

Port of Friday Harbor
Albert Jensen and Sons Boatyard and Marina
Eelgrass and Macroalgae Survey
June 3, 2020

Introduction

The Port of Friday Harbor is proposing an emergency maintenance and repair project to replace the main walkway float and travel-lift pier of the Jensen's and Sons Boatyard and Marina located in the south end of Friday Harbor (Figures 1 and 2). The Port has determined that these structures are at imminent risk of failure, which poses a safety hazard and risks spreading creosote-treated wood fragments throughout the intertidal and subtidal areas around Jensen's marine infrastructure. The main walkway float will be replaced with a fully grated walkway with encapsulated floats and will be positioned in the same footprint as the existing walkway. The float is secured by 15 creosote-treated timber piling that are severely deteriorated or broken. These piling will all be removed be replaced with 7 12-inch steel piling. The piling that support the travel lift pier are also severely deteriorated and will be repaired by installing a fiberglass jacket around the pile and filling it with grout to encapsulate the creosote-treated timber piling. These emergency repairs will restore the infrastructure to a state comparable to its original condition and alleviate imminent risks to human health and the environment.

This eelgrass survey was conducted on June 3, 2020 following the Washington State Department of Fish and Wildlife (WDFW) guidelines dated June 16, 2008. The purpose of the survey was to characterize the existing environmental conditions within the project area. The survey was conducted with a boat-towed video camera to view the seafloor along selected transects; a diver made counts of eelgrass shoots where eelgrass was observed. The travel lift area was surveyed when the predicted tide was -0.7 feet relative to Mean Lower Low Water (MLLW). This survey was conducted by Fairbanks Environmental Services, Inc. and Leon Environmental, LLC. Mr. Fairbanks has conducted similar studies throughout the Salish Sea since 1992.

The seafloor is composed of silt and fine organic material (mud); however, the intertidal and shallow subtidal substrate is degraded with an undetermined amount of anthropomorphic debris. Along the shoreline the silt is mixed with gravel. Below MLLW, the seafloor is covered with periphyton with patches of the green alga *Ulva*. Two small patches of the native eelgrass, *Zostera marina* were observed in the project area. These patches were irregular shape and the eelgrass shoots were distributed in clumps. Blades of brown algae were observed that appeared to have drifted into the marina and settled on the seafloor. A mixed community of algae was attached to piling.

Washington State Department of Natural Resources (WDNR) derelict creosote piling removal best management practices dated January 25, 2017 will be followed to avoid and minimize impacts to the eelgrass community during the construction period. Creosote-treated timber piling will be removed or encapsulated, the new floating walkway will be narrower and fully grated which will allow more natural light to reach the seafloor. The completed project will have a net-benefit to the existing marine environment.

Project Description

The Port of Friday Harbor recently acquired the Albert Jensen & Sons Boatyard and Marina (Jensen's), which requires maintenance and repairs to the existing marine infrastructure. The proposed work is being requested as an emergency project. Many of the piling securing the floats and supporting piers are severely degraded and several (with attached overhead power lines) are already broken off at the base. These areas are at high risk of imminent failure if not addressed immediately. Required emergency marina repairs and maintenance consists of three components:

1. **Piling Removal and Replacement:** On the main walkway, fifteen (15) broken and deteriorating creosote piling will be removed. Seven (7) of these piles will be replaced with 12" steel piles.
2. **Pile Jacketing:** Thirty-one (31) deteriorating 12" timber piles supporting the Travel Lift Pier will be repaired by installing a fiberglass jacket around the pile and fully grouting the annulus between the jacket and pile. These jackets will increase the diameter of each pile to approximately 18".
3. In addition to these emergency actions, the Port is proposing to replace an existing walkway float that is 280' x 10' constructed of treated-wood with a solid deck and raw-unprotected foam floatation. The new walkway float will be 280' x 8' with fiberglass grating and encapsulated floatation. Five (5) 36' x 6' wood decked finger floats will be replaced by five (5) 36' x 5' grated docks with encapsulated floatation. This will improve habitat conditions by reducing the footprint of dock area, replacing the solid deck with light permeable grating, and removing deleterious substances (creosote-treated timber piling and open-cell foam) from the environment.

All proposed project improvements will occur within the footprint of existing infrastructure. The new floats will reduce the area of overwater structures.

