

**SR 502 NE 15th Ave to NE 102nd Ave
(Sunset Oaks) Mitigation Site**

USACE NWS-2009-1093

Southwest Region

2014 MONITORING REPORT

Wetlands Program

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SR 502 NE 15th Ave to NE 102nd Ave Sunset Oaks Mitigation Site

USACE IP NWS-2009-1093



General Site Information	
USACE IP Number	NWS-2009-1093
Mitigation Location	West of the intersection of NE 95th Street and NE 87th Court, Clark County
LLID Number	1225850456931
Construction Date	2012-2013
Monitoring Period	2014-2023
Year of Monitoring	1 of 10
Area of Project Impact	11.12 acres
Type of Mitigation	Wetland rehabilitation
Planned Area of Mitigation	20.93 acres

¹ Additional mitigation provided for the SR 502 Corridor Widening project at SR 502 Mill Creek North and I-5 Cedars Creek mitigation sites. See Appendix 3, Table 1 for a breakdown of mitigation sites and mitigation acreage.

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Summary of Monitoring Results and Management Activities (2014)

Performance Standards	2014 Results ²	Management Activities
Wetland hydrology	Not present in all intended areas	
At monitoring year 1, there will be a minimum survival rate of 90% in all areas identified on the Revegetation Concept as Wetland Rehabilitation, Wetland Buffer, and Oak Woodland Preservation/Enhancement Areas.	92% survival (CI _{80%} = 88-95%) in the wetland 97% survival (CI _{80%} = 96-98%) in buffer areas	
The aerial extent of Blackberry Species and Class B (WA Dept of Agriculture and Clark County Weed Board) noxious weeds will not exceed 15% in the combined wetland rehabilitation and buffer areas.	1% cover of Himalayan blackberry, 2% cover of Scots broom	
If/when detected, Class A Noxious Weeds (WA Dept. of Agriculture and Clark County), Japanese Knotweed, and Purple Loosetrife shall be treated so that the species do not exist on the site. These species shall not be included in the 15% cover allowed for invasive species.	No Class A Noxious Weeds observed	
At monitoring years 1, 3, 5, and 7, the aerial extent of Reed Canarygrass shall not exceed 25% total cover in the wetland rehabilitation or buffer enhancement areas.	12 % cover of reed canarygrass across site	

Report Introduction

This report summarizes first-year (Year-1) monitoring activities at the State Route (SR) 502 Sunset Oaks 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 assessments of wetland hydrology. Vegetation monitoring occurred on August 11 and 12 and hydrology monitoring visits occurred on March 6, 20, and April 10, 2014.

² Estimated values are presented with their corresponding statistical confidence interval. For example, 92% survival (CI_{80%} = 88-95%) means we are 80% confident that the true survival rate is between 88% and 95%.

What is the SR 502 Sunset Oaks Mitigation Site?

This 33-acre mitigation site (Figure 1) is rehabilitated wetland located east of I-205 within the urban growth area of Vancouver in Clark County. This site was established in part to compensate for the loss of 11.12 acres of wetlands due to road improvements along SR 502. The realigned channel, associated backwater habitat, and scrub-shrub wetlands are designed to provide mitigation for lost functions including flood-flow alteration, nutrient and sediment removal, and wildlife habitat.

