



CASCADE ENVIRONMENTAL
RESOURCE GROUP LTD

Environmental Assessment

7362 Pemberton Farm Road East, Lot C, Pemberton, BC

Cascade Environmental Review



Prepared by:

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- A Phase 1 - Environmental Site Assessment
- A Stage 1 – Preliminary Site Investigation (as per the Contaminated Sites Regulations of the Waste Mgt. Act)
- An Environmental Impact Assessment

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1. Introduction

Cascade Environmental Resource Group Ltd. (Cascade) was retained by Rivertown Properties Ltd. to conduct an Environmental Assessment (EA) of 7362 Pemberton Road E in Pemberton, BC. The subject site is cleared and does not contain any structures.

The purpose of an EA is to assist VOP staff in the evaluation of rezoning and/or development permit applications, providing information to be included on the Environmental Impact Assessment Process (VOP, 2019). This report reviews and assesses the biophysical conditions, ecosystem integrity, habitat potential, species present (plant and animal), and aquatic features on and adjacent to the subject site. It includes a discussion of the environmental regulatory framework that may affect development activities and provides alternatives for mitigation or resolution. Potential constraints are identified, and recommendations are provided to inform and facilitate the environmental review and approval process.

The assessment was conducted by Adrien Baudouin, M.Sc., R.P. Bio. and Margot Webster, B.Sc., R.P.Bio. Mapping support was provided by Nicola Church, B.A., M.Sc. (G.I.S.). All project team members have extensive experience in conducting environmental inventories, reviews and assessments.

1.1. Location

The subject property is located at 7362 Pemberton Farm Road E of Pemberton, BC (Map 1), and is legally described as LOT C DISTRICT LOT 211 LILLOOET DISTRICT PLAN EPP40824 (PID 030-164-532). The subject property covers an area of 2.43 ha.

1.2. VOP Bylaw Zoning

The site is currently zoned RES-1 (Resource Management) under the VOP zoning bylaw amendment No. 862, 2019 (VOP, 2019). The intent of this zone is to accommodate resource management uses on Crown Land.

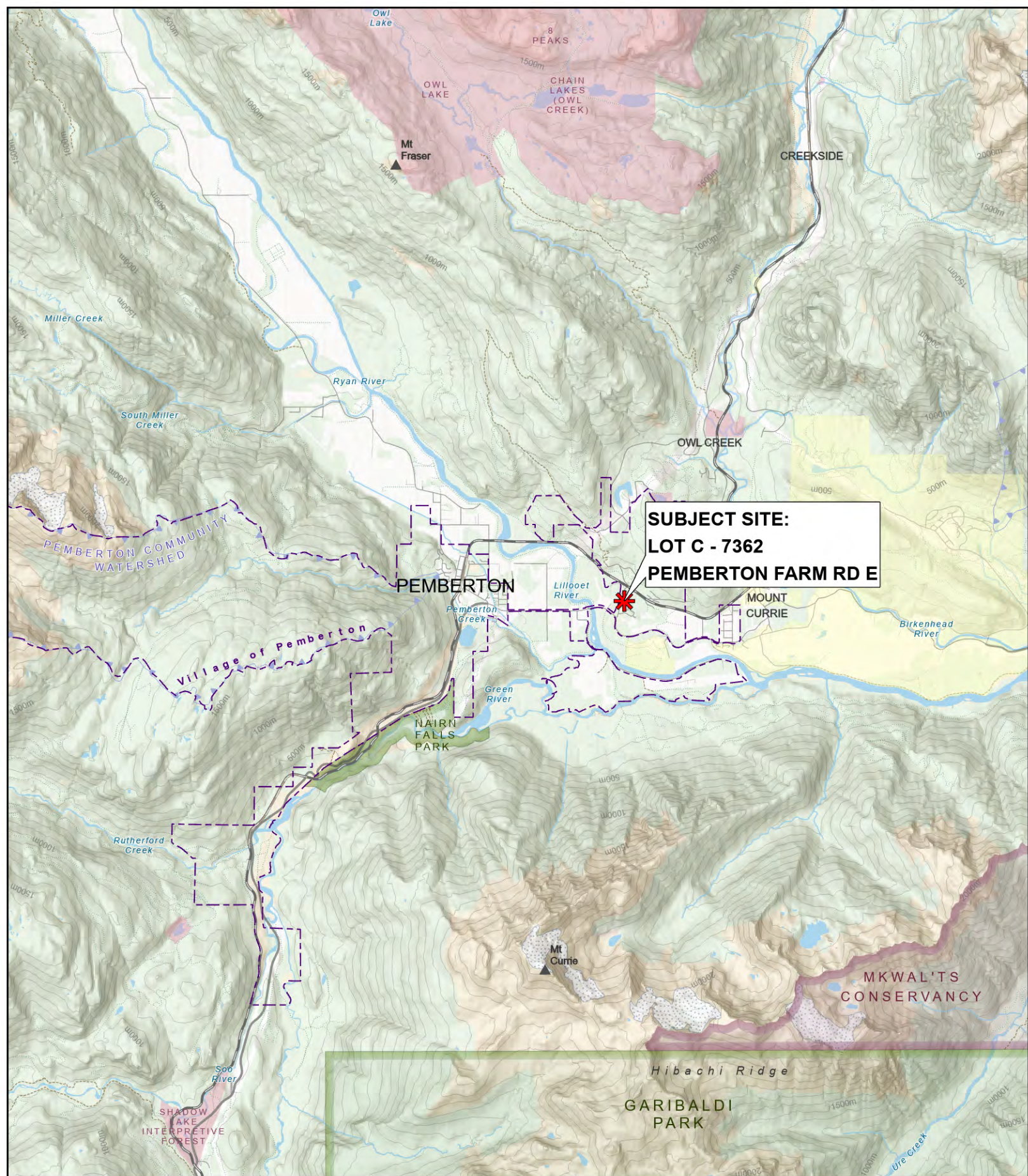
Principal Uses:

- Forestry
- Resource extraction

1.3. Methodology

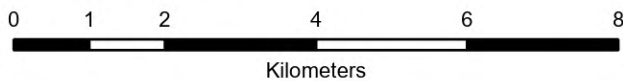
The ecosystem units present on the subject site were determined using the map imagery analysis and study of photos obtained from October 2021. Relevant sections of the Terrestrial Ecosystem Mapping standards (RISC, 1998) were employed to identify and delineate the ecosystem units and define their distribution within the study area. Terrestrial Ecosystem (TE) codes for the subject polygon are displayed in Map 2. The ecosystem units were not investigated in the field due to the disturbed nature of the site and the snow cover due to the time of year.

Wildlife that potentially occur in the area's habitats are described using the BC Conservation Data Centre (CDC), a centralized BC government database of information on species and ecological communities (BC MOE, 2021). Presence or absence of valued ecosystem components were inferred based the terrestrial ecosystem unit and study of provided photographs.



**SUBJECT SITE:
LOT C - 7362
PEMBERTON FARM RD E**

GIS Cartographer: Nicola Church
Date: 1/17/2022
CERG File #: 584-05-01
Projection: NAD 1983 UTM Zone 10N



Map 1 - Location

Environmental Assessment
7362 Pemberton Farm Rd E
Pemberton
British Columbia



2. Existing Environmental Conditions

2.1. Physical Environment

2.1.1. Climate

The study area lies within the Eastern Pacific Ranges Ecosection, within the Coast Mountains Ecoprovince in southern British Columbia (Demarchi, 1996). This Ecosection is comprised of a rugged inland area that has a transitional climate, falling between the rain shadowed Southern Interior Ecoprovince to the east, and the high rainfall associated with the Southern Pacific Ranges Ecosection to the west (Demarchi, 1996). The climate is principally influenced by frontal systems moving in from the Pacific Ocean and over the Coast Mountains to the Interior (Green and Klinka 1994). The annual precipitation in Pemberton in the year 2021 was 1051.5 mm and average temperature is 9.2°C (Environment Canada, 2021). Climate normals are not available for the Pemberton station.

Pemberton weather is typically in between that of nearby weather stations for Whistler and Lillooet. The Lillooet Seton BCHA weather station records an annual total precipitation of 349.0 mm, which mainly falls as rain. The total precipitation peaks in the month of November (44.4 mm average), and is least in the month of March (16.8 mm average). The mean annual temperature is recorded as 9.5°C. July is the warmest month, with a mean daily maximum temperature of 28.3°C, and a mean daily average temperature of 21.6°C. Conversely, January is the coolest month with a mean daily minimum temperature of -5.2°C, and a mean daily average temperature of -2.4°C (Environment Canada, 2021).

The meteorological records from the Whistler weather station record an average annual total precipitation of 1227.7 mm. The heaviest precipitation occurs in the month of November (192.1 mm average), while July is the driest month (44.7 mm average). Precipitation as snow can occur from October until May. The mean annual temperature is 6.7°C, with the highest mean monthly temperature occurring in August (16.5°C mean daily average; 24.0 mean daily maximum) and the lowest mean monthly temperature occurring in December (-2.8°C mean daily average; -5.4 mean daily minimum) (Environment Canada, 2021).

2.1.2. Geology

The subject lands are located within the Southern Coast Mountains. This complex was formed during the Mesozoic – Lower Cretaceous era, composed of marine sedimentary and volcanic rocks. This complex consists of peninsula and brokenback hill formations and is made up of conglomerate, sandstone, shale, crystal and lapilli tuff, tuffaceous sandstone, volcanic conglomerate, volcanic breccia, and andesitic to dacitic flows (Shiarizza and Church, 1997).

2.1.3. Geomorphology

The subject property exists within the major terrain area of the Lillooet River flood plain deposits which grade from gravels and sands near Meager Creek through sands and sandy loams to silt loams between Pemberton and Lillooet Lake. Soils originate from Pleistocene or Recent age unconsolidated fluvial and glacial deposits influenced by the local bedrock. The study area consists of bedrock from metavolcanic



and metasedimentary rocks with influences from unconsolidated materials and intrusive rocks (R.B. Kuurne, 1980).

2.1.4. Hydrology

There are no watercourses within the property boundary. The North Arm Channel is present west of the property, across Pemberton Farm Road East. This section of the North Arm Channel was historically fed by Lillooet River. This channel is also fed by Ivey Creek from the south slopes of Mount McKenzie (iBC Gov, 2022a).

The property lies within the Pemberton aquifer (No. 326) located throughout Pemberton valley bottom. This aquifer is composed of fluvial sand and gravel with moderate vulnerability, medium stream system, no quality concerns and has high productivity (BC Gov, 2022a). Well density throughout this aquifer is moderate. There are no wells on or adjacent to the property. There are two groundwater wells nearby, registered at Pinewood Drive, within the residential subdivision south of the property. Well tag No. 78225 is listed as unlicensed and abandoned. Well tag No. 78255 is owned by Windridge Properties.

