Restoration Stewardship Plan Outline

Project sponsors that have completed a restoration project must provide a stewardship plan at the close of the project. A plan is necessary to ensure the landowner will maintain the project area at least ten years after completion. Please complete the information below, sign, and return this form to your RCO grant manager at the close of the project.

Project Title: Meadowdale Beach Park & Estuary Restoration

SRFB Project Number: 18-1587R

1. **Project Purpose**.
   a. *Project Goals:*
      i. Restore non-natal estuary and stream habitat in Lund's Gulch Creek including natural sediment and hydrologic processes to provide high-functioning, sustainable rearing habitat for non-natal juvenile Chinook (listed as threatened by the Endangered Species Act as well as coho and chum salmon, cutthroat trout, and other fish species, within the park setting; and to meet 50% of the WRIA 8 Recovery Strategy goal for "Reconnecting Backshore Areas and Pocket Estuaries".
      ii. Restore natural transition from Lund's Gulch Creek to Puget Sound, including widened creek mouth, restored sediment transport processes, to benefit juvenile Chinook in the lower stream, upper estuary, and outer pocket estuary, as well as adjacent shoreline habitats that may receive sediment from Lund's Gulch Creek.
      iii. Given the park's setting and the presence of a high-volume railroad line through the project area, a complementary goal of the project is to provide ecological restoration improvements while also maintaining compatible recreational uses, in particular improved access to the beach for park users.
   b. *Project Objectives:*
      i. Remove undersized railroad culvert and replace with a 128 linear feet railroad bridge providing a 90-foot channel opening.
      ii. Remove 17,000 cubic yards (CY) of fill upstream of the railroad to restore a 1.3-acre estuary of Lund's Gulch Creek.
      iii. Restore natural creek sediment transport conditions in the estuary to deliver approximately 80-250 CY annual sediment to estuary and marine nearshore.
      iv. Remove 128 lf of marine and 75 lf of streambank hard armored railroad embankment (approx. 2,000 CY).

v. Restore 1.7 acres of nearshore and stream riparian buffers along the shoreline and stream using native trees and shrubs.
vi. Restore approximately 550 lf of creek in-stream habitat conditions by placing large woody debris in the lower creek and restored estuary.
vii. Address public safety (railroad crossing) and beach access issues associated with the undersized culvert, sediment, and flooding.
viii. Provide Americans with Disabilities Act (ADA)-compliant and year-round access to the beach.
ix. Enhance the park user experience through provision of diverse natural habitats.
x. Enhance environmental education opportunities, including providing interpretive signage.

2. Project Description

a. SRFB funding for this project helped to replace an existing undersized 6 ft. wide culvert under the Burlington Northern Santa Fe (BNSF) railroad, remove 128 linear feet (lf) of armored embankment, remove 17,000 CY of fill, and install a multi-span railroad bridge to create a 90 ft. wide channel opening at the mouth of Lund's Gulch Creek, a coastal salmon-bearing stream in Meadowdale Beach Park. The completed project restored a 1.3-acre pocket estuary and freshwater habitats of lower Lund's Gulch Creek, thereby providing productive rearing habitat for juvenile salmon, including Chinook, while also restoring natural creek meander, sediment transport and deposition processes in the project area. Additional habitat restoration contiguous with SRFB project elements which will also benefit salmon include restoration of 1.7 acres of nearshore and stream riparian buffers and restoration of 550 lf of creek in-stream habitat upstream of the estuary with large woody debris. Due to the park setting, the overall larger project addressed public safety for the 65,000 annual park visitors, provides ADA saltwater beach access and expand environmental education opportunities for the programs currently using the site.
While no additional restoration/enhancement projects are anticipated in the near future for Meadowdale Beach Park, this project represents a Puget Sound recovery first with potential to be replicated along other segments of the shoreline impacted by 19th and early 20th century railroad infrastructure built at the time without knowledge of the ecological impacts of such large-scale shoreline alteration.

3. Monitoring and Maintenance Responsibilities. *Describe planned maintenance and monitoring activities, including the frequency and duration of each activity to be performed, and who will be responsible for the work.*

a. Maintenance
i. Responsible Party: Snohomish County Parks
ii. Frequency: Regularly, ranges from annually to daily
iii. Duration: in perpetuity
iv. Activities include: Mowing, Ongoing maintenance of irrigation system, Invasive vegetation removal and weeding, spreading mulch, pruning, general park site clean-up and maintenance. Installation and removal of the beach access mat; installation will occur no sooner than May 30th of each year, and removal will occur no later than September 15th of each year.
v. The Agreement between the County and BNSF includes provisions that ensure BNSF has adequate resources to maintain the bridge long term.

vi. Removal of human-made stream crossings that can be a barrier to fish passage; especially juvenile fish passage. These crossings tend to be added at the beach side of the railroad and near the railroad bridge and are constructed with rocks. These should be removed as needed but should also be removed and closely monitored in mid-September through late-May.

