2019 WETLAND MONITORING REPORT

SR 520, I-5 to Medina: Bridge Replacement and HOV Project (South Lake Washington) Compensatory Mitigation Site

USACE (27) NWS-2011-376

Northwest Region

Wetlands Program
Issued March 2020
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## Site Summary

SR 520, I-5 to Medina: Bridge Replacement and HOV Project (South Lake Washington) Compensatory Mitigation Site  
**USACE NWP 27 NWS-2011-376**

<table>
<thead>
<tr>
<th>General Site Information</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>USACE Number 27</strong></td>
</tr>
<tr>
<td><strong>Ecology WQC</strong></td>
</tr>
<tr>
<td><strong>Mitigation Location</strong></td>
</tr>
<tr>
<td><strong>LLID Number</strong></td>
</tr>
<tr>
<td><strong>Construction Date</strong></td>
</tr>
<tr>
<td><strong>Monitoring Period</strong></td>
</tr>
<tr>
<td><strong>Year of Monitoring</strong></td>
</tr>
<tr>
<td><strong>Type of Impact</strong></td>
</tr>
<tr>
<td><strong>Area of Project Impact</strong></td>
</tr>
<tr>
<td><strong>Type of Compensation</strong></td>
</tr>
<tr>
<td><strong>Planned Area of Compensation</strong></td>
</tr>
</tbody>
</table>

1 Impact numbers sourced from WSDOT 2012.  
2 Compensatory Mitigation numbers sourced from WSDOT 2015. Compensatory mitigation for this project occurs at ten additional sites for a total of 8.56 acres of permanent mitigation credit.
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1. Introduction

1.1. Summary

This report summarizes fifth year (Year-5) monitoring activities at the 520 South Lake Washington Compensatory Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities included vegetation surveys, photo-documentation, and gravel sampling. Vegetation surveys occurred on June 4-5, and gravel sampling occurred on December 11, 2019.

1.2. Monitoring Results and Management Activities

<table>
<thead>
<tr>
<th>Performance Standards</th>
<th>2019 Results$^3$</th>
<th>Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>15% shoreline grade and LWD hydraulic engagement</td>
<td>Achieved</td>
<td></td>
</tr>
<tr>
<td>50% LWD retention</td>
<td>Achieved</td>
<td></td>
</tr>
<tr>
<td>D50 pebble count is less than or equal to 49mm or no greater than an 80% increase above the initial D50</td>
<td>D50 pebble count is less than 49mm</td>
<td></td>
</tr>
<tr>
<td>30% native woody cover in riparian zone</td>
<td>66% cover (CI$_{80} = 58$-$74$%)</td>
<td></td>
</tr>
<tr>
<td>No class A noxious weeds</td>
<td>None observed</td>
<td>Five weed control visits occurred between July and December, 2019.</td>
</tr>
<tr>
<td>Class B and C noxious weeds controlled</td>
<td>Garden loosestrife (Lysimachia vulgaris) observed and reported</td>
<td></td>
</tr>
<tr>
<td>Less than 25% cover listed non-designate noxious weeds</td>
<td>3% cover (visual estimate)</td>
<td></td>
</tr>
</tbody>
</table>

$^3$ Estimated values are presented with their corresponding statistical confidence interval. For example, 66% (CI$_{80} = 58$-$74$%) means we are 80% confident that the true cover value is between 58% and 74%.
2. Site Description

2.1. Location

This 3.94-acre compensatory mitigation site is located north of the Renton Boeing property on the south end of Lake Washington, King County (Figure 1).

Driving Directions (to Boeing badge office):
From Interstate (I) 5 N, take exit 154 to I-405 North. At Exit 5, take ramp for State Route (SR) 900 East toward Sunset Boulevard Northeast/Issaquah. Turn left onto SR 900/NE Sunset Blvd/N Southport Dr. Follow onto Logan Ave. N. Turn right onto N 8th St, then take the first right to park at the badge office. A badge is required to access the site. Once badges are acquired, official state vehicles can be driven around the Boeing factory and parked next to the site.

2.2. Purpose and Description

This site is combination of shoreline and riparian enhancement on the southern shoreline of Lake Washington. This site was created to partially compensate for the loss of 7.43 acres of aquatic functions and values resulting from replacing a portion of the SR 520 Bridge. The shoreline plantings, riparian plantings, and the creation of a shallow bench are designed to provide juvenile rearing and feeding habitat for Chinook and sockeye salmon.
2.3. Study Area

The shoreline enhancement area includes the lakeshore edge and re-established shallow nearshore habitat. The riparian restoration area includes wetland along the shore edge and upland areas. A portion of the riparian area is within the Boeing wing tip easement on the outer edge of the site. The Boeing wing tip easement along the southeastern edge of the site precludes planting trees and is planted exclusively with shrubs (Figure 1).