2.2. Terrestrial Environment

2.2.1. Soils

The subject property is within the Lillooet River flood plain. Soils of the flood plains are mainly imperfectly drained Gleyed Reosols, or poorly to very poorly drained Rego or Rego Humic Gleysols with lesser amounts of poorly to very poorly drained Organic soils (R.B. Kuurne, 1980). The BC Soil Information Finder Tool displays three soil polygons occurring on the subject property and are described below.

The majority of the property is within Soil Polygon 1, which contains 70% undifferentiated bedrock and 30% Collister soil. The Collister soil is sandy loam, rapidly drained, Orthic Eutric Brunisol, and colluvial deposits. Collister soils are formed in shallow (less than 1 m) colluvial deposits derived from intrusive bedrock (BC MOE, 1980).

A small portion of the parcel at the northeast corner is part of Soil Polygon 2, which is composed of 70% Scobie soil and 30% Ranson soil. The Scobie soil is silt loam, poorly drained, with no coarse fragments, by fluvial deposition. Scobie soils are formed in sandy floodplain deposits of the Lillooet River. Scobie is acidic and poorly drained due to seasonally high ground water levels and occur on level sites. Ranson soil is Rego Gleysol, loamy sand, very poorly drained, no coarse fragments and fluvial deposition. Ranson soils developed on sandy floodplain deposits of the Lillooet River that have shallow organic material (less than 20 cm) and are periodically inundated by standing water (BC MOE, 1980).

A small area on the northwest corner of the parcel is part of Soil Polygon 3, composed of 100% Wolverine soil. The Wolverine soil is loam, imperfectly drained, has no coarse fragments, and is fluvial deposit. Wolverine soils have formed in sandy fluvial deposits on the Lillooet River floodplain. They are classified as Gleyed Regosol, are imperfectly drained due to fluctuating ground water levels and occur on level to very gentle slopes (BC MOE, 1980).



2.3. Vegetation

2.3.1. Vegetation Associations

A site investigation was not conducted for this environmental assessment due to snow cover for the time of year. Vegetation and terrestrial ecosystem analysis was conducted based on base map imagery and photos taken from October 2021. The property is entirely disturbed from site preparation activities. Vegetation has been cleared, bedrock has been blasted, and aggregate is stockpiled on the property. The existing vegetation on site is sparse (Structural Stage 1a) and is described below in Table 1. The successional status is Non-Vegetated (NV) as vegetation is less than 5% cover due to anthropogenic causes. Vegetation present on site includes plants listed in Table 2 and other unidentified invasive plant species.

Table 1: Vegetation Age Class Descriptions

Structural Stage Code	Interpretation
1 a) Sparse b) Bryoid c) Lichen	<ul style="list-style-type: none"> - Community is in initial stages of primary and secondary development - Bryophytes and lichens often dominant - Times since disturbance typically <20 years but may be 50-100 + years in areas with little or no soil - Shrub and herb cover <20 % of total area - Tree cover < 10 % of total area
2a/b/c/d Herb	<ul style="list-style-type: none"> - Early successional stage or edaphic herb community - 2a forb dominated - 2b graminoid dominated, including grasses, sedges, reeds and rushes - 2c aquatic plant dominated, but not 2b plants - 2d dwarf shrub dominated, low growing woody shrubs
3a/b Shrub	<ul style="list-style-type: none"> - Shrub dominated communities maintained by environmental conditions or disturbance - 3a low shrub < 2 metres tall - 3b tall shrub < 10 metres tall - Tree cover <10 %
4 Pole/Sapling	<ul style="list-style-type: none"> - Densely stocked trees - Self-thinning not yet evident - Time since disturbance usually < 40 years
5 Young Forest	<ul style="list-style-type: none"> - Stocking density persists - Self-thinning not yet evident - Time since disturbance usually 40-80 years
6 Mature Forest	<ul style="list-style-type: none"> - Trees established after the last disturbance have matured - The second cycle of shade-tolerant trees may have become established - Time since disturbance generally 80–250 years
7 Old Forest	<ul style="list-style-type: none"> - Structurally complex stands composed mainly of shade-tolerant and regenerating tree species - Snags and coarse woody debris in all stages of decomposition typical - Time since disturbance >250 years
Modifiers: B – Broadleaf C – Coniferous M – Mixed	<ul style="list-style-type: none"> - Broadleaf stands composed of > 75 % broadleaf tree cover - Coniferous stands composed of > 75 % coniferous tree cover - Mixed stands neither coniferous nor broadleaf compose > 75 % of the total tree cover

Table 2: Vegetation present on the subject property

Common Name	Scientific Name	Native
Trees		
Douglas-fir	<i>Pseudotsuga menziesii</i>	Native
Paper birch	<i>Betula papyrifera</i>	Native
Black cottonwood	<i>Populus trichocarpa</i>	Native
Western redcedar	<i>Thuja plicata</i>	Native
Shrubs		
Red-osier dogwood	<i>Cornus sericea.</i>	Native
Thimbleberry	<i>Rubus parviflorus</i>	Native
Baldhip rose	<i>Rosa gymnocarpa</i>	Native
Forbs		
Grass	<i>Poaceae</i> sp.	Native
Common tansy	<i>Tanacetum vulgare</i>	Non-native
Common mullein	<i>Verbascum thapsus</i>	Non-native
Yarrow	<i>Achillea filipendulina</i>	Native

Biogeoclimatic Zone

The subject site is at the boundary of two separate Biogeoclimate zones. The south half of the property is within the Coastal Western Hemlock (CWH) Southern Dry Maritime (ds1) variant. CWHds1 occurs at lower elevations in drainages throughout the eastern Coast Mountains from upper Harrison Lake to the Homathko River. The climate is transitional between the coast and interior, characterized by warm, dry summers and moist, cool winters with moderate snowfall. Vegetation is typically dominated by Douglas-fir, western hemlock (*Tsuga heterophylla*), and to a lesser extent, western redcedar. The understorey contains poorly developed shrub and herb layers with falsebox, prince’s pine, full Oregon-grape, and queen’s cup. The moss layer is well developed (Green and Klinka, 1994).

The north half of the property is within the Interior Douglas-fir (IDF) Wet Warm (ww) – IDFww – Variant (Green & Klinka 1994). The IDFww zone has limited distribution in the Vancouver Forest Region. It is more commonly distributed along southwest-facing slopes. The elevational limits range from approximately 100 to 1200m. Typical vegetation is dominated by Douglas-fir with a smaller amount of western hemlock and western redcedar. The understorey is characterized by a well-developed shrub layer featuring a diverse mixture of species, including falsebox, saskatoon, tall and dull Oregon-grape, prince’s pine, birch leaved spirea, baldhip rose, beaked hazelnut and western trumpet honeysuckle. The moss layer is dominated by step moss and red-stemmed feathermoss (Green & Klinka 1994).

Biogeoclimatic subzones and variants can be further classified into site series. The site series represent subtle changes in microclimate, soil conditions and associated vegetation. The different site series are further classified into Terrestrial Ecosystem Units based on the structural stage of the vegetation and the terrain of the site.

Terrestrial Ecosystem

TE codes for the polygon areas were identified based on the vegetation and soil attributes available from online resources and photographs from October 2021. The subject property was classified into one non-vegetated TE polygon, representing the development on the property (Map 2). The polygon TE codes are described in the following sections.

Polygon 1: 10ES1M

Polygon 1 - TEM Code ES (Exposed Soil)

POLYGON 1 TEM CODE DERIVATION			
Decile			
10	ES Exposed Soil	1 Sparse	M Mixed

Polygon 1 consists of the site series **10ES1M** and comprises the entire subject property (Map 2). The topography features a level slope and soils consisting of bedrock and fluvial river deposits with a seasonally high water table. The site no longer experiences flooding due to local flood mitigations (iMapBC, 2022a).

Exposed Soil is a classification given to non-vegetated or sparsely vegetated units. These are areas not included in other definitions which include areas of recent disturbance from natural or anthropogenic causes where vegetation cover is less than 5%. The structural stage is 1 – Sparse and stand composition is mixed (M) (Province of BC, 1998).



Photo 1: Looking south at the subject property. Minimal vegetation on disturbed site. October 26, 2021.



Photo 2: Looking north at the subject property. Aggregate stockpile is on site with minimal shrub and herb vegetation. October 26, 2021.

2.3.2. Rare and Endangered Plant Species and Ecological Communities

In BC, there are two governing bodies involved with the ranking of species and/or ecological communities at risk. At the national level, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) provides advice in regards to the *Species at Risk Act* (SARA), and at the provincial level, the Conservation Data Centre (CDC) manages the BC Status List.

The Canadian government created SARA in 2002 to complement the Accord for the Protection of Species at Risk (a national effort to identify and protect threatened and endangered wildlife and their associated habitats across the country). COSEWIC is the scientific body responsible for assigning the status of species at risk under SARA.

A species that is listed as Endangered, Extirpated or Threatened is included on the legal list under Schedule 1 of SARA and is legally protected under SARA with federal measures to protect and recover these species in effect.

The BC CDC designates provincial red or blue list status to animal and plant species, and ecological communities of concerns (BC MOE, 2021). The red list includes indigenous species or subspecies considered to be endangered or threatened. Endangered species are facing imminent extirpation / extinction, whereas threatened groups or species are likely to become endangered if limiting factors are not reversed. The blue list includes taxa considered to be vulnerable because of characteristics that make them particularly sensitive to human activities or natural events. Although blue listed species are at risk, they are not considered endangered or threatened. Yellow listed species are all others not included on the red or blue lists and may include species which are declining, increasing, common, or uncommon. Table 3 to Table 6 below include the CDC listed (i.e. rare and threatened) species that have the potential to occur on the subject site; species designated as SARA Schedule 1 are also noted. Potentially occurring species are based on broad habitat preferences delineated by forest district and biogeoclimatic zone, and refined by habitat type available in the subject site. Forest and anthropogenic terrain were selected as habitat type to identify potential listed species for the purposes of this report.



Potential occurrences are then designated as unlikely or possible based upon species specific habitat requirements and an on-site assessment of those habitats. Note that a comprehensive evaluation of the study area for each species was not possible due to time constraints, seasonal migration patterns, and the transient nature of some species.

The CDC iMap (BC Gov, 2021b) does not list any rare and endangered plant species on the subject lot. A list of potentially occurring plant species at risk in the area of the subject site is provided below in Table 3. However, none of these species has the potential to occur on site due to specific habitat requirements.

