

**I-405 Congestion Relief and Bus Rapid Transit Projects:
Renton Nickel Improvement Project
(Renton Stage 1) Mitigation Site**

USACE NWP 200600097

Northwest Region

2014 MONITORING REPORT

Wetlands Program

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I-405/I-5 to SR 169 Stage 1 Widening Stream (Renton Stage 1) Mitigation Site

USACE NWP (23) 98-4-00050

	General Site Information				
	USACE Permit Number	200600097			
	Mitigation Location	Multiple locations within the cities of Renton and Tukwila			
	LLID Number	1222329474660			
	Construction Date	2008-2009			
	Monitoring Period	2010-2020			
	Year of Monitoring	5 of 10			
	Area of Project Impact	Wetland	Buffer	Stream Channel Impacts	Stream Shading Impacts
		1.61 acres	4.96 acres	0.07 acre	0.27 acre
	Type of Mitigation	Urban Forest Planting		Understory Planting	
Area of Mitigation¹	1.7 acre		0.24 acre		

¹The 1.61 acres of wetland impact are being mitigated for with 1.3945 credits from the Springbrook Creek Wetland and Habitat Mitigation Bank. The actual urban forest planting (2.22 acres) and understory planting areas (0.59) are higher than the USACE required acres in the table. Impact numbers come from the USACE permit 200600097.

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Summary of Monitoring Results and Management Activities (2014)

Performance Criteria ²	2014 Results ³
Performance Standards (Springbrook Stream Mitigation Site)	
Establish 160 linear feet of new channel, where the existing box culvert is located, with 3 boulder groups.	Present according to construction plans
Establish 290 linear feet of off-channel habitat in side channel with 14 pieces of LWD.	15 root-wads and 6 rock features present
The bankfull width/depth and wetted width/depth ratio will be maintained within 80 percent of the reference reach data.	Not evaluated
Performance Standards and Permit Requirements (All Mitigation Areas)	
After five years, aerial cover of native woody species will be at least 60 percent in riparian planting areas.	West Fork Panther Creek- 95% cover (CI _{80%} = 93-97%) Green River- 57% cover (CI _{80%} = 45-69%) Gilliam Creek- 35% cover (CI _{80%} = 28-42%) Springbrook Creek- 61% cover (CI _{80%} = 51-71%)
At least two native, non-invasive riparian species will achieve a minimum of 10 percent relative cover for each species in the riparian planting area	A minimum of two native species have achieved ten percent relative cover in the riparian planting areas at all four sites.
Reed canarygrass, purple loosestrife, Scot's broom, and Japanese knotweed will not exceed 20 percent aerial cover.	Qualitatively estimated: West Fork Panther Creek- 5% cover Green River- 5% cover Gilliam Creek- 3% cover Springbrook Creek- 2% cover
Japanese Knotweed will not be present	West Fork Panther Creek- Absent Green River- Present Gilliam Creek- Present Springbrook Creek- Present

² Performance Standards apply to Springbrook Creek stream mitigation site, USACE permit requirements apply to both Springbrook Creek stream mitigation site as well as 2.22 acres of urban forest riparian plantings and 0.59 acres of understory plantings located on Gilliam Creek, West Fork Panther Creek, and the Green River.

³ Estimated values are presented with their corresponding statistical confidence interval. For example, 95% cover (CI_{80%} = 93-97%) means we are 80% confident that the true woody cover value is between 93 and 97 percent.

Report Introduction

This report summarizes Year-5 monitoring activities at the Interstate (I) 405 Renton Stage 1 wetland and stream Mitigation Sites. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities include vegetation surveys and photo-documentation completed on September 9 and 10, 2014.

What is the I-405 Renton Stage 1 Stream Mitigation Site?

This stream mitigation site, Springbrook Creek (Figure 1), removed a box culvert creating natural stream bed of 160 linear feet and 9,000 square feet. This site was created to compensate for impacts to stream channel, shading, and stream buffer due to road improvements along I-405 and SR 167. The created side channel and enhanced riparian plantings are designed to provide habitat improvement opportunities of increased riparian diversity of trees and shrubs, create high quality pools in the side channel, increase potential for year-round off-channel rearing, and provide large woody debris revetment along the side channel. An additional 2.22 acres of urban forest riparian plantings and 0.59 acre of understory plantings are located on Gilliam Creek, West Fork Panther Creek, and the Green River. Appendix 1 includes site directions.

