


# SHINGLE SPIT BOAT LAUNCH REPLACEMENT: Biophysical Assessment and Environmental Management Plan

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**CALIDRIS  
Ecological  
SERVICES**  
wildlife - ecology - restoration

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## 1. INTRODUCTION

Calidris Ecological Services Ltd. (Calidris) has been retained by the Comox Valley Regional District (CVRD) to provide permitting support for the proposed replacement of the Shingle Spit boat launch on Hornby Island, BC. This biophysical overview assessment was conducted to inform project permitting, design and environmental mitigation. Note that First Nation engagement and assessment for archaeological or cultural resources were not included in the scope of this report. It is understood that an archaeological assessment in support of this project is being completed under a separate cover.

### 1.1. Project Description

The CVRD is proposing to replace the existing boat launch at Shingle Spit on Hornby Island. The new proposed launch will utilize the existing footprint with a ramp extension of approximately 15 m waterward to allow for safe launching at lower tides and a width increase of approximately 6 m.

A project design has been prepared by Cascara Consulting Engineers Ltd. in Nanaimo, BC. (Appendix A). The new ramp will be approximately 10 m wide (including shoulders) by 47 m long. The design includes a new boarding float anchored with four 300mm (12 inch) steel piles embedded to a minimum depth of 6 m along the south side of the ramp.

The launch is positioned inside of the breakwater of the BC Ferries terminal in the Lambert Channel. No work to the breakwater is proposed. The ramp will be constructed of pre-cast concrete panels placed on a steel frame. Where shortened panels are required to accommodate the piles, a small amount of cast-in-place concrete will fill in the gaps. Cast-in-place concrete will also be used for the abutments at the top of the boat launch. The edges of the new ramp will be armoured with class 250 riprap over non-woven geotextile cloth with a one-meter shoulder on each side of the ramp. Projected areas for the project are provided in Table 1.

The existing launch will be demolished; the fill and waste concrete will be reused, where possible, to create a new level surface for the new construction.

The boarding float deck is anticipated to be made of a fiberglass grating (e.g., Mini-mesh). The boarding floats are expected to be 56 m long by 2.17 m wide for a total area of approximately 121.5m<sup>2</sup>. The floats will extend 14.8 m beyond the last precast concrete plank of the launch, the floats are connected directly to the concrete abutment with a hinged connection.

Much of the work can be carried out from shore, however, a barge will likely be required for installation of the seaward-most piling as well as delivery of construction materials to the site.

**Table 1. Project Footprint Areas (excluding boarding floats).**

Component	Area (m <sup>2</sup> )
Total project footprint	735.85
Total project footprint below mean high tide (4.6m)	485.00
Existing ramp footprint	164.25
Existing ramp footprint below high tide (4.6m)	94.02
New footprint	571.60
New footprint below mean high tide (4.6m)	390.98
<b>Note: Project areas were provided by Cascara Consulting Engineers Ltd. and were derived from the project engineering drawings.</b>	

## 1.2. Regulatory Setting

The new boat launch will require a federal review by Fisheries and Oceans Canada to determine if the project is likely to result in “*harmful alteration, disruption or destruction of fish habitat*” (HADD) under the *Fisheries Act*. A Request for Review will be submitted to Fisheries and Oceans Canada for this purpose. If the project is found to result in a HADD, approval under the *Fisheries Act* will be required and a habitat compensation scheme will be required.

It is understood that upland works associated with the project are within an existing foreshore lease. The CVRD will communicate directly with the province regarding any necessary changes to this lease to allow the project.

The project meets the criteria of a *Minor Work* as described in Section 14 and 15 of the Minor Works Order<sup>1</sup> of the *Canadian Navigable Waters Act* (2021) and may therefore proceed without review of approval from Transport Canada as long as the conditions of the order are met.

## 2. METHODS

### 2.1. Desktop Review

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

- BC Conservation Data Centre (BC CDC) iMap application for known occurrence records of species and ecosystems at risk;
- BC Ecosystems Explorer for potential species at risk;
- Habitat Wizard for provincial fresh watercourse mapping and fish presence;
- Community Mapping Network Eelgrass Bed Mapping (2024);
- Canada Marine Planning Atlas;
- Wildlife Tree Stewardship Atlas;
- The Coastal Resource Information Management System (CRIMS)
- Comox Valley Regional District iMap tool (2024).

The BC Ecosystems Explorer was queried with the following search criteria: ‘Animals’ within the ‘Comox Valley Regional District’ that occur within habitat subtypes: ‘Intertidal Marine’ and ‘Subtidal Marine’. The results were then reviewed. Species were categorized into ‘high’, ‘moderate’, ‘low’ and ‘nil’ likelihood to interact with the project based on the following definitions:

High: Species is known to occur regularly in the region, suitable habitat for the species is present within or adjacent to the project area.

Moderate: Species is rare in the region, but suitable habitat occurs within or adjacent to the project area, or, the species is common in the region but there is no suitable habitat in the project area and the species is not highly mobile and therefore unlikely to interact with the project.

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<sup>1</sup> <https://laws-lois.justice.gc.ca/eng/regulations/SOR-2021-170/page-1.html#h-1308703>

- Low: Species is rare in the region and/or there is no suitable habitat for the species in or adjacent to the project area, or the species is migratory and highly mobile and interaction with the project is unlikely.
- Nil: Species whose known ranges are outside of the project area, or where there have been no recent (within 5 years) occurrence records, or species who are not mobile and whose habitat requisites are not present within the project area.

The Birds of North America (Cornel Lab 2024) online was used to reference habitat requisites for avifauna in the BC CDC search results. Mammals, mollusks and fish were assessed using available Recovery Strategies or species accounts from the BC CDC (2024).

## 2.2. Field Assessment

An assessment of the site was conducted on June 7, 2024 by Kim Poupard, R.P.Bio. The timing of the field assessment corresponded with a low tide event; field work occurred between 12:50 and 14:30. A low tide of 0.15 meters occurred at 13:05. The intertidal area and nearshore shallow water areas were surveyed on foot with a meandering transect. Observations were made opportunistically. Representative photos of the site at low tide were taken from a variety of vantage points. Photos of the site at high tide were provided by Matthew Fawcus of MCCOI Marine who conducted the bathymetry surveys of the site. This work was coordinated with a maximum high-tide event on January 11, 2024.

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

- Habitats likely to support species at risk (e.g., rock outcrops, riparian, reefs, eelgrass beds);
- Ecosystems at risk;
- Species at risk;
- Invasive plants;
- Wildlife habitat features (e.g., wildlife trees, stick nests, dens and burrows);
- Marine flora and fauna including species at risk;
- Important wildlife habitat (.g., wetlands, riparian, old growth forest, reefs, eelgrass beds); and
- Watercourses.

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

A description of the marine ecosystem, terrestrial vegetation communities and general site conditions was compiled and described with field notes and site photographs. Note that the field assessment was limited to chance encounters and general descriptions of land and marine cover types; no species-specific surveys were conducted.

### 3. RESULTS

The launch is positioned within the BC Ferries breakwater on the eastern shore of Hornby Island. The area has seen a considerable amount of industrial activity. The existing boat launch and ferry terminal have been in place for at least 20 years according to imagery from Google Earth™. There are remnants of old structures on the beach including old concrete footings the purpose of which are not known (Appendix D: Photo 3).

