ENVIRONMENTAL ASSESSMENT

235, 239 QUARRY DRIVE & 434, 431 BAKER ROAD
SALT SPRING ISLAND

PREPARED FOR:
BRADLEY FOSSEN
AURORA PROFESSIONAL GROUP INC.
SALT SPRING ISLAND, BC

AND

ISLANDS TRUST - SALT SPRING ISLAND
500 LOWER GANGES RD #1
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AND

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SOLUTION ORIENTED. PROTECTION OF THE ENVIRONMENT. ABSOLUTE INTEGRITY. OPEN COMMUNICATION. RESPECT.

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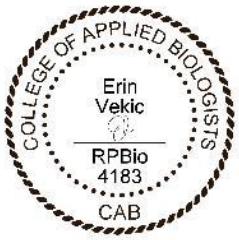
CAVEAT

This Environmental Assessment (EA) has been prepared with the best information available at the time of writing, including the Salt Spring Island Official Community Plan, communications with the client, a site visit, review of site plans and design drawings and other documentation relevant to the project. This EA has been developed to assist the project in remaining in compliance with relevant environmental regulations, acts and laws pertaining to the project and to identify sensitive environmental features that may require mitigation and consideration during future phases of the project.

Report Prepared By:



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1 INTRODUCTION

Corvidae Environmental Consulting Inc. (Corvidae) is pleased to provide this Environmental Assessment (EA) for the properties located at 235, 239 Quarry Drive and 434, 431 Baker Road, Salt Spring Island (the Site)(Figure 1)(Table 1). The Site includes four shoreline lots that are zoned as Rural (R). The Site occurs within the Shoreline Development Permit Area (DPA) 3 as outlined in the Salt Spring Island Official Community Plan (OCP) and shown on Map 20. DPA 3 includes upland areas within 10 metres of the natural boundary and the marine environment 300 m seaward of the natural boundary (measured horizontally).

Table 1. Site details

Civic Address	PID	Legal description	Current Zoning
235 Quarry Drive	009-555-706	LOT 1, PLAN VIP46155, SECTION 6, RANGE 1W, COWICHAN LAND DISTRICT, PORTION NORTH SALT SPRING, & SEC 7	R
239 Quarry Drive	009-555-731	LOT 3, PLAN VIP46155, SECTION 6&7, RANGE 1W, COWICHAN LAND DISTRICT, PORTION NORTH SALT SPRING	R
434 Baker Road	009-555-781	LOT 5, PLAN VIP46155, SECTION 6, RANGE 1W, COWICHAN LAND DISTRICT, PORTION NORTH SALT SPRING	R
431 Baker Road	000-014-656	LOT AM2, PLAN VIP7144, SECTION 6, RANGE 1W, COWICHAN LAND DISTRICT, PORTION NORTH SALT SPRING, EXCEPT PLAN 40042, EXC PT IN PL 40042	R

This EA is provided in support of proposed coastal erosion mitigation development activities (the project) at the Site within the shoreline DPA. The project is proposed in response to identified bluff failure that is occurring due to the following mechanisms: 1) upland conveyance of rainwater contributing to pore water pressure in the soils/surficial material wedge sitting atop bedrock coastal bluffs, and 2) wave action creating toe erosion (bedrock) or undercutting (sediments). These issues and mechanisms have been outlined in detail within Geohazard Assessment Reports that were completed for each property listed in Table 1 by a Qualified Professional (QP) (submitted separately).

Design mechanisms are currently being developed; it is planned that a beach nourishment technique will be applied to the Site. This is determined by following the marine shoreline design guidelines decision tree (Johannessen et al. 2014). This technique involves the strategic placement of material (e.g., sand, gravel) to reduce erosion of upper beach and backshore areas. Placement of gravel and limited fines creates porosity and air space to decrease wave energy along the shoreline. Materials sourced for the proposed beach nourishment would be brought in via barge and applied to specific areas at the Site, as directed by a QP.

