# SR 539: Ten Mile Road to Badger Road (SR 546) Widening (MP 5.90 to MP12.62) (Wiser Lake) Mitigation Site WIN #A53910D

# USACE NWS-2007-470

## Northwest Region

### 2014 MONITORING REPORT

**Wetlands Program**

***Issued March 2015***

**Washington State Department of Transportation**

**Environmental Services Office**

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# SR 539: Ten Mile to Badger Road (SR 546) Widening (MP 5.90 to MP 12.62) (Wiser Lake) Mitigation Site

# USACE NWS-2007-470

| General Site Information | | | |
|---|---|---|---|
| **USACE IP Number** | NWS-2007-470 | | |
| **Mitigation Location** | Three miles south of the City of Lynden on the west side SR 539 in Whatcom County | | |
| **LLID Number** | 1224861489020 | | |
| **Construction Date** | 2008-2009 | | |
| **Monitoring Period** | 2010-2019 | | |
| **Year of Monitoring** | 5 of 10 | | |
| **Type of Project Impact** | Wetland | Open Water | Buffer |
| **Area of Project Impact** | 1.57 acres | 0.98 acre | 3.30 acres |
| **Type of Mitigation**[1] | Wetland Enhancement | | Buffer Enhancement |
| **Area of Mitigation** | 2.53acres | | 2.09 acres |

[1] Additional mitigation for this project is provided at the Potter Road mitigation site. See Appendix 3 for more information. Source for impact and mitigation acreage from USACE #NWS-2007-470.

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## Summary of Monitoring Results and Management Activities (2014)

| Performance Standards | 2014 Results[2] | Management Activities |
|---|---|---|
| 35% cover of native woody vegetation in the forested and scrub-shrub wetland | 90% native cover | |
| 70% cover of herbaceous species in the emergent wetland | Emergent: 70% cover ($CI_{80\%}$ = 61-79%)<br>Aquatic Bed: 1% cover | |
| No more than 20% cover by non-native invasive species (specified in the mitigation plan) across the entire mitigation site. | 6% invasive cover | Weed control conducted on seven separate occasions throughout 2014( February, April, July, and September) |
| Japanese knotweed (*Reynoutria japonica*), and purple loosestrife (*Lythrum salicaria*) shall not be tolerated on the mitigation site. | None observed | |

## Report Introduction

This report summarizes Year-5 monitoring activities at the State Route (SR) 539 Wiser Lake 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. Vegetation monitoring occurred on August 11-12, 2014.

[2] Estimated values are presented with their corresponding statistical confidence interval. For example, 70% ($CI_{80\%}$ = 61-79% cover) means we are 80% confident that the true cover value is between 61% and 79%.

## What is the SR 539 Wiser Lake Mitigation Site?

This 4.62-acre mitigation site (Figure 1) is a wetland enhancement area west of SR 539 adjacent to the south shoreline of Wiser Lake. This site was created to partially compensate for permanent impact to 1.57 acres of wetlands and 0.98 acre of open water impact due to improvements along SR 539. The aquatic bed, emergent, and scrub-shrub wetland and buffer areas are designed to provide mitigation for lost wetland functions including wildlife habitat, toxicant/nutrient removal, export of organic matter, and flood flow alteration.

