

Suggested Baseline Data Needs for developing Whiteman Cove Restoration Options
Review Document
October 23, 2019

Data and Analysis Completed to date:

- a. Bathymetry data collection in Whiteman Cove and development of bathymetry surface (1-foot contours) for bed elevations in the Cove (2015)
- b. Site topography/bathymetry basemap combining bathymetry data collected in 2015 and LIDAR elevation data from Puget Sound Lidar Consortium (2000-2005)
- c. Historical shoreline analysis of Whiteman Cove and adjacent shoreline along Carr Inlet
- d. Coastal processes evaluation, including estimates of storm waves and qualitative evaluation of sediment transport processes. This included a preliminary reference site study.
- e. Statistical analysis of tidal heights (i.e. percent occurrence over time) and comparison with elevations of seabed in the Cove and the current water level (measured in 2015).
- f. Estimates of freshwater inflow into the cove based on topography information and available information from USGS.
- g. Unsteady hydrodynamic modeling. One-dimensional model of Whiteman Cove developed using information compiled or developed above; output included water levels and current velocities. Numerous options modeled including considerations for:
 - i. Culverts
 - ii. Tide gates, including self-regulating tide gates (i.e. operation criteria)
 - iii. Open channels (armored and unarmored)
 - iv. Several different invert elevations and opening sizes for all of the above
- h. Water Quality Data collection
 - 2015:
 - 5 whole water samples collected, and salinity/temperature data collected in April 2015 within Whiteman Cove
 - Additional salinity and temperature data collected at two additional locations within Whiteman Cove
 - 2019
 - 5 whole water samples collected in Cove and 1 in Carr Inlet in September 2019. Salinity/temperature/DO/pH data also collected at these six locations.
 - Salinity/temperature/DO/pH data collected at 9 additional locations, including locations along the perimeter of the Cove underneath existing overhanging vegetation

Additional Data to be Collected and Associated Actions

- Include surface water inputs to lagoon in modeling
Action: Current existing information will be updated as part of the feasibility study (**FS**)

- Consider potential impacts to domestic wells
Action: This work will be included in the FS.
- Water Quality Data Collection/Install necessary water quality monitoring equipment early on in the process (now)
Action: Water quality monitoring will be conducted but will not require the installation of equipment. Water quality data collected in September 2019 and salinity/temp/DO/pH data will be collected two additional times before the end of 2019 at the same 15 locations sampled in 9/2019. Additional data sampling will also be conducted in 2020. This information will be documented in the FS.
- Assess potential for erosion on private tidelands
Action: This work will be included in the FS
- Assess potential changes in property values
Action: The timing for assessing the changes to property values is best done following completion of the FS work and based on the final restoration option.
- Assess changes in water levels throughout tidal cycles
Action: This work was previous conducted and will be updated, as needed, as part of the FS
- Assess ecologic changes that may occur with change to freshwater environment at the head of the bay that will result from loss of tidal inundation
Action: Analysis of potential ecologic changes to Whiteman Cove will be included in the FS, including modeling changes to salinity in the Cove due to proposed options.
- Ensure that other sources of pollution do not impact the success of the project
Action: Water quality data collected in 2015 and in 2019 will be used to evaluate potential water quality concerns for the project as part of the FS.
- Impacts and benefits to recreational opportunities and viewscapes
Action: SEPA review will include an evaluation of these impacts
- Document the changes that will occur with the loss of the saltwater lake ecosystem
Action: SEPA review will include an evaluation of these impacts
- Qualify the restoration's contribution to salmon recovery
Action: The contribution to salmon recovery can be qualified as part of the FS through literature review and documentation from other, similar natural and restored systems (i.e. reference sites).
- Evaluate tide gates as a restoration option
Action: Information from the 2015 study will be summarized with other available reference information and included in the FS.

- Data collection effort should be developed to study or inform evaluation of fish habitat within the lagoon under a variety of fish passage options
Action: This work was included in the 2015 study, and will be summarized and updated as needed as part of the FS. Additional analysis will also be completed for the selected final project option.
- Collect water quality data during time periods when fish would be using the system
Action: The current water quality monitoring plan will provide an assessment of water quality during different times of the year, including time periods when fish could potentially be using the system.
- Salinity and temperature data should be collected along the fringes of the lagoon (i.e. underneath overhanging vegetation) and not only out in the center of the lagoon
Action: This has been included in current water quality data collection plan.
- Consider Whiteman Creek, and its relationship to the Cove when evaluating the fish habitat in Whiteman Cove. The creek has been alternated, including construction of culverts and addition of fill within the channel. Conduct a stream survey as part of base-line data collection
Action: A stream survey will not be conducted under this project. Flow from Whiteman Creek will be included in the modelling work conducted as part of the FS.
- Reach out to homeowners connected to the creek to evaluate their interest in the project
Action: DNR will continue to have scheduled and open dialogue with homeowners throughout this project.
- What is the similarity of Whiteman Cove to two nearby systems Rocky Bay and Vaughn Bay? Do these systems have deep water in them at low tide?
Action: As part of the FS, we will look at these two sides and consider if Rocky and Vaughn Bay are applicable to use as reference sites in the FS
- Fish survey was identified as a data gap in Whiteman Cove. Baseline data collection should include an evaluation of current habitat in the Cove, including a fish survey. Identify specific fish and life cycles that will be addressed with this project
Action: Fish survey work will not be conducted during this stage of the project. Fish survey work would be more appropriate directly before and after the restoration is complete. A baseline habitat reconnaissance will be conducted as part of the FS work to document general habitat features of the Cove, including observable fish and other wildlife present at the time of the reconnaissance.
- Quantify value of current habitat versus potential future habitat conditions
Action: SEPA review will include this evaluation

- Discuss the project with Seattle Shellfish Company
Action: DNR will continue to have scheduled and open dialogue with Seattle Shellfish Company throughout this project.
- Develop specific project objectives prior to moving forward with feasibility study and/or development of options
 - Have baseline data on hand to inform development objectives
 - Define success of the project, how will DNR monitor success**Action:** The final scope of work will include a task to develop project objectives in coordination with permitting agencies and project stakeholders. These objectives will be developed prior to developing proposed alternatives; as the success of the project is contingent on meeting the defined project objectives.
- Suggestion of options to consider such as a self-regulating tide gate
Action: Previous studies in 2015 confirmed the challenges to developing tide gate operations that would allow fish passage and retain current water levels due to the relatively high elevations of both the bottom of the Cove and the water level that would need to be maintained. This discussion will be included in the FS work.

Additional Data to be Collected as part of Feasibility Study Work (not specifically in response to comments):

- Utility location service with location markings surveyed by a licensed surveyor.
- Topography survey of (1) the roadway along the southern edge of the lagoon (i.e. along the spit and adjacent to Carr Inlet) and (2) the remnants of the outlet channel along the beach to the north of the Cove.
- Surface sediment samples will be collected at discreet locations within the Cove and along the shoreline adjacent to the Cove in order to estimate the particle size distribution (i.e. gradation) of the surface sediment within the project area.
- Preliminary geotechnical recommendations as part of FS work. Geotechnical information will be collected in later phases of the work once preferred alternative is selected.