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Habitat Assessment Report Fairwinds Schooner Cove Redevelopment

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1 Introduction

Fairwinds Landing in Schooner Cove is planning to expand development on the site, including renovation of the existing hotel building and construction of additional residential buildings in the upland portions of the property.

Development within the foreshore areas of the site (the area below the natural boundary) is minor but will include an additional overwater ramp extending to the existing marina float (Figure 1 and Figure 2). These structures will be incorporated into a planned public waterfront walkway.

To support the project's design and permitting an intertidal survey was conducted March 6, 2017, to collect biophysical data at the proposed overwater ramp area. In addition, recommendations are provided for shoreline habitat enhancement in order to meet the requirement of the Regional District of Nanaimo (RDN) Development Permit Area (DBA) designation that states "shoreline development should result in a net enhancement to shoreline ecology, following advice from a marine biologist on low-impact shoreline structures".

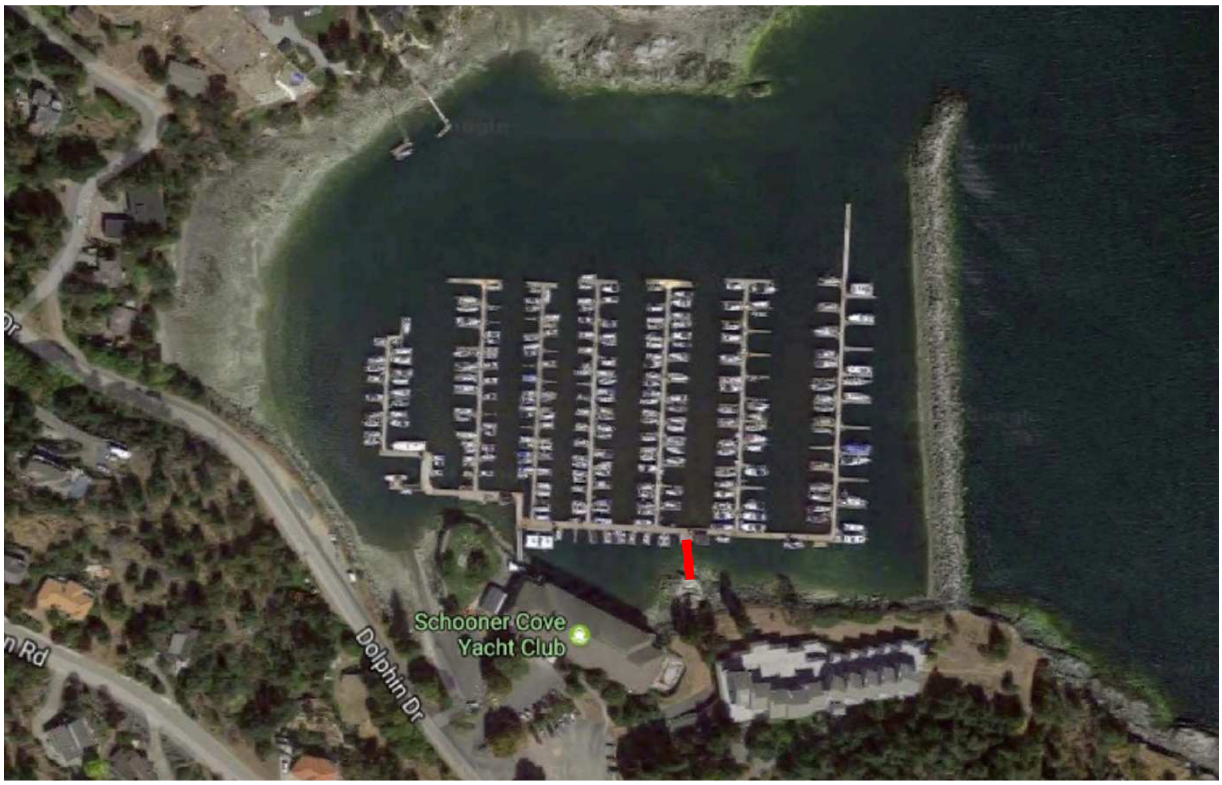


Figure 1. Nanoose Bay Schooner Cove. Red line indicates location of proposed overwater ramp.

Figure 2. Location of the proposed overwater ramp in Schooner Cove.