The existing launch is in degraded condition (Appendix D: Photo 1 -2). There are large cracks in the surface concrete and the edges and end of the concrete have been eroded. Undermining of the concrete surface is also evident. Further, the current launch does not allow for safe launching at lower tides. It was estimated that at least a two-meter tide is required to launch small craft safely on the existing infrastructure.

#### 3.1. Background Information Review

The project is located within the Coastal Douglas-fir moist maritime (CDFmm) biogeoclimatic zone (iMapBC 2021) and within the Strait of Georgia Federal Marine Bioregion (CMPA 2024).

A review of the BC Eelgrass Mapping Portal indicates the nearest documented eelgrass (*Zostera* sp.) beds are approximately 6.2 km to the northeast in Tribune Bay on the south shore of Hornby Island and 7.9 km to the southwest along the eastern shore of Vancouver Island near Deep Bay. The Hakai Central Coast Eelgrass survey (2012-2020) indicates some presence of eelgrass off the shore of Shingle Spit. Note that none was noted during the field assessment; however, dive surveys were not completed as part of this assessment.

Eelgrass mapping funded by the Island Trust Fund and completed by the SeaChange Marine Conservation Society in 2013 indicates eelgrass presence within the breakwater as well as along much of the eastern shore of Hornby Island (Island Trust Fund 2013). The BC Shorezone mapping application (2023, also produced by SeaChange marine Conservation Society) indicates an Eelgrass polygon inside of the breakwater. The polygon attributes indicate 'medium' confidence and 'sparse' density of eelgrass mixed with green algae in this area. There are much larger polygons to the north of the ferry terminal and south of the breakwater that indicate a denser distribution of Eelgrass.

Hornby Island supports a number of rare and endangered species and ecosystems. The BC Conservation Data Center (CDC) iMap application indicates the area directly upslope of the boat launch hosts red-listed ecosystem Douglas-fir / dull Oregon grape (*Pseudotsuga menziesii* / *Mahonia nervosa*). The red-listed invertebrate Common Wood-nymph (*Cercyonis pegala incana*) is also mapped over this polygon.

Due to the vast number of occurrence records in the area, a number of which are masked, the project was submitted to the BC CDC for review. A detailed response was provided on June 24<sup>th</sup>, 2024 from Robyn Renton (pers comm) and included a list of the masked occurrence records so they could be evaluated against the project. Note that these records are protected under a confidentiality agreement and are therefore not disclosed herein. However, the records were evaluated for potential interactions with the project. Aside from some minor potential sensory disturbance during the construction stage, no impacts to the masked occurrences are anticipated as a result of the project.

The Canada Marine Planning Atlas (CMPA 2024) was reviewed for critical habitat areas and sensitive ecological features. No critical habitat areas overlap the project area. The project is within a mapped Ecological and Biologically Significant Area (CMPA 2024). A Sponge Reef Area is mapped approximately 17 km to the east of the launch, north of Lasqueti Island (CMPA 2024).

The launch is at the north end of the Savoie Rocks – Maude Reef Rockfish Conservation Area which stretches from Shingle Spit (north of the launch) to just north of Norman Point.

The Coastal Resource Information Management System (CRIMS 2024) indicates shoreline pacific herring (*Clupea pallasii*) spawning area around the entire perimeter of Hornby Island. Including in nearshore areas near the boat launch.

There are no mapped watercourses within 1 km of the proposed project according to the BC Habitat Wizard database (Habitat Wizard 2024). However, the CVRD iMap tool indicated two, first order watercourses approximately 500 m to the east and southeast. The southeastern watercourse drains to the sea, the other does not show connectivity.

The Wildlife Tree Stewardship (WiTS) database indicates the nearest documented Bald Eagle (*Haliaeetus leucocephalus*) nest trees are 920 m to the north northeast (BAEA 106-501) and 960 m to southeast (BAEA 106-534). The nearest Great Blue Heron (*Ardea herodias fannini*) nest is a documented colony (GBHE 106-105) approximately 350 m north of the launch. The record indicates that the last recorded use of this site was in 1998, however. No other Great Blue Heron nests are documented within two kilometers of the launch. Note that the coastal population of Great Blue Heron (*fannini subspecies*) are provincially blue-listed and federally listed as ‘Special Concern’ under Schedule 1 of the Species at Risk Act (SARA).

### 3.2. Field Assessment

The foreshore, intertidal and shallow water areas in the vicinity of the launch are relatively uniform. The foreshore is consistently gently sloping between 13 and 17 % and dominated by cobble substrate with trace gravels. There are some small sandy areas approximately 50 m north of the existing launch near the ferry causeway.

The area of the 15 m extension to the existing launch could be visually assessed on foot and by wading from the shoreline as well as viewed from above from the breakwater. Approximately eight meters of the extension were dry at the time of the assessment.

Pacific oyster (*Crassostrea gigas*) was abundant amongst the cobble substrate (Appendix D: Photo 5) as were acorn barnacles (*Chthamatus dalli*). Shore crabs (*Hemigrapsus sp.*) were abundant within the cobble substrate across the beach area. The remains of red rock crab (*Cancer productus*) were also observed.

A number of seaweeds and algae were noted in nearshore areas including sea lettuce (*Ulva lactuca*), Turkish towel (*Chondracanthus exasperatus*) and Japanese wireweed (*Sargassum muticum*). A complete list of species detected during the field reconnaissance is provided in Appendix B. No fish or marine species at risk were observed during the field assessment. No eelgrass was observed within the proposed footprint of the new ramp.

The upland areas of the launch are generally disturbed and include gravel road surface and weedy road edges. There is a steep hillside adjacent the launch (to the east) that hosts mature mixed forest dominated

by big-leaf maple (*Acer macrophyllum*) and Douglas-fir (*Pseudotsuga menziesii*). No impacts to this slope are anticipated as a result of the project.

Purple Marten (*Progne subis*), a provincially blue-listed species, was noted at the ferry terminal approximately 100 m north of the boat launch. Species-specific nest boxes have been placed along the ferry dock and are inhabited by nesting pairs of Purple Marten during the breeding season. This species likely forages in the area around the Project. Impacts to this species are not anticipated given the background disturbance present at the nest boxes (e.g., ferry terminal operations).

There is no freshwater fish or aquatic habitat within the Project Area and no wetlands or suitable areas for aquatic obligate breeding amphibians.

Representative photos of the launch and surrounding area are provided in Appendix D.

### 3.3. Species at Risk

Species at risk from the BC CDC Ecosystems Explorer query results with a ‘moderate’ or ‘high’ likelihood of interacting with the project based on the criteria provided above in Section 2, are provided in Table 2 and discussed below; the complete search results are provided in Appendix B.

