



The red arrow indicates the patch of marsh grass



We were unable to survey the lower intertidal areas of most of Davie Bay due to the 1.5 m (4.9') level of the low tide on the 4th of February; however, due to the low slope of the beaches we were able to get a good look at the lower intertidal areas of both the eastern (E) and western (W) bays which are separated by a small sand spit that runs between the main land and a small island. The photo on the right shows the extent of this sand spit. This area is considered part of the intertidal zone, because during some of the highest tidal events the spit is completely covered by water.



The photos below give an accurate location of where the observations were made. For clarity purpose this report will deal with the observations made in each of these small bays separately.



**Preliminary Environmental Review
of the Davie Bay Site
on the
Western Shore of Texada Island**

Prepared for:

The Friends of Davie Bay

By:

Vision Marine Consulting Ltd.

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SDG

Introduction

Vision Marine Consulting Ltd. was retained by the Friends of Davie Bay on Texada Island to carry out a brief environmental overview of the Davie Bay area as well as Stronberg Creek in order to get a better understanding of the ecological importance and sensitivity of the area. The surveys took place on the 4th of February 2010 and given the limited time (5 hrs.) available for the work, the biologists from Vision Marine Consulting Ltd. were limited to land based observations and measurements and did not carry out the scuba surveys of the subtidal areas of the bay. Though the observations reported here are accurate; a more comprehensive survey of the area should be undertaken to more accurately report on the biodiversity of the area as well as the ecological importance of the Bay.



The photo on the left shows the extent of the Davie bay area surveyed. The animals and plants listed in the biodiversity list were observed within this area. The survey was carried out between:
 N 49°35'53.09"
 W -124°23'04.03" the western most limit of the study area and
 N 49°36'11.61"
 W -124°23'46.92" the eastern most limit of the study area.

Beaches

Davie Bay has six small beaches separated by bedrock outcrops. The uplands exhibit a very healthy riparian area. Some of the vegetation noted during the survey includes but is by no means limited to the species recorded in the Riparian Area table below.

Riparian Area Vegetation Observed in Davie Bay

Tree Species	
Red Alder (<i>Alnus rubra</i>)	Western Red Cedar (<i>Thuja plicata</i>)
Western Hemlock (<i>Tsuga heterophylla</i>)	Coast Douglas Fir (<i>Pseudotsuga menziesii</i> var. <i>menziesii</i>)
Bigleaf Maple (<i>Acer macrophyllum</i>)	Arbutus (<i>Arbutus menziesii</i>)
Shrub Species	
Salmonberry (<i>Rubus spectabilis</i>)	Red Huckleberry (<i>Vaccinium parvifolium</i>)
Trailing blackberry (<i>Rubus ursinus</i>)	Salal (<i>Gaultheria shallon</i>)
Oregon Grape (<i>Mahonia nervosa</i>)	Thimbleberry (<i>Rubus parviflorus</i>)
Himalayan Blackberry (<i>Rubus discolor</i>)	English Laurel (<i>Prunus laurocerasus</i>)
Herbs Species	

Bracken Fern (<i>Pteridium aquilinum</i>)	Sword Fern (<i>Polystichum munitum</i>)
Deer Fern (<i>Blechnum Spicant</i>)	Lady Fern (<i>Athyrium filix-femina</i>)
Prince's Pine (<i>Chimaphila umbellata</i>)	Creeping Buttercup (<i>Ranunculus repens</i>)
Holly	Dead Nettle, Yellow Lamium (<i>L. Galeobdolon</i>)
Periwinkle (<i>Vinca minor</i>)	Himalayan Blackberry (<i>Rubus Discolor</i>)
Sedge Varietals	Moss Varietals
Grass Varietals	

The beaches are typical with the upper intertidal section of the beach composed mainly of composed of sand and gravel with an abundance of drift wood logs strewn over the high tide line. All of the beaches observed demonstrate the characteristics of beaches that are commonly used by forage fish (Surf smelt (*Hypomesus pretiosus*), Pacific sand lance (*Ammodytes hexapterus*), Pacific herring (*Clupea harengus pallasii*). Forage fish are extremely important species to the ecology of coastal waters. Forage fish are a critical food source for many larger fish species including salmon, rockfish and ling cod, as well as for marine mammals, and seabirds. The beaches that they habitually spawn on are quickly disappearing due to uncontrolled development in the Strait of Georgia and as a consequence their population numbers have been steadily declining making it imperative that all potential spawning beaches are protected.