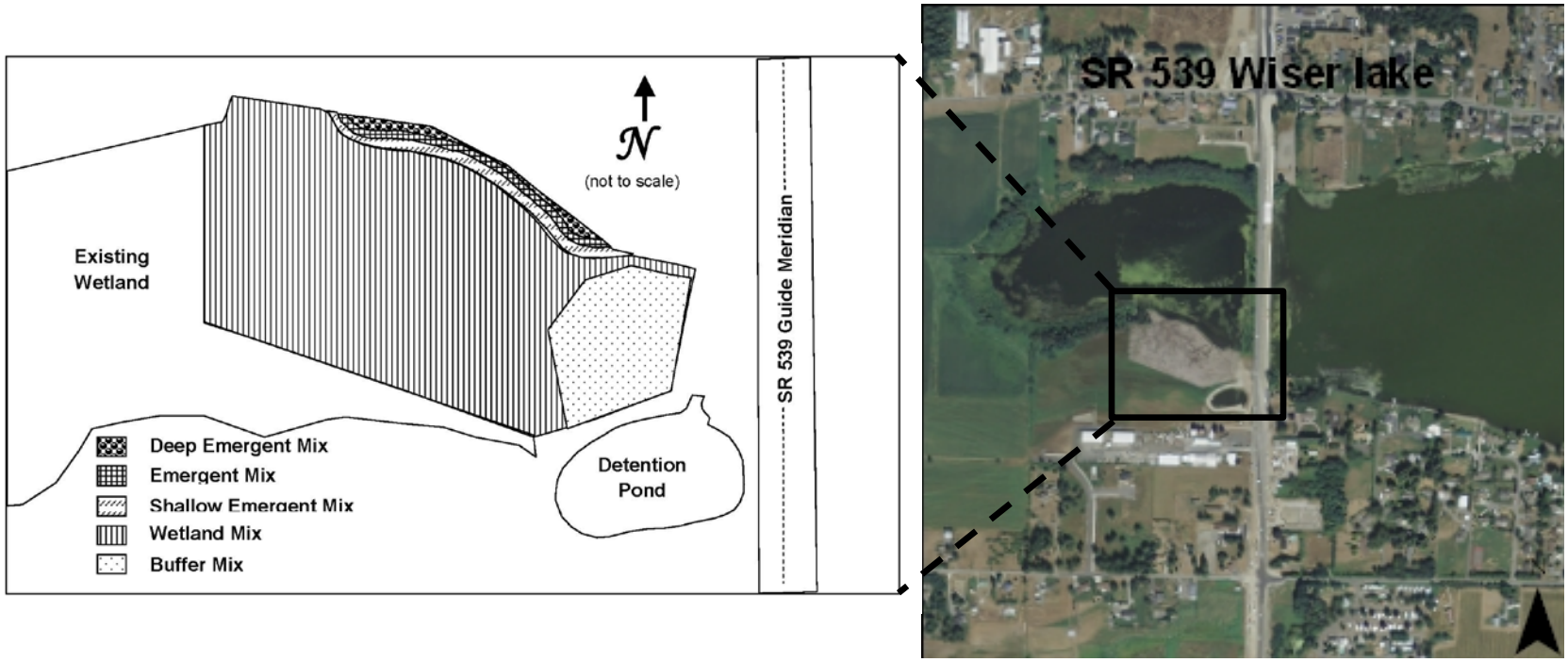


**Figure 1 Site Sketch**

The SR 539 Wiser Lake Mitigation Site includes narrow strips of aquatic bed and emergent wetlands along the shoreline of the lake. The surrounding enhanced wetland and upland buffer provide buffer functions for the lake. Appendix 1 includes site directions.

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## What are the performance standards for this site?

### Year 5

Performance Standard 1
Native facultative or wetter woody species will achieve a minimum of 35 percent coverage in the forested and scrub-shrub wetland communities. Native colonizing vegetation will be included in these coverage calculations.

Performance Standard 2
Emergent species on the Wiser Lake Mitigation Site will achieve a minimum of 70 percent cover including naturally recruited native species.

Performance Standard 3
No more than 20 percent cover by non-native invasive species (Table 24) (see Appendix 3 – Table 2) across the entire mitigation site.

Performance Standard 4
Japanese knotweed and purple loosestrife shall not be tolerated on the mitigation site. The presence of Japanese knotweed, English ivy (*Hedera helix*), purple loosestrife, and Eurasian water milfoil (*Myriophyllum spicatum*) will initiate the invasive species contingency measures.

### Year 10

Performance Standard 5
Native facultative or wetter woody species will achieve a minimum of 60 percent coverage in the forested and scrub-shrub wetland communities. Native colonizing vegetation will be included in these coverage calculations.

Appendix 1 shows the planting plan (Grant 2007).

## How were the performance standards evaluated?

To evaluate standards for vegetative cover, two separate baselines were established (Figure 2). A 98-meter baseline was oriented parallel to the shoreline. Fifteen sampling transects were randomly placed perpendicular to the baseline. The point intercept method was used to determine emergent cover. A 1 x 1-meter sample unit with a resolution of 25 points was randomly place along each transect (Performance Standard 2). The vegetated area sampled is approximately 0.2 acre in size. The lacustrine aquatic bed and emergent wetland was intended to comprise 0.33 acre. The remaining 0.13 acre not sampled is un-vegetated open water. Native emergent cover was evaluated based on the actual sample and a weighted version which includes the area not sampled.

