

# **Cedars Mitigation Site**

**I-5 I-205 NE 134<sup>th</sup> Street IC  
USACE NWS-2010-185**

**SR 502 NE 15<sup>th</sup> Ave to NE 102<sup>nd</sup> Ave  
USACE NWS-2009-1093**

**Southwest Region**

**2015 MONITORING REPORT**

**Wetlands Program**

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General Site Information			
<b>USACE NWP</b>	NWS-2010-185, NWS-2009-1093		
<b>Mitigation Location</b>	Rural Clark County, east of the Hockinson area.		
<b>LLID Number</b>	1225109457410		
<b>Construction Date</b>	2012		
<b>Monitoring Period</b>	2013 to 2022		
<b>Year of Monitoring</b>	3 of 10		
<b>Type of Project Impact</b>	Permanent Wetland Impact	Temporary Wetland Impacts	
<b>Area of Project Impact</b>	4.12 acres	0.35	
<b>Type of Mitigation<sup>1</sup></b>	Wetland Establishment	Wetland Enhancement	Wetland Preservation
<b>Area of Mitigation</b>	11.3 acres	0.48 acre	17.46 acres

<sup>1</sup>See Appendix 3, Table 3 for an accounting ledger sourced from As-Built documentation that includes details on project impacts, mitigation type, and acreages. The site contains a total of 11.3 acres of wetland establishment, 7.65 acres of which was used for this project. The remaining 3.65 acres of wetland establishment can be used for another project within the Salmon Creek Watershed.

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## Summary of Monitoring Results and Management Activities (2015)

Performance Standards	2015 Results <sup>2</sup>	Management Activities
Wetland Hydrology	See results	
Minimum density of 4,000 living native woody species per acre.	2,934 plants/acre (CI <sub>80%</sub> = 2,645-3,222)	1,500 snowberry planted in January
At least 6 species of native trees and/or shrubs will be present in the native woody species areas (forested, scrub shrub, and buffer areas).	24 native woody species present across site	
Minimum of 40% aerial cover of native facultative wet and wetter species within the emergent zone.	95% cover (CI <sub>80%</sub> = 89-100%)	
Blackberry Species and Class B noxious weeds will not exceed 15% in the planted areas	No Class B species observed	
Class A Noxious Weeds, Japanese Knotweed, and Purple Loosestrife shall not exist on the site.	None observed	
Reed Canarygrass at the Cedars mitigation site shall not exceed 20% total cover in the wetland creation areas	5% cover (qualitative)	3 separate visits for weed control were conducted in 2015
Temporary Impacts	2015 Results <sup>2</sup>	Management Activities
Minimum of 40% aerial cover of native facultative wet and wetter species within the emergent zone.	65% cover (CI <sub>80%</sub> = 57-73%)	
Reed Canarygrass in the temporary impact areas will be 10% below the existing baseline conditions	1% cover	

