 m	15 m
	Shade	30 m (South)	30 m (South)
Minimum SPEA (from stream boundary)		15 m	15 m

Note that the shade Zone of Sensitivity is 30m for Shawnigan Lake but due to the orientation of the Subject Property in relation to the lake foreshore, the estimated minimum SPEA does not increase from 15m.

SEI has established the Shawnigan Lake highwater mark for the Lakeside Area and the SPEA will extend from this boundary.

The Site watercourses and corresponding estimated SPEAs are shown in Figure 3 below. Please note that the mapped locations and SPEA distances are estimated and for preliminary planning purposes only. A RAPR Detailed Assessment and Site survey will be required to determine watercourse locations and SPEA boundaries.

Figure 3. Site watercourse locations with estimated SPEAs (Source: Google Earth, Accessed December 2021).

6.1.1.3 SPEA Protection

Development is not permitted within the minimum SPEA of the identified watercourses and Shawnigan Lake as detailed in the **Municipal Development Permit Area Constraints** section above. In addition to the setback area, measures under RAPR will be required to protect the SPEA if development is proposed within the RAA. SPEA protection measures are considered as follows:

Danger Tree and Windthrow Assessment

A QP (Qualified Professional) may be required to conduct an assessment of the potential for danger trees and windthrow hazard within the RAAs. SEI did not observe danger trees during the assessment.

Slope Stability Assessment

A QP may be required to conduct an assessment of slope stability hazard within the RAAs to protect the integrity of the SPEAs. SEI did not observe field indicators of slope stability issues during the assessment. SEI observed that the forested area in the east portion of the Upland Area becomes steeply sloped. If development is proposed in this area, a slope stability assessment will be required.

Protection of Trees

To protect trees within the RAA, delineation fencing should be installed at the critical root zones of trees to prevent disturbance.

Encroachment into the SPEA

Where practical, fencing should be installed to demarcate the SPEAs. Low split-rail or medium height wood fencing would be appropriate for the Subject Property.

Erosion and Sediment Control During Construction

An erosion and sediment control plan prepared by a QEP for the construction stage of Site development will be required.

Stormwater Management

A Stormwater Management Plan prepared by a QP will be required for to address SPEA protection.

Floodplain

A portion of the Subject Property is included in flood mapping completed as part of the 2020 Shawnigan Lake Flood Preparedness Monitoring Project[2] by the CVRD. SEI did not observe evidence of flooding or flood hazard on the Subject Property but a QP may be required to complete further assessment.

utilized in the preparation of the plan.

6.1.2 Development Permit Area 1 – Sensitive Ecosystem Protection

The sensitive ecosystem mapping polygons overlap with the southeast portion of the Upland Area. SEI contacted the CVRD but details regarding the specific sensitive ecosystem that the polygon represents were not made available prior to the issuance of this report. The mapping is showing in Figure 4 below:

[2] https://www.cvrd.ca/DocumentCenter/View/97804/Shawnigan-Lake-Flood-Preparedness-Report