**Table 2. Wildlife Species at Risk with Potential of occurring within the Project Area.**

English Name	Scientific Name	BC List	COSEWIC	SARA (Schedule)	Project Interaction Potential
Brant	<i>Branta bernicla</i>	Blue			Moderate
Great Blue Heron, <i>fannini</i> subspecies	<i>Ardea herodias fannini</i>	Blue	SC	1-SC	High
Western Grebe	<i>Aechmophorus occidentalis</i>	Red	SC	1-SC	Moderate
Surf Scoter	<i>Melanitta perspicillata</i>	Blue			Moderate
Grey Whale	<i>Eschrichtius robustus</i>	No Status	SC/E	1-SC	Moderate
Steller Sea Lion	<i>Eumetopias jubatus</i>	Blue	SC	1-SC	High
Northern Abalone	<i>Haliotis kamtschatkana</i>	Red	E	1-E	Moderate
Olympia Oyster	<i>Ostrea lurida</i>	Blue	SC	1-SC	Moderate
<b>Notes: COSEWIC = Committee on the Status of Endangered Wildlife in Canada; SARA = Species at Risk Act, SC = Special Concern; E = Endangered</b>					

Brant goose (*Branta Bernicla*) migrate through the project area in spring and fall. They typically occur in the region in the spring between March and April (BC CDC 2010). Southward migration is generally completed in a single flight from breeding areas in Alaska and therefore they generally do not stop in the region during southern migration (Lewis et al 2020). In the spring, Brants may stage along gently sloping shoreline areas around Hornby Island, including the project area. This species is highly mobile and only likely occurs in the project area during spring migration, it is not expected to be negatively impacted by this project given the construction timing (See Table 6 in Section 5.5).

Great Blue Heron (*Ardea herodias fannini*) are large wading birds residing along the Pacific coast from southeastern Alaska south to Washington (BC CDC 2024). They typically nest communally in tall Sitka spruce, western red cedar, western hemlock, pine, red alder and black cottonwood (BC CDC 2024). However, single nests are also known in the region in mature forest. There are no known active heron nests within two kilometers of the project site. Foraging habitat includes aquatic areas generally less than

0.5m deep, such as marine intertidal areas, estuaries, riparian areas, wetlands, freshwater lakes and muskegs (BC CDC 2024). The project is not expected to have any impact on Great Blue Heron nesting. The project may cause temporary disturbance to Great Blue Heron foraging habitat during construction.

Western Grebe (*Aechmophorus occidentalis*) typically use marshes, lakes, and bays; they winter along sheltered seacoasts along the Pacific Coast from southeastern Alaska and British Columbia south to northwestern Mexico (BC CDC 1996). They migrate in flocks and breed in south-central BC; generally on large, inland lakes (BC CDC 1996). Western Grebe primarily eat fish and obtain food by diving underwater from the surface. Western Grebe are most likely to be in the project area during winter; however, non-breeders may be present year-round (LaPorte et al. 2020). Potential interactions with the project by this species is limited to temporary sensory disturbance to foraging habitat during construction.

Surf Scoter (*Melanitta perspicillata*) typically occur in marine littoral areas and less frequently in bays or on freshwater lakes and rivers (BC CDC 1994). They migrate in flocks along the Pacific coast and breed in western Alaska and other northern areas (BC CDC 1994). Wintering habitat is primarily coastal from the Aleutian Islands to Baja California and the Gulf of California (BC CDC 1994). Surf Scoter are common in the region during the winter months. Interactions with the project are expected to be limited to temporary sensory disturbance to potential foraging areas during construction.

Grey whales (*Eschrichtius robustus*) are large baleen whales that live in coastal waters and shallow shelf waters off of the north Pacific. Three designatable units of this species are recognized: 1. the Pacific Coast Feeding Group that remain in nearshore areas of the Pacific Northwest year-round; 2. The Northern Pacific Migratory Population that migrate between Mexico and the Bering, Chukchi and Beaufort Seas and are not 'summer residents' in the region; and, 3. the Western Pacific Population that once migrated to the Sea of Okhotsk and southern China and have been effectively lost (COSEWIC 2017). Grey Whales are present in near-shore and inshore waters of British Columbia year-round, with the numbers increasing markedly during the migration seasons as individuals moving to and from the Arctic or eastern Russia pass through the area.

Grey whales are best known as benthic foragers that rely heavily on amphipod crustaceans and other swarming organisms found in or on soft bottom sediment (COSEWIC 2017). The "mud plumes" created as they filter sediments through their baleen are characteristic of feeding Grey Whales. They also forage in the water column opportunistically. In British Columbia, grey whales forage on ghost shrimp (*Neotrypaea* spp.) in shallow (< 3 m), sheltered bays and inlets, on amphipods in somewhat deeper (< 35 m) sandy bays on the exposed outer coast, on mysids or crab larvae over rock and boulder substrates and in kelp beds (< 30 m), and on the eggs and larvae of Pacific Herring in eelgrass beds (COSEWIC 2017). Though not commonly observed in the region, potential forage habitat for this species is present along the shore of Hornby Island including in the Lambert Channel. Construction noise, particularly pile-driving, can have an adverse effect on this species. Potential impacts to this species are limited to the construction phase.

Stellar Sea Lion (*Eumetopias jubatus*) use a range of marine habitats including near-shore coastal waters. When not on land, sea lions may congregate at nearshore traditional rafting sites or move out to the edge of the continental shelf (BC CDC 2011). Waters extending 0.9 km from rookeries (and major haulouts) were determined to be essential habitat by the Recovery Team (BC CDC 2011); these waters, plus an air zone extending 0.9 km above a rookery or major haulout and (in Alaska) a land zone extending 0.9 km landward from a rookery/major haulout are included in critical habitat designations.

Rookeries are areas where adults congregate for breeding and pupping. These habitats generally occur on beaches of remote islands with difficult access for humans and other mammalian predators (Sea Lion Recovery Plan Team 1991). Beaches can be sand, gravel, cobble, boulder, or bedrock. Rookery sites may be used as haulout sites during the nonbreeding season. There are no known rookery sites in the vicinity of the project.

Haulouts are areas used by adult sea lions during the nonbreeding season and by nonbreeding adults and subadults throughout the year (Sea Lion Recovery Plan Team 1991). Haulout locations include exposed rocks, reefs, beaches, jetties, breakwaters, navigational aids, floating docks and sea ice. Selection of both rookery and haulout sites appears to depend on a number of factors including substrate type, degree of exposure to wind and waves, proximity to food resources, tradition of use, season and the degree of human disturbance (COSEWIC 2013). There are a number of haulout locations in and around Hornby Island. Fisheries and Oceans Canada (2010) identifies a “major winter haulout” somewhere between Fanny Bay and Deep Bay. The author has also observed Stellar’s Sea Lions on Flora Islet in the spring on numerous occasions.

Stellar’s sea lions are most abundant in the region during the spring season but may be present year-round. Interactions with the project are expected to be limited if mitigation to avoid harm to marine mammals are observed during construction. The completed project is not expected to have any interaction with this species.

Northern Abalone (*Haliotis kamtschatkana*) occurs in a wide range of habitats including sheltered bays to exposed, rocky coastlines (COSEWIC 2009). They require hard substrate in intertidal and shallow subtidal waters and full salinity with good water exchange and a source of macro-algae. Encrusting algae is important for settlement (COSEWIC 2009). No Northern Abalone were observed during the field assessment and the area likely does not support substrate suitable for this species as it is dominated by cobble with trace gravels and sand and abundant shells and does not have the required bedrock, rock or encrusting algae. The project is not expected to impact this species.