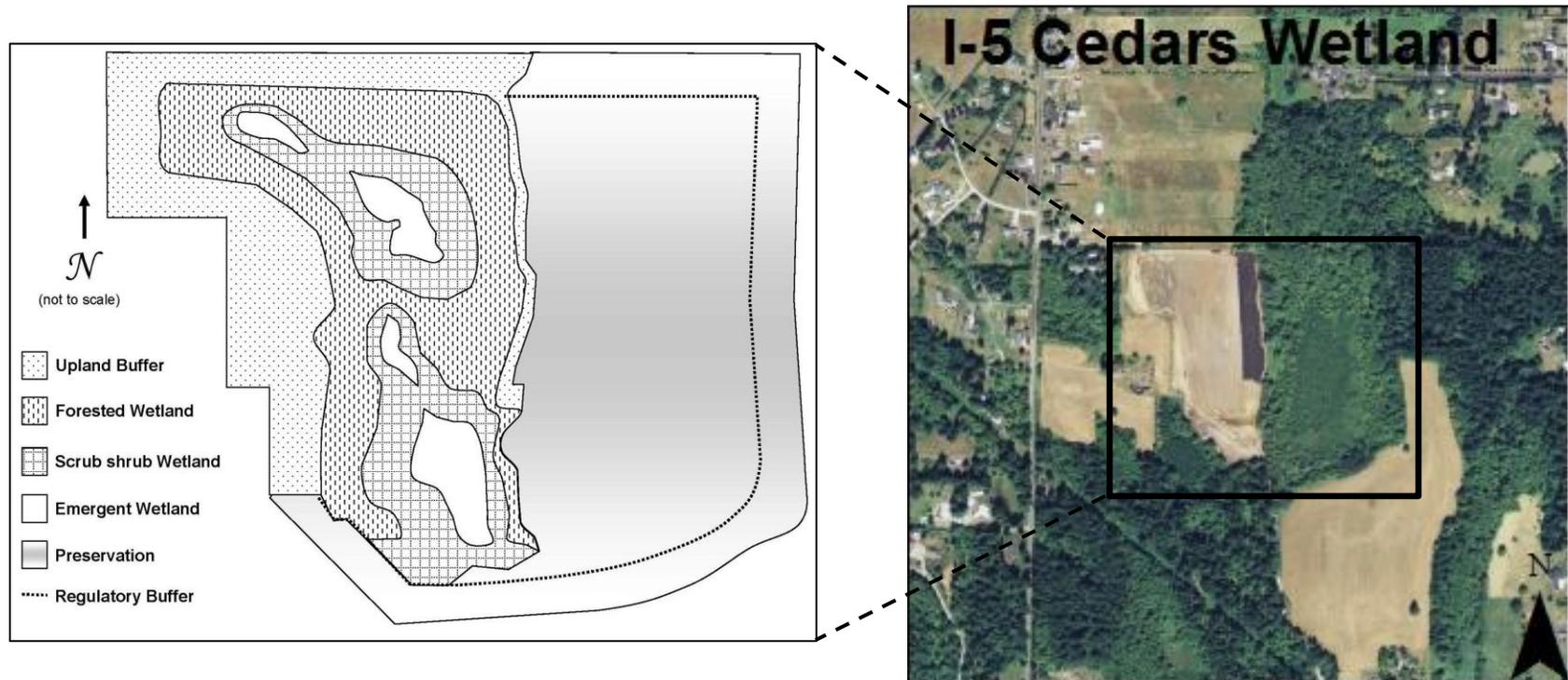
## Report Introduction

This report summarizes Year-3 monitoring activities at the Interstate (I) 5 Cedars Wetland Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities occurred on July 27-29, 2015 and included vegetation surveys and photo-documentation. Assessments of wetland hydrology occurred on March 9, 20 and April 6, 2015. Vegetation monitoring at the temporary impacts occurred on July 8, 2015.

<sup>2</sup> Estimated values are presented with their corresponding statistical confidence interval. For example, 2,934 plants/acre (CI<sub>80%</sub> = 2,645-3,222) means we are 80% confident that the true density is between 2,645 and 3,222.

## What is the I-5 Cedars Wetland Mitigation Site?

This 42.95-acre mitigation site (Figure 1) is located in the Salmon Creek Watershed. This site was created to compensate for the permanent loss of 4.41 acres of wetlands and 1.10 acres of buffer due to the construction of the I-5/Salmon Creek Interchange Project. The 11.78 acres of reestablished and enhanced wetland mosaic and surrounding 3.95 acres of buffer are intended to provide mitigation for lost wetland functions including wildlife habitat, water quality, headwaters storage, and flood flow attenuation.



**Figure 1 Site Sketch**

The I-5 Cedars Wetland Mitigation Site consists of the wetland mosaic and buffer described above and is adjacent to 17.46 acres of wetland preservation with 9.76 acres of regulatory buffer.

## What are the performance standards for this site?

### Year 3

#### Performance Standard 1

The soils will be saturated to the surface, or standing water will be present 12 inches or less below the surface for at least 10 percent of the growing season (growing season as defined in the Soil Survey of Clark County, WA, USDA, 1972) in years when rainfall meets or exceeds the 30-year precipitation average.

#### Performance Standard 2

At monitoring Year 3 there will be a minimum density of native woody vegetation (planted and volunteer trees and shrubs) in forested, scrub shrub and buffer areas as follows: Minimum density of 4000 living native woody species per acre

#### Performance Standard 3

At least six species of native trees and/or shrubs will be present in the native woody species areas (forested, scrub shrub, and buffer areas)

#### Performance Standard 4

At monitoring Year 3 there will be a minimum percent cover of native emergent vegetation in emergent areas (Cedars mitigation site AND temporary impact areas within WSDOT RW) as follows: Minimum of 40 percent aerial cover of native facultative wet and wetter species within the emergent zone.