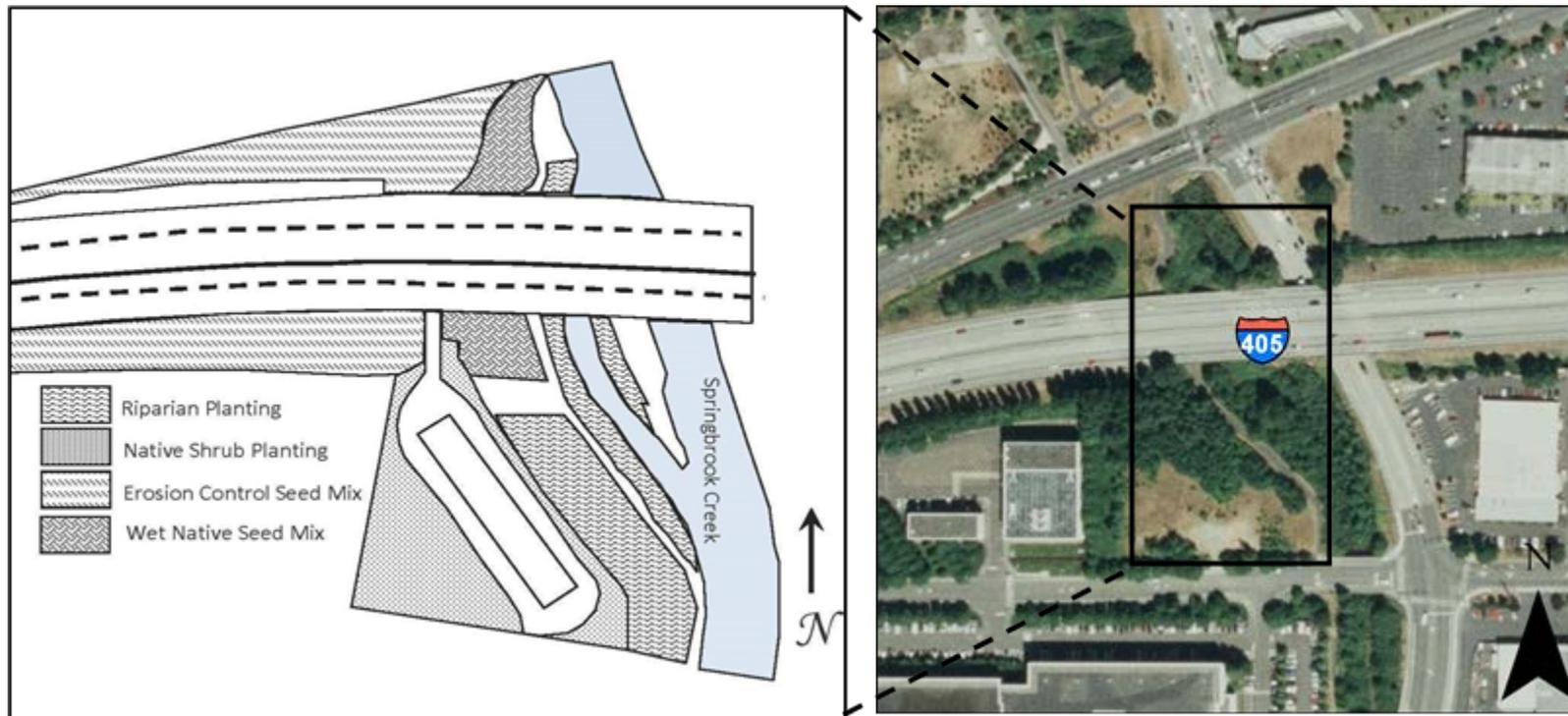


Figure 1 Site Sketch

What are the performance standards for this site?

Year 5

Performance Standard 1 (Springbrook Creek)

Establish 160 linear feet of new channel, where the existing box culvert is located, with 3 boulder groups.