This EA document, in combination with the Geohazard Assessment Reports, will be utilized to inform future coastal erosion mitigation development activities, as determined by a QP, to target the identified bluff failure at the Site. This EA will be updated to include potential environmental effects of the proposed project and recommended environmental protection measures once formalized project design details have been received. All future proposed coastal erosion mitigation development activities must be

completed in accordance with the Salt Spring Island Official Community Plan (OCP) Bylaw No. 434 as well as relevant provincial and federal legislation.

Site Location

Property Boundary

N

0 25 50 100 150 200 Meters

Project: 235 Quarry Road, 239 Quarry Road, 431 Baker Road &434 Baker Road
Sources: Capital Regional District

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Rev. #	Date
0	October 19, 2023

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Figure 1

1.1 REGULATORY FRAMEWORK

This environmental assessment is designed to comply with the provisions set out in the Salt Spring Island Official Community Plan (OCP) Volume 2 Part E for development permit areas (DPAs) and for compliance with the provisions for environmental protection contained in the following relevant legislation:

Municipal

Salt Spring Island OCP, Bylaw No. 434 (Salt Spring Island Local Trust Committee 2008)

DPA 3 - Shoreline

> "*Development Permit Area 3 is shown on Map 20. It is all that area of land covered by water between the natural boundary of the sea and a line drawn parallel to and 300 m seaward of the natural boundary of the sea. It also encloses the land within 10 m of the natural boundary of the sea (measured horizontally) in areas where the marine environment has been identified as being particularly sensitive to development impacts.*
>
> *Development Permit Area 3 is designated according to Section 879 (1)(a) of the Municipal Act to identify objectives and guidelines for the form and character of the commercial and general employment development allowed on the water surface. It is also designated according to Section 879 (1)(a) and (b) to protect the natural environment and to protect development from hazardous conditions*."

Objectives for DPA 3 include the following:

- "To protect the quality of the tidal waters that surround Salt Spring Island.
- To protect fish and wildlife habitat.
- To prevent erosion and hazardous conditions that could result from interrupting the natural geohydraulic processes along the shoreline.
- To protect development from hazardous conditions. BL488 (07/20)
- To protect the natural beauty of the island's shoreline areas where commercial and general employment developments are allowed.
- To ensure such development is unobtrusive and contributes to the natural, public character of the Crown foreshore."

The development permit areas are show in Figure 2. The guiding principle for the use of Development Permits is found within the *Local Government Act*. Development Permit Areas can be designated for purposes such as, but not limited to: protects, enhances and restores the biodiversity and ecological values and functions of environmentally sensitive areas; fosters compatibility between development, existing land uses and environmentally sensitive areas; maintains connectivity between sensitive ecosystems; and protects water quality and quantity.

Provincial

- Wildlife Act (1996)
- Invasive Species Council of BC
- *Weed Control Act* (1996, current as of October 2016)

Federal

- Migratory Birds Convention Act (1994)
- Species at Risk Act (SARA) (2002)
- Fisheries Act (2019)
- Canadian Environmental Protection Act (CEPA) (1999)
- Canadian Navigable Waters Act (1985)

Guidelines

Washington State Aquatic Habitat Guidelines Program: Marine Shoreline Design Guidelines (2014)
https://wdfw.wa.gov/sites/default/files/publications/01583/wdfw01583.pdf

Development Permit Area 3 - Shoreline

- Shoreline - Forshore
- Shoreline - On-land portion
- Property Boundary

N

0 25 50 100 150 200 Meters

Project: 235 Quarry Road, 239 Quarry Road, 431 Baker Road &434 Baker Road
Sources: Capital Regional District

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Figure 2

2 SCOPE OF WORK

Corvidae completed an environmental assessment for the aforementioned properties listed in Table 1. The environmental assessment documented the ecological features on the Site with a focus on the shoreline and foreshore areas. Background information was reviewed, including applicable databases. During the assessment, the following features were documented in this report:

- Areas of sensitivity, including the marine shoreline environment.
- Areas of habitat and biodiversity values.
- Plant communities and plant species on site.
- Potential wildlife presence and wildlife habitat.
- Soil types and terrain.
- Surface water flow patterns.