#### Performance Standard 5

The aerial extent of Blackberry Species and Class B (WA Dept. of Agriculture and Clark County Weed Board) noxious weeds will not exceed 15 percent in the combined wetland and buffer areas.

#### Performance Standard 6

Class A Noxious Weeds (WA Dept. of Agriculture and Clark County), Japanese Knotweed, and Purple Loosestrife shall be treated so that the species do not exist on the site. These species shall not be included in the 15 percent cover allowed for invasive.

#### Performance Standard 7

At monitoring Years 1, 3, 5, and 7, the aerial extent of Reed Canarygrass shall not exceed 20 percent total cover in the wetland creation areas.

## **Temporary Impacts**

### Performance Standard 8

At monitoring Year 3 there will be a minimum percent cover of native emergent vegetation in emergent areas (Cedars mitigation site AND temporary impact areas within WSDOT RW) as follows: Minimum of 40 percent aerial cover of native facultative wet and wetter species within the emergent zone.

### Performance Standard 9

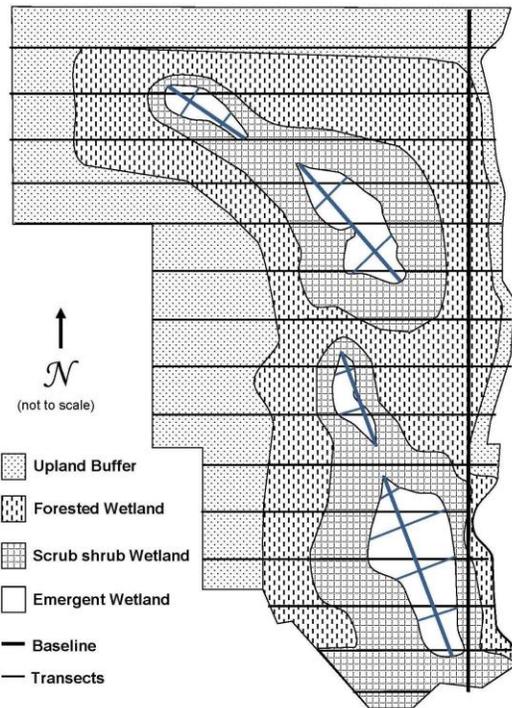
The aerial extent of Reed Canarygrass at the temporary impact areas will be managed at a threshold 10 percent below the existing baseline conditions established in Performance Standard 5A in all years.

Appendix 1 shows the planting plan (WSDOT 2011).

## How were the performance standards evaluated?

WSDOT staff collected hydrology data using methods described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (Version 2.0) (USACE 2010) (Performance Standard 1).

The table below documents the sampling methodology utilized for the remaining performance standards (PS)/performance criteria (PC) 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).



**Figure 2 Site Sampling Design (2015)**

**Placement of Baseline:** North to south along the eastern edge of the site and a second segmented baseline down the center of each of the emergent planting areas (Figure 2).

	PS 2 & 3	PS 4	PS 5,6,7, & 9	PS 8
<b>Attribute</b>	Density	Cover	Presence/ Absence & Cover	Cover
<b>Target pop.</b>	Native Woody	Herbaceous	Noxious Weeds/ Invasive sp.	Herbaceous
<b>Zone</b>	Entire site	Emergent	Entire site	Emergent
<b>Sample method</b>	UBT	Point Line	Qualitative	Point Line
<b>SU length</b>	Variable	10 m	N/A	20
<b>SU width</b>	1 m	N/A	N/A	N/A
<b>Points per SU</b>	N/A	20	N/A	20
<b>Total # of SU</b>	18	10	N/A	10

## How is the site developing?

In general the site is developing well despite failing to meet the native woody density performance standard for Year 3. Although the standard was not met, the density of 6.7 plants/100ft<sup>2</sup> (CI<sub>80%</sub> = 6.1-7.4) is greater than the 4plants/100ft<sup>2</sup> that tends to be the typical performance standard for density in other regions. The emergent planting areas have developed a robust and diverse community that is meeting the final year performance standard target. Invasive cover across the site is low.