![Site Sketch](image)

Figure 1. Site Sketch
3. Performance Standards and Methods

3.1. Performance Standards

Year 5

Performance Standard 1
The slope of the enhanced shoreline habitat is at or below 15% grade, as measured from low lake level to the high lake level elevation to a 1-m depth. The LWD structures are engaged within the wetted portion of the lakes (at high lake level).

Performance Standard 2
At least 50 percent of placed LWD pieces are retained within the project limits.

Performance Standard 3
At the shoreline substrate enhancement sites (not including the deep water gravel installation at the east approach, Seward 2 or Seward 4 sites), median substrate particle size (D50) is less than or equal to 49 mm or no greater than an 80 percent increase above the initial D50 (whichever is greater). The initial D50 is measured during the as-built gravel installation. The D50 will be estimated based on pebble counts in each area of gravel supplementation, respectively. The b-axis of substrate particles will be measured along transects from the high water level to the waterward extent of substrate enhancement. Transects will be spaced along shoreline every 30 meters, and only in the area of substrate enhancement. The D50 at deep water gravel installation sites (at east approach, Seward 2 or Seward 4) will be estimated by visual inspection or grab samples from the water surface.

Performance Standard 4
Cover of native woody species (planted and volunteer) is at least 30% in the riparian zone.

Performance Standard 5
Washington State and King County listed Class A Noxious Weeds identified on the site are eradicated.
Performance Standard 6
King County listed Class B and C Weeds identified on the site are controlled. Control of noxious weeds means to prevent all seed production and to prevent the dispersal of all propagative parts capable of forming new plants. If Japanese knotweed (*Reynoutria japonica*) is found at the mitigation site during monitoring, WSDOT (or its designated representatives) will promptly remove the stems above ground and chemically treat it to facilitate elimination of roots and rhizomes below ground.

Performance Standard 7
Noxious weeds listed by King County as Non-Designate including reed canarygrass, non-native blackberries, and Scot’s broom do not exceed 25 percent aerial cover in riparian zones.

Year 10
Performance Standard 8
Cover of native woody species (planted and volunteer) is at least 50% in the riparian zone.

Appendix A shows the planting plan (USACE 2012) and as-built grading schematic (WSDOT 2015).
3.2. Methods

Performance Standards (PS) 1 and 2 were evaluated by visual inspection. Performance Standard 3 was evaluated by substrate particle size analysis of multiple samples collected in each area of gravel supplementation. Transects were spaced along the shoreline every 30 meters in the area of substrate enhancement. One sample was collected from a random location along each transect (not shown in Figure 2). Staff at the WSDOT Materials Lab in Tumwater conducted sieve analysis of the combined samples. Figure 2 and the tables below document sample methods used for all of the remaining performance standards required by the mitigation plan or permits. Additional details on our methods are located here: WSDOT Wetland Mitigation Site Monitoring Methods Paper (WSDOT 2008).

![Figure 2. Sample Design](image)

**Placement of Baseline:** The baseline was placed southwest to northeast through the center of the riparian area.

<table>
<thead>
<tr>
<th>Attribute</th>
<th>PS 4, 8</th>
<th>PS 5</th>
<th>PS 6</th>
<th>PS 7</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cover</td>
<td>Presence/Absence</td>
<td>Presence/Absence</td>
<td>Cover</td>
</tr>
<tr>
<td>Target population</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Native woody species</td>
<td>Class A noxious weeds</td>
<td>Class B and C noxious weeds</td>
<td>Invasive species</td>
<td></td>
</tr>
<tr>
<td>Zone</td>
<td>Riparian</td>
<td>Entire site</td>
<td>Entire site</td>
<td>Riparian</td>
</tr>
<tr>
<td>Sample method</td>
<td>Line Intercept</td>
<td>Qualitative</td>
<td>Qualitative</td>
<td>Qualitative</td>
</tr>
<tr>
<td>SU length</td>
<td>10m</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total # of SU</td>
<td>22</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
4. Discussion

4.1. Site Development

This site has met the final year (year-5) performance standards for shoreline enhancement. Shoreline enhancement was intended to provide juvenile rearing and feeding habitat and protection from predators for Chinook and sockeye salmon, as well as provide a migratory corridor for juvenile Chinook salmon. This included removing a derelict flume structure, creating a gradual shoreline grade, adding more than 9,000 cubic yards of fine gravel, sand, cobble, and sediment, and installing three engineered log jams. All shoreline enhancements remain intact.