3 METHODS

3.1 DESKTOP REVIEW

Baseline biophysical conditions were compiled by reviewing the best available data and information including existing reports for the area and conducting searches of online provincial and federal databases:

- BC Conservation Data Centre (BC CDC 2023a and 2023b).
- BC HabitatWizard (Province of BC 2023).
- Aerial photographs of the property (Google Earth 2023).
- CRD mapping system and database (CRD 2021).
- MapIT application (Islands Trust 2023)
- Salt Spring Island Official Community Plan Bylaw No. 434 (Salt Spring Island Local Trust Committee 2008).

3.2 FIELD ASSESSMENT

A field assessment of the property was completed by a Qualified Environmental Professional (QEP) from Corvidae. The assessment included characterization of vegetation and habitat types, wildlife sign and species observations, wildlife habitat, and assessed the current conditions of the Site.

4 ENVIRONMENTAL SITE ASSESSMENT

Corvidae completed a site visit on May 30th, 2023. Site photos are included as Appendix A.

4.1 CLIMATE AND BIOGEOCLIMATIC ZONE

The project is located within the Coastal Douglas-fir (CDF) biogeoclimatic zone, specifically in the Moist Maritime Coastal Douglas-fir Subzone (CDFmm) (BC CDC 2021b). The CDFmm occurs at low elevations (<150 m) along southeast Vancouver Island, the southern Gulf Islands, and part of the Sunshine Coast.The CDFmm has the mildest climate in Canada. This subzone has a long growing season with warm, dry summers and mild, wet winters.

4.2 TERRAIN AND SOILS

Soils in the CDF biogeoclimatic zone, generally derived from morainal, colluvial, and marine deposits, are typically Brunisols, grading with increased precipitation to Humo-Ferric Podzols (Nuszdorfer et al. 1991). Soils on the Site are generally comprised of loam, well-draining, Orthic Dystric Brunisol soils. (GALIANO soil association) (BC SIFT 2018). The Site slopes moderately to steeply from northeast to southwest in the direction of the shoreline.

4.3 VEGETATION

South-facing, dry banks along the shoreline and immediate backshore area were forested and characterized by a Douglas-fir – arbutus woodland with lesser amounts of shore pine and Garry oak. The structural stage was observed to be young forest with larger (mid-seral) trees occurring intermittently. Species observed are consistent with the red-listed Douglas-fir – arbutus ecological community, which is an ecological community that is at risk of being lost (extirpated, endangered or threatened) in BC. Understory species in the immediate backshore included predominantly low growth of salal and dull Oregon-grape. Banks along the shoreline were characterized by pink (hairy) honeysuckle, grasses, weeds, evergreen huckleberry, and invasive species. The moss layer was very poorly developed near the shoreline.

All vegetation species detected during the site assessment are listed in Table 2. Six invasive species were observed, including English ivy, scotch broom, Himalayan blackberry, bull thistle, oxeye daisy, and spurge-laurel. All are listed as Control Species according to the Capital Regional District, whereby established infestations of these species are common and widespread throughout the Capital Region. Control should be focused in high value conservation areas[1].

[1] Capital Regional District. 2019. Status List for Priority Invasive Plants in the Capital Region. Available at: https://www.crd.bc.ca/docs/default-source/default-document-library/2019-03--regional-priority-invasive-species-list.pdf?sfvrsn=836aceca_0.

Table 2. Plant species observed on site during the field visit on May 30, 2023.