Survey Methods

This eelgrass and macroalgae survey followed the WDFW guidelines dated June 16, 2008 for an advanced survey and US Army Corps of Engineers Tier 1 and Tier 2 survey. The survey was completed by using a boat-towed video camera to record observations along 13 transects parallel to the main walkway (Figure 3). The transects are described as:

Transect 1: 25 feet west of the end of the float-fingers and parallel to the walkway dock

Transect 2: 10 feet west of the end of the float-fingers and parallel to the walkway dock

Transect 3: along the west end of the float fingers and parallel to the walkway dock

Transect 4: Parallel to the existing walkway and pier in the shallow (landward) portion of the center of the mooring fingers

Transect 5: Along the east edge of the existing walkway from -1 foot to -6 feet MLLW

Transect 6: 10 feet east of and parallel to the walkway dock from -1 to -9 feet MLLW

Transect 7: 25 feet east of and parallel to the walkway dock -1 to -5 feet MLLW

Transect 8: 25 feet west of and parallel to the walkway dock, seaward section

Transect 9: 10 feet west of and parallel to the walkway dock, seaward section

Transect 10: Along the west edge of the walkway dock, seaward section. Boats were moored along the dock and the video camera was used to view around and between the boats but the video image was not recorded.

Transect 11: Along the east edge of the walkway dock, seaward section between boat houses.

Transect 12: 10 feet east and parallel to the walkway dock, seaward section between boat houses.

Transect 13: 25 feet east and parallel to the walkway dock, seaward section between boat houses.

Transect A: U-shaped video recording through the landward mooring area between fingers 1 and 2.

Transect B: U-shaped video recording through the landward mooring area between fingers 2 and 3.

Transect C: Video recording through the center of mooring area between boats moored between fingers 3 and 4.

Transect D: Video recording through the center of mooring area between boats moored between fingers 4 and 5.

Travel lift area: Observations of the marine vegetation and conditions around the travel lift area were completed during a low-tide event when the seafloor was exposed.

The boat-towed underwater video camera was interfaced with a GPS receiver and transect were recorded to postprocessing. Observed eelgrass patches were also mapped in the field relative to the marina structures. Photographs of the project area and travel lift area were taken to document the existing conditions.

After video observations were completed, a diver counted the number of shoots in a ¼ square meter quadrat in the two small patches of eelgrass that was observed.

Results

The predicted tide level was -0.7 feet MLLW and the observed tidal level recorded by NOAA (preliminary) was -0.5 feet MLLW at the Friday Harbor tidal station on June 3, 2020. Video transects T-1 through T-7 were recorded from 8:50 to 9:40 and then during the extreme low tide, the survey of the travel lift area was completed. Video recording was resumed at 10:45 and completed at 11:30.

The seafloor in the walkway float replacement area is composed of mud (silt mixed with organic detritus) which is covered with periphyton, a mix of micro-algae such as diatoms, bacteria, and microscopic organisms (Figure 4). Small patches of the green alga *Ulva* were observed throughout the survey area (Figure 5). Blades of brown algae such as *Saccharina* were observed scatter in the study area, these blades did not appear to be attached to rocks, it is possible that these blades have drifted into the area and settled onto the bottom.

Two small patches of the native eelgrass *Zostera marina* were observed at the water depth of approximately -7 feet MLLW (Figure 3). The eelgrass shoots were distributed in clumps within the patches. One patch is located to the west of the walkway float with an irregular shape

approximately 12 feet by 6 feet and has a density of 35.2 shoots per square meter. The second patch is east of the walkway float between the rows of boathouses and has the density of 46.8 shoots per square meter (Figure 6).

The following incidental marine fauna were abundant throughout the survey area:

- Dungeness crab (*Metacarcinus magister*)
- Red rock crab (*Cancer productus*)
- Graceful crab (*Metacarcinus gracilis*)
- Plumose anemone (*Metridium farcimen*)
- Painted anemone (*Urticina* spp.)
- Clown nudibranch (*triopha catalinae*)
- Ghost shrimp burrows (*Neotrypaea californiensis*)
- Mud shrimp burrows (*Upogebia pugettensis*)
- Pacific-snake prickleback (*Lumpenus sagitta*)
- Juvenile flat fish

Travel lift Area

The travel lift pier is positioned over the upper intertidal area from approximately elevation from 0 feet to +8 feet MLLW (Figure 7). The sediment consists of silt mixed with gravel. The marine vegetation is very sparse with some rockweed (*Fucus*) attached to the large gravel and *Ulva*. Pickleweed (*Salicornia depressa*) is present along the Ordinary High Water Line (OHWL) (Figure 8). The seafloor under the travel lift pier and in the open space between the piers is bare of sediment. A derelict pier is located to the east of the pier and sediment under the derelict is bare.

Conclusion

The seafloor in the project area is primarily mud covered with periphyton below MLLW. Landward of MLLW, the seafloor is bare mud. The brown alga *Fucus* was observed attached to large gravel at the upper intertidal zone to the west of the travel lift and pickleweed is present along the OHWL. The green alga *Ulva* was observed in patches throughout the study area. Two small patches of the native eelgrass *Zostera marina* are present at -7 feet MLLW; one patch is located to the east of the main walkway and another patch is located to the east of the walkway in the fairway between the boathouses.