The line intercept method was used to estimate woody cover (Performance Standard 1). A 55-meter baseline was orientated east to west through the center of the planting area characterized as buffer. Ten sampling transects were randomly placed perpendicular to the baseline. Twelve 30-meter sample units were randomly placed along the transects. Invasive cover was qualitatively assessed (Performance Standards 3 and 4). Only the area characterized as buffer on the planting plan was quantitatively sampled.

The site has developed more rapidly than anticipated and has been meeting the year-10 final year standard for wetland woody cover for two years. On April 1, 2014 a request to discontinue quantitative sampling for woody cover was sent to USACE and the Department of Ecology, this request was accepted on April 28, 2014. The final year standards are still currently being met.

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

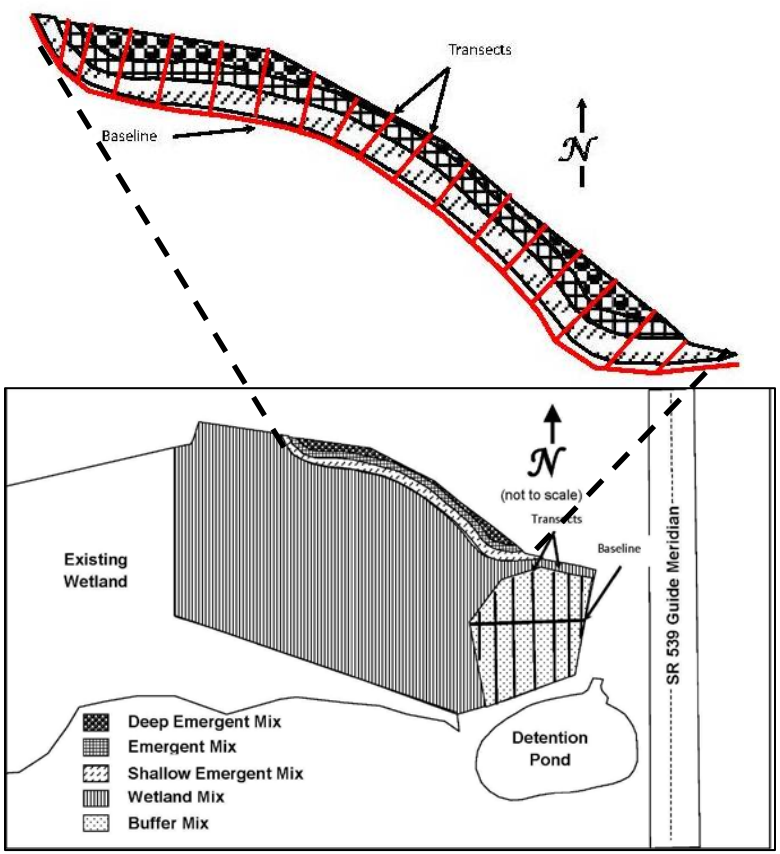



**Figure 2 Site Sampling Design (2014)**

## How is the site developing?

The site is developing rapidly and consists of several dense and diverse vegetation communities. Native woody cover in the scrub/shrub and enhanced buffer is exceeding the final year year-10 performance standard. Native woody vegetation is so dense in areas, that traversing the site can be difficult. A diverse community of native and non-invasive, non-native emergent plants are established in both the emergent portion of the wetland an in the understory of the scrub-shrub wetland. Rocky Mountain pond-lily (*Nuphar lutea*) is beginning to colonize the aquatic bed and over time this area should see an increase in native cover (Photo 1). At this point in time however, the aquatic bed is characterized by open water and has not developed as desired. Of the intended 0.33 acre emergent and aquatic bed 0.22 acre has developed as emergent wetland with the remaining 0.11 acre being 99 percent open water.

Invasive cover is generally low across the site. Hairy willow-herb (*Epilobium hirsutum*), a Class B noxious weed, was aggressively targeted for eradication and was not observed on site during the monitoring visits in 2014.

**Photo 1**
**Rocky Mountain pond-lily (*Nuphar lutea*) colonizing (August 2014)**

Results for Performance Standard 1 and 5
(At least 35% (60%, Year-10) cover of woody vegetation in the scrub-shrub wetland):

Cover of native facultative and wetter woody species is estimated at 90 percent exceeding the Year-10 performance criteria. Nootka rose (*Rosa nutkana*), snowberry (*Symphoricarpos albus*), salmonberry (*Rubus spectabilis*), and twinberry honeysuckle (*Lonicera involucrata*) are the dominant species (Photo 2). Woody cover in this zone is generally one stratum, averaging two to three meters in height. The scrub/shrub is so dense that traversing the area is extremely difficult.