2 Methods

On March 06, 2017, an intertidal transect was conducted perpendicular to the shoreline along the alignment of the proposed overwater ramp structure to characterize the intertidal habitats during low tide. Measurements of slope distance and vertical elevation were made at changes in biota and/or substrate along the transect. Vertical elevations were measured using a survey level and surveyor's rod[1]. All elevations are reported relative to chart datum (CD). The tidal minimum during the survey was 185 cm.

Qualitative observations of key biota zones (biobands) such as barnacle, rockweed (*Fucus* sp.), and red/green algae, as well as substrate were recorded for each habitat zone. Vegetation was recorded as percent cover and identified to species or species group (e.g. biobands as summarized above). Fauna was recorded as either percent cover (for sessile invertebrates) or as an estimate of abundance (i.e., present (P), common (C) and abundant (A)) for mobile invertebrates and identified to species or next highest taxonomic classification. Substrate was classed as bedrock, boulder, cobble, pebble, sand, and silt/mud/clay consistent with DFO classifications and recorded by percent cover range. Photographs were collected along the transect. The coastal riparian zone was also described.

In addition, an underwater camera with HD video was used to document the seabed of the subtidal zone on the marina dock where the overwater ramp would tie into.

3 Results

The proposed overwater ramp is located over a natural bedrock outcrop (Figure 3). The backshore is comprised of fill over bedrock with landscaping. The substrate from the supratidal[2] to shallow subtidal zone is bedrock. In the subtidal zone the substrate is a mix of boulder, coarse shell hash and sand (Figure 4).

Vegetation in the riparian zone includes turf grasses and mature arbutus and Douglas fir. The supratidal zone is bare of vegetation and fauna, except for splash zone lichen. The intertidal zone contains sparse foliose red algae (*Pyropia*/*Porphyra* and *Mastocarpus*) in the upper intertidal; and a dense band of rockweed (*Fucus* sp.) with some foliose and filamentous green algae in the mid intertidal zone (Table 1; Figure 5). Japanese wireweed (*Sargassum muticum*) and tufted red algae is present in the subtidal zone of the proposed overwater ramp (Table 1; Figure 5 and Figure 6). Fauna includes abundant barnacles in the upper intertidal zone with some Pacific oyster (*Crassostrea gigas*) present; and leather star (*Dermasterias imbricata*) and orange sea cucumber (*Cucumaria miniata*) present in the subtidal zone (Table 1; Figure 5 and Figure 6).

[1] Elevations were corrected to chart datum for the final report based on the tidal height prediction at the time of each transect using tidal prediction software (Tides and Currents Pro).
[2] The zone that extends inland from the higher high water line (HHW) of the mean tides.