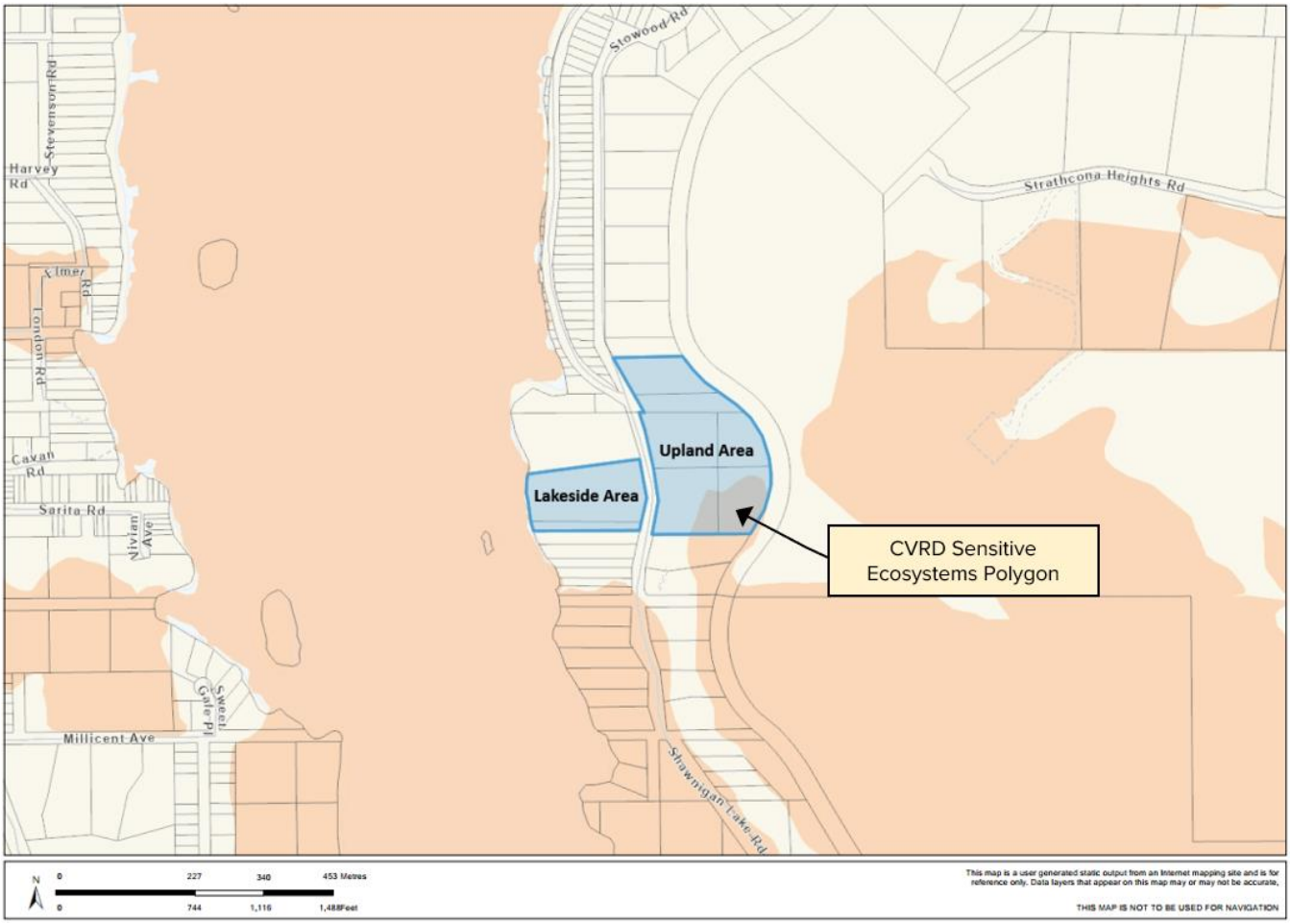

Figure 4. CVRD Web Map with the Sensitive Ecosystems layer activated (Source: CVRD Web Map, accessed December 2021)

The presence and overlap with the Upland Area of the Sensitive Ecosystem polygon make the Site subject to an assessment that includes:

- Inventory of biophysical features;
- Identification of populations, habitats or natural features (e.g. wetlands, snags, coarse woody debris, etc.) supporting species at risk;
- Identification of the boundaries of environmentally sensitive areas;
- Description of site development plans and operations, including location and area calculations for proposed parcels, roads/driveways, building sites, impervious surface areas and natural and landscaped areas; and
- Assessment of the potential environmental effects of proposed development on sensitive and important ecosystems and watercourses.