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

Results for Performance Standard 2
(Emergent species will achieve a minimum of 70 percent cover including naturally recruited native species):

Of the intended 0.33 acre emergent and aquatic bed 0.22 acre has developed as emergent wetland with the remaining 0.11 acre being 99 percent open water. Native emergent cover is estimated at70% cover ($CI_{80\%}$ = 61-79%) (Photo 3), within the 0.22 acre that has developed. The dominant species include soft-stem bulrush (*Schoenoplectus tabernaemontani*), small-fruited bulrush (*Scirpus microcarpus*), and dotted smartweed (*Persicaria punctata*). The cover of the aquatic bed is estimated at one percent and is beginning to be colonized by Rocky Mountain pond-lily (*Nuphar lutea*) The cover of the two areas combined, 0.11 acre of open water at one percent cover and the 0.22 acre at 70 percent cover, is estimated to be a combined 40 percent cover, falling below the year 5 standard of 70 percent.

Results for Performance Standard 3
(No more than 20% cover of non-native invasive species):

The cover of the listed non-native invasive species across the entire mitigation site is estimated at six percent. Invasive species from Table 24 (Appendix 3) observed include: Himalayan blackberry (*Rubus armeniacus*), bull thistle (*Cirsium vulgare*) and reed canarygrass (*Phalaris arundinacea*). This is made up predominantly of reed canarygrass near the shoreline of Wiser Lake.

Results for Performance Standard 4
(Japanese knotweed and purple loosestrife shall not be tolerated on the mitigation site):

No Japanese knotweed (*Fallopia japonica*) or purple loosestrife (*Lythrum salicaria*) was observed on site during monitoring activities.

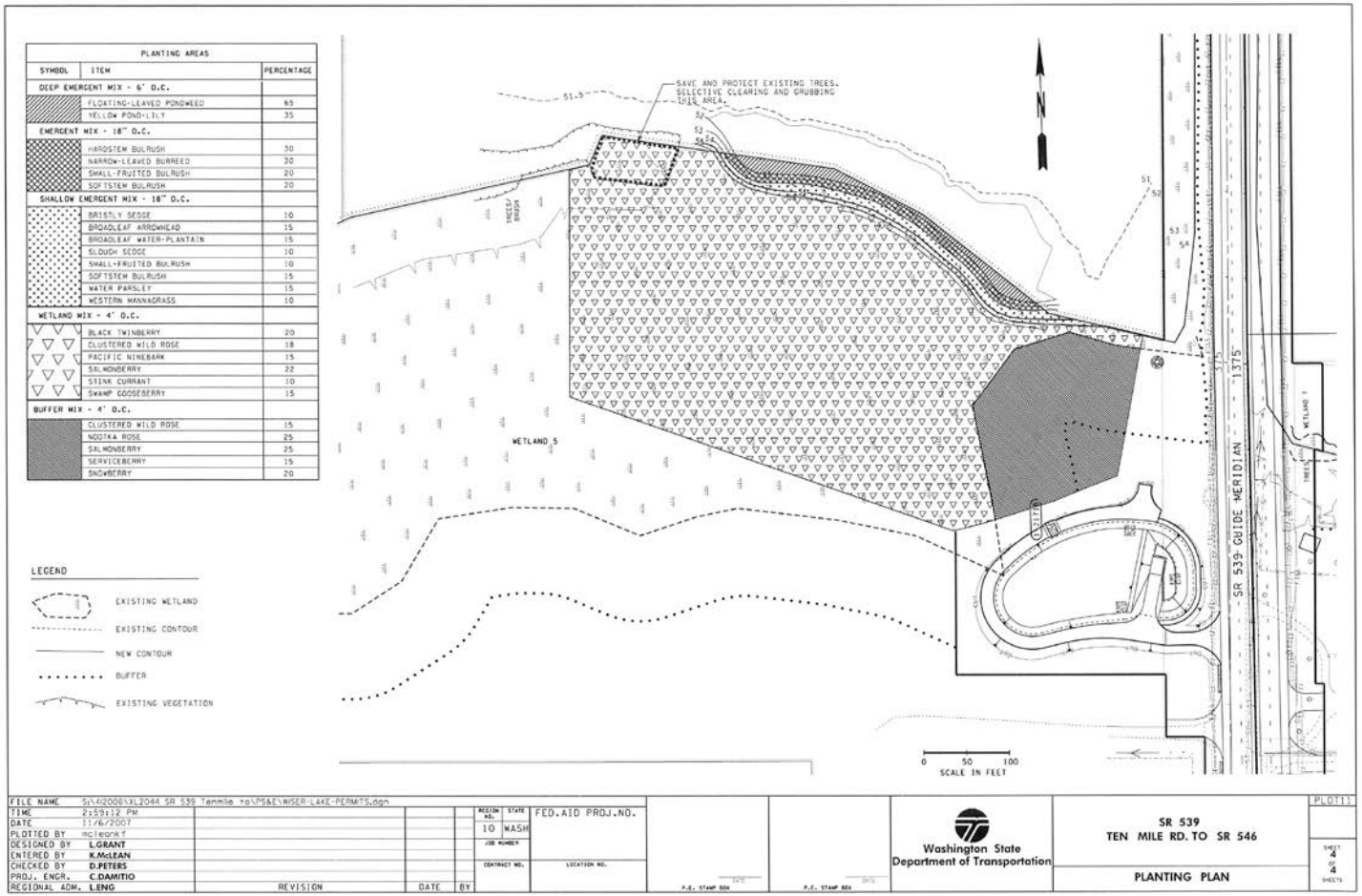
**Photo 3**
**Emergent cover (August 2014)**