Table 3: Plant species at risk potentially occurring on the site

Common Name <i>Scientific name</i>	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA Status		
Tall bugbane <i>Actaea elata var. elata</i>	Red	1-Endangered	Commonly found in coniferous forest, deciduous forests, broadleaf forest, mixed forest. Favours seepage slopes and benches in mature forest situations.	Unlikely - Not known in area.
Alpine anemone <i>Anemone drummondii var. drummondii</i>	Blue	-	Habitat ranges from alpine/ tundra, grasslands, shrubs, meadows, and rock areas.	Unlikely - Not known in area.
Vancouver Island beggarticks <i>Bidens amplissima</i>	Blue	1-Special concern	Habitat preferences include beaches, estuaries, mudflats, intertidals, wetlands, marshes, and ditches. This wetland and shoreline species is tied to varying water levels.	Unlikely - No suitable habitat.
Mountain moonwort <i>Botrychium montanum</i>	Blue	-	Habitat requirements include coniferous forests. Commonly found in meadows and moist coniferous forests at upper montane to subalpine elevations.	Unlikely – Site at lower elevation.
Roell's brotherella <i>Brotherella roelli</i>	Red	1-Endangered	Occurs in second-growth forests and forms on mats or rotting forest remains (stumps, logs, tree bases). Incident light is deemed important for this moss.	Unlikely - Not known in area.
Columbian carpet moss <i>Bryoerythrophyllum columbianum</i>	Blue	1-Special concern	On soil over rock; rock is usually acidic and soil is often sandy. Habitats include grassland steppe as well as ledges and bluffs near rivers.	Unlikely - No suitable habitat.
Two-edged water starwort <i>Callitriche heterophylla var. heterophylla</i>	Unknown	-	Habitat requirements include lakes, ponds, open waters.	Unlikely - No suitable habitat.
Jones' sedge <i>Carex jonesii</i>	Blue	-	Found roadside in ditches and in herbaceous riparian areas.	Unlikely - Not known in area.



Common Name <i>Scientific name</i>	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA Status		
Cliff paintbrush <i>Castilleja rupicola</i>	Blue	1-Threatened	Habitat requirements include rock ledges and crevices in cliffs or on rocky slopes. Commonly found in 1030-2190 elevation. Found in alpine/ tundra zones.	Unlikely - Not known in area.
Miner's lettuce <i>Claytonia perfoliate ssp. intermontana</i>	Blue	-	Found in coniferous forest, grasslands, shrubs, sparsely vegetated shrubs, talus.	Unlikely - Not known in area.
British Columbia bugseed <i>Corispermum hookeri var. pseudodeclinatum</i>	Unknown	-	Unknown	Unknown.
Slender hawksbeard <i>Crepis atribarba ssp. atribarba</i>	Blue	-	Found in coniferous open forests, shrublands and grasslands. Tend to favour dry area.	Unlikely - Not known in area.
Slender spike-rush <i>Eleocharis nitida</i>	Blue	-	In peaty or sandy areas, wet soils and shallow waters. Found in wetlands and fens.	Unlikely - No suitable habitat.
Elmera <i>Elmera racemose</i>	Red	-	Habitat requirements include alpine/ tundra, and alpine grasslands.	Unlikely - No suitable habitat.
Banded cord-moss <i>Entosthodon fascicularis</i>	Blue	1-Special concern	Found in grasslands, shrublands, and Garry Oak maritime meadow. Tend to favour humid or damp areas.	Unlikely - No suitable habitat.
Silver hair moss <i>Fabronia pusilla</i>	Red	1-Endangered	Found on rock and can occasionally be found on the bases of trees. Little information is available.	Unlikely - Not known in area.
Poor pocket moss <i>Fissidens pauperculus</i>	Red	1-Endangered	Habitat requirements include bare, moist soil banks, often growing with <i>Fissidens bryoides</i> . Few details exist on the habitat of <i>Fissidens pauperculus</i> .	Unlikely - No suitable habitat.



Common Name <i>Scientific name</i>	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA Status		
Leafy mitrewort <i>Mitellastrca caulescens</i>	Blue	-	Commonly found in wet to moist meadows and woodlands in the lowland and montane zones. Habitat ranges: coniferous forests, moist/ wet forest, riparian area, rock, sparsely vegetated rock, cliffs, talus.	Unlikely - Not known in area.
Slender muhly <i>Muhlenbergia filiformis</i>	Blue	-	Occurs in dry coniferous forests and near springs (cold and hot).	Unlikely - Not known in area.
whitebark pine <i>Pinus albicaulis</i>	Blue	1-Endangered	Within montane forests and on thin, rocky, cold soils at or near timberline. 1300 - 3700 m	Unlikely - Subject site elevation is below 600 m
elegant Jacob's-ladder <i>Polemonium elegans</i>	Red	-	Rock, cliff and talus	Unlikely - Nearest record in Skagit Valley Provincial Park
Alaska holly fern <i>Polystichum setigerum</i>	Blue	-	Occurring in Coastal BC in moist to mesic shady forests, rock outcrops, and lava flows in the lowland and montane zones. Can also be found in riparian areas, rock, sparsely vegetated rocks, near streams and rivers.	Unlikely - No suitable habitat.
Stiff-leaved pondweed <i>Potamogeton strictifolius</i>	Blue	-	Found in lakes, ponds, and open waters.	Unlikely - No suitable habitat.
Leafless wintergreen <i>Pyrola aphylla</i>	Blue	-	Occurs coastal BC and lower mainland.	Unlikely - Nearest record on Texada Island
American bulrush <i>Schoenoplectus americanus</i>	Unknown	-	Found in unique habitats such as Alkali ponds, salt flats, and estuaries. Can also be found in wetlands, fens, marshes and swamps.	Unlikely - No suitable habitat.
Lance-leaved figwort <i>Scrophularia lanceolata</i>	Blue	-	Habitat requirements include coniferous forest, grasslands, shrublands, and meadows.	Unlikely - Not known in area.
Purple-marked yellow violet <i>Viola purpurea var. venosa</i>	Blue	-	Found in alpine, rock, sparsely vegetated rock, talus and tundra habitats.	Unlikely - No suitable habitat.

Source: BC Ecosystems Explorer, Ministry of Environment.



2.3.3. Rare and Endangered Ecological Communities

The term "ecological" is a direct reference to the integration of biological components with non-biological features such as soil, landforms, climate and disturbance factors. The term "community" reflects the interactions of living organisms (plants, animals, fungi, bacteria, etc.), and the relationships that exists between the living and non-living components of the community. Currently, the most common ecological communities that are known in BC are based on the Vegetation Classification component of the Ministry of Forests and Range Biogeoclimatic Ecosystem Classification, which focuses on the terrestrial plant associations of BC's native plants.

Large tracts of undisturbed plant communities are considered ecologically more important than disturbed/fragmented or second growth communities. Vegetation on the subject site consists mostly of barren disturbed ground, as the subject lands have been disturbed by anthropogenic activities. Existing vegetation on site consists of low shrubs, herbs and invasive species in low densities, particularly at the east and west property boundaries. Ecological communities of concern are described in a climax state. Due to the lack of vegetation and disturbed state of the property, it is not possible for any of these communities to occur on the subject property.

2.4. Wildlife and Wildlife Habitats

The subject site is unlikely to provide high or moderate quality wildlife habitat due to the absence of forest, aquatic habitat, native vegetation, available forage, coarse woody debris and wildlife trees. Wildlife may be present on the site when moving between habitats due to the site's proximity to the North Arm Channel (west), south facing lower McKenzie Ridge slopes (north), rocky slope (south), and open grass areas (east, northeast).

2.4.1. Mammals

Various mammals are common in the area and are likely to be present on the property when moving between habitats: black bears may move between high elevation habitat (north) and low elevation or aquatic feeding areas; black-tailed deer utilize lower slopes of McKenzie ridge in the winter; other potentially occurring mammals include the northern flying squirrel (*Glaucomys sabrinus*), bushy-tailed woodrat (*Neotoma cinerea*), ermine (*Mustela erminea*), deer mouse (*Peromyscus maniculatus*), coyote (*Canis latrans*), wolf (*Canis lupus*), cougar (*Puma concolor*), bobcat (*Lynx rufus*), raccoon (*Procyon lotor*), western long-eared bat (*Myotis evotis*), hoary bat (*Lasiurus cinereus*), silver-haired bat (*Lasionycteris noctivagans*), snowshoe hare (*Lepus americanus*), pine marten (*Martes americana*), pika (*Ochotona princeps*), common shrew (*Sorex cinereus*), dusky shrew (*Sorex monticolus*) and yellow-pine chipmunk (*Tamias amoenus*).

2.4.2. Birds

The site is mostly barren of vegetation and is unlikely to provide suitable nesting habitat. Limited grass, shrubs and adjacent properties may provide foraging for birds that inhabit the Pemberton area. Birds that may occur on the site are listed in Table 5.



Table 4: Bird species potential occurring on the subject site.

Common Name	Scientific Name
Northern goshawk	<i>Accipiter gentilis atricapillus</i>
Western grebe	<i>Aechmophorus occidentalis</i>
White-throated swift	<i>Aeronautes sexatalis</i>
Grasshopper sparrow	<i>Ammodramus savannarum</i>
Short-eared owl	<i>Asio flammeus</i>
Burrowing owl	<i>Athene cucularia</i>
Upland sandpiper	<i>Bartramia longicauda</i>
American bittern	<i>Botaurus lentiginosus</i>
Marbled murrelet	<i>Brachyramphus marmoratus</i>
Brant	<i>Branta bernicla</i>
Rough-legged hawk	<i>Buteo lagopus</i>
Green heron	<i>Butorides virescens</i>
Smith's longspur	<i>Calcarius pictus</i>
Red knot	<i>Calidris canutus</i>
Canada warbler	<i>Cardellina canadensis</i>
Lark sparrow	<i>Chondestes grammacus</i>
Common nighthawk	<i>Chordeiles minor</i>
Evening grosbeak	<i>Coccothraustes</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Olive-sided flycatcher	<i>Contopus cooperi</i>
Black swift	<i>Cypseloides niger</i>
Bobolink	<i>Dolichonyx oryzivorus</i>
Horned lark, strigata subspecies	<i>Eremophila alpestris strigata</i>
Rusty blackbird	<i>Euphagus carolinus</i>
Prairie falcon	<i>Falco mexicanus</i>
Peregrine falcon	<i>Falco peregrinus</i>
Peregrine falcon <i>anatum</i> subspecies	<i>Falco peregrinus anatum</i>
Gyrfalcon	<i>Falco rusticolus</i>
Tufted puffin	<i>Fratercula cirrhata</i>
Northern fulmar	<i>Fulmarus glacialis</i>
Barn swallow	<i>Hirundo rustica</i>