Olympia oysters (*Ostrea lurida*) are found primarily in the lower intertidal and shallow subtidal zones of estuaries and saltwater lagoons (COSEWIC 2011). They have also been found on tidal flats, in splash pools, near freshwater seepage, in tidal channels, bays and sounds, or attached to pilings or the undersides of floats (COSEWIC 2011). No Olympia oysters were observed during the site visit. This project is not expected to impact Olympia oyster.

Killer whales (*Orcinus orca*) did not occur in the results of the BC CDC search as the criteria restricted results to intertidal and sub-tidal areas. However, due to the significance of this species, its federal status and its potential to interact with the project, it has been considered in this assessment. Three of five designatable units may occur in the project area: 1. Northern resident population as the project is at the south-end of their range; 2. The southern resident population as the project is within their range; and 3. The West-coast transient population which travel widely and may occur throughout the coastal waters of British Columbia. Note that all three designatable units are provincially red-listed. The northern resident population and the transient populations are designated as ‘Threatened’ under the SARA and the southern resident population is designated as ‘Endangered’. (COSEWIC 2008). Killer whales may move through the area at any time of the year and must be considered in mitigation during construction. They

may be sensitive to construction noise and in particular to piling installation. Potential adverse impacts to this species can be managed through marine mammal mitigation for the project.

The Project Area contains limited suitable breeding habitat for migratory birds. The adjacent mature mixed forest landward of the project likely does support nesting migratory species. The *Migratory Bird Convention Act* prohibits harm to migratory birds or disturbance to their nests or eggs. The Project Area is within nesting zone A1 which has a nesting period of March 26 to August 9 (Environment Canada 2020). While not anticipated to be required for this project, should tree clearing and vegetation be required, it should be avoided during this period. If it is unavoidable, a pre-clearing nesting bird survey should be conducted by a qualified professional to assess compliance with the *Migratory Bird Convention Act* and the provincial *Wildlife Act*.

#### 4. ENVIRONMENTAL IMPACT ASSESSMENT

The new boat ramp will include extending the existing ramp approximately 15 m further seaward and widening it by approximately 6 m (including shoulders). The existing boat ramp is approximately 164.25m<sup>2</sup> in area. The new proposed boat ramp will be approximately 735.85m<sup>2</sup> area resulting in a new footprint area of 571.60m<sup>2</sup>; 390.98 m<sup>2</sup> of which will be below the mean high tide.

Of the proposed works, the shoulder riprap rock along the boat ramp will be exposed for colonization by marine organisms. Rock to be used for the ramp shoulder and armouring is estimated to be 800 to 1200mm in diameter. Once placed on the seabed and stacked for the shoulder and armouring, this rock is expected to provide a 3-dimensional offsetting compensation surface for marine flora and fauna to colonize (including interstitial voids) of 2.5:1. The estimated surface area of the riprap is 321.6m<sup>2</sup>, thus:

$$(53.6 \text{ m long boat ramp}) \times 6\text{m} (\sim 1 \text{ m should on each side and } 2 \text{ m, } 1.5:1 \text{ fill slope}) = 321.6\text{m}^2$$

$$321.6\text{m}^2 \times 2.5 = 804 \text{ m}^2$$

This results in approximately 804 m<sup>2</sup> of new hard surface area for marine flora and fauna to colonize within the proposed riprap area of the new project. It is expected that marine flora and fauna will quickly colonize the new riprap within one to two years. There is currently no rip rap shoulder on the existing boat launch.

The risk of sediment generation is expected to be low due to a lack of fine-textured material on the beach around the ramp.

Based on this assessment of the existing boat launch and the proposed layout of the new ramp and floating dock, the proposed project is not expected to have any significant impacts on marine species or ecosystems if mitigation measures provided below are observed. The diversity of marine flora and fauna within the project area is generally low with low to moderate habitat value. The area is somewhat degraded by the existing ferry terminal.

Upland habitat in the area of the project was deemed to be extremely low in habitat value, comprised primarily of weedy species and scattered shrubs.

## 5. ENVIRONMENTAL MANAGEMENT PLAN

General minimum environmental mitigation requirements that will be required of the contractor are provided below. This EMP will be provided with project tender documents to prospective bidders.

This document has been reviewed and approved by the CVRD. Environmental Protection and Management is an iterative process that may require updates and amendments during construction. This EMP should be considered a “living document” and revised through the project as necessary.

Table 3 summarizes project activities with a high potential for adverse environmental effects.

**Table 3. High Risk Activities Associated with the Project**

Activity	Risk
Site preparation	Removal of the old structure and contouring of the ground may impact intertidal marine fauna.
Pile driving	Sensory disturbance to marine and terrestrial wildlife species including potential physical injury to fish and marine mammals as well as interference of echo location. Potential sediment generation.
Cast-in-place concrete	Contamination of water due to high alkalinity.
Rip-rap placement below the tide line	Physical injury to fish and other marine fauna, sedimentation generation.

### 5.1. Environmental Monitoring

A qualified Independent Environmental Monitor (EM) will be retained for the project. This person may be hired by the construction contractor or by the Project Owner (CVRD). The role of the EM is to inspect, evaluate and report on the compliance and effectiveness of work practices and environmental protection and mitigation procedures as identified in the project-specific EPP as well as any other specific requirements in the project permits or approvals. The EM can provide advice and recommend improvements to the plan as necessary. All works near the marine environment are to be conducted in compliance with the following:

- A Field Guide to Fuel Handling, Transportation and Storage (MWLAP & MoF 2002);
- BC Guidelines for Industry Emergency Response Plans (MoE 2002);
- Best Management Practices for Pile Driving and Related Operations (PWGSC 2003).
- *Fisheries Act* (Canada);
- *Species at Risk Act* (Canada);
- *Environmental Management Act* (BC) Spill Reporting Regulation; and
- *Migratory Birds Convention Act* (Canada).

The EM shall have the authority to advise contractor(s) and project staff to modify or halt construction operations that conflict with safe environmental practices and procedures.

## **5.2. Roles and Responsibilities**

### ***Comox Valley Regional District (CVRD)***

The CVRD is the Project owner and is responsible for application and approval of all necessary permits. The CVRD may require or conduct surveillance of the Project throughout construction to ensure the work is being carried out as per the contract requirements and conditions of this EMP and project authorizations. The CVRD will lead, or delegate, communications with regulatory agencies, First Nations and the public.

### ***Prime Contractor***

The prime contractor is responsible for constructing the project in a safe and appropriate manner as per the requirements of the tenure including compliance with this EMP, relevant Best Management Practices (BMPs) and any other requirements associated with project authorizations.

The prime contractor, its staff and any sub-contractors or other project personnel must read and understand this EMP. The contractor will attend regular meetings to discuss environmental issues and will respond and address any non-compliance issued raised by the EM. The Contractor is responsible for the preparation of any incident reporting, as required. The contractor will communicate the construction schedule with the EM and the CVRD.

The prime contractor must retain a copy of this EMP on site for reference while work is being conducted. Copies of relevant permits and emergency contact information will also be kept on site and readily available.

### ***Environmental Monitor (EM)***

The EM will be hired by the CVRD to monitor and report compliance of the project with this EMP. The EM will attend a pre-work start up meeting with the contractors to summarize the environmental performance standards detailed herein. Periodic field inspections will be carried out during construction.

The EM has the authority to stop work if unauthorized damage to the environment is occurring or non-compliance with applicable laws is observed.