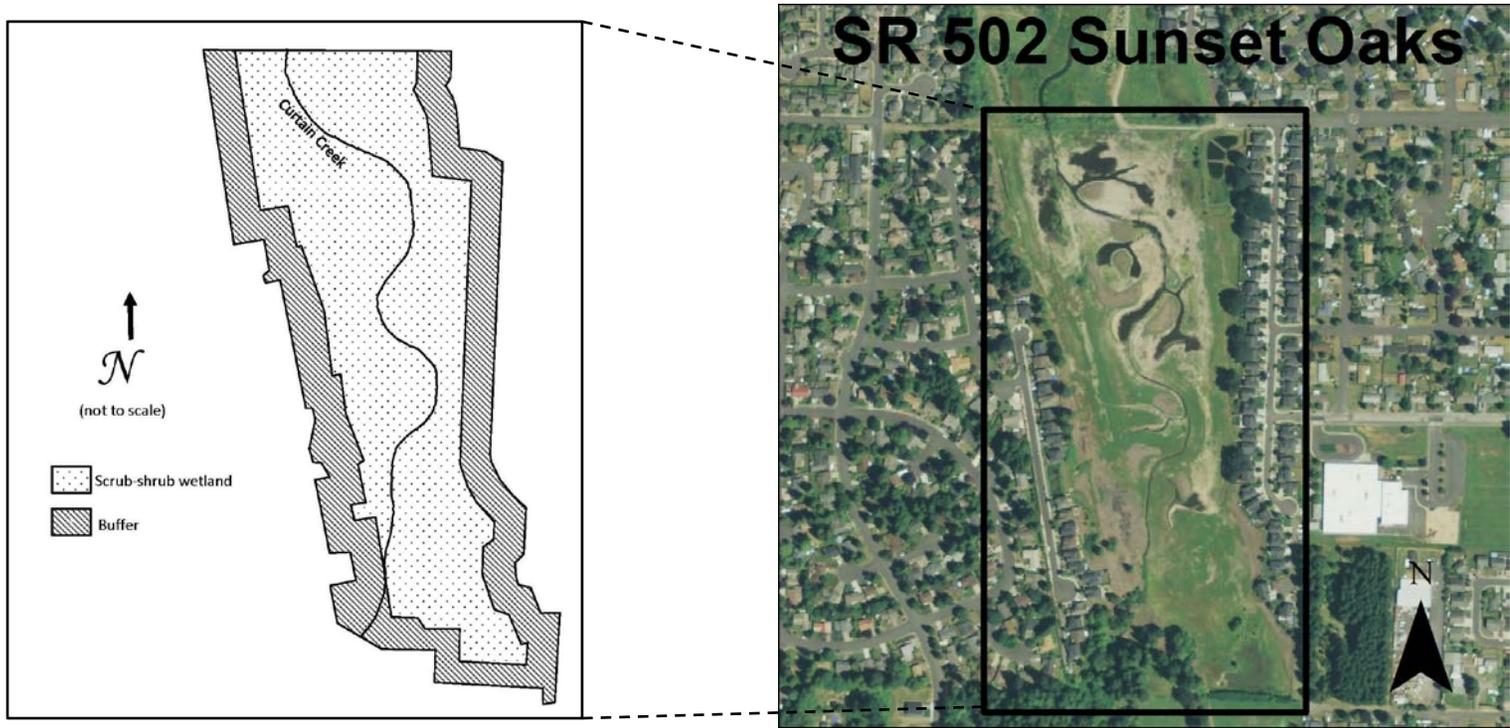


Figure 1 Site Sketch

The SR 502 Sunset Oaks Mitigation Site contains a mosaic of forested, scrub shrub, and emergent systems on either side of the realigned Curtain Creek. Upland and wet buffer areas surround the site to the east, west, and south. Appendix 2 includes site directions.

What are the performance standards for this site?

Year 1

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% 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 1, there will be a minimum survival rate of 90% in all areas identified on the Revegetation Concept as Wetland Rehabilitation, Wetland Buffer, and Oak Woodland Preservation/Enhancement Areas.

Performance Standard 3

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

Performance Standard 4

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

Performance Standard 5

At monitoring years 1, 3, 5, and 7, the aerial extent of Reed Canarygrass shall not exceed 25% total cover in the wetland rehabilitation or buffer enhancement areas.

Appendix 1 shows the planting plan (WSDOT 2011).

How were the performance standards evaluated?