Common Name	Scientific Name
Caspian tern	<i>Hydroprogne caspia</i>
Yellow-breasted chat	<i>Icteria virens</i>
California gull	<i>Larus californicus</i>
Short billed dowitcher	<i>Limnodromus griseus</i>
Hudsonian godwit	<i>Limosa haemastica</i>
Western screech owl	<i>Megascops kennicottii</i>
Lewis's woodpecker	<i>Melanerpes lewis</i>
Black scoter	<i>Melanitta americana</i>
Surf scoter	<i>Melanitta perspicillata</i>
Long-billed curlew	<i>Numenius americanus</i>
Black-crowned night-heron	<i>Nycticorax nycticorax</i>
Sage thrasher	<i>Oreoscoptes montanus</i>
Band-tailed pigeon	<i>Patagioenas fasciata</i>
American white pelican	<i>Pelecanus erythrorhynchos</i>
Double crested cormorant	<i>Phalacrocorax auratus</i>
Red necked phalarope	<i>Phalaropus lobatus</i>
American golden plover	<i>Pluvialis dominica</i>
Eared grebe	<i>Podiceps nigricollis</i>
Purple martin	<i>Progne subis</i>
Cassin's auklet	<i>Ptychoramphus aleuticus</i>
American avocet	<i>Recurvirostra americana</i>
Black-throated green warbler	<i>Setophaga virens</i>
Williamson's sapsucker	<i>Sphyrapicus thyroideus</i>
Williamson's sapsucker, thyroideus subspecies	<i>Sphyrapicus thyroideus thyroideus</i>
Forster's tern	<i>Sterna forsteri</i>
Spotted owl	<i>Strix occidentalis</i>
Ancient murrelet	<i>Synthliboramphus antiquus</i>
Wandering tattler	<i>Tringa incana</i>
Barn owl	<i>Tyto alba</i>
Common murre	<i>Uria aalge</i>

2.4.3. Amphibians and Reptiles

Two species of snake may potentially occur on site: the valley gartersnake (*Thamnophis sirtalis fitchi*) and the wandering gartersnake (*Thamnophis elegans vagrans*). The northern alligator lizard (*Elgaria coerulea*) also has the potential to occur on the subject site near the south rock slope.



Photo 3: Looking south at the rocky slope adjacent the residential subdivision at the southeast corner of the property. October 26, 2021.



Photo 4: Looking southwest on the property at the rocky slope along its southern border. October 26, 2021.

2.4.4. Wildlife Species at Risk

A search was conducted for potentially occurring wildlife species at-risk through the BC Conservation Data Centre on January 18, 2022 based on the site’s biogeoclimatic zone and geographic location. Potentially occurring wildlife species are provided in Table 6. Potential occurrence at the subject site is determined based on specific habitat requirements and population distribution.

From the search results, one wildlife species at-risk has the potential to occur on site: common nighthawk (*Chordeiles minor*).