## What is planned for this site?

The region has committed to replanting the deeper water areas of the emergent zone with soft-stem bulrush (*Schoenoplectus tabernaemontani*), to encourage further colonization of this zone.

# Appendix 1 – Planting Plan

(from Grant 2007)




**Driving Directions:**

Head north on Interstate 5 towards Bellingham. Take exit 256A for SR 539/Meridian St. Turn right (North) onto SR 539 N/Meridian St. Follow SR 539 north for approximately 8 miles. The site is located on the west side of SR 539 just after crossing E. Bartlett Rd. It is on the southwest shore of Wiser lake. Park in front of the stormwater pond.

# Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on August 12, 2014 and document current site development.

**Photo Point 1**

**Photo Point 2**

**Photo Point 3**

**Photo Point 4**

The photographs below were taken from permanent photo-points on August 12, 2014 and document current site development.

**Photo Point 5**

**Photo Point 6**

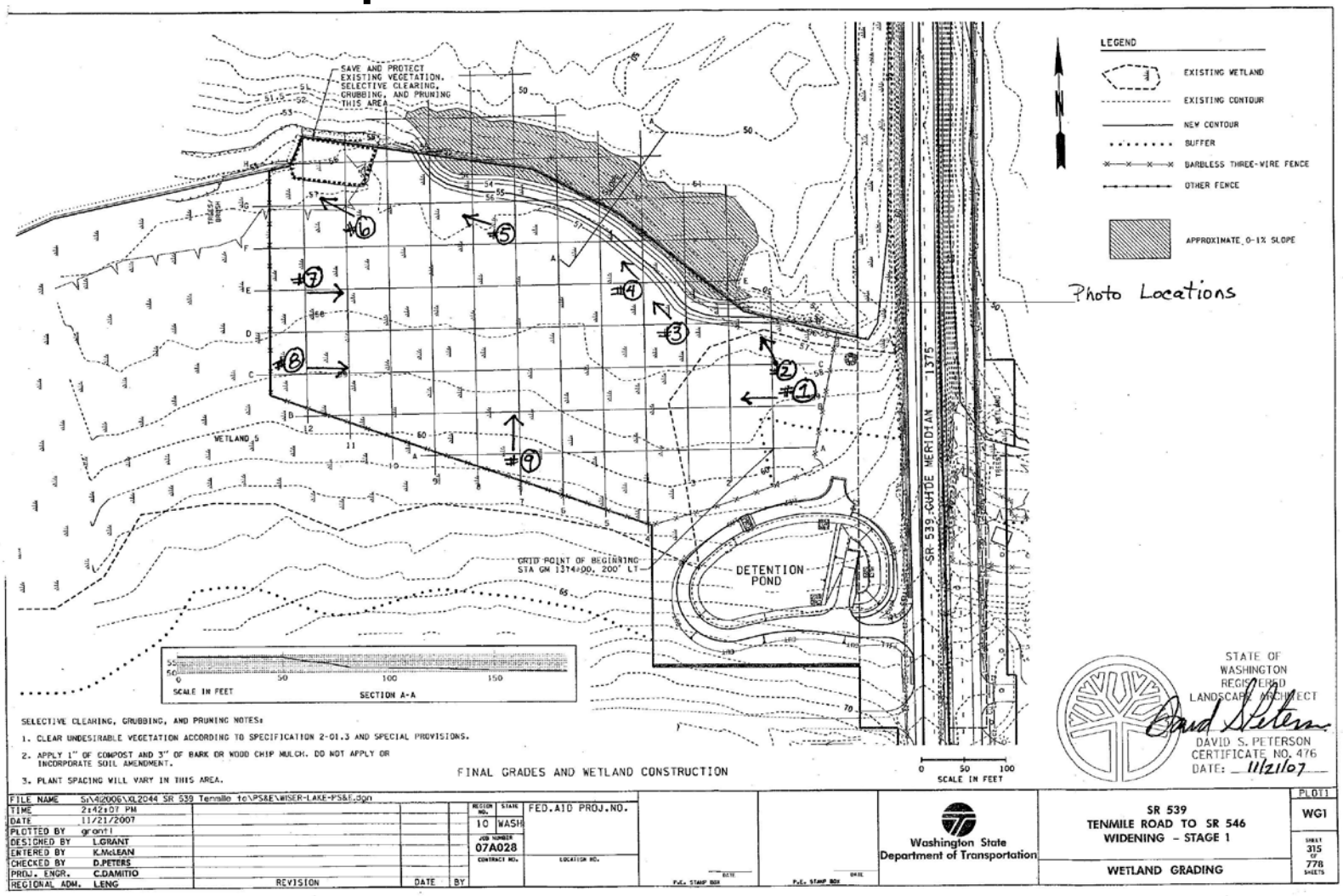
**Photo Point 7**

**Photo Point 8**

The photographs below were taken from permanent photo-points on August 12, 2014 and document current site development.

**Photo Point 9**

# Photo Point Map



# Appendix 3 – Data Tables

### Table 1. Mitigation Area Breakdown

| Mitigation Type | Potter Road Mitigation Site (ac) | Strand Road Mitigation Site (ac) | **Wiser Lake Mitigation Site (ac)** | Larson Road Mitigation Site (ac) | Totals (ac) |
|---|---|---|---|---|---|
| **SR 539 Ten Mile Road to Badger Rd (SR 546) USACE #NWS-2007-470-SOD** | | | | | |