To evaluate standards for vegetative cover, a baseline was established on the east and west side of Curtain Creek (Figure 2). Twenty-four sampling transects were randomly placed perpendicular to each baseline. The unequal-area belt transect method was used to estimate woody survival (Performance Standard 2). The presence of blackberry species, county listed Class-B weeds (Performance Standard 3), Class A Noxious Weeds, Japanese knotweed, purple loosestrife (Performance Standard 4), and reed canarygrass (Performance Standard 5) were estimated qualitatively with visual assessments.

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).

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

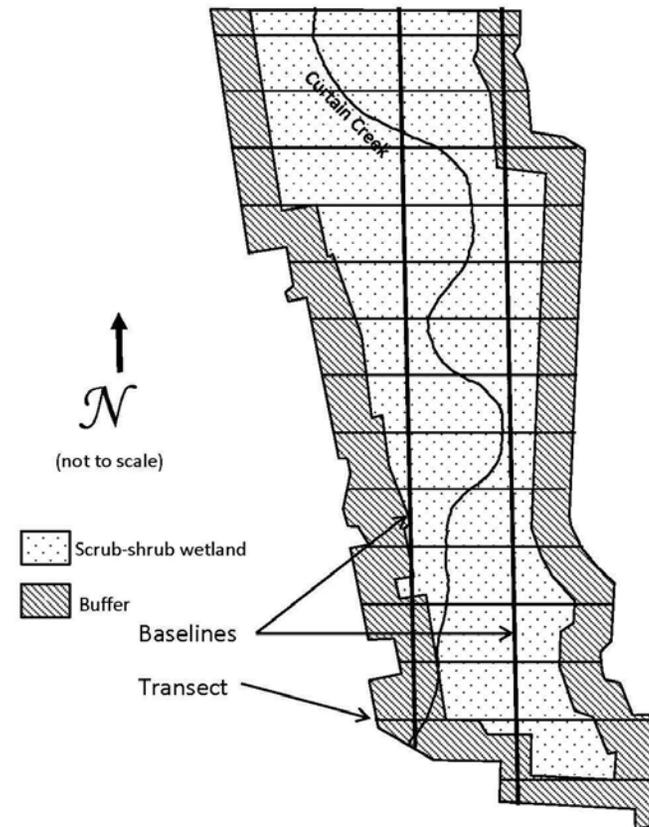


Figure 2 Site Sampling Design (2014)

How is the site developing?

This site is generally developing as intended. Survival rates in both buffer and wetland planting areas are adequate and invasive cover is relatively low throughout all zones. Although hydrology monitoring results did not consistently meet the criteria, this may in part be due to the short time between well installation and well readings. Performance Standards related to objective 28 were not addressed due to the lack of an as-built grading and planting plans.

Results for Performance Standard 1
(Wetland Hydrology):

Wetland hydrology was not consistently observed in all intended wetland areas in 2014, despite obvious surface water and saturation observed across much of the site on all three visits (Photo 1). This may be due to the fact that well installations occurred on each visit wells were monitored. It is likely that the water levels did not have time to equilibrate after installation when they were checked. See Table 2 Appendix 3 for hydrology monitoring results.

Results for Performance Standard 2
(There will be a minimum survival rate of 90% in all areas identified on the Revegetation Concept as Wetland Rehabilitation, Wetland Buffer, and Oak Woodland Preservation/Enhancement Areas):

Survival was assessed across the buffer areas and wetland areas separately. Survival across the wetland area is 92% (CI_{80%} = 88-95%) in the wetland (Photo 2). This survival estimate likely achieves the performance standard target. Most of the observed mortality was observed in the northeastern portion of the wetland that appears to be wetter than intended. Survival in the buffer areas is 97% (CI_{80%} = 96-98%) (Photo 3).



Photo 1 Shallow inundation in scrub-shrub wetland (April 2014)



Photo 2 Woody plantings in the scrub-shrub wetland (August 2014)

Results for Performance Standard 3

(The aerial extent of Blackberry Species and Class B noxious weeds will not exceed 15% in the combined wetland rehabilitation and buffer areas):

The cover of non-native blackberries across the site is qualitatively estimated at one percent. Blackberry species were observed in buffer areas along both the east and west site boundaries in drier areas. Scotch broom (*Cytisus scoparius*), a Class B weed was observed in higher portions of the wetland and it is qualitatively estimated to provide two percent cover across the site.