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
Arbutus	*Arbutus menziesii*	Yellow	--
Baldhip rose	*Rosa gymnocarpa*	Yellow	--
Balsam poplar	*Populus balsamifera*	Unknown	--
Bigleaf maple	*Acer macrophyllum*	Yellow	--
Blue wildrye	*Elymus glaucus*	Yellow	--
Bracken fern	Pteridium aquilinum	Yellow	--
Broadleaf stonecrop	*Sedum spathulifolium*	Yellow	--
Bull thistle	*Cirsium vulgare*	**Invasive**; Exotic	--
Common lamb's-quarters	*Chenopodium album*	Exotic	--
Common snowberry	*Symphoricarpos albus*	Yellow	--
Common sow-thistle	*Sonchus oleraceus*	Exotic	--
Douglas-fir	*Pseudotsuga menziesii*	Yellow	--
Dull Oregon-grape	*Mahonia nervosa*	Yellow	--
Evergreen huckleberry	*Vaccinium ovatum*	Yellow	--
English ivy	*Ilex aquifolium*	**Invasive**; Exotic	--
Field elm	*Ulmus minor*	Exotic	--
Garry oak	*Quercus garryana var. garryana*	Yellow	--
Himalayan blackberry	*Rubus armeniacus*	**Invasive**; Exotic	--
Oceanspray	*Holodiscus discolor var. discolor*	Yellow	--
Oxeye daisy	*Leucanthemum vulgare*	**Invasive**; Exotic	--
Pacific crab apple	*Malus fusca*	Yellow	--
Perennial sow-thistle	*Sonchus arvensis*	Exotic	--
Pink honeysuckle	*Lonicera hispidula*	Yellow	--
Red alder	*Alnus rubra*	Yellow	--
Salal	*Gaultheria shallon*	Yellow	--
Scotch broom	*Cytisus scoparius*	**Invasive**; Exotic	--
Scouler's willow	*Salix scouleriana*	Yellow	--
Slough sedge	*Carex obnupta*	Yellow	--
Spurge laurel	*Daphne laureola*	**Invasive**; Exotic	--
Trailing blackberry	*Rubus ursinus*	Yellow	--
Tufted hairgrass	*Deschampsia cespitosa*	Yellow	--
Western redcedar	*Thuja plicata*	Yellow	--
Willow dock	*Rumex transitorius*	Yellow	--

[1] BC CDC 2023a

[2] Government of Canada 2023a

4.4 WILDLIFE

The trees on the Site and within surrounding areas provide nesting and roosting habitat for birds, including migratory songbirds, year-round resident species, raptors, and owls. Understory shrubs, although lacking in density overall, may provide nesting habitat for birds and small mammals. One bald eagle nest is mapped by the Wildlife Stewardship Atlas (WiTS) approximately 400-500 m northwest of the Site (Nest ID BAEA-101-433), however, there are no trees shown at this mapped location based on available aerial imagery. No nests were observed during the site assessment.

South-facing slopes may provide suitable habitat for reptiles and forested areas are likely frequented by both large and small mammals. The marine environment is also anticipated to support many species (e.g., river otter, plainfin midshipman, shorebirds, waterfowl, marine mammals, etc.) given the presence of eel grass beds and surf smelt and Pacific sandlance spawning habitat that are mapped in proximity to the proposed project area (MapIT 2023). Belted kingfisher nesting burrows were observed in several locations along the proposed project area (Photo 4). The species listed in Table 3 were observed on or near the Site during the assessment.

Table 3. Wildlife Species observed on site during the field visit on May 30, 2023.