In addition, a QEP prepared Environmental Site Plan is required that:

- Includes details of specific provisions that will be implemented to preserve and protect the natural environment, ecosystems and biological diversity of sensitive ecosystems within the DPA;

- Specifies terms and conditions regulating any activities that may adversely affect or disturb species, vegetation, soils, watercourses, natural features or ecological processes of sensitive ecosystems within the DPA, where such disturbance is unavoidable;
- Details specific provisions that will be implemented to restore and enhance the natural environment, ecosystems and biological diversity of sensitive ecosystems within the DPA;
- Defines measures for professional environmental supervision, inspection and monitoring of development activities and related environmental effects on sensitive ecosystems occurring during and after development, including the environmental consequences of any contravention of a condition of the development permit and proposed measures for mitigation of these consequences.

6.2 Invasive Species

During the site assessment, multiple invasive species with varied priority for management were identified. Of particular concern for site development was the medium-sized established patch of Himalayan Blackberry located in the north portion of the Upland Area and the spurge laurel identified in the south portion of the Upland Area. Only one spurge laurel plant was identified, SEI recommends further field work in this area to identify additional occurrences, if present. No giant hogweed plants were identified on the Site, the sole species prohibited under the CVRD invasive species bylaw.

Himalayan blackberry and spurge laurel are not listed as noxious weeds province-wide under Part 1, Schedule A of the BC *Weed Control Regulation* but spurge laurel is listed as a priority species by the CVRD.

Prior to development activities, an Invasive Species Management Plan should be developed by a QEP to provide measures for the removal of invasive species and limit the introduction and spread of invasive species as the result of development activities. The CVRD's Invasive Plant Species Strategy[3] should be

6.3 Protection of Birds

If vegetation clearing is required for development (including low-lying shrubs), it should be conducted outside the breeding bird season (which extends from March through August), to avoid incidental take of bird nests or their eggs, and prevent contravention of Sec. 34 of the BC Wildlife Act and the Canada Migratory Birds Convention Act. If clearing during the breeding season is unavoidable, appropriate nesting surveys and nest-specific management planning as per the most recent Canadian Wildlife Service (CWS) guidelines, are recommended under the direction of a QEP. Additionally, raptor nest surveys should be conducted prior to any clearing activities at any time of year to identify potential nesting sites constructed after the above-discussed dates, as some raptor species may build their nests outside of the typical passerine bird breeding period. It is noted that nests of eagle, peregrine falcon, gyrfalcon, osprey, heron, or burrowing owl are protected year-round under Section 34 of the BC Wildlife Act.

6.4 Wildlife Protection Measures

An amphibian and small mammal search of the work area may be required by a QEP immediately prior to the commencement of development, and as needed during the construction phase. Amphibians and small mammals may be present within the work areas, and direct physical harm shall be mitigated through

[3] https://www.cvrd.ca/DocumentCenter/View/101060/2015-Invasive-Plant-Species-Strategy-for-the-CVRD

consideration of site isolation measures (exclusion fencing installed along the east, west and south property perimeter) and precautionary sweeps to encourage any potentially present small mammals to vacate the area through deterrence techniques. Precautionary surveys will be conducted throughout construction on an as needed basis at the discretion of a QEP.

Each tree should be inspected prior to removal to ensure no wildlife is nesting or hibernating in potential cavities. Almost all the trees proposed for removal are dead or in poor health and therefore, the chance of cavity and wildlife presence is high.

7 Conclusions and Endorsement

This EOA Report is limited to a preliminary environmental assessment of the Site. Once the details of proposed development are known, further assessment will be required to meet municipal development permit area requirements and Provincial RAPR assessment standards. This report is endorsed by the undersigning QEP. Please contact the undersigned if you require any additional information or clarification of the above.

SARTORI ENVIRONMENTAL INC.

Prepared and endorsed by:

The undersigned certifies the work described herein fulfills standards acceptable of a Registered Biology Technologist.

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Reviewed and Endorsed by:

The undersigned certifies the work described herein fulfills standards acceptable of a Professional Biologist.

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