b. Monitoring:

i. Plant monitoring during the 1-year Plant Warranty period: to ensure that plantings planted as part of the project meet the warranty requirements and to ensure maximum survivability.
   1. Responsible Party: Snohomish County Parks
   2. Frequency: Quarterly for 1 year following project completion
   3. Duration: 1 year post construction
   4. Activities: visit the site and observe conditions of plants, mulch, watering/irrigation, and weeds. Contractor will replace plants that do not survive during the warranty period.

ii. Fish Passage Conditions: to document that the project objective of restoring natural fish passage conditions is achieved.
   1. Responsible Party: Snohomish County DCNR and Tulalip Tribes
   2. Frequency: occurs once
   3. Duration: during year 1 post construction
   4. Activities include: install conductivity, temperature, and depth (CTD) diver gauge, and monitor channel cross-section water depth velocity, including rod and level data to compare to CTD diver gauge location

iii. Channel cross-section and profile surveys: to document channel conditions in the restored estuary and ensure that fish passage conditions are maintained. This will document the adjustment of the channel and profile in the first 10 years following restoration in the creek outlet, upper estuary, and lower estuary monitoring areas.
   1. Responsible Party: Snohomish County DCNR
   2. Frequency: year 1, 5, and 10 post construction. Collect data in late March when juvenile salmon are expected to use the restored estuary.
   3. Duration: 10 years post construction
   4. Activities include: Collect horizontal and vertical positioning data using Real-Time Kinematic Global Positioning System (RTK-GPS) at cross-channel transects located throughout the creek outlet, upper estuary, and lower estuary monitoring area. Collect horizontal and vertical positioning data using RTK-GPS along a profile extending throughout the creek outlet, upper estuary, and lower estuary monitoring areas.

iv. Stream Habitat in lower Lund's Gulch Creek and creek outlet: To document instream habitat quality in the portions of the creek included in the restoration. The data will indicate how effective the stream restoration components included in the design are for improving habitat conditions for salmon.
   1. Responsible Party: Snohomish County DCNR
   2. Frequency: year 1, 3, 5, and 10 post construction. Sampling should be conducted in the same month each sampling year.
   3. Duration: 10 years post construction
   4. Activities include: wadeable stream habitat survey and benthic macro-invertebrate sampling

v. Large Woody Debris retention and recruitment in upper estuary: To document the recruitment or loss of large wood in the embayment of the upper estuary. The data will indicate how effective the large wood placement was and the overall availability of large wood as habitat structure in the upper estuary.
    1. Responsible Party: Snohomish County DCNR
    2. Frequency: year 1, 3, 5, and 10 post construction. Sampling should be conducted in the same month each sampling year.
    3. Duration: 10 years post construction
    4. Activities include: Count the number of large wood pieces in the upper estuary. Large wood criteria will match those used in Snohomish County (2019b), which are wood larger than 6.6 feet long and 3.9 inches in diameter. A full count will be conducted during low tide. Placed and anchored pieces will be identified, and the amount of wood covered by sediment will be evaluated.

vi. Planned vegetation survival and coverage: To document the re-establishment of a native plant community in the restoration area.
    1. Responsible Party: Snohomish County DCNR
    2. Frequency: Vegetation will be monitored in established plots and along transects once annually in Years 1, 3, 5, and 10 post-construction. Monitoring should be conducted in mid- to late summer at mean low tide for the estuarine marsh areas and freshwater wetland, and at any time of the day for the riparian areas.
    3. Duration: 10 years post construction
    4. Activities include: 33-ft diameter circular plot survey, wetland ratings, quadrant sampling in high saltmarsh, low saltmarsh, and freshwater wetlands, point-line sampling in riparian zone.

vii. Additional Effectiveness Monitoring will be completed by the Tulalip Tribes pending funding availability. Refer to Attachment A.

c. This park has several volunteer groups that engage in vegetation maintenance.
d. In addition, the multiple environmental educational groups have a vested interest in this project and have expressed interest in volunteer opportunities.

4. Planned effectiveness monitoring:

a. Given the significance of the Meadowdale project and the interest in evaluating the effectiveness of the habitat restoration, DCNR contracted with Environmental Science Associates to prepare this comprehensive Monitoring Plan. As this is the first stream mouth restoration project along the Puget Sound shoreline impacted by the BNSF railroad, effectiveness monitoring is particularly important to inform the design of future restoration projects at other stream mouths. In addition, the effectiveness monitoring provides essential information to document the benefits and sustainability of investments by Snohomish County, the grant funding programs who contributed to the restoration, and to BNSF Railway who controls the right-of-way.
b. Refer to Attachment A for Monitoring Plan Effectiveness Monitoring and timeline.