Performance Standard 2 (Springbrook Creek)

Establish 290 linear feet of off-channel habitat in side channel with 14 pieces of LWD

Performance Standard 3 (Springbrook Creek)

The bankfull width/depth and wetted width/depth ratio will be maintained within 80 percent of the reference reach data.

Performance Standard 4 (All mitigation areas)

After five years, aerial cover of native woody species will be at least 60 percent in riparian planting areas.

Performance Standard 5 (All mitigation areas)

At least two native, non-invasive riparian species will achieve a minimum of 10 percent relative cover for each species in the riparian planting area

USACE Permit Requirement 1 (All mitigation areas)

Reed canarygrass, purple loosestrife, Scot's broom, and Japanese knotweed will not exceed 20 percent aerial cover in the riparian restoration areas. If this cover threshold is exceeded, weed eradication or control measures will be implemented as part of a detailed contingency plan.

USACE Permit Requirement 2 (All mitigation areas)

Japanese Knotweed shall not be present at the Springbrook Creek stream mitigation site, the 1.7 acres of urban forest riparian planting, and the 0.24 acre Gilliam Creek understory plantings.

USACE Permit Requirement 3 (Gilliam Creek and Green River Sites)

After five years, aerial cover of native woody species will be at least 25 percent in the urban forest riparian plantings.

Appendix 1 shows the planting plan (WSDOT 2008).

How were the performance standards evaluated?

The LWD and boulders were counted at Springbrook Creek and the lengths of the channels were estimated (Performance Standards 1 and 2). We did not have access to reference data for this site to evaluate Performance Standard 3.

To evaluate standards for woody cover, the line-intercept method was used at each site (Performance Standard 4 and Permit Requirement 3).

Panther Creek: The base line was 13 meters long with five transects placed perpendicular to the baseline using the restricted random method. Sample units were 5 meters long.

Green River: The base line was 111 meters long with eleven transects placed perpendicular to the baseline using the systematic random method. Sample units were 10 meters long.

Gilliam Creek: The base line was 167 meters long with seventeen transects placed perpendicular to the baseline using the systematic random method (Figure 2). Sample units were 5 meters long in the riparian zone and 10 meters long in the urban forest zone.

Springbrook: The base line was 133 meters long with nine transects placed perpendicular to the baseline using the systematic random method. Sample units were 7 meters long.

Relative cover of woody species at each site was addressed qualitatively (Performance Standard 5). Invasive species cover and presence/absence of knotweed was also addressed qualitatively (Permit Requirements 1 and 2).

The sample design for each site was similar to the one used at Gilliam Creek (Figure 2), each had a baseline placed parallel to the creek and transects were run perpendicular to the baseline.

For additional details on the methods, see the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

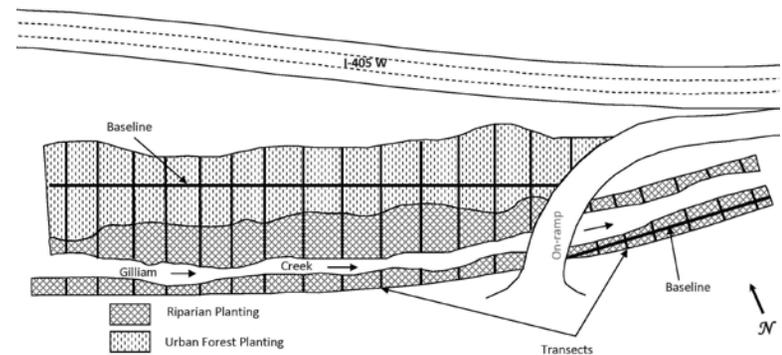


Figure 2 Gilliam Creek Sampling Design (2014)

How are these sites developing?

West Fork Panther Creek

The riparian plantings on the west side of Panther Creek are thriving. There is a thick overstory of conifers and an understory of shrubs.

Green River

The Green River planting area is thickly vegetated with native woody trees and shrubs. Japanese knotweed is present along the banks of the Green River, but invasive cover is relatively low across the site.

Gilliam Creek

Both the understory and the urban forest plantings have developed into a diverse community at Gilliam Creek. Invasive cover is low throughout the site, though Japanese Knotweed is present along the banks of the creek. Two areas on the north side of the creek could also benefit from a limited amount of woody re-planting, however existing vegetation provides overstory cover throughout this zone.