Results for Performance Standard 4

(Class A Noxious Weeds, Japanese Knotweed, and Purple Loosetrife shall be treated so that the species do not exist on the site):

None of these target species were observed on site in 2014.

Results for Performance Standard 5

(The aerial extent of Reed Canarygrass shall not exceed 25% total cover in the wetland rehabilitation or buffer enhancement areas):

The cover of reed canarygrass (*Phalaris arundinacea*) is qualitatively estimated at 12 percent across the site. This species was observed in both wetland and buffer areas throughout the site.



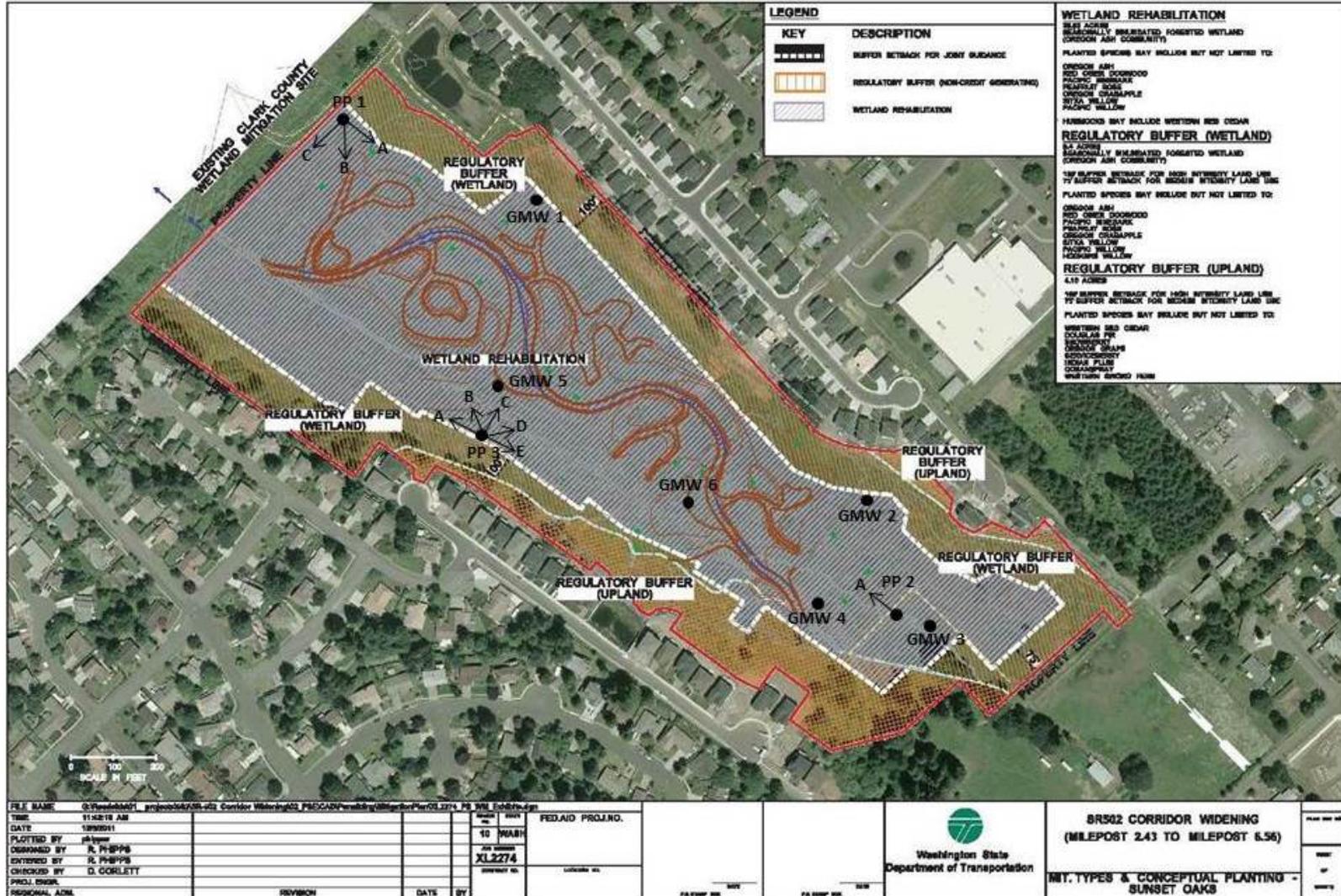
Photo 3 Woody plantings in upland buffer