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
American robin	*Turdus migratorius*	Yellow	--
Bald eagle	*Haliaeetus leucocephalu*	Yellow	--
Brown creeper	*Certhia americana*	Yellow	--
Chestnut-backed chickadee	*Poecile rufescens*	Yellow	--
Dark-eyed junco	*Junco hyemalis*	Yellow	--
Orange-crowned warbler	*Vermivora celata*	Yellow	--
Red breasted nuthatch	*Sitta canadensis*	Yellow	--
Spotted towhee	*Pipilo maculatus*	Yellow	--

[1] BC CDC 2023a

[2] Government of Canada 2023a

4.5 MARINE ENVIRONMENT

The shoreline type within the proposed project area is classified as low rock/boulder (Islands Trust n.d.). As per Map 11 of the Salt Spring Island OCP, a portion of the shoreline near 431 and 434 Baker Road is classified as an 'Environmentally Sensitive Shoreline Area' (Figure 3). Suitable forage fish spawning habitat is mapped in this area for surf smelt and Pacific sand lance. These species are an important food source for marine predators. Other notable marine environmental features include the presence of mapped eelgrass beds (flat, continuous) and patches just offshore in proximity to the Site that provide habitat for herring and forage fish (Map 13b, Galiano Conservancy 2014).

Sensitive Shoreline Area

- Sensitive Shoreline Area
- Property Boundary

Forage Fish Spawning Habitat

- Surf Smelt
- Surf Smelt/Pacific Sandlance

Eelgrass Meadow (2022)

- Dense
- Moderate
- Undetermined

N

0 100 200 400 600 Meters

Project: 235 Quarry Road, 239 Quarry Road, 431 Baker Road &434 Baker Road
Sources: Capital Regional District

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0	October 19, 2023
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Figure 3

4.6 SPECIES AT RISK

A query of the BC CDC iMap tool yielded occurrences of 5 species and 5 ecological communities at risk within a two-kilometer radius of the property, including one (1) masked occurrence (BC CDC 2023b). Species are listed in Table 3 and the location of occurrences in relation to the property is provided in Figure 4.

One ecosystem at risk overlaps the Site boundary: the Garry oak / California brome (*Quercus garryana* / *Bromus carinatus*) ecological community (red-listed). This occurrence is based on Terrestrial Ecosystem Mapping (TEM) and has not been confirmed on the ground (Province of BC 2023). This ecological community was not detected during the site assessment. Species observed near the shoreline within the Site most closely characterize the Douglas-fir / arbutus ecological community (coniferous woodland habitat) which is also red-listed but is not mapped in this area by the CDC. This community has been impacted through disturbance associated with residential development along the shoreline.

No other species or ecosystems listed in Table 4 were detected on the Site during the assessment. Suitable habitat was not identified on the Site for the species listed in Table 4.

Table 4. Species at risk that may occur in the vicinity of the Site.

Common Name	Scientific Name	BC Provincial Status[1]	*SARA* Schedule 1 Status[2]
Species			
Threaded vertigo	*Vertigo rowellii*	Blue	Special Concern
Painted Turtle - Pacific Coast Population	*Chrysemys picta* pop. 1	Red	Threatened
Macrae's clover	*Trifolium dichotomum*	Red	n/a
Leafless wintergreen	*Pyrola aphylla*	Blue	n/a
Western screech-owl, *kennicottii* subspecies	*Megascops kennicottii kennicottii*	Blue	Threatened
Ecological Community			
Garry oak / oceanspray	*Quercus garryana / Holodiscus discolor*	Red	n/a
Garry oak / California brome	*Quercus garryana / Bromus carinatus*	Red	n/a
Grand fir / dull Oregon-grape	*Abies grandis / Mahonia nervosa*	Red	n/a
Douglas-fir / dull Oregon-grape	*Pseudotsuga menziesii / Mahonia nervosa*	Red	n/a
Trembling aspen / Pacific crab apple / slough sedge	*Populus tremuloides / Malus fusca / Carex obnupta*	Red	n/a

[1] BC CDC 2023a
[2] Government of Canada 2023a

A query of the Fisheries and Oceans Canada Species at Risk Distribution Map (Government of Canada 2023b) yielded the following marine species at risk that have the potential to occur in proximity to the project:

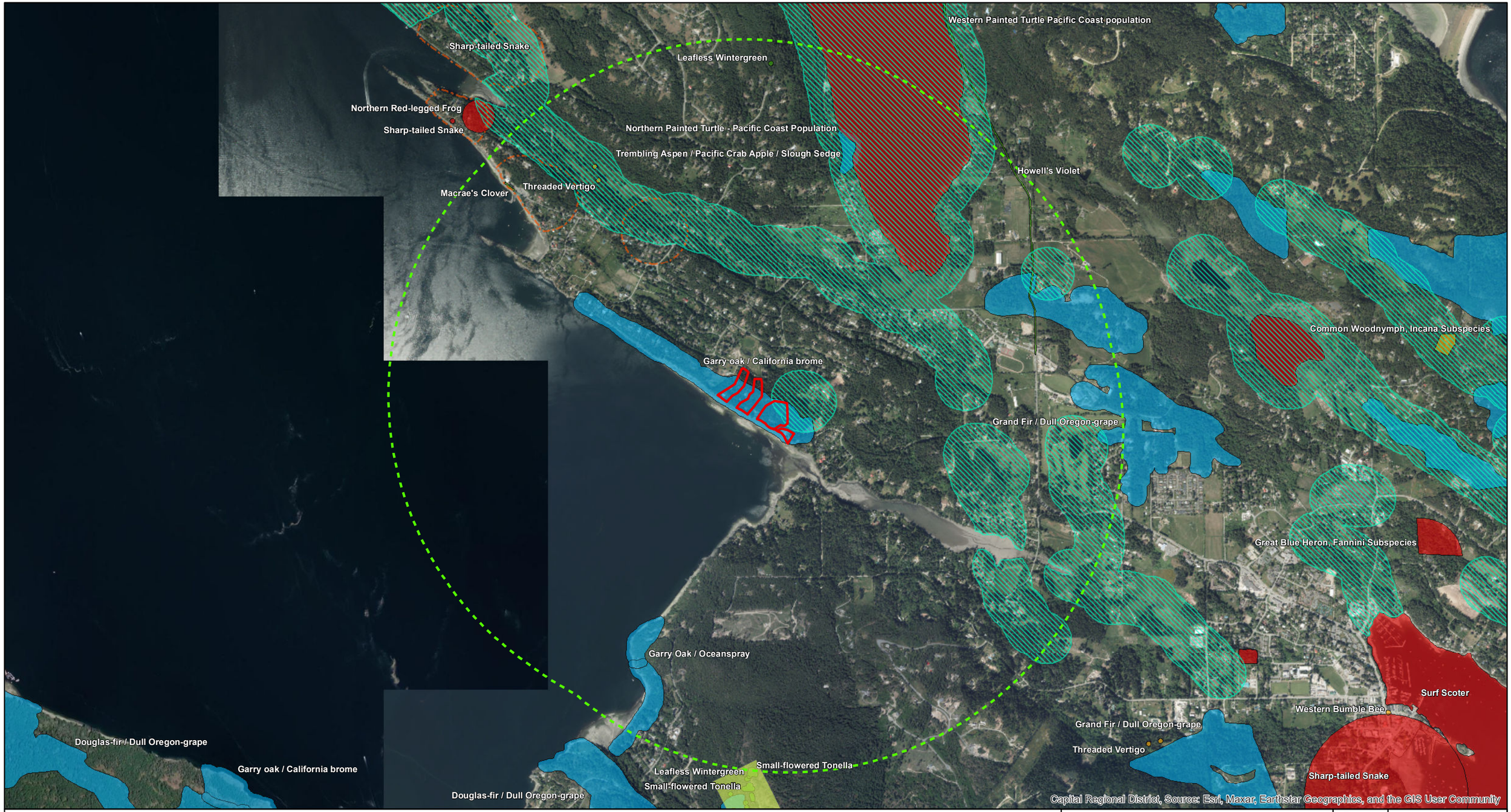
Table 5. Aquatic species at risk that may occur in the vicinity of the Site.