Springbrook Creek Mitigation Site

The woody plantings on the west side of the pedestrian trail are thriving with a thick overstory of mature black cottonwood (*Populus balsamifera*). Those adjacent to Springbrook Creek appear somewhat stressed and woody species establishment and growth in this zone has been slower. All bank logs and boulder clusters are present according to plan and invasive cover is low across the site.

Results for Performance Standard 1 (Springbrook Creek)
(Establish 160 linear feet of new channel, where the existing box culvert is located, with 3 boulder groups):

At the time of the monitoring visit, the box culvert had been removed and approximately 160 feet of new channel along Springbrook creek was present (Photo 1). The boulder groups were present and the site appears to have been constructed to plan.

Results for Performance Standard 2
(Establish 290 linear feet of off-channel habitat in side channel with 14 pieces of LWD):

A side channel off of Springbrook creek is present and it appeared to be at least 290 feet long. Fifteen pieces of LWD were observed in and along the side channel and boulders were interspersed with the LWD (Photo 1).

Results for Performance Standard 3
(The bankfull width/depth and wetted width/depth ratio will be maintained within 80 percent of the reference reach data. A reference reach will be identified and these data will be obtained during the final design of the proposed stream mitigation and proposed bridges):

At this time, we do not have access to reference data regarding the bankfull and wetted width/depth ratios for Springbrook creek.



Photo 1
Off channel area with LWD and boulders (Sept 2014)



Photo 2
Woody vegetation along Panther Creek (Sept 2014)

Performance Standard 4, 5 and USACE Permit Requirements 1 and 2 (All Areas)

(After five years, aerial cover of native woody species will be at least 60 percent in riparian planting areas and 2 woody species will achieve at least 10 percent relative cover):

The cover of native woody species at West Fork Panther Creek is 95% (CI_{80%} = 93-97%). The woody community on the west side of Panther creek is thriving and dominated by willows (*Salix* spp.), and Douglas-fir (*Pseudotsuga menziesii*) and each having at least ten percent relative cover (Photo 2).

The cover of native woody species at the Green River riparian planting area is 57% cover (CI_{80%} = 45-69%). This is just below the performance standard target. Cover is relative even across both urban forest and riparian zones (Photo 3). The dominant species present include western red cedar (*Thuja plicata*), and Cascara buckthorn (*Frangula purshiana*), both with at least ten percent relative cover

The cover of native woody species at the Gilliam Creek riparian planting area is 35% (CI_{80%} = 28-42%). The dominant species observed include red alder (*Alnus rubra*), Lewis' mock orange (*Philadelphus lewisii*), and Pacific ninebark (*Physocarpus capitatus*), each with at least ten percent relative cover.

The cover of native woody species at the Springbrook Creek is 61% (CI_{80%} = 51-71%) and is dominated by western red cedar (*Thuja plicata*), Pacific ninebark (*Physocarpus capitatus*), and willows (*Salix* spp.), each with at least ten percent relative cover.



Photo 3
Woody cover in urban forest planting area (September 2014)



Photo 4
Gilliam Creek urban forest (Sept 2014)

Results for Performance Standard 6 and Permit Requirements 3 and 4

(Reed canarygrass, purple loosestrife, Scot's broom, and Japanese knotweed will not exceed 20 percent aerial cover and Japanese knotweed shall not be present):

The cover of non-native species is qualitatively estimated to be:

West Fork Panther Creek- 5% cover

Green River- 5% cover

Gilliam Creek- 3% cover

Springbrook Creek- 2% cover

Japanese knotweed (*Fallopia japonica*) is present at all sites except for the Panther Creek site. The Green River site appears to have the highest amount of non-natives with reed canarygrass (*Phalaris arundinacea*), thistles (*Cirsium spp.*), and Japanese knotweed (*Reynoutria japonica*) present.