The EM will hold a pre-construction meeting with the construction crew to review environmental protection requirements identified within this document, the project-specific EPP, and all associated regulatory documents. During the construction phase of the project, the EM will have the primary responsibility to confirm that environmental management measures, controls and specifications are implemented in accordance with the project environmental performance standards as outlined in this EMP and the EPP as well as with terms and conditions of regulatory permits and approvals and Industry Best Management Practices (BMPs).

The primary responsibilities of the EM are:

- Have an understanding of all aspects of the project including the contract documents, agency guidelines and other documents, and confirm if all mitigation measures contained within are being appropriately implemented;

- Review the contractor's work plans to confirm if the project environmental performance standards are being met, and make recommendations to address any deficiencies;
- Hold an, onsite, pre-construction meeting with the contractor to review the project environmental performance standards and regulatory requirements;
- Monitor Contractor work activities as required and be on call should an emergency arise;
- Consult with the Construction Project Manager / Engineer should a work stoppage be necessary if environmental protection is compromised;
- Inventory contents of Emergency Spill Kits and confirm if they are appropriately stocked and maintained;
- Monitor on-site machinery for oil leaks and follow-up, including any repairs prior to machinery being mobilized on site;
- Observe, document and report spills and spill cleanup and contact appropriate authorities in the event of an environmental incident or development of unforeseen site conditions with potential for serious environmental degradation; and
- Prepare a weekly environmental monitoring report that summarizes each site visit which summarize all in-water construction activities, mitigation measures and document any near misses or incidents.

### **5.3. Communication Plan**

The EM will communicate directly to the prime contractor's onsite supervisor to provide feedback on environmental performance. If non-compliance with the EMP is noted, the supervisor will be notified as soon as possible. A stop work order will be given to the prime contractor's supervisor to enforce.

If an agreement cannot be reached, the EM may bring issues to the attention of the CVRD.

The EM will communicate environmental performance to the CVRD on a bi-weekly basis and will provide an overall summary at the conclusion of the construction phase of the project.

A project contact list will be compiled and distributed before construction commences. A copy of this list should be affixed to this EMP. This list should be kept up to date, as required.

### **5.4. Environmental Incident Reporting**

An environmental incident is one that has caused an adverse effect to the environment. An environmental near miss is when an action had the potential to cause an impact to the environment.

Where required to report an environmental incident by law, regulation or local bylaws, the Contractor will immediately notify the CVRD before reporting the incident. The EM should also be engaged to support proper documentation and reporting.

It is the responsibility of the Contractor to report environmental incidents and near misses with as much detail as possible, as soon as it is safe to do so.

The CVRD or designate will complete incident reporting and liaison with regulatory agencies, as required.

Reportable incidents are not always precisely defined. When in doubt, contact the project EM and the CVRD to ensure compliance. Reportable spill criteria are provided in Table 4.

**Table 4. Reportable Spill Criteria.**

Substance	Quantity
Any spill of a substance that may cause harm to the environment or any quantity of a substance on the Schedule of the Spill Reporting Regulation that enters or is likely to enter a body of water.	Any
Class 1: Explosives, as defined in Section 2.9 of the Transportation of Dangerous Goods Regulation	50 g, or less if the substance poses a danger to public safety
Class 2.1: Flammable gases, other than natural gas as defined in Section 2.9 of the Transportation of Dangerous Goods Regulation	10 kg
Waste oil as defined in section 1 of the Hazardous Waste Regulation	100 L

### 5.5. Environmental Protection Measures

Required environmental protection measures for the project are provided in Tables 5 to 14.

**Table 5. General Project Environmental Mitigation Requirements**

Ref.	General Measures
1	All activities must comply with applicable laws and regulation including local bylaws and related orders.
2	All permit and approval conditions, terms and requirements must be implemented. Copies of permits are to be present on site. Work is to be conducted in accordance with all applicable laws and regulations.
3	All site personnel, including sub-contractors, must review and understand this EMP and sign a Project Orientation Record (to be provided).
4	Environmental considerations must be a component of regular tailboard meetings.
5	A project Environmental Monitor (EM) will be hired by the CVRD (project owners) to advise on environmental issues and monitor contractor compliance with this EMP, environmental regulations and permit requirements.
6	In case of an environmental incident, a report must be filed within 24 hours.
7	A pre-construction site meeting should be held on site that includes the prime contractor, CVRD and the EM to discuss the project approach and environmental performance standards.
8	Vehicles and machinery will not be left idling on site. When equipment is not being used it should be turned off and parked in a suitable, designated area.
9	All machinery working on or below the foreshore must be equipped with environmentally friendly, biodegradable hydraulic fluid.
10	Vehicles and machinery must arrive on site in clean, leak free condition and in good working order.
11	The site is to be inspected regularly and kept clean and tidy.

**Table 6. Project Timing Considerations**

Ref.	Construction Timing Considerations
12	Construction must occur during the least-risk summer work window for Area 14N which is June 1 to September 1 (Gov. of Canada 2024).
13	Construction activities must be restricted to daylight hours and during suitable weather conditions for the activity (e.g., good visibility is required for piling installation).
14	In-water works should be timed with low-tides to the extent possible.

**Table 7. Archaeological Chance Find Procedures**

Ref.	Archaeological and Heritage Measures
15	In the event of a chance archaeological find, the contractor shall suspend work and immediately notify the CVRD.
16	Discovered artefacts or sites of archaeological interest at the site are protected under the <i>Heritage Conservation Act</i> . Under this Act, the contractor and its employees are responsible for protecting archaeological resources uncovered during the course of work, this may include but is not limited to human bones, pit houses, stone tools, rock paintings, shell deposits (middens) or culturally modified trees.
17	If suspected human remains are found, the contractor shall stop work immediately and notify the CVRD who will notify police. Do not disturb the site, stake or flag off the affected location to prevent additional disturbance. Treat the remains with full dignity and respect and do not allow anyone to touch or photograph the remains. Cover any exposed bones until police arrive. Assign an employee to watch over the remains until the police arrive.

**Table 8. Fish and Fish Habitat Protection Measures**

Ref.	Fish and Fish Habitat Measures
18	In the case that dead or dying fish are observed, the dead/dying fish are to be collected (when it is safe to do so). The EM will identify and enumerate the fish and inform Fisheries and Oceans Canada (DFO) and the CVRD.
19	The EM will have the authority to shut down the work and immediately contact DFO should fish or fish habitat be at risk.
20	Limit the duration of in-water works, undertakings and activities so that it does not diminish the ability of fish to carry out their life processes (spawning, rearing, feeding, migrating).