Table 5: Wildlife Species at Risk Potentially Occurring on the Subject Site

Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Northern goshawk <i>Accipiter gentilis atricapillus</i>	Blue	-	Breeds throughout most of mainland BC east of the Coast Ranges.	Unlikely – Site within coast mountains.
Northern goshawk <i>Accipiter gentilis laingi</i>	Red	Threatened	Coastal forests of BC, especially central and northern coastal islands. Closest known occurrence is the Gulf Islands	Unlikely – No suitable forest habitat on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Green sturgeon <i>Acipenser medirostris</i>	Blue	Special Concern	Found in estuaries, lower reaches of large rivers, and in salt or brackish water off river mouths.	None – No fish habitat on site.
White sturgeon <i>Acipenser transmontanus</i>	-	Endangered	In British Columbia they are restricted to the Fraser, Columbia and Kootenay River systems and in Harrison and Pitt Lakes.	None – No fish habitat on site.
Western grebe <i>Aechmophorus occidentalis</i>	Red	Special Concern	Marshes, lakes, and bays; in migration and winter also sheltered seacoasts, less frequently along rivers (Subtropical and Temperate zones).	Unlikely – No suitable aquatic habitat on site.
White-throated swift <i>Aeronautes saxatalis</i>	Blue	-	Primarily mountainous country, especially near cliffs and canyons where breeding occurs; forages over forest and open situations in a variety of habitats (Subtropical and Temperate zones).	Unlikely – No cliffs or canyons on subject site.
Grasshopper sparrow <i>Ammodramus savannarum</i>	Red	-	Prefer grasslands of intermediate height and are often associated with clumped vegetation interspersed with patches of bare ground. No known occurrences near site.	Unlikely – No grasslands on site.
Nelson's sparrow <i>Ammodramus nelsoni</i>	Red	-	Range in BC is from Dawson Creek and northwards.	Unlikely – Outside of range.
Western toad <i>Anaxyrus boreas</i>	Yellow	Special Concern	Various upland habitats around ponds, lakes, reservoirs, and slow-moving rivers and streams.	Unlikely - No aquatic habitat on site.
Mountain beaver <i>Apodontia rufa</i>	Yellow	Special Concern	Mountain Beaver is found in extreme southwestern British Columbia in the Cascade Mountains, and south of the Fraser River.	Unlikely – Not present in BC Coast Mountains.
Mormon Metalmark <i>Apodemus mormo</i>	Red	Endangered	In BC occurs only in south Okanagan valley.	Unlikely – Outside of range.
Great blue heron <i>Ardea herodias fannini</i>	Blue	Special Concern	Aquatic areas <0.5 m deep, fish bearing streams and rivers, undisturbed nesting in tall trees. Closest known occurrence is Lost Lake.	Unlikely - No aquatic areas on site.
Emma's dancer <i>Argia emma</i>	Blue	-	Aquatic and riparian habitat.	Unlikely – No suitable habitat on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Vivid dancer <i>Argia vivida</i>	Blue	Special Concern	Cold springs and warm springs.	Unlikely – No suitable habitat on site.
Coastal tailed frog <i>Ascaphus truei</i>	Yellow	Special Concern	Although they may be found in fish-bearing streams, tailed frogs typically occur in non-fish bearing, permanent, cold, fast flowing mountain streams that flow over rocky substrates.	Unlikely – No suitable aquatic habitat.
Short-eared owl <i>Asio flammeus</i>	Blue	Special Concern	In general, any area that is large enough, has low vegetation with some dry upland for nesting, and that supports suitable prey may be considered potential breeding habitat, although many will not have breeding short-eared owls. Nearby water is a requirement for nesting habitat.	Unlikely – No suitable grasslands or fields on site.
Burrowing owl <i>Athene cunicularia</i>	Red	Endangered	Habitat includes open grasslands, especially prairie, plains, and savanna, sometimes other open areas such as vacant lots near human habitation or airports. This owl spends much time on the ground or on low perches such as fence posts or dirt mounds.	Unlikely – Site is not open grassland.
Upland sandpiper <i>Bartramia longicauda</i>	Red	-	Likely restricted to a few suitable areas within the Peace River lowlands near Ft. St. John and the Cariboo-Chilcotin grasslands near Riske Creek and at least one area in the East Kootenays north of Cranbrook.	Unlikely – Not within range.
American bittern <i>Botaurus lentiginosus</i>	Blue	-	Breeding occurs in lowland marshes in lakes, ponds, and rivers in south and central interior British Columbia and in the lower Fraser Valley.	Unlikely – No suitable aquatic habitat on site.
Marbled murrelet <i>Brachyramphus marmoratus</i>	Blue	Threatened	Coastal areas within 2 km of shore, occasionally on rivers and lakes within 20 km of the ocean in old growth forest. Closest known occurrence is Toba River.	Unlikely - No old growth forest or shore.
Brant <i>Branta bernicla</i>	Blue	-	Restricted to coastal B.C., mainly Vancouver Island, Queen Charlotte Islands, and the Fraser River delta.	Unlikely – Pemberton is not coastal.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Rough-legged hawk <i>Buteo lagopus</i>	Blue	-	Grasslands, field, marshes, sagebrush flats, and open cultivated areas; sometimes rat-infested garbage dumps. Nests on cliffs (typically) or in trees in arctic and subarctic, in tundra, mountain sides, forests with plenty of open ground. Winters in low valleys of southern BC.	Unlikely – Site does not contain fields or grasslands.
Green heron <i>Butorides virescens</i>	Blue	-	Aquatic areas, especially slow moving, shallow waters with good riparian cover.	None – No fish habitat on site.
Smith's longspur <i>Calcarius pictus</i>	Blue	-	BREEDING: Dry, grassy, and hummocky tundra (AOU 1983). NON-BREEDING: in migration and winter in grassy and weedy areas, fields, prairies and airports.	Unlikely – No suitable grass habitat on site.
Red knot <i>Calidris canutus</i>	Red	Threatened/ Endangered	Primarily seacoasts on tidal flats and beaches, less frequently in marshes and flooded fields. On sandy or pebbly beaches, especially at river mouths; feeds on mudflats, loafs and sleeps on Salinas and salt-pond dikes. Nests on ground in barren or stony tundra and in well-vegetated moist tundra.	Unlikely – No suitable aquatic habitat on site.
Immaculate green hairstreak <i>Callophrys affinis</i>	Blue	-	Grassland, meadows, shrub, sparsely vegetated rock. Host plant to larvae is sulphurflower buckwheat.	Unlikely – No suitable host plant.
Western pine elfin <i>Callophrys eryphon sheltonensis</i>	Blue	-	Grassland, wetland, bog at alpine or tree line.	Unlikely – No suitable habitat.
Johnson's hairstreak <i>Callophrys johnsoni</i>	Red	-	Older coniferous forests, particularly with western hemlock that are infected by dwarf mistletoe.	Unlikely – No forest habitat.
Canada warbler <i>Cardellina canadensis</i>	Blue	Threatened	Known to reside in Dawson Creek and northwards.	Unlikely – Site is not within range.
Western thorn <i>Carychium occidentale</i>	Blue	-	Low elevation forests in rich, relatively undisturbed leaf litter, usually dominated by Bigleaf maple.	Unlikely – No forest or leaf litter on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Salish sucker <i>Catostomus</i> sp. 4	Red	Threatened	Salish Sucker has a small, restricted range in the lower Fraser River Valley in southwest BC. This fish faces significant threats including severe hypoxia and habitat degradation.	None – No fish habitat on site.
Common wood-nymph <i>Cercyonis pegala incana</i>	Red	-	Pasture, fields, forests, grassland, sparsely vegetated rock.	Unlikely – Site is not vegetated.
Roosevelt elk <i>Cervus elaphus roosevelti</i>	Blue	-	Roosevelt Elk are restricted in British Columbia (and Canada) to Vancouver Island and portions of the southwestern mainland. A small remnant population of Roosevelt elk occur in the Phillips/Apple River area on the mainland coast.	Unlikely – Range restricted to mainland coast and Vancouver Island.
Northern rubber boa <i>Charina bottae</i>	Yellow	Special Concern	Rubber Boas are most often associated with low elevation mountainsides. Here they can take advantage of warm aspect slopes	Unlikely – Site is disturbed and barren.
Hoffman's checkerspot <i>Chlosyne hoffmanni</i>	Red	-	Range is from Manning provincial park and southwards through the Cascades.	Unlikely – Not within range.
Lark sparrow <i>Chondestes grammacus</i>	Blue	-	Breeding range extends from extreme southern British Columbia and eastern Washington. Thrives in grazed habitats, disturbed areas, and ecotones. Agriculture may increase edge habitat.	Unlikely – Only occurs in the interior of BC.
Common nighthawk <i>Chordeiles minor</i>	Yellow	Threatened	Mountains and plains in open coniferous forest, savanna, grassland, and towns. Nesting occurs on the ground on a bare site in an open area.	Possible – May occur at the east side of the site where there is less traffic.
Painted turtle <i>Chrysemys picta</i>	-	Endangered/ Special Concern	Ponds, marshes, small lakes, ditches, and sluggish streams, usually with muddy bottoms and considerable growth of aquatic plants.	Unlikely – No suitable aquatic habitat on site.
Painted turtle (Rocky Mountain Population) <i>Chrysemys picta</i> pop. 2	Blue	Special Concern	The Rocky Mountain Population is confined to lower elevations and valley bottoms in the southeastern portion of the province, east of the Cascade Mountains and north to Williams Lake.	Unlikely – Outside of range.
Hairy-necked tiger beetle <i>Cicindela hirticollis</i>	Blue	-	Dunes, beach.	Unlikely – No suitable habitat.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Evening grosbeak <i>Coccothraustes vespertinus</i>	Yellow	Special Concern	Coniferous (primarily spruce and fir) and mixed coniferous- deciduous woodland, second growth, and occasionally parks; in migration and winter in a variety of forest and woodland habitats, and around human habitation.	Unlikely – No forest on site.
Yellow-billed cuckoo <i>Coccyzus americanus</i>	Red	-	Associated with open, brushy deciduous woodlands, riparian groves, overgrown orchards, woodlots, parks, and abandoned farmland, coastal alder groves, forest edges, wooded suburbs, and orchards.	Unlikely – Not observed in Pemberton area and little deciduous forest on site.
North American racer <i>Coluber constrictor</i>	Blue	Special Concern	In the NW, North American Racers generally absent from dense forest/high mountains. Racers are restricted to the dry southern interior grasslands of the southern Columbia, Okanagan/Similkameen, Kettle, Thompson, Nicola and the middle Fraser drainages.	Unlikely – Not known in the area.
Sharp-tailed snake <i>Contia tenuis</i>	Red	Endangered	In British Columbia, the Sharp-tailed Snake occurs in low-elevation woodland habitats dominated by Douglas-fir, arbutus and/or Garry oak. The snakes are often found in small openings on talus rocky outcrops and on warm hillsides	Unlikely – Site is highly disturbed with no habitat complexity.
Olive-sided flycatcher <i>Contopus cooperi</i>	Blue	Threatened	Mixed coniferous-deciduous forest with old growth snags along forest edges. Known to occur in the Pemberton area.	Unlikely – No forest habitat on site.
Townsend's big-eared bat <i>Corynorhinus townsendii</i>	Blue	-	On the West Coast, Townsend's big-eared bats are found regularly in forested regions and buildings, and in areas with a mosaic of woodland, grassland, and/or shrubland. In BC, it inhabits Vancouver Island, the Gulf Islands and the Vancouver area; and in the interior, it has been found as far north as Williams Lake and east to Creston.	Unlikely – No suitable habitat although may forage in general open area.
Coastrange sculpin Cultus population <i>Cottus aleuticus</i> pop. 1	Red	Threatened	Cultus Pygmy Sculpin is restricted to a single lake in southwestern B.C., which makes it highly vulnerable to any ecological change.	None – No fish habitat on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Tundra swan <i>Cygnus columbianus</i>	Blue	-	Winter range is restricted to a few localities in southernmost British Columbia; migrants are widespread. Migrations along coast and Peace River country. Winter habitat along South Thompson River and Shuswap Lake.	Unlikely – Outside of range.
Black swift <i>Cypseloides niger</i>	Blue	Endangered	Nests behind or next to waterfalls and wet cliffs, on sea cliffs and in sea caves. Along BC coast, Vancouver Island, southern BC and interior.	Unlikely – No suitable nest habitat.
Monarch <i>Danaus plexippus</i>	Red	Endangered	Occur throughout the dry BC interior and along the pacific coast.	Unlikely – Do not occur through coast mountains.
Coastal giant salamander <i>Dicamptodon tenebrosus</i>	Blue	Threatened	In BC, this species is found in southwestern B.C., extending from the west side of Vedder Mountain to the slopes east of Chilliwack Lake.	Unlikely – Site is outside of species' range.
Bobolink <i>Dolichonyx oryzivorus</i>	Blue	Threatened	Breeding is locally distributed in the main valley bottoms in the southern and central interior, east to Creston. This species generally selects habitat with moderate to tall vegetation, moderate to dense vegetation, and moderately deep litter, lacking woody vegetation.	Unlikely – No suitable grass or agriculture habitat.
Alkali bluet <i>Enallagma clausum</i>	Blue	-	Lake, pond, open water.	Unlikely – No aquatic habitat.
Silver-spotted skipper <i>Epargyreus clarus californicus</i>	Blue	-	Occurs along southern BC coast.	Unlikely – Not within range.
Horned lark <i>Eremophila alpestris strigata</i>	Red	Endangered	Occurs in lower mainland along coast and in southern Kootenays.	Unlikely – Not within range.
Propertius duskywing <i>Erynnis propertius</i>	Red	-	Open oak or mixed woodlands with the foodplant oaks.	Unlikely – No oaks or forest.
Western pondhawk <i>Erythemis collocata</i>	Blue	-	Lakes, pond, open water, wetland, marsh.	Unlikely – No aquatic habitat on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Rusty blackbird <i>Euphagus carolinus</i>	Blue	Special Concern	Breeds in habitats that are dominated by coniferous forest with wetlands nearby including bogs, marshes and beaver ponds. During the winter, it is found in wet woodlands, swamps, and pond edges and often forages in agricultural lands.	Unlikely – No suitable aquatic habitat on site.
Dun skipper <i>Euphyes vestris</i>	Blue	Threatened	Grassland, shrub, meadow.	Unlikely – No suitable forage vegetation.
Prairie falcon <i>Falco mexicanus</i>	Red	-	The provincial population was down to one known active nesting site south of Williams Lake. The species has been extirpated from its historic core area of the province, the Okanagan Valley, for almost a decade. Bred in cliff habitats.	Unlikely - Not known to occur in Pemberton area.
Peregrine falcon subsp. <i>Falco peregrinus anatum</i>	-	Special Concern	The Anatum (<i>F.p. anatum</i>) Peregrine Falcon occurs in the southern interior, and although taxonomy still is uncertain, it is thought to be the subspecies that inhabits the Fraser River valley and Gulf Islands. Anatum Peregrine Falcons typically nest on rock cliffs above lakes or river valleys where abundant prey is nearby.	Unlikely – No suitable cliff habitat on site.
Peregrine falcon <i>Falco peregrinus</i>	Red	Special Concern	Cliff edges near water, interior rivers and wetlands.	Unlikely – No suitable cliff habitat on site.
Gyr Falcon <i>Falco rusticolus</i>	Blue	-	Usually nests on cliff ledges, ideally beneath sheltering overhang; sometimes nests in trees or on man-made structures.	Unlikely – No cliff habitat on site.
Tufted puffin <i>Fratercula cirrhata</i>	Blue	-	Coastal sea bird.	Unlikely – Site not close to ocean.
Northern fulmar <i>Fulmarus glacialis</i>	Red	-	Coastal sea bird.	Unlikely – Site not close to ocean.
Prairie fossaria <i>Galba bulimoides</i>	Blue	-	Known populations in southern BC include Vancouver Island and Kamloops. Lives in perennial-water habitats and vernal habitats.	Unlikely – No suitable aquatic habitat.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Dusky fossaria <i>Galba dalli</i>	Blue	-	Lakes, ponds, rivers and marshes across southern BC.	Unlikely – No suitable aquatic habitat.
Golden fossaria <i>Galba obrussa</i>	Blue	-	Known occurrences from north of Prince George in a straight line south to the Okanagan.	Unlikely – Not within range.
Pygmy fossaria <i>Galba parva</i>	Blue	-	In BC recorded only northeast of Prince George.	Unlikely – Not within range.
Wolverine <i>Gulo gulo</i>	Blue	Special Concern	A range of habitat types from valley bottoms to alpine meadows, strongly associated with the presence of large ungulate prey.	Unlikely - Site close to human activity and development.
Wolverine subsp. <i>Gulo gulo luscus</i>	Blue	Special Concern	A range of habitat types from valley bottoms to alpine meadows, strongly associated with the presence of large ungulate prey.	Unlikely - Site close to human activity and development.
Star gyro <i>Gyraulus crista</i>	Blue	-	Selective habitats of eutrophic ponds, lakes, slow moving streams and seasonal ponds in central and eastern BC.	Unlikely – No suitable aquatic habitat.
Northern abalone <i>Haliotis kamtschatkana</i>	Red	Endangered	Kelp beds along outer well-exposed coasts.	Unlikely – Site is not coastal.
Pale jumping slug <i>Hemphillia camelus</i>	Blue	-	Dry to moist coniferous forests, on and around mossy stumps, rocks and logs, also in leaf litter.	Unlikely – No suitable forest habitat.
Western branded skipper <i>Hesperia Colorado oregonia</i>	Red	-	Few occurrences on Vancouver Island and Gulf Islands. Gary oak ad coastal sand ecosystems.	Unlikely – No suitable habitat and not within range.
Nevada skipper <i>Hesperia nevada</i>	Blue	-	Observed as a single flying specimen through open grassland areas. Larval foodplant is bunchgrass.	Unlikely – No suitable vegetation on site.
Barn swallow <i>Hirundo rustica</i>	Blue	Threatened	Open areas, fields, ponds with vertical nesting habitat, especially buildings. Known to occur throughout the Pemberton area.	Unlikely – No suitable nest habitat on site.
Caspian tern <i>Hydroprogne caspia</i>	Blue	-	Seacoasts, bays, estuaries, lakes, marshes, and rivers.	Unlikely – No suitable aquatic habitat.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Yellow-breasted chat <i>Icteria virens</i>	Red	Endangered	The Yellow-breasted Chat breeds in the extreme southern portions of the province in the Okanagan and Similkameen valleys.	Unlikely – Not within species' range.
