SR 410 Nile Valley Landslide – Reconstruct Highway & Manage Env Mitigation (Nile Slide) Mitigation Site

USACE NWS-2010-511

South Central Region

2017 MONITORING REPORT

Wetlands Program

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**SR 410 Nile Valley Landslide – Reconstruct Highway & Manage Env Mitigation (Nile Slide) Mitigation Site**

**USACE NWS-2010-511**

<table>
<thead>
<tr>
<th>General Site Information</th>
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<tbody>
<tr>
<td><strong>USACE NWP 23</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>Area of Project Impact</strong></td>
</tr>
<tr>
<td><strong>Type of Mitigation</strong></td>
</tr>
<tr>
<td><strong>Planned Area of Mitigation</strong></td>
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</tbody>
</table>

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1 Impact numbers sourced from WSDOT 2011.
2 Mitigation numbers sourced from WSDOT 2015. Additional out-of-kind mitigation included rock barbs, large woody debris structures, and a flood fence.
Summary of Monitoring Results and Management Activities (2017)

<table>
<thead>
<tr>
<th>Performance Standards</th>
<th>2017 Results</th>
<th>Management Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Document areas inundated behind the levee</td>
<td>Achieved</td>
<td></td>
</tr>
<tr>
<td>Density of four native species/100ft² OR average of 15% cover native woody species in the planted floodplain area</td>
<td>6.4 plants/100ft² (CI80% = 5.0-7.8)</td>
<td></td>
</tr>
<tr>
<td>Document inundation in off-channel fish habitat</td>
<td>Present</td>
<td></td>
</tr>
<tr>
<td>Removal of Class A noxious weeds and control of Class B noxious weeds</td>
<td>None observed</td>
<td>One visit per month May-September</td>
</tr>
</tbody>
</table>

Report Introduction

This report summarizes fourth-year (Year-4) monitoring activities at the 410 Nile Slide 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 and photo-documentation on October 2 and 23, 2017.

3 Estimated values are presented with their corresponding statistical confidence interval. For example, 6.4 plants/100ft² (CI80% = 5.0-7.8) means we are 80% confident that the true density value is between 5.0 and 7.8 plants/100ft².
What is the 410 Nile Slide Mitigation Site?

This 51.9-acre mitigation site (Figure 1) is an out-of-kind mitigation effort created within the floodplain of the Nile River, 28 miles east of Yakima, Washington. This site was created to compensate for the loss of 1.93 acres of wetlands due to the realignment of SR 410 following the catastrophic 2009 landslide. The riparian enhancement and floodplain rehabilitation areas are designed to improve river and floodplain interaction. The riparian plantings will eventually provide shade, decrease water temperatures and become available for large woody debris recruitment.

The SR 410 Nile Slide Mitigation Site contains a created backwater channel that will provide off-channel habitat for fish and refugia during flood events. In addition, rock barbs, large woody debris structures, and a flood fence were constructed to recruit additional woody material and provides extensive floodplain preservation. Appendix 3 includes site directions.
What are the performance criteria for this site?

Year 3 (monitored in Year 4)

Performance Standard 1
Document whether flows were high enough to enter the breeches. If so, document the areas inundated behind the levee.

Performance Standard 2
Native species, planted and/or volunteer, will exhibit an average density of at least four plants per 100 square feet OR an average cover of 15 percent. If dead plantings are replaced to meet either of these thresholds, the performance measure will be met.

Performance Standard 3
Submit photos that document backwater inundation as well as the presence of woody debris (off-channel fish habitat).

Performance Standard 4
County-listed Class A weeds will be removed from the site, when observed. The spread of county-listed Class B weeds, or other non-native species that significantly reduce the survivability of native vegetation, will be controlled.

Appendix 1 shows the as-built (WSDOT 2015).
How were the performance standards evaluated?

Photos to document inundation in the off-channel fish habitat were taken on October 23, 2017 (Performance Standard 1) and photos were taken May 25, 2017 to document levee breeching (Performance Standard 3). The table and figure below document the sampling methodology utilized for all of the remaining performance standards (PS) as required by the mitigation plan or permits. For additional details on the methods see the WSDOT Wetland Mitigation Site Monitoring Methods Paper (WSDOT 2008).

**Placement of Baseline:** The 993-meter baseline runs through each section of the planted riparian areas (Figure 2).

![Site Sampling Design (2017)](image)

<table>
<thead>
<tr>
<th>Attribute</th>
<th>PC 2</th>
<th>PC 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target population</td>
<td>Density</td>
<td>Presence/Absence</td>
</tr>
<tr>
<td>Native species</td>
<td>Noxious weeds</td>
<td></td>
</tr>
<tr>
<td>Zone</td>
<td>Riparian and floodplain</td>
<td>Entire site</td>
</tr>
<tr>
<td>Sample method</td>
<td>UBT</td>
<td>Qualitative</td>
</tr>
<tr>
<td>SU width</td>
<td>1 m</td>
<td></td>
</tr>
<tr>
<td>Total # of SU</td>
<td>39</td>
<td></td>
</tr>
</tbody>
</table>
How is the site developing?

This site is developing well. Native plant cover, both woody and herbaceous combined, is exceeding the final-year performance standard. Density of native woody vegetation varies across the site, however where density of woody species is lower, native bunch grasses have colonized. Invasive cover is low, with no effect on the survivability of the native vegetation. Cover of all invasive species across the site is qualitatively estimated at less than five percent. This includes a couple small patches of reed canarygrass (*Phalaris arundinacea*) in the southern riparian Phase II area and in the riparian area adjacent to the backwater channel. Unidentifiable knapweeds (*Centauria* species) were observed throughout the northwestern riparian Phase I area. There is significant erosion happening along the northeastern riparian Phase I bank area.
Results for Performance Standard 1
(Document areas inundated behind the levee):

Levee breeching occurred on May 25, 2017. The map in Appendix 2 documents the extent of the breech.

Results for Performance Standard 2
(Density of four native species/100ft² or 15% cover of native species in the planting areas):

Density of native species is estimated at 6.4 plants/100ft² (CI$_{80\%}$ = 5.0-7.8) (Photo 2). This exceeds the performance standard target. Dominant species include black cottonwood (Populus balsamifera), sandbar willow (Salix exigua), and snowberry (Symphoricarpos albus).

Results for Performance Standard 3
(No Class A noxious weeds and Class B noxious weeds controlled):

No Class A or Class B noxious weeds observed at the time of monitoring.

Results for Performance Standard 1
(Document areas of off-channel fish habitat inundation):

At the time of monitoring, the off-channel fish habitat area was inundated (Photo 1).
What is planned for this site?

Routine weed control will continue in 2018.
Appendix 1 – As-Built with Photo Point Locations
(from WSDOT 2015)
Appendix 2 – Levee Breach Flooding (2017)
Appendix 3 – Photo Points
The photographs below were taken from permanent photo-points on October 23, 2017 and document current site development.

Photo Point 1

Photo Point 2

Photo Point 3

Photo Point 4
Photo Point 5

Driving Directions:
From I-5, take Exit 68 to US 12 East. From US 12, turn left onto SR 410 westbound. Drive for 8.6 miles and find the parking pad on the east side of the road.
Literature Cited