**Table 9. Environmental Mitigation Measures for Pile Driving**

Ref.	Pile Driving Measures
21	Pile driving should be completed during low tide conditions to reduce underwater acoustic impacts. It is expected that the four 300mm (12”) steel piles will be installed during periods of very low tides.
22	Pile driving shall be completed in compliance with “Best Management Practices for Pile Driving and Related Operation <sup>2</sup> ” (PWGSC 2003) and in compliance with DFO guidance for marine mammal and fish acoustic disturbance thresholds.
23	Pile driving operations must be completed during suitable weather. Weather must permit visual observation of fish and marine mammals.
24	Ensure any vessels are not operating in shallow water causing direct physical disturbance to the seabed from propeller scour. Water-based equipment used for demolition and construction is not to ground upon the seabed except for the use of anchors or spuds needed to keep the equipment in place.
25	Minimize movements/repositioning of the barge and subsequent spudding to minimize physical disturbance to the seabed. No spudding or anchoring is to occur within sensitive habitats such as eelgrass or kelp beds.
26	If possible, piles should be installed with a vibratory hammer rather than a drop hammer.
<b>Vibratory Hammer</b> (The following mitigation are specific to pile installation with a vibratory hammer)	
27	Due to the relatively small diameter of the piles, the low quality of the habitat and the unlikelihood of interactions with species at risk, installation of the piles with a vibratory hammer will likely not require active acoustic monitoring (to be confirmed in Letter of Advice from DFO).
28	Establish a 500 m marine mammal exclusion zone around the project site prior to pile installation. This will require active surveying from a suitable vessel prior to and during pile driving activities.
29	Monitor for marine mammals for at least 30 minutes prior to the start of pile installation by vibratory hammer. If a marine mammal enters the exclusion zone, temporarily suspend pile installation until the individual has left the exclusion zone or has not been sighted for 30 minutes.
30	An experienced QEP is to monitor the area in the vicinity of the piles for the presence of fish during all pile driving activities. If injured or dead fish are observed, pile driving is to cease immediately. Pile driving should only resume after additional mitigation measures (e.g., bubble curtain) are implemented to avoid and mitigate further impacts to fish.
<b>Drop (Impact) Hammer</b> (The following mitigation are specific to pile installation with an impact hammer)	
31	A QEP is to conduct acoustic monitoring during all impact pile driving to verify that underwater acoustic thresholds are not exceeded.
32	Install an effective sound attenuation device (e.g., bubble curtain) to be used prior to and during impact pile driving to ensure sound levels do not exceed 207 dB and/or 1 µPa and a Cumulative Sound Exposure Level (SEL) of 203 dB and 1 µPa <sup>2</sup> outside of the sound attenuation device.

<sup>2</sup> [file:///C:/Users/Kim/Downloads/2f1571-165057\\_qibsons\\_nov\\_2\\_-\\_appendix.pdf](file:///C:/Users/Kim/Downloads/2f1571-165057_qibsons_nov_2_-_appendix.pdf)

33	Establish separate fish and marine mammal exclusion zones (e.g., perimeter) around the sound source prior to impact pile driving. The pinniped exclusion zone is to be a minimum 75 m. The cetacean exclusion zone is to be a minimum of 500 m or the distance where sound levels do not exceed 160 dB <sub>RMS</sub> and 1 µPa during impact pile driving, whichever is greater.
34	Monitor work area for the presence of fish for at least 10 minutes prior to the start of impact pile driving and during all pile driving activities. If injured or dead fish are observed, pile driving is to cease immediately. Pile driving should only resume after additional mitigation measures are implemented to avoid and mitigate further impacts to fish (e.g., bubble curtain).
35	An experienced and qualified marine mammal observer(s) is to monitor for marine mammals in the exclusion zone for 30 minutes prior to the start of and during all impact pile driving.
36	If fish and marine mammals are not observed in the respective exclusion zones during the prestart period, a soft start procedure is recommended where the impact energy is gradually increased over a 10-minute period. The soft start procedure is also recommended any time after there is a break of 30 minutes or more during impact pile driving.
37	If a marine mammal enters the marine mammal exclusion zone, temporarily suspend pile installation until the individual has left the exclusion zone or has not been resighted for 30 minutes.
38	If hydroacoustic monitoring indicates that these thresholds are being exceeded, work is to be halted and additional measures implemented to effectively reduce sound levels below the above thresholds.
39	Pile driving must not be conducted during rough weather and sea conditions (high winds and waves). Marine weather forecasts shall be monitored daily by general contractor.

**Table 10. Fuel Handling Protocols**

Ref.	Fuel Handling Protocols
40	Plastic containers used to carry petroleum products shall be designed and used for that sole purpose.
41	Ensure proper containment for petroleum storage, transfer and refuelling facilities that may contain any spillage or leakage. No refuelling of equipment is permissible below the marine high-water mark.
42	Any fuel or lubricants stored temporarily on site must have secondary containment capable of holding 110% of the contents of the container. Containment should be protected to prevent it from filling with precipitation.
43	Ensure fuel/oil storage containers are stored on impermeable surface as far from the foreshore as practical, given the constraints of the site.
44	Verify that containers do not leak and are sealed with a proper fitting cap or lid
45	Label containers according to the Transportation of Dangerous Goods Act Regulations.
46	Perform construction activities in a manner that prevents the release of oil, fuel, coolant or other pollutants into the environment.

**Table 11. Water Quality Protection Measures**

Ref.	Measures to Protect Water Quality
47	Prior to in water works, the work area must be isolated with a floating sediment curtain. This curtain can be affixed to the breakwater then wrapped around the site to the beach. It must be weighted at the bottom and a minimum 2 m deep. It should be positioned so that fish can escape the curtain; there must be an adequate gap between the sea floor and the bottom of the curtain.
48	The effectiveness and condition of the curtain must be regularly inspected (daily) during construction and any time severe wind or waves occur. Periodic clearing of floating debris will likely be required to maintain the integrity of the curtain.
49	If an activity generates turbidity, water quality will be monitored outside of the silt curtain. Should turbidity exceed 8 NTU (when background levels are less than 8 NTU) or >10% (when background levels are greater than 8 NTU) in 24hrs above background levels, additional measures will be employed to control turbidity. Background will be defined as the level at an appropriate adjacent reference site that is not affected by works at the site.
50	A qualified EM shall be on-site during high-risk activities to provide guidance and to monitor water quality within the marine environment.
51	All gravel or rock fill material used to create the sub-base and shoulders for the boat ramp is to be clean and free of clay or fine silts before placement.
52	All gravel or rock fill placement in the upper intertidal must be completed during low tide conditions and in the dry.
53	EM shall conduct water quality monitoring for turbidity (visually and with a turbidity meter as required), and hydrocarbon sheens from fuel, hydraulic oil and grease and follow Spill Reporting Criteria.
54	If any pouring of concrete/grouting should take place, the pour area must be contained and the forms must be leak free and monitored during the pour.
55	If any pouring of concrete/grouting should take place, no uncured concrete or concrete pour water is to enter the marine environment. Low pH caused by uncured concrete is harmful to fish.

**Table 12. Non-hazardous Waste Management**

Ref.	Management of Non-hazardous Waste
56	Ensure all waste, litter and other construction-related materials are removed from the site and disposed of appropriately.
57	Keep the site clean and tidy. Clean up the site at the end of each work day and ensure that all waste generated from construction is managed appropriately.
58	Provide sanitary facilities for workers use if adequate facilities on site are not available. Facilities must be secure and located at least 30 m from the top of the bank of any watercourse. These should be kept clean, in good working order and emptied regularly.