California gull <i>Larus californicus</i>	Blue	-	Seacoasts, bays, estuaries, mudflats, marshes, irrigated fields, lakes, ponds, dumps, cities, and agricultural lands.	Unlikely - No suitable habitat on site.
Snowshoe hare subsp. <i>Lepus americanus washintonii</i>	Red	-	The <i>washingtonii</i> subspecies hare population occurs at Burnaby Lake Regional Park.	Unlikely – Site is not within range.
White-tailed jackrabbit <i>Lepus townsendii</i>	Red	-	Primarily Great Basin and northern Great Plains, from Sierra Nevada east to Mississippi River, and from south-central Canada (south-central British Columbia).	Unlikely – Site not within range.
Viceroy <i>Limenitis archippus</i>	Red	-	Any habitat with willows or small aspens as the main larval foodplant. Prairies, wetlands, riparian, watercourses.	Unlikely – No suitable vegetation or aquatic habitat.
Short-billed dowitcher <i>Limnodromus griseus</i>	Blue	-	Mudflats, estuaries, shallow marshes, pools, ponds, flooded fields and sandy beaches. Prefers shallow salt water with soft muddy bottom, but visits various wetlands during migration.	Unlikely - No suitable aquatic habitat.
Hudsonian godwit <i>Limosa haemastica</i>	Red	Threatened	Nests on grassy tundra, near water. Bogs and marshes. Near coast or river. Nests on the ground in a sparsely lined depression, in or under edge of prostrate dwarf birch or on dry top of hummock in sedge marsh	Unlikely - No suitable aquatic habitat.
Western river cruiser <i>Macromia magnifica</i>	Blue	-	Lakes, ponds, open water, streams.	Unlikely – No suitable aquatic habitat.
Western screech-owl <i>Megascops kennicottii</i>	-	Threatened	Widespread distribution along most of the coast, much rarer in the southern interior. Population threatened in the long-term by large-scale forest harvesting at low elevations.	Unlikely – No forest habitat on site.
Western screech-owl (subsp.) <i>Megascops kennicottii kennicotti</i>	Blue	Threatened	Likely restricted to mature lowland coniferous and mixed forests below 600 m elevation.	Unlikely – No forest habitat on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Lewis's woodpecker <i>Melanerpes lewis</i>	Blue	Threatened	Breeds primarily in open forested areas at low elevations where an abundance of large snags provides suitable nesting sites and an open, grassy understory supports high populations of flying insects. Found east of coast mountains.	Unlikely – No snags or forest on site.
Black scoter <i>Melanitta americana</i>	Blue	-	Along coast from southern Vancouver Island and sw mainland coast, north to Queen Charlotte Islands, Prince Rupert, and Chatham sound region. Few records in interior: southern interior ecoprovince, 108 Mile House, Moose Lake (Mt. Robson), Spatsizi River, Fern Lake (Kwadacha Wilderness Park), Beaton Park.	Unlikely – Not known to occur in Pemberton area.
Surf scoter <i>Melanitta perspicillata</i>	Blue	-	Primarily marine littoral areas, less frequently in bays or on freshwater lakes and rivers	Unlikely - No suitable aquatic habitat.
Long-tailed weasel subsp. <i>Mustela frenata altifrontalis</i>	Red	-	Found in a wide variety of habitats, usually near water. Favored habitats include brushland and open woodlands, field edges, riparian grasslands, swamps, and marshes.	Unlikely – Unknown range throughout BC, limited water on site.
Southern red-backed vole subsp. <i>Myodes gapperi occidentalis</i>	Red	-	Prefers cool, mesic deciduous, coniferous, or mixed forests, especially areas with large amount of ground cover. Most of forested Canada (northern British Columbia to Labrador) south through the Rocky Mountains to central New Mexico.	Unlikely – Not known within coastal mountains.
Little brown myotis <i>Myotis lucifugus</i>	Yellow	Endangered	Hibernates in caves and abandoned mines. Does not appear to hibernate in buildings. Summer roosts are buildings, tree cavities, rock crevices, caves and under tree bark. Hunts insects in open areas.	Unlikely – No roosting habitat and limited food availability.
Double-crested cormorant <i>Nannopterum auritum</i>	Blue	-	Lakes, ponds, rivers, lagoons, swamps, coastal bays, marine islands, and seacoasts; usually within sight of land. Nests on the ground or in trees in freshwater situations, and on coastal cliffs.	Unlikely – No suitable habitat.
Long-billed curlew <i>Numenius americanus</i>	Blue	Special Concern	Prairies and grassy meadows, generally near water	Unlikely – No suitable grass habitat on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Black-crowned Night-heron <i>Nycticorax nycticorax</i>	Red	-	Marshes, swamps, wooded streams, mangroves, shores of lakes, ponds, lagoons; salt water, brackish, and freshwater situations. Roosts by day in mangroves or swampy woodland.	Unlikely – No suitable habitat on site.
Grappletail <i>Octogomphus specularis</i>	Red	Special Concern	Riparian forest, riparian shrub. Along woodland streams draining lakes.	Unlikely – No suitable aquatic or riparian habitat.
Jutta arctic <i>Oeneis jutta chermocki</i>	Blue	-	Conifer, deciduous or mixed forest, riparian shrub or forest, grassland, wetland.	Unlikely – No suitable habitat on site.
Audouin's night-stalking tiger beetle <i>Omus audouini</i>	Red	Threatened	Common pest of Douglas-fir cones. Occurs at lower mainland and Vancouver Island in BC.	Unlikely – Outside of range.
Cutthroat trout subsp. <i>Oncorhynchus clarkii clarkii</i>	Blue	-	Sea-run populations, freshwater-resident populations (lacustrine and fluvial) and headwater stream populations.	None – No fish habitat on site.
Sinuuous snaketail <i>Ophiogomphus occidentis</i>	Blue	-	Lake, stream, river.	Unlikely – No suitable aquatic habitat on site.
Mountain goat <i>Oreamnos americanus</i>	Blue	-	Alpine and subalpine habitat; steep grassy talus slopes, grassy ledges of cliffs, or alpine meadows. Usually at timberline or above. In winter can move to lower elevations where snow is not as deep and more food is available.	Unlikely – Site is low elevation.
Sage thrasher <i>Oreoscoptes montanus</i>	Red	Endangered	Sagebrush plains, primarily in arid or semi-arid situations, rarely around towns. In BC only found in southern Okanagan.	Unlikely – No suitable habitat.
Bighorn sheep <i>Ovis canadensis</i>	Blue	-	There is a natural absence of Bighorn Sheep from heavily forested and high snowfall ranges such as the Coast, Purcell and Selkirk mountains. Habitats include open grasslands, alpine, subalpine, shrub-steppe, rock outcrops, cliffs, meadows, moist draws, stream sides, talus slopes, plateaus, deciduous forest, clear-cut or burned forest, and conifer forest, all on moderately steep to steep slopes.	Unlikely – Not found in area due to snow.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Blue dasher <i>Pachydiplax longipennis</i>	Blue	-	Found in lower mainland in BC. Lakes, ponds, open water, wetland, riparian forest. Occasional use in sparsely vegetated rock, cliff, stream, river.	Unlikely – No suitable aquatic habitat.
Indra swallowtail <i>Papilio indra</i>	Red	-	Arid rocky mountainous lands: canyons, cliffs, foothills, barrens. Known in BC only from Gibson Pass and Allison Pass in Manning Park.	Unlikely – Not within range.
Clodius Parnassian <i>Parnassius clodius claudianus</i>	Blue	-	Host plant is <i>Dicentra Formosa</i> that occurs in moist, cool mesothermal areas. Coastal, or wet moist areas.	Unlikely – No suitable habitat on site.
Clodius Parnassian <i>Parnassius clodius pseudogallatinus</i>	Blue	-	Moist riparian habitats by low elevation streams.	Unlikely – No suitable habitat on site.
Band-tailed pigeon <i>Patagioenas fasciata</i>	Blue	Special Concern	Habitat is forest, fields, riparian, springs. Generally found in temperate and mountain coniferous and mixed forests and woodlands, especially pine-oak woodlands, and locally in southern lowlands; also forage in cultivated areas, suburban gardens and parks. Will often forage in diverse habitats not used for nesting.	Unlikely – No suitable vegetated areas on site.
American white pelican <i>Pelecanus erythrorhynchos</i>	Red	-	In BC, breeding is restricted to Stum Lake, 70 km northwest of Williams Lake. Foraging occurs up to 165 km from the breeding colony.	Unlikely – Not within range.
Red-necked phalarope <i>Phalaropus lobatus</i>	Blue	Special Concern	Primarily pelagic, sometimes occurring in migration on ponds, lakes, open marshes, estuaries, and bays.	Unlikely – no suitable habitat.
Common sootywing <i>Pholisora catullus</i>	Blue	-	Very seldom in any kind of natural setting in most of its range, most typically weedy backyards, vacant lots, landfills, edges of croplands; any place where its weedy annual foodplants grow in the open. Can occur in the earliest stages of old field succession and in unnatural persistent grasslands such as edges of pastures. Associated with its host plants <i>Chenopodium</i> and <i>Amaranthus</i> .	Unlikely – Host plants do not occur in the Pemberton area.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Rocky mountain physa <i>Physella propinqua</i>	Blue	-	Permanent, cool water habitats, most often in lakes.	Unlikely – No suitable aquatic habitat.
Sunset physa <i>Physella virginea</i>	Blue	-	The type locality of this species is Mountain Lake, but otherwise the habitat needs of this species are unknown.	Unlikely – No suitable aquatic habitat.
River peaclam <i>Pisidium fallax</i>	Blue	-	In rivers, streams and exposed habitats in lakes; sand or gravel substrates.	Unlikely – No suitable aquatic habitat.
Gopher snake subsp. <i>Pituophis catenifer deserticola</i>	Blue	Threatened	Occurs within the arid interior of the province including the Okanagan, Similkameen, Kettle, Granby, Nicola, Thompson, and Fraser watersheds.	Unlikely – Site not within species' range.
Meadow rams-horn <i>Planorbula campestris</i>	Blue	-	This species is found in vegetated vernal ponds, swamps, and springtime flooded portions of permanent water bodies.	Unlikely – No suitable aquatic habitat.
American golden-plover <i>Pluvialis dominica</i>	Blue	-	Short grasslands, pastures, golf courses, mudflats, sandy beaches, and flooded fields	Unlikely – No suitable habitat.
Eared grebe <i>Podiceps nigricollis</i>	Blue	-	Marshes, ponds and lakes; in migration and winter also salt lakes, bays, estuaries and seacoasts	Unlikely – No suitable habitat.
Sonora skipper <i>Polites Sonora</i>	Blue	Special Concern	Mostly Canadian Zone moist meadows. Moist forest, riparian habitat.	Unlikely – No suitable habitat.
Purple martin <i>Progne subis</i>	Blue	-	Found from Port Neville and Shoal Bay, south to the tip of Vancouver Island (Pedder Bay area), on the west coast of the island in Barkley Sound and east to Squamish, Brae Island and Colony Farm, Pitt River.	Unlikely – Site not within species' range.
Cassin's auklet <i>Ptychoramphus aleuticus</i>	Red	Special Concern	Found along coast and islands.	Unlikely – Site not within species' range.
Northern red-legged frog <i>Rana aurora</i>	Blue	Special Concern	The range of the Northern Red-legged Frog extends from southwestern British Columbia, south along the Pacific coast, west of the Cascade Mountains, to northwestern California..	Unlikely – Site is not coastal.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Oregon spotted frog <i>Rana pretiosa</i>	Red	Endangered	Oregon Spotted Frog is found in extreme southwestern British Columbia, within the Fraser River Basin.	Unlikely – Site not within species' range.
American avocet <i>Recurvirostra americana</i>	Blue	-	Lowland marshes, mudflats, ponds, alkaline lakes, and estuaries.	Unlikely – No suitable habitat.
Nooksack dace <i>Rhinichthys cataractae</i> – <i>Chehalis lineage</i>	Red	Endangered	Limited to three adjacent streams (Bertrand, Pepin and Fishtrap creeks) all tributaries of the Nooksack River in Washington State.	None – No fish habitat on site.
Bull trout <i>Salvelinus confluentus</i>	Blue	-	The bottom of deep pools in cold rivers and large tributary streams, often in moderate to fast currents with temperatures of 45-50 F; also large coldwater lakes and reservoirs.	None – No fish habitat on site.
Bull trout <i>Salvelinus confluentus pop. 28</i>	Blue	Special Concern	The Southcoast British Columbia populations inhabit the Skagit, Squamish, Ryan, Lillooet, Pitt and Lower Fraser Rivers, the Pitt, Birkenhead, Chilliwack, and Chehalis Lakes, and Phelix and Ure Creeks (COSEWIC 2012).	None – No fish habitat on site.
California hairstreak <i>Satyrium californica</i>	Blue	-	Open woodland and edges, brushland, chaparral. Hosts are genera Ceanothus, Cercocarpus, Quercus and a few others.	Unlikely – No suitable vegetation on site.
Half-moon hairstreak <i>Satyrium semiluna</i>	Red	Endangered	This species ranges from extreme southern interior British Columbia, Canada, south to northeastern California, northern Nevada, and east across central Idaho, southwestern Montana, western Wyoming to northern Utah and Colorado, US.	Unlikely – Site not within species' range.
Townsend's mole <i>Scapanus townsendii</i>	Red	Endangered	Restricted to a very small area of land in the central Fraser Valley (Abbotsford and Juntindon).	Unlikely – Site not within species' range.
Black-throated green warbler <i>Setophaga virens</i>	Blue	-	The northeastern corner of British Columbia is the western extent of this species' breeding range. The majority of records are from the Peace Lowland of the Boreal Plains.	Unlikely – Site not within species' range.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Pacific water shrew <i>Sorex bendirii</i>	Red	Endangered	Inhabits the coastal lowlands of northern California, Oregon, Washington and British Columbia, where it is restricted to the lower Fraser River valley.	Unlikely – Site not within Fraser River valley.
Olympic shrew <i>Sorex rohweri</i>	Red	-	Restricted to southwestern British Columbia in the Fraser Lowland and Northwestern Cascade Ranges Ecoregions.	Unlikely – Site not within species' range.
Trowbridge's shrew <i>Sorex trowbridgii</i>	Blue	-	Restricted to the Lower Mainland and Fraser River corridor north to about Boston Bar.	Unlikely – Site not within species' range.
Zerene fritillary subsp. <i>Speyeria zerene bremnerii</i>	Red	-	The species is known from the leeward side of Vancouver Island, with the majority of element occurrences in the south.	Unlikely – Site not within species' range.
Herrington fingernailclam <i>Sphaerium occidentale</i>	Blue	-	Recorded only from a few records in south eastern BC. Restricted to waterbodies that dry up for a part of each year.	Unlikely – Not within range and no suitable habitat.
Rocky mountain fingernailclam <i>Sphaerium patella</i>	Red	-	Reported from Burnaby Lake, Abbotsford lake and Kuyquot. In lakes, sloughs, rivers and streams.	Unlikely – Outside of range and no suitable aquatic habitat.
Striated fingernailclam <i>Sphaerium striatinum</i>	Blue	-	This species is found in broad habitat types over southern BC; however, there are only 3 known records. It lives in rivers, streams and lakes but not temporary water bodies.	Unlikely – No suitable aquatic habitat.
Williamson's sapsucker <i>Sphyrapicus thyroideus</i>	Blue	Endangered	In BC, <i>thyroideus</i> breeds from Manning Provincial Park near the U.S.A. border, north to the Lytton, Cache Creek and Kamloops areas, through the Okanagan Highlands and east as far as Greenwood.	Unlikely – Does not occur in coast mountains.
Williamson's sapsucker (subsp.) <i>Sphyrapicus thyroideus thyroideus</i>	-	Endangered	Occurs north of the U.S. border with the western limit of its range in Manning Park, and Botanie Creek (about 15 km north of Lytton); the northern limits of its range 35 km north of Cache Creek, and 50 km north of Kamloops; and the western limits of its range 10 km west of Grand Forks.	Unlikely – Does not occur in coast mountains.
Pygmy longfin smelt <i>Spirinchus</i> sp. 1	Red	-	Restricted to two lakes in the lower mainland, Pitt Lake and Harrison Lake.	Unlikely – No suitable aquatic habitat and not within range.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Widelip pondsnail <i>Stagnicola traski</i>	Blue	-	Freshwater snails have adapted to most North American habitats including permanent standing, intermittent, and flowing waters.	Unlikely - No suitable aquatic habitat.
Forster's tern <i>Sterna forsteri</i>	Red	-	Freshwater and salt marshes, in migration and winter also seacoasts, bays, estuaries, rivers and lakes.	Unlikely - No suitable aquatic habitat.
Spotted owl <i>Strix occidentalis</i>	Red	Endangered	Dense forest and deep wooded canyons; generally in mature stands or old growth; requires cool summer roosts. Nests on broken tree top, cliff ledge, in natural tree cavity, or in tree on stick platform, often the abandoned nest of hawk or mammal; sometimes in cave.	Unlikely – No suitable forest habitat.
Autumn meadowhawk <i>Sympetrum vicinum</i>	Blue	-	In ponds, slow streams and lakes with dense, emergent vegetation.	Unlikely – No suitable vegetation on site.
Northern bog lemming subsp. <i>Synaptomys borealis artemisiae</i>	Blue	-	Habitat consists primarily of fens and bogs, may also occur in wet meadows, moist mixed and coniferous forests; alpine sedge meadows, krummholz spruce-fir forest with dense herbaceous and mossy understory, mossy streamsides.	Unlikely – No suitable aquatic habitat on site.
Ancient murrelet <i>Synthliboramphus antiquus</i>	Blue	Special Concern	Nineteen colonies are legally protected: 16 colonies are within Gwaii Haanas National Park Reserve, two (Reef and Limestone islands) are Provincial Wildlife Management Areas and one (Hippa Island) is an Ecological Reserve.	Unlikely – Site not within sea shore range.
Black petaltail <i>Tanypteryx hageni</i>	Blue	-	Found in seepage areas and bogs, flat or on hillsides, often associated with streams and usually not under forest canopy in wet mountain ranges. The eggs are laid in the soil of bog, larvae in burrows opening above water, adults forage along sunny forest edges.	Unlikely – No suitable aquatic habitat.
American badger <i>Taxidea taxus</i>	Red	Endangered	Badgers are most commonly found in the Cariboo, Thompson, Okanagan, and East Kootenay regions of BC.	Unlikely – Not known in Coast Mountains.
Eulachon <i>Thaleichthys pacificus</i>	Blue	Endangered/ Threatened	Pacific Coast (E), Fraser River (E) and Nass/Skeena River (T) populations.	None – No fish habitat on site.