The riparian area is developing a dense and diverse canopy and is currently exceeding the final year (year-10) standard for native woody cover. Substantial cover in the northeastern portion of the site is provided by mature black cottonwood (*Populus balsamifera*), while the southwestern end of the site is dominated by redosier dogwood (*Cornus alba*) and Nootka rose (*Rosa nutkana*). Dense thickets of willows (*Salix spp.*) line the waterward edge of the riparian area.

Noxious weed cover is highest in the wing tip easement area where woody density is lower; however, weed cover is low throughout the site, and weed control activity was evident in this area at the time of monitoring.

In addition to successful shoreline enhancement for salmonid habitat, beaver chewed logs were observed onsite, as well as several species of wetland-dependent or wetland-associated birds, including great blue heron, bald eagle, belted kingfisher, osprey, and a mallard with ducklings.
4.2. Results

**Performance Standard 1**
(15% shoreline grade and LWD hydraulic engagement)

There has been no visual increase in the grade of the shoreline slope, which remains as installed at 15% or less. Large woody debris was hydraulically engaged during both June and December visits (Photo 1).

**Performance Standard 2**
(50% LWD retention)

All three engineered log jams remain in place (Photo 2). Eleven unanchored logs over ten feet long were dispersed along the shoreline between the log jams, and large woody debris is dispersed throughout the riparian planting area.

**Performance Standard 3**
(D50 pebble count is less than or equal to 49mm or no greater than an 80% increase above the initial D50)

The original D50 collected in 2015 was 5.8mm. The 2019 D50 measurement is 3.79mm. This is well below the performance standard threshold and represents a decrease from the initial D50.
**Performance Standard 4, 8**  
(30% native woody cover in riparian zone [50% in year 10])

Woody cover in the riparian zone is estimated at 66% (CI\textsubscript{80} = 58-74%). This exceeds the year-10 performance standard of 50%, and is the second year in a row the site has met the performance standard for riparian cover (Appendix C, Table 1). There are two distinct plant communities in the riparian zone; the southwest side of the site is dominated by shrubs up to three meters tall (Photo 3), while the northeast side of the site contains mature, 30-meter tall black cottonwood (*Populus balsamifera*) underplanted with shrubs and conifers (Photo 4).

**Performance Standard 5**  
(No class A noxious weeds)

No Washington State and King County listed Class A Noxious Weeds were observed on site.

**Performance Standard 6**  
(Class B and C noxious weeds controlled)

One small patch of a King County class B designate, garden loosestrife (*Lysimachia vulgaris*), was observed along a transect on the west side of the site and reported to managers. No jubata grass (*Cortadaeria sellona*) was observed this year. No knotweeds (*Reynoutria spp.*) were observed on site.
Performance Standard 7
(Less than 25% cover listed non-designate noxious weeds)

The estimated cover of class B and C weeds listed by King County as non-designate, including non-native blackberries and Scotch broom (*Cytisus scoparius*), is estimated at 3%. This consists of oxeye daisy (*Leucanthemum vulgare*), spotted touch-me-not (*Impatiens capensis*), Himalayan blackberry (*Rubus armeniacus*), common St. John’s wort (*Hypericum perforatum*), and yellow flag iris (*Iris pseudacorus*). Herbaceous weed cover is higher in the wing tip easement area where native woody cover is lower (Photo 5).

![Photo 5. Oxeye daisy (Leucanthemum vulgare) in the wing tip easement area (June 2019)](image)

4.3. Adaptive Management

Weed control is scheduled to be conducted in March, May, July, September and November of 2020.
5. References


Appendix A. Planting Plan with Photo Point Locations

(from WSDOT 2012)
Appendix B. Photo Points

The photographs below were taken from permanent photo-points on June 5, 2019 and document current site development.

Photo Point 1

Photo Point 2

Photo Point 3

Photo Point 4
## Appendix C. Data Tables

Table 1. Year 10 performance standards met in Years 4 and 5 at South Lake Washington

<table>
<thead>
<tr>
<th>Performance Standards (Year-10)</th>
<th>Year 4 (2018) Qualitative Results</th>
<th>Year 5 (2019) Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cover of native woody species (planted and volunteer) is at least 50% in the riparian zone.</td>
<td>55%</td>
<td>66% (CI$_{80}$ = 58-74%)</td>
</tr>
</tbody>
</table>