Wetland hydrology is present throughout the vast majority of the site, however Well 1 has not consistently exhibited wetland hydrology. This well is located at the very edge of the intended wetland area and characterizes a very small area of the site that appears to be graded slightly higher than the surrounding wetland area.

The site is intended to provide flood flow attenuation, nutrient and sediment removal, and general wetland habitat. The wetland has the ability to store flood water and impound it there for an extended period of time. With this structure in place combined with the herbaceous and woody vegetation present, the site is most likely providing the water quality and quantity functions that were intended.

Results for Performance Standard 1

(Wetland hydrology present):

Water was observed in various depths across the site on each of the visits (Photo 1). (See Appendix 1 and 3 for a map of well locations and results). Water was not observed in the top 12 inches of the soil surface on all three visits in Well 1. This well is located in the very last section that supported heavy equipment as the contractor was working out of the site and is more compacted. The area would still delineate as wetland using a mosaic concept, or by using the difficult hydrology methodology.

Results for Performance Standard 2

(Minimum density of 4,000 living native woody species per acre):

The density of native woody species across the site is estimated at 2,934 plants/acre ( $CI_{80\%} = 2,645-3,222$ ) (Photo 2). Although this fails to meet the performance standard the site is still on track to meet the native woody cover standards in Year 5.

Results for Performance Standard 3

(At least six species of native trees and/or shrubs will be present in the native woody species areas):

A total of 24 native woody species are present across the site.

Results for Performance Standard 4

(Minimum of 40% aerial cover of native facultative wet and wetter species within the emergent zone):

The cover of native facultative wet or wetter species is estimated at 95% ( $CI_{80\%} = 89-100\%$ ) (Photo 3). The cover greatly exceeds the final year performance standard. A total of 11 species were observed.



**Photo 1  
Inundation in the emergent wetland (April 2015)**

Results for Performance Standard 5

(Blackberry Species and Class B noxious weeds will not exceed 15% in the planted areas):

No Class B species observed. The cover of blackberries is visually assessed at two percent. The blackberry is concentrated in the buffer areas with a small number growing in the wetland areas.

Results for Performance Standard 6

(Class A Noxious Weeds, Japanese Knotweed, and Purple Loosestrife shall not exist on the site):

No Class A, Japanese knotweed, or purple loosestrife were observed on site at the time of monitoring.

Results for Performance Standard 7

(Reed Canarygrass shall not exceed 20% total cover in the wetland creation areas):

The cover of reed canarygrass is qualitatively estimated at five percent. Reed canarygrass is concentrated in the corners of the forested wetland on the edge of the buffer.



**Photo 2**  
**Native woody density (July 2015)**



**Photo 3**  
**Emergent cover (July 2015)**

## Temporary Impact Areas

### Results for Performance Standard 8

(Minimum of 40% aerial cover of native facultative wet and wetter species within the emergent zone)

The cover of native facultative wet and wetter species within the emergent zone is estimated at 65% ( $CI_{80\%} = 57-73\%$ ). This is comprised almost entirely of tufted hairgrass (*Deschampsia caespitosa*).

### Results for Performance Standard 9

(Reed Canarygrass at the temporary impact areas will be managed at a threshold 10% below the existing baseline conditions established):

The pre-existing cover of reed canarygrass was 100 percent. The current cover of reed canary grass is qualitatively estimated one percent.