Common Name Scientific name	Status		Habitat Requirements	Potential Occurrence
	BC List	SARA		
Wandering tattler <i>Tringa incana</i>	Blue	-	Breeding range is small, limited to the St. Elias Mountains in extreme northwestern British Columbia, but likely extends south to at least Gnat Pass near Dease Lake.	Unlikely – Not within range.
Barn Owl <i>Tyto alba</i>	Red	Threatened	Fields of dense grass. Open and partly open country (grassland, marsh, lightly grazed pasture, hayfields) in a wide variety of situations, often around human habitation.	Unlikely - No dense grass on site.
Common murre <i>Uria aalge</i>	Red	-	Pelagic and along rocky seacoasts.	Unlikely – Site is not coastal.
Grizzly bear <i>Ursus arctos</i>	Blue	Special Concern	Non-forested or partially forested sites with a wide range of foraging opportunities and choice of habitats.	Unlikely – Known to occur in area, but no habitat features or forage on site.

All references from CDC explorer (BC CDC, 2021) and E-Fauna BC (UBC, 2020)

2.5. Valued Ecosystem Components

2.5.1. Wildlife Trees

There are no wildlife trees on the property.

2.5.2. Coarse Woody Debris

There is no coarse woody debris on the property.

2.5.3. Wildlife Movement Corridors

Wildlife tend to use routes with particular features when moving across the landscape to forage for food, disperse, find mates, or locate breeding sites. These features can include such things as cover, shade, vegetation, water or surface characteristics. Scale is also a significant factor in determining the suitability of a landscape; larger animals with home ranges covering hundreds of kilometres (e.g. grizzly bear) have far different movement corridor requirements than some reptiles, whose corridor requirements are measured in metres.

There are no habitat features on site that would support the movement of wildlife through cover or shade. Daytime human presence and traffic in this area is also a deterrent to wildlife presence or movement through the subject property.



2.5.4. Rock slopes

Rock slopes provide specialized habitat for many species, particularly reptiles or small mammals. One alligator lizard was observed just southeast of the property along the rock slope by Cascade on June 2, 2021 (Photo 5).



Photo 5: Rock slope at the northeast corner of the property with a path connecting to the adjacent subdivision. October 26, 2021.

2.6. Aquatic Environment

There is no aquatic habitat on site.

2.7. Socio-Economic Conditions

2.7.1. Cultural and Heritage Resources

The subject site is within the traditional territories of the St'át'imc Nation, as mapped within the St'át'imc Land Use Plan. The St'át'imc Nation territory extends north to Churn Creek and south to French Bar, north and east toward Hat Creek Valley; west to the headwaters of Lillooet River, Ryan River and Black Tusk. They have historical ties to the land that includes utilization of the natural resources of the Pemberton area (St'át'imc First Nation, 2004).