A patch of marsh grass was found on the upper intertidal area of one of the beaches. This coincided with the freshwater input from a small creek.

The mid intertidal zone for most of the beaches was composed of cobbles and boulders with sand and gravel filling in the interstitial spaces in between. Please note that the many of the cobbles and boulders were covered with fucus. There was also an abundance of shore crabs in these areas





Photo of the eelgrass present in the lower intertidal zone of the western bay

The Western Bay

The lower intertidal flat of the eastern bay has a distinct and well established bed of Dwarf Eelgrass (*Zostera japonica*) photo the left. This bed is approximately 33 m. wide by 20 m. deep for a total meadow area of 660 m². There was also ample evidence along the beaches of the presence of the eelgrass *Zostera marina* (Photo below); however, despite being able to see the distinctive green colour of the meadow below the water surface we were unable to verify its presence without properly diving the site along transect lines.

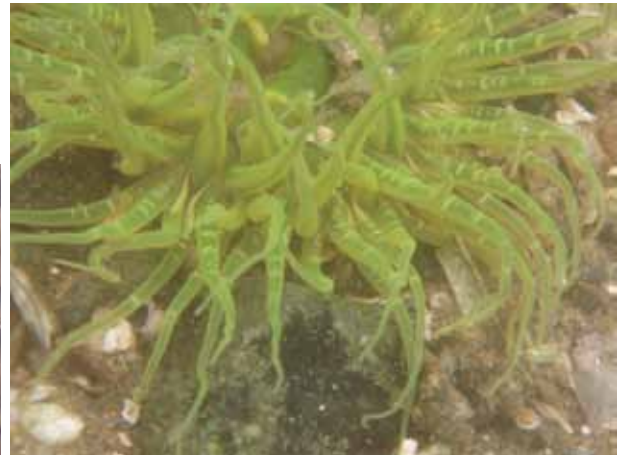


Dead fronds of the eelgrass *Zostera marina* found along the shoreline of the western bay

The Eastern Bay

Unlike the western bay, the eastern bay is opened to the prevailing south westerly winds that push a huge amount of fine suspended matter along the western shores of Texada Island. Not surprisingly, we found that the lower intertidal zone of the eastern bay is covered by a layer of fine mud and small woody debris. However, this small bay supports a significant population of shellfish as evidenced by the large number of holes in the sand and clam shells on the surface.

Also present in this bay were healthy populations of sand dollars (*Echinarachnius excentricus*) and burrowing anemones (*Anthopleura artemisia*) (Photos below). The substrate was not sampled for annelid worms however, we feel that given the productivity of this bay, a benthic invertebrate inventory would be important.



Vision Marine Consulting Ltd. carried out a very quick biological inventory of the marine flora and fauna found in the area. This list is by no means to be considered complete since we were not able to properly carry out a proper survey of Davie Bay. The list can be seen in the table below.