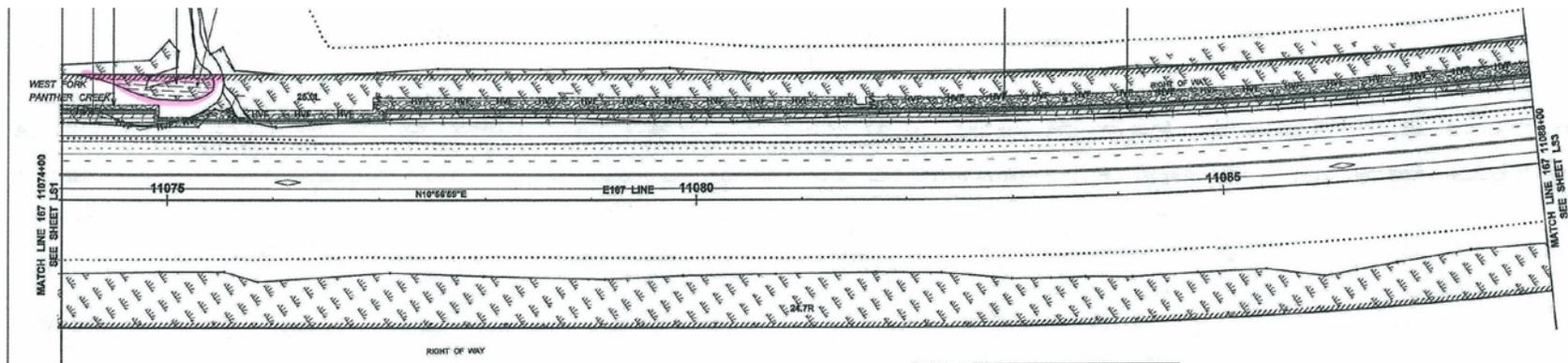
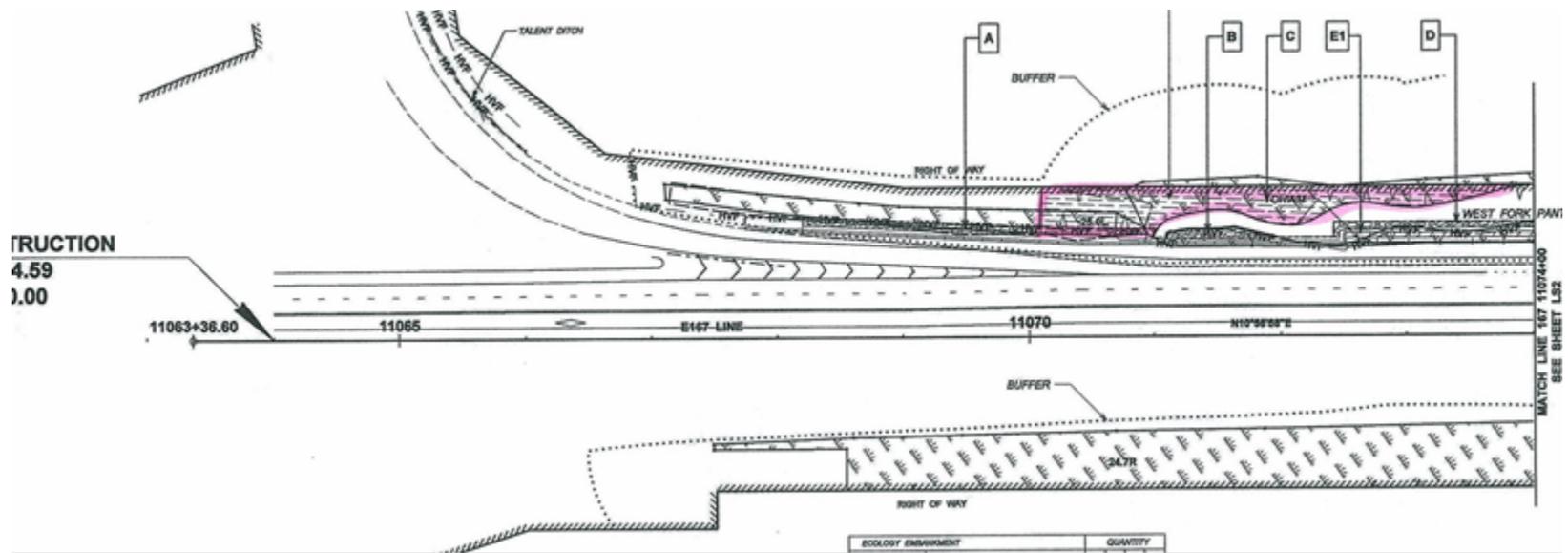
USACE Permit Requirement 5 (Gilliam Creek and Green River Sites)

After five years, aerial cover of native woody species will be at least 25 percent in the urban forest riparian plantings.