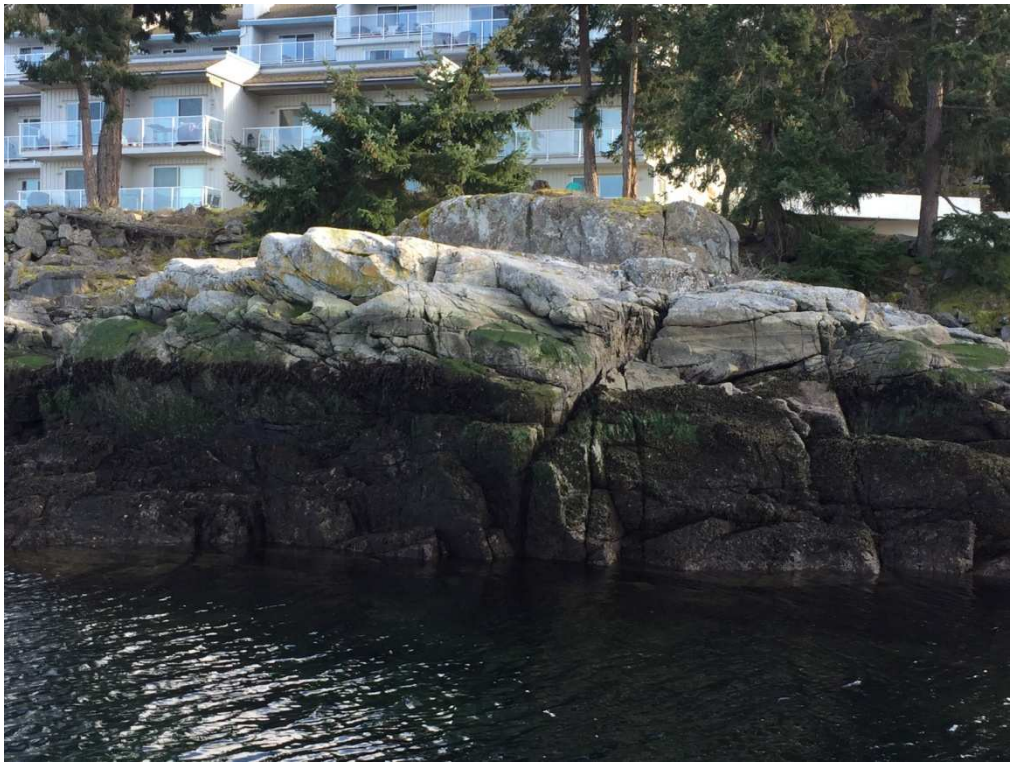


Figure 3. Natural bedrock outcrop in the proposed overwater ramp location.

Figure 4. Boulder, sand and shell hash substrate in subtidal zone of the proposed overwater ramp location.

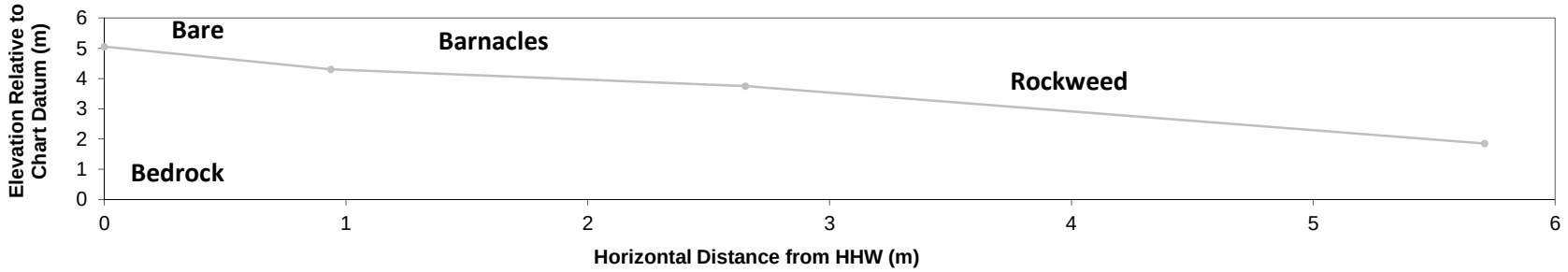
Table 1. Biophysical description of the intertidal zone at the proposed ramp installation site.

BARE	ELEVATION	+5.1 to +4.3 m
	SLOPE DISTANCE	0.0 to 1.2 m
	SUBSTRATE	Bedrock
	VEGETATION	Splash zone lichen
	INVERTEBRATES	-
BARNACLE	ELEVATION	+4.3 to +3.8 m
	SLOPE DISTANCE	1.2 to 3.0 m
	SUBSTRATE	Bedrock
	VEGETATION	Pyropia/Porphyra sp. (<10%) *Mastocarpus* sp. (<1%)
	INVERTEBRATES	Barnacles (A), Pacific oyster (P)
FUCUS	ELEVATION	+3.8 m to +1.9 m
	SLOPE DISTANCE	+3.0 to +6.6 m
	SUBSTRATE	Bedrock
	VEGETATION	Rockweed (*Fucus* sp.) (50%) Foliose and filamentous green algae (<10%)
	INVERTEBRATES	Barnacles (P)

Elevations: relative to chart datum (e.g. - 5 = 5m below chart datum; +5 = 5m above chart datum).

Vegetation: % cover estimated for dominant species

Invertebrates: A = Abundant. C = Common. P = Present



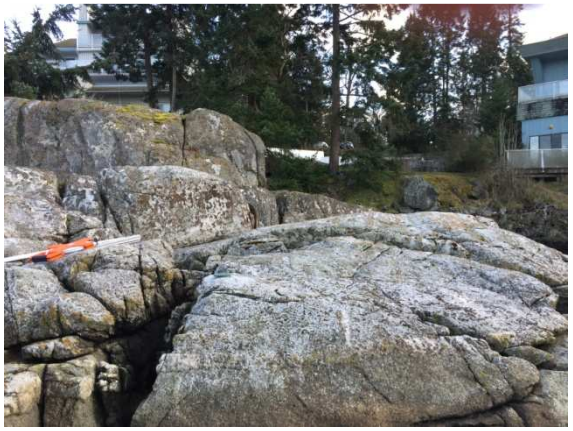


Photo 1: Backshore and supratidal zone showing bedrock.