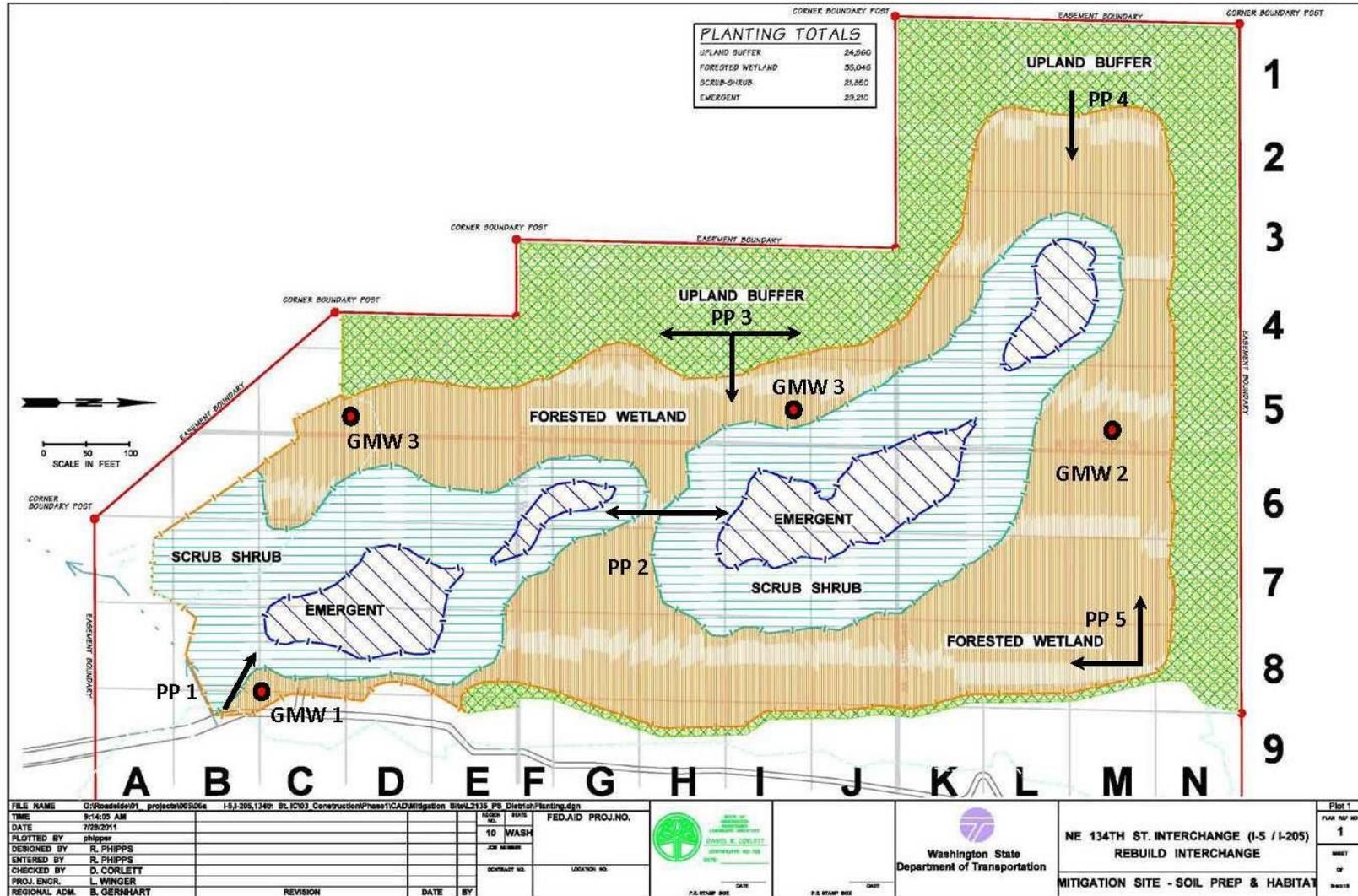
**Photo 6**  
**Emergent Cover**

**What is planned for this site?**

The region has plans to continue weed control throughout the growing season and to supplement woody plantings during the dormant planting season as needed.

# Appendix 1 – Planting Plan with Photo Point Locations and Well Locations

(from WSDOT 2011)



## Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 27, 2015 and document current site development.



**Photo Point 1**



**Photo Point 2a**



**Photo Point 2b**



**Photo Point 3a**



**Photo Point 3b**



**Photo Point 3c**



**Photo Point 4**



**Photo Point 5a**



**Photo Point 5b**

# Appendix 3 – Data Tables

**Table 1. Hydrology Observations.**

Date	Surface Observations	Well ID #	Water Level (inches below soil surface unless otherwise noted)
March 25, 2015	About 90% of wetland area inundated or saturated to the soil surface. Small area in SE corner (around well 1) is drier than the rest of the wetland.	1	13.5"
		2	0.5" inundation
		3	1" inundation
		4	0.5" inundation
April 6, 2015	Well 1 dry to bottom. Well 3 saturated to surface. Emergent areas inundated. Rest of site saturated with pockets of inundation.	1	Dry to the bottom of the well
		2	0.5"
		3	Saturated to the surface
		4	2"
March 9, 2015	Inundated in central location with saturation to the surface on fringe at lower flat elevation below grading contours	1	18"
		2	Saturated to surface
		3	Saturated to the surface
		4	4"

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