Common Name	Scientific Name	*SARA* Schedule 1 Status[1]
Steller Sea Lion	*Eumetopias jubatus*	Special Concern
Killer Whale (Northeast Pacific southern resident population)	*Orcinus orca*	Endangered
Killer Whale (Northeast Pacific transient population)	*Orcinus orca*	Threatened
Humpback Whale	*Megaptera novaeangliae*	Special Concern
Harbour Porpoise	*Phocoena phocoena*	Special Concern
Grey Whale (Eastern North Pacific population)	*Eschrichtius robustus*	Special Concern
Leatherback Sea Turtle	*Dermochelys coriacea*	Endangered
Northern Abalone	*Haliotis kamtschatkana*	Endangered
Yelloweye Rockfish	*Sebastes ruberrimus*	Threatened
Tope	*Galeorhinus galeus*	Special Concern

[1] Government of Canada 2023a

CRITICAL HABITAT

A mapped western painted turtle critical habitat polygon overlaps the northeastern corner of 434 Quarry Road (Province of BC 2023b; Figure 4). Critical habitat mapping is based on known occurrences and potential occurrences of suitable aquatic habitat features. Critical habitat may include lakes, ponds, marshes, river channels, roadside or drainage ditches, sluggish streams, and sloughs, and up to 150m of terrestrial habitat surrounding the aquatic feature, as most Western painted turtles in B.C. are typically found within 150m from water (Environment and Climate Change Canada 2018). The critical habitat polygon is associated with an unnamed lake that is located upslope of the project area. The project area includes only the immediate shoreline area which is not considered suitable habitat for western painted turtle.



SAR and critical habitat within 2 km of the site

Critical Habitat

- Property Boundary
- 2 km area around property boundary
- Sharp-tailed Snake
- Small-flowered Tonella
- Western Painted Turtle Pacific Coast population

Species at Risk

- Ecological Community
- Invertebrate Animal
- Vascular Plant
- Vertebrate Animal

N

0 500 1,000 2,000 Meters

Project: 235 Quarry Road, 239 Quarry Road, 431 Baker Road &434 Baker Road
Sources: DataBC, Capital Regional District

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Figure 4

5 POTENTIAL ENVIRONMENTAL IMPACTS AND RECOMMENDED ENVIRONMENTAL PROTECTION MEASURES

A list of environmental considerations is provided below based on current project design. This list may be updated in future should the design plans change.

- Impacts on sensitive terrestrial ecosystem areas, such as upland woodland habitat.
- Impacts on sensitive marine features, such as mapped suitable forage fish spawning habitat.
- Impacts on existing shoreline sediment delivery systems.
- Impacts on benthic organisms.
- Impacts that could compromise archaeological, First Nations cultural, historical, heritage sites or significant or outstanding landscape features.
- Spread of invasive plant species.
- Changes in wildlife habitat availability and wildlife mortality risk.
- Sediment movement in the project area.

Preliminary mitigation measures for the proposed beach nourishment works includes the following:

- Construction will be completed during periods of low tide (work in the dry).
- Ensure that works are overseen by an Environmental Monitor (EM)
- Enhancement of backshore vegetation through planting of native species, particularly overhanging species such as Oceanspray. This is included in the detailed design plan with specific plant species, locations, spacing, methods of planting and maintenance.
- Apply suitable substrate for forage fish spawning in the upper reaches of the beach profile where feasible.
- Match borrowed substrate with native sediments within the project area (mimic natural conditions).
- Maintain the current natural beach slope to the extent possible.
- Execute beach nourishment activities when birds or other mobile organisms are the least active.
- Avoid mapped suitable spawning forage fish habitat and ensure that the timing of project works does not interfere with forage fish spawning.
- Install belted kingfisher nest boxes.
- Remove invasive species along the backshore and re-plant with native species.

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