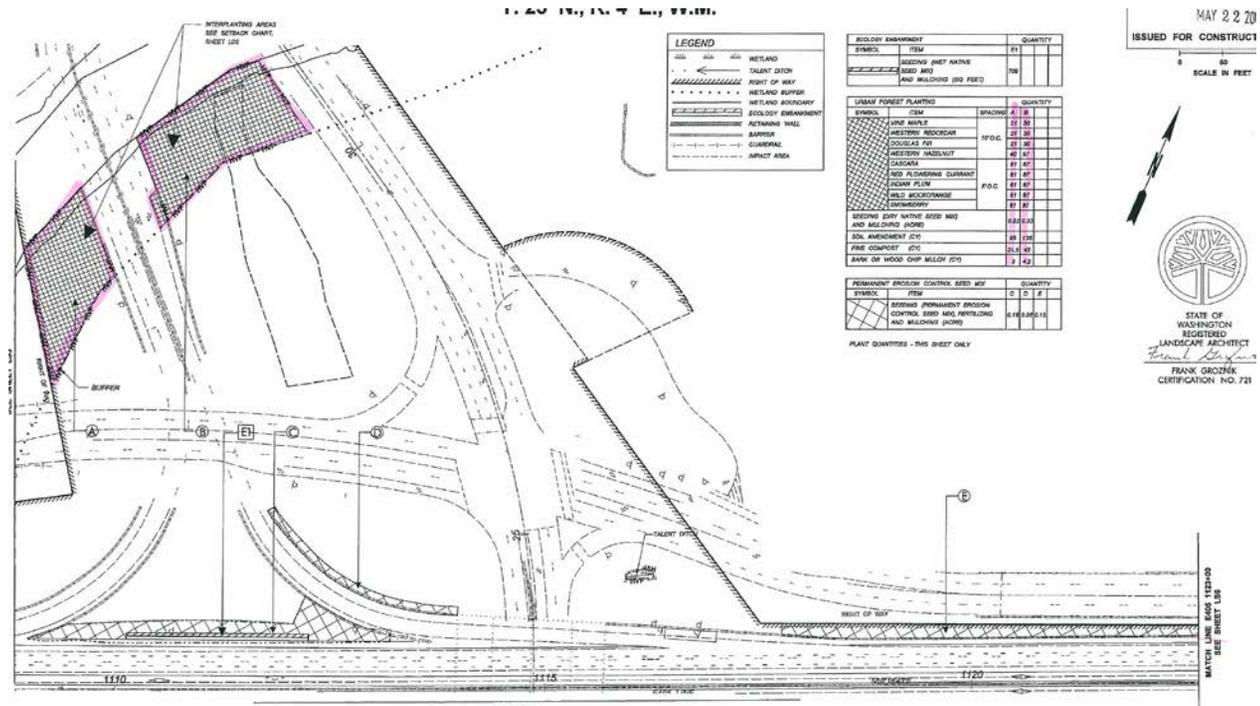
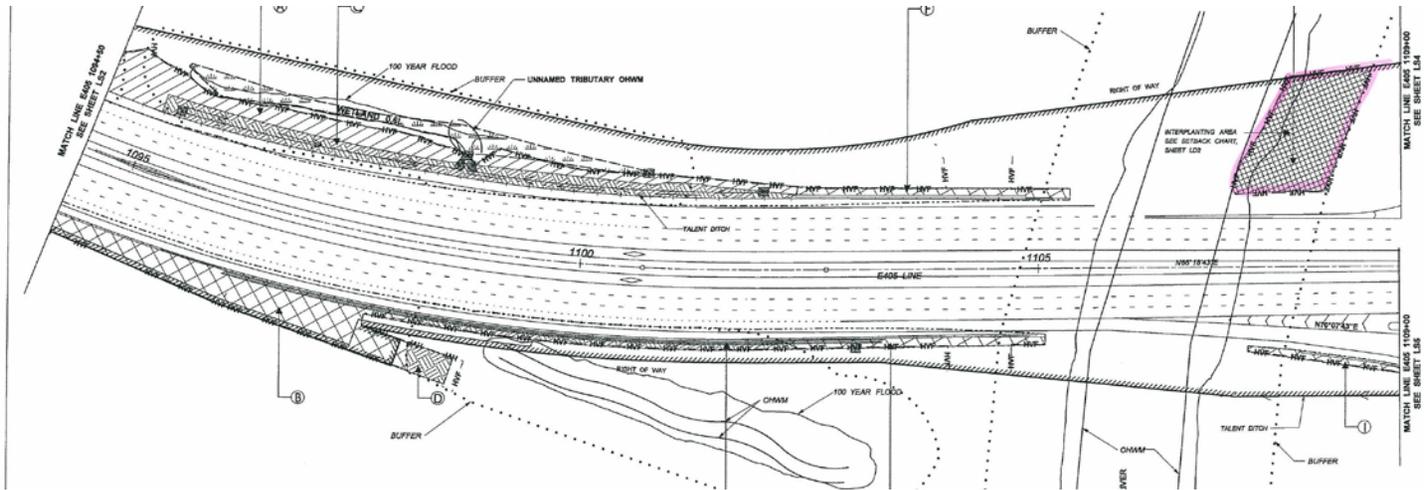
The cover of native woody species in the urban forest planting area at Gilliam Creek is 39% cover ($CI_{80\%} = 30-47\%$) (Photo 4). This cover value exceeds the permit requirement target. The cover of native woody species in the urban forest planting area at the Green River site is 57% cover ($CI_{80\%} = 45-69\%$), which also exceeds the permit requirement target.