Marine Fauna	
Ochre starfish (<i>Pisaster ochraceus</i>)	Pacific Oyster (<i>Crassostrea gigas</i>)
Acorn Barnacles (<i>Balanus glandula</i>)	Tube Worms (<i>Serpula vermicularis</i>)
File Limpet (<i>Lottia limatula</i>)	Giant Plumose Anemone (<i>Metridium giganteum</i>)
Native Oyster (<i>Ostrea lurida</i>)	Red Rock Crab (<i>Hemigrapsus nudus</i>)
Short Plumose Anemone (<i>Metridium senile</i>)	Burrowing Anemone (<i>Anthopleura artemisia</i>)
Butter Clam (<i>Saxidomus gigantea</i>)	Olympia Oyster (<i>Ostrea conchaphila</i>)
Purple Shore Crab (<i>Hemigrapsus nudus</i>)	Green Shore Crabs (<i>Hemigrapsus oregonensis</i>)
Pacific Blue Mussels (<i>Mytilus trossulus</i>)	Mottled Starfish (<i>Evasterias troschelii</i>)
Calcareous Tube Worm (<i>Serpula vermicularis</i>)	Mahogany Clam (<i>Nuttallia obscurata</i>)
Butter Clam (<i>Saxidomus gigantea</i>)	Pacific Littleneck (<i>Protothaca staminea</i>)
Manila Clam (<i>Venerupis philippinarum</i>)	Mask Limpet (<i>Tectura persona</i>)
Rough Keyhole Limpet (<i>Diodora aspera</i>)	Monterey Sea Lemon (<i>Archidoris montereyensis</i>)
Red Rock Crab (<i>Cancer productus</i>)	Green Shore Crabs (<i>Hemigrapsus oregonensis</i>)
Ochre Star (<i>Pisaster ochraceus</i>)	Excentric Sand Dollar (<i>Echinarachnius excentricus</i>)
Hairy Tunicate (<i>Boltenia villosa</i>)	Acorn Barnacle (<i>Balanus glandula</i>)
Northern Ronquil (<i>Ronquilus jordani</i>)	
Marine Flora	
Dwarf Eelgrass (<i>Zostera japonica</i>)	Kelp (<i>Laminaria saccharina</i>)
Sea Lettuce (<i>Ulva fenestrata</i>)	Little Rockweed (<i>Pelvetiopsis limitata</i>)
Dwarf Rock Weed (<i>Pelvetiopsis limitata</i>)	Turkish Wash Cloth (<i>Mastocarpus papillatus</i>)
Purple Laver (<i>Porphyra sp.</i>)	Staghorn Felt (<i>Ceramium sp.</i>)
Other Fauna	
Herring Gull (<i>Larus argentatus</i>)	River Otter (<i>Lutra canadensis pacifica</i>)
Pacific Harbour Seal (<i>Phoca vitulina richardsi</i>)	Bald Eagle (<i>Haliaeetus leucocephalus</i>)

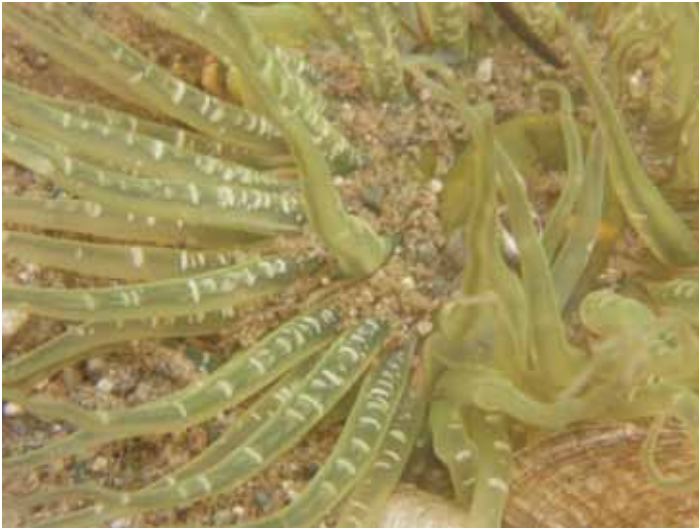
Here we see a few photographs of some of the marine fauna that was found in Davie Bay.



Short Plumose Anemone (*Metridium senile*)



Tube Worms (*Serpula vermicularis*)



Burrowing Anemone (*Anthopleura artemisia*)



Monterey Sea Lemon (*Archidoris montereyensis*)



Ochre Star (*Pisaster ochraceus*)



File Limpet (*Lottia limatula*) & Acorn Barnacle (*Balanus glandula*)

Stronberg Creek

Vision Marine Consulting Ltd. was asked to evaluate the potential that Strongberg creek has to be a salmon bearing creek. For this reason we began our survey at the mouth of the creek. Though the first reach of the creek shows a riffle pool morphology with a slope of 5% or less which is suitable for salmon spawning (Top Photo), less than 100 m. from the mouth of the creek we found what we considered an impassable barrier for salmonids at this time (Middle Photo).



Even though this barrier is caused by a log jam and therefor considered a temporary obstruction, we do not feel that at this time Stronberg creek can offer any significant spawning habitat for salmon. It is possible for chum and pink salmon to use this short stretch of creek to spawn as they do with eagle river near Powell River,; however this is unlikely. In the event that in the future this log jam is removed, the potential for Stronberg creek to become a major salmon creek remains