**Table 13. Measures to Protect Wildlife During Construction**

Ref.	Management of Wildlife
59	A qualified EM shall be on-site to monitor marine mammal activity within the surrounding area and to provide guidance to the contractor on environmental protection and mitigation measures as well as stop work if in any instance where there is potential for harm to marine mammals.
60	If there is a risk of harm to a marine mammal from direct contact, temporarily suspend construction until there is no longer a risk of harm from direct contact or the individual has not been sighted for 30 minutes.
61	If there are observations of marine mammals within 500m of the work site the following is to be recorded: date, time, position of animal (Lat/Long), species and number of animals and date and time of work stoppages due to marine mammals, if required.
62	If any disturbance of marine mammals is observed, all operations shall be shut down and notification provided to the local fisheries officer or the DFO reporting hotline 1-800-465-4336.
63	Do not destroy, remove or clear any bird nests. If a bird nest is encountered, cease work at the site (a minimum 30 m from the nest) and contact the EM.
64	Clearing of vegetation or trees should be conducted outside of the migratory bird nesting window (March 26 to August 9) to avoid non-conformance with the <i>Migratory Bird Convention Act</i> . If clearing cannot be conducted within this period, a pre-clearing nesting bird survey must be conducted prior to clearing work. It is advised that clearing works not be conducted between May and July as this corresponds to the peak of the breeding period for this region and is likely to result in project delays.
65	Ensure proper storage of potential wildlife attractants such as food, garbage, petroleum products, or other material with strong odours.
66	Do not feed, disturb or harass wildlife. If wildlife are encountered allow to passively disperse, or if necessary, contact EM for advice on abatement or relocation.
67	All sightings of rare or endangered species (wildlife and plants) must be reported to the EM.
68	Personnel pets are not allowed on the worksite.

**Table 14. Spill Prevention Measures**

Ref.	Spill Prevention Measures
70	Appropriate spill control equipment (spill kits) will be kept on site during the work. Operating personnel are to be familiar with the contents and use of the spill response equipment and the location and operation of emergency 'shut-offs';
71	Spill kits shall be located in each piece of equipment at all times. Spill response material shall include an adequate inventory of sorbent pads, socks and booms to sufficiently respond to petroleum leaks and spills from construction related activities.
72	If a fuel or hydraulic oil spill occurs, the operator of the machine shall stop work immediately, address the immediate containment and clean-up of the spill and undertake the repair or replacement of the machinery before work is allowed to continue;

Ref.	Spill Prevention Measures (continued)
73	The EM is to be made aware of all fuel, oil and chemical spills that occur during the project;
74	Hazardous waste material generated in the course of the project (oil adsorbent pads, oily & grease covered rags, containers, etc.) shall be disposed of in compliance with hazardous waste regulations. Hazardous waste material shall be contained in a designated and properly identified waste disposal container for later disposal to avoid contact with wildlife; and
75	A Spill Response Plan and Emergency Response Plan are to be developed by the contractor and posted on-site.
76	All reportable spills will be reported as soon as possible (within 24 hours) to Emergency BC.

## 6. STATEMENT OF LIMITATIONS

The material in this report reflects the authors' best judgement based on the information available at the time of preparation. Any use which a third party makes of this information, or any reliance or decisions made based on it, are the sole responsibility of such third party. Calidris accepts no responsibility for damages, if any, suffered by any third party as a result of decisions or actions based on this report.

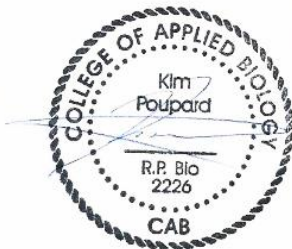
## 7. CLOSURE

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

Yours truly,

**CALIDRIS ECOLOGICAL SERVICES Ltd.**

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## **APPENDIX A:**

# **Engineering Design Drawings**

## **APPENDIX B:**

# **BC CDC Ecosystems Explorer Search Result**

**Table B1: BC CDC Ecosystems Explorer Search Results for Wildlife and Project Interaction Potential.**

Group	English Name	Scientific Name	BC List	COSEWIC	SARA	Project Interaction Potential
Bird	American Avocet	<i>Recurvirostra americana</i>	Blue	-	-	Low
Bird	American Golden-Plover	<i>Pluvialis dominica</i>	Blue	-	-	Low
Bird	American White Pelican	<i>Pelecanus erythrorhynchos</i>	Red	NAR	-	Low
Bird	Ancient Murrelet	<i>Synthliboramphus antiquus</i>	Blue	SC	1-SC	Low
Bird	Black Scoter	<i>Melanitta americana</i>	Blue	-	-	Low
Bird	Brandt's Cormorant	<i>Urile penicillatus</i>	Red	-	-	Low
Bird	Brant	<i>Branta bernicla</i>	Blue	-	-	Moderate
Bird	California Gull	<i>Larus californicus</i>	Red	-	-	Low
Bird	Canada Goose, <i>occidentalis</i> subspecies	<i>Branta canadensis occidentalis</i>	Red	-	-	Low
Bird	Caspian Tern	<i>Hydroprogne caspia</i>	Blue	NAR	-	Low
Bird	Cassin's Auklet	<i>Ptychoramphus aleuticus</i>	Red	SC	1-SC	Low
Bird	Common Murre	<i>Uria aalge</i>	Red	-	-	Low
Bird	Double-crested Cormorant	<i>Nannopterum auritum</i>	Blue	NAR	-	Low
Bird	Forster's Tern	<i>Sterna forsteri</i>	Red	DD	-	Low
Bird	Great Blue Heron, <i>fannini</i> subspecies	<i>Ardea herodias fannini</i>	Blue	SC	1-SC	High
Bird	Gyrfalcon	<i>Falco rusticolus</i>	Blue	NAR	-	Low
Bird	Horned Puffin	<i>Fratercula corniculata</i>	Red	-	-	Low
Bird	Hudsonian Godwit	<i>Limosa haemastica</i>	Red	T	-	Low
Bird	Long-billed Curlew	<i>Numenius americanus</i>	Yellow	T	1-SC	Low
Bird	Marbled Murrelet	<i>Brachyramphus marmoratus</i>	Blue	T	1-T	Low
Bird	Northern Fulmar	<i>Fulmarus glacialis</i>	Red	-	-	Low
Bird	Peregrine Falcon, <i>pealei</i> subspecies	<i>Falco peregrinus pealei</i>	Blue	SC	1-SC	Low
Bird	Red Knot	<i>Calidris canutus</i>	Blue	T	1-T	Low
Bird	Short-billed Dowitcher	<i>Limnodromus griseus</i>	Red	-	-	Low
Bird	Surf Scoter	<i>Melanitta perspicillata</i>	Blue	-	-	Moderate
Bird	Thick-billed Murre	<i>Uria lomvia</i>	Red	-	-	Low
Bird	Tufted Puffin	<i>Fratercula cirrhata</i>	Blue	-	-	Low

Bird	Upland Sandpiper	<i>Bartramia longicauda</i>	Red	-	-	Low
Bird	Wandering Tattler	<i>Tringa incana</i>	Blue	-	-	Low
Bird	Western Grebe	<i>Aechmophorus occidentalis</i>	Red	SC	1-SC	Moderate
Fish	Green Sturgeon	<i>Acipenser medirostris</i>	Blue	SC	1-SC	Low
Fish	White Sturgeon (Lower Fraser River Population)	<i>Acipenser transmontanus</i> pop. 4	Red	T	-	Low
Mammal	Grey Whale	<i>Eschrichtius robustus</i>	No Status	SC/E/NAR	1-SC	Moderate
Mammal	Steller Sea Lion	<i>Eumetopias jubatus</i>	Blue	SC	1-SC	High
Mollusk	Northern Abalone	<i>Haliotis kamtschatkana</i>	Red	E	1-E	Moderate
Mollusk	Olympia Oyster	<i>Ostrea lurida</i>	Blue	SC	1-SC	Moderate
Turtle	Leatherback Sea Turtle	<i>Dermochelys coriacea</i>	Red	E	1-E	Nil