| Creation | 1.74 | 0.00 | 0.00 | 0.00 | 1.74 |
| Enhancement | 1.49 | 0.00 | 2.53 | 0.00 | 4.02 |
| Buffer Enhancement | 4.77 | 0.00 | 2.09 | 0.00 | 6.86 |

### Table 2. From the Mitigation Plan Table 24. Non-native invasive species

| **Scientific Name** | **Common Name** |
|---|---|
| *Buddleia alternifolia* | fountain butterfly bush |
| *Cirsium arvense* | Canada thistle |
| *Cirsium vulgare* | Bull thistle |
| *Cytisus scoparius* | Scot's broom |
| *Geranium robertianum* | herb Robert |
| *Hedera helix* | English ivy |
| *Ilex aquifolium* | English holly |
| *Iris pseudoacorus* | yellow flag iris |
| *Lythrum salicaria* | purple loosestrife |
| *Phalaris arundinacea* | reed canarygrass |
| *Polygonum cuspidatum (and related species and hybrids)* | Japanese knotweed |
| *Prunus laurocerasus* | English laurel |
| *Rubus laciniatus* | evergreen blackberry |
| *Rubus armeniacus (discolor)* | Himalaya or Armenian blackberry |

# Literature Cited


1. Grant, L. 2007. Final Wetland Mitigation Report SR 539: Tenmile Road to Badger Road (SR 546 Widening (MP 5.90 to MP 12.62) Planting Plan. Seattle (WA) WSDOT. Northwest Region,

2. [USACE] US Army Corps of Engineers. 2007. Department of the Army Permit Number NWS-2007-470.

3. [WSDOT] Washington State Department of Transportation. 2007. Final Wetland Mitigation Report SR 539: Tenmile Road to Badger Road (SR 546 Widening (MP 5.90 to MP 12.62). Seattle (WA) Northwest Region Environmental Services.

4. [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