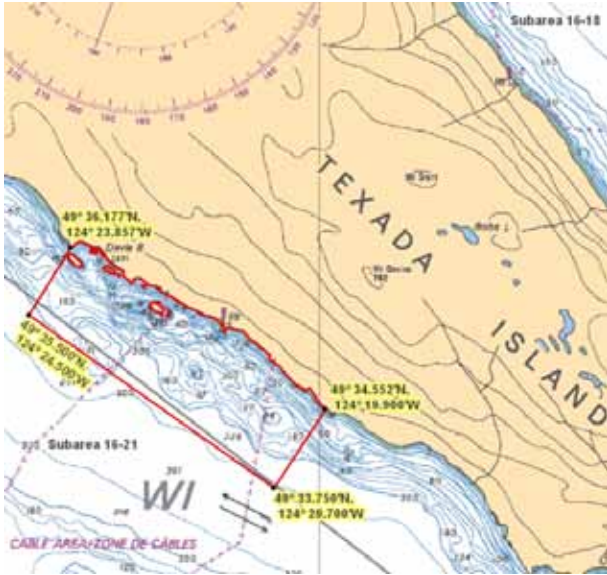


very limited since there is a permanent impassable barrier less than 200 m. upstream from the log jam (bottom Photo). For this reason we did not continue our survey of the creek beyond this point. We were informed by local long term residents that Stronberg creek supports a healthy population of cutthroat trout. This being the case we would suggest that an environmental assessment study be carried out on the potential impacts that any development may have on the flow and water quality of the creek, prior to any approvals.



Conclusions

Vision Marine Consulting was told by the Friends of Davie Bay that the project they are concerned about is being carried out within the boundaries of a rockfish conservation area. Vision Marine Consulting Ltd. confirmed this statement by visiting the Fisheries and Oceans Website (<http://www.pac.dfo-mpo.gc.ca/fm-gp/maps-cartes/rca-acs/rca-acs/south-sud/DavieBayChart3512-eng.htm>) Rockfish Conservation Areas - Pacific Region Area 16 - Davie Bay - a copy of the Chart 3512 that is on the



Fisheries and Oceans site is presented here as evidence of where Davie Bay is located in relation to the rockfish conservation area. Rockfish conservation areas were set up by Fisheries and Oceans Canada with the purpose of protecting the dwindling stocks of rockfish from overfishing. One of the reasons for the protected areas is to provide the fish with sanctuaries where they can live and breed without the added pressures of fishing. One of the benefits of these areas is that the young fish produced in these areas will spill out beyond the protected areas and begin to repopulate the areas that offer suitable habitat but are currently not supporting viable rockfish populations. This being the case it is very important to have a proper environmental assessment to determine what impacts the proposed mining activities will have in the area and in particular with the various stages of the life cycle of the rockfish.

Forage Fish

The beaches in the Davie Bay area have the potential of being spawning habitat for one or more forage fish species. Any development that endangers these beaches must not be allowed to proceed. It is also very important to carry out the proper surveys to determine whether or not there are any forage fish spawning on these beaches.

Sensitive Habitat

Vision Marine Consulting Ltd. has determined that there is sensitive habitat in the immediate vicinity of the proposed conveyor belt. The sand spit is part of the intertidal zone between Texada and the small island that is going to be used as the barge terminal. The effects that the pylons on the stability of the spit is of great concern. Vision Marine Consulting Ltd. was informed that the spit will also be used as an all terrain vehicle (ATV) road. It is our opinion that this activity will have negative effects on the stability of the beach and should not be allowed under any circumstance.

The sand spit also supports a 660 m² eelgrass meadow of *Zostera japonica* that must be protected. Although we were not able to carry out a proper underwater survey of the subtidal zone of the western bay, we did see a large area of green vegetation under the water. Though we cannot confirm conclusively that this is a *Zostera marina* meadow, the abundance of dead *Zostera marina* fronds found along the shores of this small bay suggest that there are more extensive eelgrass meadows in the immediate area. We would also like to carry out an underwater survey at the mouth of the eastern bay to confirm the presence or absence of eelgrass in this area.

Bathymetry

The bathymetry of the area where the proposed barge site is proposed is of concern. Though the maximum depth of the area is 30 m. the depth decreases rapidly within a very short distance (less than 50 m.). Given the stormy conditions prevalent in Sabine Channel the possibilities of a barge or tug grounding in Davie Bay is a concern.

This report was prepared for The Friends of Davie Bay and is based on data gathered in the field by Vision Marine Consulting Ltd. and the reports of the members of the Friends of Davie Bay.

The information here presented is accurate to the best of our knowledge given the very limited time we had to survey the area.

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