An archeological investigation was not conducted as part of this study. However, an archaeological data request was received from the Archaeology Branch of the Ministry of Forests, Lands and Natural Resource Operations on January 20, 2022. According to provincial records, there are no known archaeological sites recorded on the subject site, and the area of the subject site is not considered to have a high potential for previously unidentified archaeology sites to be found on the subject property.

Archaeological sites are protected under the *Heritage Conservation Act*, and should such a site be discovered during development, all works must be halted and the archaeology branch must be contacted immediately (archaeology@gov.bc.ca).



2.7.2. Other Undertakings in the Area

Mining

No current coal, mineral and placer claims exist on the subject property (BC Gov, 2022a).

Recreation and Tourism

No recreation or tourism activities were observed or found on the subject site. No recreation or tourism features are identified on site from mapping data (BC Gov, 2022a).

Forestry Management

The site is at the southern boundary of the following current Forest Development Units (FDU): Birkenhead and Railroad 752. No FDUs are registered on the subject site (BC Gov, 2022a).

Ground Water

There are no groundwater wells on the subject property. Two wells exist south of the property identified on mapping within the subdivision to the south, along Pinewood Drive (BC Gov, 2022a).

Anthropogenic Features

The subject site is cleared of vegetation and is mostly graded. There is a large stockpile of aggregate in the center of the property. There are no structures on the property.

Adjacent Land Use

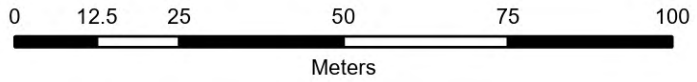
The property is located within the Village of Pemberton along Pemberton Farm Road East. The property is bounded by:

- Residential development to the south;
- Pemberton Farm Road East and North Arm Channel to the west;
- Private cleared lots to the north currently used for recreational parking;
- Grass sports fields to the east within the SunStone subdivision.

Cadastre - DataBC
 Subject Site



GIS Cartographer: Nicola Church
 Date: 1/17/2022
 CERG File #: 584-05-01
 Projection: NAD 1983 UTM Zone 10N



Map 2 - Site Map

Environmental Assessment
 7362 Pemberton Farm Rd E
 Pemberton
 British Columbia





3. Environmental Constraints

3.1. Physical Environment

3.1.1. Climate

The climate in the study area has high levels of precipitation. The Stormwater Management Plan should include snow removal, snow storage and storm event recommendations. Climate change should not affect this property or its development.

3.1.2. Geology

A geotechnical report should be conducted by a qualified professional if required.

3.1.3. Geomorphology

The geomorphology of the subject site and poses no obvious constraints to rezoning or development.

3.1.4. Hydrology

Hydrology of the site is very limited to temporary pooling from precipitation and groundwater. A Stormwater Management Plan is recommended for site design to direct surface flows and encourage the retention of stormwater within permeable surfaces. The plan should also make recommendations for potential flood control within the property (BC MOE, 2014).

3.2. Terrestrial Environment

3.2.1. Soils

An assessment of the soils of the site is outside the scope of this Environmental Assessment; soils on the subject site should be addressed under a separate geotechnical report, if required.

3.2.2. Vegetation

The vegetation on the subject property does not present any constraints or concerns for rezoning or development. The entire property has been disturbed due to anthropogenic activities and is mostly non-vegetated. Existing vegetation covers 5% or less of the property and contains invasive plant species. The state of vegetation on the subject site has low ecological value. It is recommended to remove invasive plant species during development in accordance to the Sea to Sky Invasive Species Council's recommendations (<https://ssisc.ca/invasives/how-to>) to prevent the spreading of weeds.

Rare and Endangered Plant Species

A list of plant, macrofungi and lichen species at risk that are known to occur within the geographical region of the property's forest district and biogeoclimatic zone is provided in Table 3. However, none of these species has the potential to occur on site due to specific habitat requirements.



Rare and Endangered Ecological Communities

No rare or endangered ecological communities exist on the subject property due to its disturbed state and lack of vegetation. Ecological communities on the subject site does not pose a constraint to rezoning or development.

3.3. Wildlife and Wildlife Habitat

3.3.1. Birds and Nests

Shrubs on the subject property provide potential nesting sites for a range of bird species. The BC *Wildlife Act* states:

A person commits an offence if the person, except as provided by regulation, possesses, takes, injures, molests or destroys

- (a) *A bird or its egg,*
- (b) *The nest of an eagle, peregrine falcon, gyrfalcon, osprey, heron or burrowing owl or,*
- (c) *The nest of a bird not referred to in paragraph (b) when the nest is occupied by a bird or its egg.*

Development on the subject property may be constrained by the *Wildlife Act* if vegetation removal or ground disturbance impacts ground nesting birds or birds nesting in vegetation from April 1 to September 1. It is recommended a QEP conduct a song bird nesting survey prior to ground disturbance or vegetation clearing to avoid impact

3.3.2. Rare and Endangered Wildlife Species

Wildlife species with the potential to occur within the geographic region and biogeoclimatic zone of the subject site are listed in Table 6. One of these species is determined to have the potential to occur on the property:

- Common nighthawk (yellow, 1-T)

A species that is listed as Endangered, Extirpated or Threatened within Schedule 1 of *Species At Risk Act* (SARA) is legally protected under the Act by certain prohibitions. A species that is listed within Schedule 1 of SARA with the classification of Special Concern will not receive protection under the SARA general prohibitions.

SARA contains prohibitions that make it an offence to:

- kill, harm, harass, capture, or take an individual of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated;
- possess, collect, buy, sell or trade an individual of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated;
- damage or destroy the residence (e.g. nest or den) of one or more individuals of a species listed in Schedule 1 of SARA as endangered, threatened or extirpated, if a recovery strategy has recommended the reintroduction of that extirpated species.



Common Nighthawk

Common Nighthawks require open ground or clearings for nesting. The species breeds in a wide range of open habitats including sandy areas (e.g., dunes, eskers, and beaches), open forests (e.g., mixedwood and coniferous stands, burns, and clearcuts), grasslands (e.g., short-grass prairies, pastures, and grassy plains), sagebrush, wetlands (e.g., bogs, marshes, lakeshores, and riverbanks), gravelly or rocky areas (e.g., outcrops, barrens, gravel roads, gravel rooftops, railway beds, mines, quarries, and bare mountain tops and ridges), and some cultivated or landscaped areas (e.g., parks, military bases, airports, blueberry fields, orchards, cultivated fields). The female lays the eggs directly on the soil or bare rock in sites with more open ground cover with low or no vegetation, adequate camouflage from predators, and nearby shade (Environment Canada, 2016a).

The subject site contains moderate to low potential ground nesting habitat as the entire site is barren and gravelly. The site does not offer potential foraging habitat. Any ground disturbance for development within the breeding and nesting season (April to September) should ensure no bird nest is disturbed. It is recommended to retain a QEP to conduct a bird nest survey prior to ground disturbance.

3.4. Valued Ecosystem Components

3.4.1. Wildlife Trees

No wildlife trees are observed on the subject property.

3.4.2. Coarse Woody Debris

No CWD is observed on the subject property.

3.4.3. Wildlife Movement Corridor

The subject site provides limited potential for wildlife movement corridor due to a lack of habitat features. There are no habitat features that should be protected.

3.5. Aquatic Environment

The subject site does not contain any watercourses; however, North Arm Channel flows west of the subject site. A Riparian Areas Protection Regulation (RAPR) assessment has not been conducted to determine the Streamside Protection and Enhancement Area (SPEA). As the property is within the Riparian Assessment Area (RAA), within 30 m of the watercourse (Map 2), there is potential for the SPEA to fall within the property boundary. A RAPR assessment may be required. This should be taken into design consideration for development.



3.6. Socio-Economic Conditions

3.6.1. Cultural and Heritage Resources

The archaeological data request has determined there are no known archaeological sites recorded on the subject site, and the area of the subject site is not considered to have a high potential for previously unidentified archaeology sites to be found on the subject property.

If an archaeological site is encountered during future development of the subject site, activities must be halted and the appropriate authorities consulted as archaeological sites are protected under the *Heritage Conservation Act*.

3.6.2. Other Undertakings in the Area

Timber Harvesting

Timber harvesting presents no obvious constraints or concerns for the rezoning or development of the subject property.

Mining

Mining presents no obvious constraints or concerns for rezoning or development of the subject property.

Recreation and Tourism

Recreation and tourism present no obvious constraints or concerns for rezoning or development of the subject property.

Anthropogenic Features

No anthropogenic features pose constraints to rezoning or development of the subject property.

Adjacent Land Users

Adjacent land use does not restrict development or rezoning within the subject property.



4. Conclusions and Recommendations

This report details the baseline conditions and identifies potential environmental constraints for the development within 7362 Pemberton Road E (Lot C) in Pemberton, BC. Based on the conditions observed on the site and the information reviewed, the site appears to be suitable for the proposed development subject to the following recommendations:

1. Land clearing activities conducted during the nesting bird season of April 1 to September 1 must comply with Section 35 of the *Wildlife Act*, which forbids the destruction of nests occupied by a bird, its eggs, or its young. If vegetation clearing is to occur between April 1 and September 1, a song bird nesting survey of the vegetated areas should be conducted by a QEP in order to ensure compliance with the *Wildlife Act*.

The survey will identify the location of any active bird nests including that of the common nighthawk. This bird is a species at risk identified as having the possibility of nesting on site. Any active birds' nests found during clearing must be adequately protected by a forested buffer as per Section 34 of the *Wildlife Act*.

2. Vegetation should be retained wherever possible. Retention of vegetated areas will facilitate wildlife movement through the site and retain breeding and foraging areas. Prior to vegetation clearing, it is recommended that a QEP conduct a song bird nesting survey and species at risk survey.
3. Design and construction practices should minimize erosion and sedimentation in storm water runoff.
4. Landscape plans for the subject site should include native tree and shrub species that are not bear attractants.
5. Future development and construction on the property should follow guidelines and recommendations outlined in: *Develop with Care: Environmental Guidelines for Urban and Rural Land Development in British Columbia* (MOE, 2014) and *Land Development Guidelines for the Protection of Aquatic Habitat* (DFO, 1993). This includes best management recommendations for stormwater, pollution prevention and wildlife and ecosystem management.
6. Avoid impacts to local bear populations by following recommended management plans and adhering to the Village of Pemberton Wildlife Attractants Bylaw (684, 2011).
7. Should any future development be proposed within the 30m Riparian Assessment Area of North Arm Channel, a Riparian Areas Protection Regulation assessment should be conducted, west of the subject site.
8. Removal of the invasive plant species on site should be done in accordance to the recommendations by the Sea to Sky Invasive Species Council.



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