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**Port of Friday Harbor
Jensen and Sons Boatyard and Marina**

Figure 1. Location and Vicinity Map

Data Sources: FEMA (2018), Leon Environmental, LLC (2018), San Juan County (2016), San Juan Surveying (2018), Whatcom Environmental (2018)

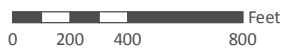




Figure 2. Jensen's and outline of survey area. Ecology aerial photograph August 15, 2006.

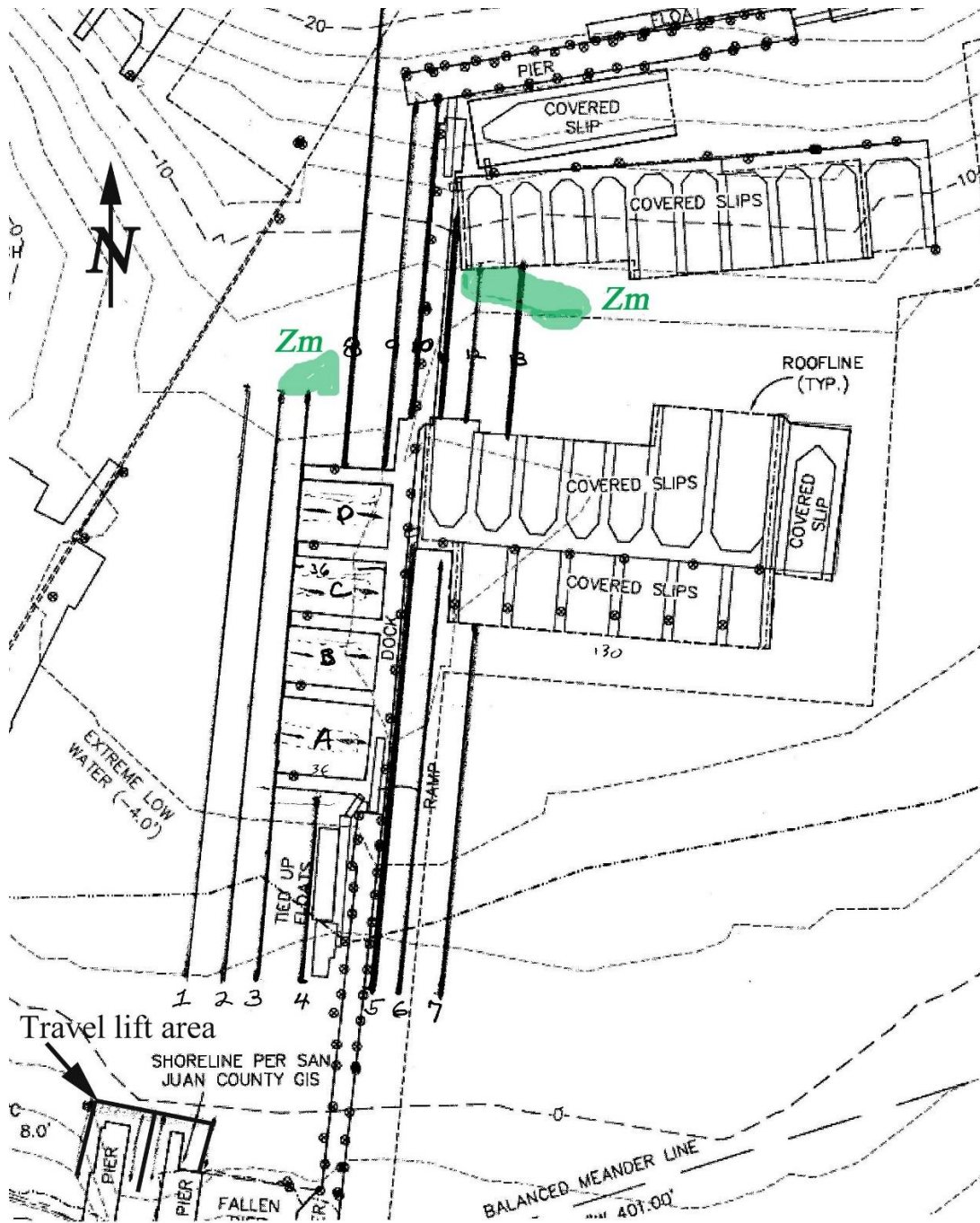


Figure 3. Selected video transects relative to main walkway, location of eelgrass patches



Figure 4. Below MLLW, the sediment is primarily mud covered with periphyton.



Figure 5. The green alga *Ulva* was observed growing in patches throughout the study area.



Figure 6. The native eelgrass *Zostera marina* was observed in two small patches in the study area.



Figure 7. The travel lift area is located over the upper intertidal area with silt mixed with gravel. Tide = -0.5 MLLW.



Figure 8. The brown alga *Fucus* is growing attached to large gravel to the west of the travel lift pier. Pickleweed is growing along the OHWL.