Checklist of Sea Level Rise Considerations for Nearshore Restoration Projects in Puget Sound

The following considerations for incorporating the impacts of sea level rise into restoration projects are adapted from the Washington Coastal Resilience Project.[1] See pages 16-30 therein for context and details about each consideration as well as recommendations for additional information and resources.

These considerations are not intended to be prescriptive or comprehensive for a given project but rather to provide a resource and a starting point for the development of climate-resilient projects.

All Projects

- ☐ Consider how much upland space is available to accommodate landward migration of nearshore habitat.
- ☐ Consider how increasing coastal flooding and wave energy might increase erosion rates of nearshore habitats.
- ☐ Consider the extent to which stormwater runoff could increase due to increasing proximity of nearshore habitats to impervious surfaces.

[1]Raymond, C., Conway-Cranos, L., Morgan, H., Faghin, N., Spilsbury, D., Krienitz, J., Miller,I., Grossman, E. and Mauger, G., 2018. Sea level rise considerations for nearshore restoration projects in Puget Sound. A report prepared for the Washington Coastal Resilience Project https://cig.uw.edu/wp-content/uploads/sites/2/2018/11/Raymondetal_SLR_Restoration_2018_Comharpressed.pdf

- ☐ Consider how changing coastal hazards (inundation, flooding, and erosion) may affect landowner willingness and political will to conduct restoration.

Acquisition Projects

- ☐ Consider how much additional land may be necessary to support landward migration of habitats or increased shoreline erosion.
- ☐ Consider the extent to which sediment sources in the drift cell are unarmored and sediment supply is intact.
- ☐ Consider how project infrastructure may be affected by sea level rise.

Restoration Projects

Revegetation

- ☐ Consider how vegetation species will be impacted by inundation, greater wave stress, and exposure to saltwater.
- ☐ Consider the extent to which revegetation plants and trees will be exposed to an increase in wave-driven erosion.
- ☐ Consider how the distribution of vegetation types within the project area may be affected by sea level rise.

Armor, Groin, and Structure Removal

- ☐ Consider the extent to which objectives for habitat function can be achieved with additional inundation, erosion, and landward migration of habitat types.
- ☐ Consider the extent to which current sediment input and transport processes in the drift cell are intact.
- ☐ Consider how much upland space is available for increased shoreline erosion.
- ☐ Consider how greater coastal flooding will contribute to erosion of habitats.

- ☐ Consider how much erosion protection on neighboring properties will affect existing or planned project infrastructure with increasing coastal flooding and wave run-up.
- ☐ Consider how increased exposure to saltwater affects adjacent land uses.

Dike and Berm Removal and Channel Rehabilitation

- ☐ Consider how the project changes the position of the tidal exchange.
- ☐ Consider the extent to which sediment deposition and current rates of marsh accretion are expected to keep pace with sea level rise.
- ☐ Consider how future rates of riverine sediment transport and deposition could alter rates of marsh accretion.
- ☐ Consider if future conditions of freshwater input will support development of marsh vegetation.
- ☐ Consider how past subsidence on the site will interact with future inundation levels to affect the expected trajectory of habitat development.
- ☐ Consider how increases in storm surge and wave-driven erosion will affect restoring habitat.
- ☐ Consider how inundation will change the tidal prism and the elevation of sea water relative to the marsh.
- ☐ Consider how the combination of infrastructure removal, inundation, and higher extreme water levels could affect flood hazard to adjacent properties.
- ☐ Consider how increased inundation and coastal flooding will affect the intended function of the setback dike or other project infrastructure.
- ☐ Consider how greater wave energy could contribute to flood hazards on adjacent land.
- ☐ Consider how increasing exposure to saltwater and changes in below-ground hydrology will affect neighboring land uses.

- ☐ Consider how project infrastructure could be physically stressed by greater wave energy.

Hydraulic Modification

- ☐ Consider how increases in storm surge and wave-driven erosion will affect restoring habitat.
- ☐ Consider how the restoration project changes the position of tidal exchange.
- ☐ Consider how sediment deposition and current rates of marsh accretion are expected to keep pace with sea level rise.
- ☐ Consider how future rates of riverine sediment transport and deposition could alter rates of marsh accretion.
- ☐ Consider the combined effects of structure removal and sea level rise on the implications of flooding, drainage, and saltwater intrusion on adjacent properties and land uses.
- ☐ Consider how well the project infrastructure will continue to function as expected given greater inundation, coastal flooding, and changes in groundwater hydrology.

Topography Restoration

- ☐ Consider how inundation will change the elevation of the water relative to expected vegetation development.
- ☐ Consider how greater coastal flooding will contribute to erosion of restoring habitat.
- ☐ Consider how sediment deposition and current rates of marsh accretion are expected to keep pace with sea level rise.
- ☐ Consider how much future rates of riverine sediment transport and deposition could alter rates of marsh accretion.