What is planned for this site?

Replanting at Gilliam Creek and the Green River will occur in Fall 2015. Knotweed control will take place at the Springbrook Creek, Gilliam Creek, and Green River sites in summer and fall 2015.



Green River



Driving Directions:

Gilliam Creek Plantings Head North on I-5 (50mi). Take exit 153 for South Center Parkway and Mall. Head north on South Center/Tukwila Parkway. When you reach 61st Ave. park at the mall. The only safe parking is in the mall parking lot. You will have to cross the street and walk east to reach the plantings.

Green River Plantings (from Gilliam Creek) Continue east on South Center/Tukwila Parkway. Cross under I-405 and head east on (right) Southcenter Blvd./Fun Center Way Take a left on Interurban Ave S. Take second right on Fort Dent Way, turn around and get back onto Interurban Ave southbound. Park on shoulder of Interurban Ave S, north of I-405.

Panther Creek Plantings (from Green River Plantings) Head north on I-405 (~2mi). Take exit 2 SR-167 S toward Auburn. Take E Valley Rd/SW 43rd exit towards S 180th st. Turn right at E Rainier Ave S/E Valley Rd. Park in the back of the Clarion Hotel. The plantings are along the right-of-way of SR-167.

Springbrook Creek Plantings (From Panther Creek Plantings) Head north on E Valley Rd. Take a left on SW 34th St. Take a right on Oakdale Ave SW. The site is located on the corner of 16th St SW and Oakdale Ave. SW. There is a black gate around the site on the north side of 16th just west of Oakdale Ave. Park inside the gate.

Literature Cited

1. [USACE] US Army Corps of Engineers. 2007. Department of the Army Nationwide Permit Number 200600097.
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3. [WSDOT] Washington State Department of Transportation. 2006. I-405 Congestion Relief and Bus Rapid Transit Projects. Renton Nickel Improvement Project (I-405, I-5 to SR 169). Seattle (WA): Washington State Department of Transportation, Urban Corridors Office.
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5. [WSDOT] Washington State Department of Transportation. 2008. WSDOT Wetland Mitigation Site Monitoring Methods. <http://www.wsdot.wa.gov/NR/rdonlyres/C211AB59-D5A2-4AA2-8A76-3D9A77E01203/0/MethodsWhitePaper052004.pdf>