Photo 2: Bedrock with barnacle in upper intertidal zone and rockweed in the mid intertidal zone

Photo 3: Bedrock with rockweed and green algae in the intertidal zone to the water line.

Figure 5. Intertidal transect profile and photo documentation.

Figure 6. Brown algae (*Sargassum muticum*), tufted red algae, and leather star (*Dermasterias imbricata*) in the subtidal zone of the proposed overwater ramp location.

4 Summary and Recommendations

The supratidal to shallow subtidal zones of the proposed ramp location are comprised of a natural bedrock outcrop. On either side of the outcrop is rip rap embankment, constructed to contain upland foreshore fill.

Japanese wireweed and rockweed are present at the site. This vegetation may be used by Pacific herring (*Clupea pallasii*) for spawning or by juvenile salmon (*Oncorhynchus* spp.) for cover. No sensitive habitats (e.g. eelgrass, salt marsh, or forage fish (Pacific sand lance and/or surf smelt) spawning beaches) or listed species (e.g. Olympia oysters (*Ostrea lurida*) and northern abalone (*Haliotis kamtschatkana*)) were observed during the intertidal survey or from the video of the subtidal zone. With appropriate design and mitigation the proposed bedrock site is environmentally appropriate for the ramp construction.

The impact to intertidal habitats will depend on the method of construction and the types of materials used. Development planning should attempt to retain or conserve natural shorelines whenever possible. Positioning concrete support above high water for the walkway access ramp will result in negligible impact to intertidal habitats. If pile driving is required the following is recommended:

- Minimize disturbance by using the minimum number and size/diameter of pilings required to achieve safety and stability.

- Avoid the use of creosote treated piles.
- Follow guidelines of Pile Driving Best Management Practices: https://buyandsell.gc.ca/cds/public/2016/08/17/f0fcf96f5bd08535ff8e81aac62bbd74/fp802-160141_bc_pile_driving_practices.pdf
- Adhere to Fisheries and Oceans Canada construction timing windows (http://www.dfo-mpo.gc.ca/pnw-ppe/timing-periodes/bc-s-eng.html)
    - Summer window: June 1 to September 1
    - Winter window: December 1 to February 15

Materials used for overwater ramps should reduce shading to intertidal and shallow subtidal areas by minimizing the size of overwater structures and light permeable surfaces should be used over areas with benthic vegetation. Ramps should also minimize overwater lighting; lighting should be a diffuse light source, installed low (at or near deck surface), and positioned to not shine down into the water or up into sky.

5 Habitat Enhancement Opportunities

In order to meet the RDN's requirement to provide a net enhancement to shoreline ecology the following habitat enhancements are recommended:

1. Restore native riparian vegetation on natural and modified (rip rap embankments) shorelines to the extent practical to enhance ecological function and habitat value. This could include:
    - Planting native coastal riparian grasses, herbs and shrubs in the viewing area (landscaped area to the west of hotel; Figure 7). The proposed landscaping plan fulfills these criteria.
    - Planting native coastal riparian grasses, herbs and shrubs in the backshore adjacent to the proposed overwater ramp.
    - Planting native marsh vegetation at higher elevations of the beach at the existing boat ramp area (west of the hotel; Figure 8).
    - Removal of invasive species (e.g. Himalayan blackberry and Scotch broom) from the nearshore property to the extent practical (e.g. as recommended by a qualified landscape architect).
2. Clean up of debris in the intertidal and subtidal zone. This includes:
    - Removing asphalt underneath the hotel footprint.
    - Breaking up and removing the boat cleaning grid by the boat ramp area during a low tide (Figure 9). Cap the boat cleaning grid footprint with clean pebble/cobble or pit run material.
    - Remove piles in the boat ramp area, including piles from the boat cleaning grid (three creosote and two concrete; Figure 9) and the six short creosote pilings west of the boat ramp (Figure 10).

Figure 7. Landscaped viewing area in Schooner Cove

Figure 8. Boat ramp area in Schooner Cove.

Figure 9. Boat cleaning grid in the boat ramp area of Schooner Cove.

Figure 10. Piles to the west of boat ramp in Schooner Cove.

6 Conclusion

Implementation of the mitigation measures will result in negligible impacts to intertidal habitats from construction of the overwater ramp, and a net increase in shoreline habitat values from the enhancement/restoration measures outlined above.