**Notes:**

COSEWIC = Committee on the Status of Endangered Wildlife in Canada; SARA = Species at Risk Act; SC = Special Concern; E = Endangered; T = Threatened; NAR = Not at Risk  
Search Criteria: Animals AND 'Regional Districts': Comox Valley Regional District AND Habitat Subtypes: Intertidal Marine; Subtidal Marine

## **APPENDIX C:**

# **Incidental Observations**

**Table C1. Incidental Species Observations during July 2024 Field Assessment.**

Group	Common Name	Scientific Name	BC List	SARA	Method of Detection
Bird	American Robin	<i>Turdus migratorius</i>	yellow	-	observed
Bird	Bald Eagle	<i>Haliaeetus leucocephalus</i>	yellow	-	observed
Bird	Belted Kingfisher	<i>Megaceryle alcyon</i>	yellow	-	Song
Bird	Chestnut-backed Chickadee	<i>Poecile rufescens</i>	yellow	-	Song
Bird	Dark-eyed Junco	<i>Junco hyemalis</i>	yellow	-	observed
Bird	Double-crested Cormorant	<i>Nannopterum auritum</i>	yellow	-	observed
Bird	Glaucous-winged Gull	<i>Larus glaucescens</i>	yellow	-	observed
Bird	Northwestern Crow	<i>Corvus brachyrhynchos</i>	yellow	-	observed
Bird	Purple Martin	<i>Progne subis</i>	Blue	-	observed
Bird	Song Sparrow	<i>Melospiza melodia</i>	yellow	-	Song
Bird	Spotted Towhee	<i>Pipilo maculatus</i>	yellow	-	observed
Bird	White-crowned Sparrow	<i>Zonotrichia leucophrys</i>	yellow	-	Song
Invertebrate	Acorn barnacle	<i>Chthamalus dalli</i>	n/a	n/a	observed
Invertebrate	Lewis's moonsnail	<i>Neverita lewisii</i>	n/a	n/a	shell
Invertebrate	Nuttall's Cockle	<i>Clinocardium nuttallii</i>	n/a	n/a	observed
Invertebrate	Ochre sea star	<i>Pisaster ochraceus</i>	n/a	n/a	observed
Invertebrate	Pacific Oyster	<i>Crassostrea gigas</i>	n/a	n/a	observed
Invertebrate	Purple mahogany clam	<i>Nuttallia obscurat</i>	n/a	n/a	observed
Invertebrate	Red rock crab	<i>Cancer productus</i>	not reviewed	-	observed
Invertebrate	Shore crab	<i>Hemigrapsus sp.</i>	not reviewed	-	observed
Invertebrate	Soft-shell clam	<i>Mya arenaria</i>	n/a	n/a	observed
Marine Plant	Japanese wireweed	<i>Sargassum muticum</i>	n/a	n/a	observed
Marine Plant	Sea lettuce	<i>Ulva lactuca</i>	n/a	n/a	observed
Marine Plant	Turkish towel	<i>Chondracanthus exasperatus</i>	n/a	n/a	observed
Plant	Arbutus	<i>Arbutus menziesii</i>	yellow	-	observed
Plant	Big-leaf maple	<i>Acer macrophyllum</i>	yellow	-	observed
Plant	Bitter cherry	<i>Prunus emarginata</i>	yellow	-	observed
Plant	Bracken fern	<i>Pteridium aquilinum</i>	yellow	-	observed
Plant	Bull thistle	<i>Cirsium vulgare</i>	exotic	-	observed
Plant	Coastal Douglas-fir	<i>Pseudotsuga menziesii var. menziesii</i>	yellow	-	observed
Plant	Common snowberry	<i>Symphoricarpos albus</i>	yellow	-	observed
Plant	Curly-cup gumweed	<i>Grindelia squarrosa</i>	unknown	-	observed
Plant	Garry oak	<i>Quercus garryana</i>	yellow	-	observed

Plant	Green sorrel	<i>Rumex acetosa</i>	exotic	-	observed
Plant	Hedge mustard	<i>Sisymbrium officinale</i>	exotic	-	observed
Plant	Hop clover	<i>Trifolium sp.</i>	exotic	-	observed
Plant	Oceanspray	<i>Holodiscus discolor</i>	yellow	-	observed
Plant	Pacific ninebark	<i>Physocarpus capitatus</i>	yellow	-	observed
Plant	Pale flax	<i>Linum bienne</i>	exotic	-	observed
Plant	Periwinkle	<i>Vinca sp.</i>	exotic	-	observed
Plant	Purple toadflax	<i>Linaria purpurea</i>	exotic	n/a	observed
Plant	Redtop	<i>Agrostis gigantea</i>	exotic	-	observed
Plant	Ribwort plantain	<i>Plantago lanceolata</i>	exotic	-	observed
Plant	Rose sp.	<i>Rosa sp.</i>	-	-	observed
Plant	Trailing blackberry	<i>Rubus ursinus</i>	yellow	-	observed
Plant	Wall barley	<i>Hordeum murinum spp.</i> <i>Murinum</i>	exotic	-	observed

## **APPENDIX D:**

# **Representative Site Photographs**



**Photo 1.** Showing the current condition of the boat launch as viewed from the adjacent breakwater. Note the BC ferries dock in the background. The new launch will extend seven meters from the end of the existing dock into the shallow area visible at bottom left of photo. The people in the photo were hoping to launch a small boat at the time of the assessment but the tide was too low to allow for a safe launch.



**Photo 2.** Showing the current condition of the boat launch, note eroded end of the launch.



**Photo 3.** Showing habitat conditions adjacent to the boat launch. Note old infrastructure, cobble substrate and abundant oyster shells.



**Photo 4.** Showing habitat conditions adjacent to the boat launch as viewed from the end of the breakwater. Note a few shrubs and deciduous species on the breakwater and near the top of the launch.



Photo 5. Showing position of the launch in relation to the breakwater and BC Ferry Dock (background, at right).



Photo 6. Showing abundant Pacific oyster among the cobble substrate that dominates the foreshore and intertidal area around the launch.



**Photo 7.** Showing the BC Ferry at dock directly in front of where the new launch is going to be placed, as viewed from the breakwater (foreground, at left).



**Photo 8.** Showing the BC Ferry at dock wrapping around the launch, as viewed from the breakwater. The launch is outside of the frame at far right of photo.



**Photo 9.** Showing the BC Ferry at dock and breakwater at high tide on January 11, 2024. Photo provided by MCCOI Marine and taken during the bathymetry surveys for informing the engineering plan.



**Photo 10.** Showing the launch at high tide on January 11, 2024. Photo provided by MCCOI Marine and taken during the bathymetry surveys for informing the engineering plan.



**Photo 11.** Showing the launch at high tide on January 12, 2024. Photo provided by MCCOI Marine and taken during the bathymetry surveys for informing the engineering plan.