What is planned for this site?

Routine weed control will occur in 2015.

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

(WSDOT 2012)



Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on August 14, 2014 and document current site development.



Photo Point 1a



Photo Point 1b



Photo Point 1c



Photo Point 2a



Photo Point 3a



Photo Point 3b



Photo Point 3c



Photo Point 3d



Photo Point 3e

Driving Directions:

From I-205 South, take Exit 32. Take the ramp right onto Padden Parkway. Turn left onto NE Padden Parkway. In 1.1 miles turn left onto NE 94th Ave. In 0.8 miles turn left onto NE 99 St and proceed to the end of the road. The site will be in front of you.

Appendix 3 – Data Tables

Table 1. Mitigation site acreage³

Mitigation Type	Cedars Creek Mitigation Site (ac)	Mill Creek North Mitigation Site (ac)	Sunset Oaks Mitigation Site (ac)	East Fork Lewis Mitigation Bank (credits)	Totals (ac)
Establishment	0.33	3.88			4.21
Reestablishment		13.91	6.54	4.72	20.45
Future Mitigation					
Establishment	4.37	0.68			5.05
Reestablishment		12.2	14.39		26.59

³ Acreage numbers for Mill Creek Complex South were taken from the Final Critical Areas Mitigation Plan (WSDOT 2012). All other acreage numbers were taken from USACE Permit Number NWS-2009-1093. Additional mitigation for the SR 502 Corridor Widening project will be added in 2015.

Table 2 Hydrology Observations

Date	Surface Observations	Well ID #	Water Level (inches below soil surface unless otherwise noted)
March 6, 2014	Site is completely inundated	Well 1	Saturated to the soil surface
		Well 2	Saturated to the soil surface
		Well 3	Saturated to the soil surface
		Well 4	2.0"
		Well 5	Not installed on this visit
		Well 6	Not installed on this visit
March 20, 2014	Water flowing through middle of site, low areas saturated, hummocks lack water.	Well 1	Saturated to the soil surface
		Well 2	Saturated to the soil surface
		Well 3	14.0"
		Well 4	11.0"
		Well 5	10.0"
		Well 6	Dry to bottom of well
April 10, 2014	Most of PSS saturated to the soil surface but several dry areas present. A few wells installed on this visit were dry but likely did not have enough time to equilibrate.	Well 1	12.0"
		Well 2	Dry to bottom of well
		Well 3	6.0"
		Well 4	Dry to bottom of well
		Well 5	13.5"
		Well 6	17.5"

Literature Cited

1. [USACE] US Army Corps of Engineers. 2012. Department of the Army Individual Permit Number 2009-1093.
2. [USACE] US Army Corps of Engineers. 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0), Wakeley JS, Lichvar RW, Noble CV, editors. Vicksburg (MS): US Army Engineer Research and Development Center. ERDC/EL TR-10-3. Available at: http://www.usace.army.mil/Portals/2/docs/civilworks/regulatory/reg_supp/west_mt_finalsupp.pdf
3. [WSDOT] Washington State Department of Transportation. 2012. SR 502 Corridor Widening. Vancouver (WA): Washington State Department of Transportation, Southwest Region.
4. [WSDOT] Washington State Department of Transportation. 2012. SR 502 Corridor Widening (Mill Creek North) Mitigation Site Planting Plan.
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