

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

USACE NWS-2007-470-SOD

Northwest Region

2010 MONITORING REPORT

Wetland Assessment and Monitoring Program

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

USACE NWS-2007-470-SOD

	General Site Information			
	USACE IP Number	NWS-2007-470-SOD		
	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	1 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	2.53 acres		2.09 acres

¹ Additional mitigation for this project is provided at the Potter Road mitigation site. See Appendix 2 for more information.

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Summary of Monitoring Results and Management Activities (2010)

Performance Standards	2010 Results	Management Activities
100% survival of planted woody species in the buffer and the scrub-shrub wetland	89% cover	Plants replaced on 3/1/2010
30% cover of native emergent species in the emergent zone composed of 80% planted species	5% cover	
No more than 20% cover of non-native invasive species	5-10% cover	Manual weed control and herbicide application occurred in December 2010.

Report Introduction

This report summarizes Year-1 monitoring activities at the State Route (SR) 539 Wisner 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 completed on July 20th and 21st.

What is the SR 539 Wisner 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 Wisner 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.

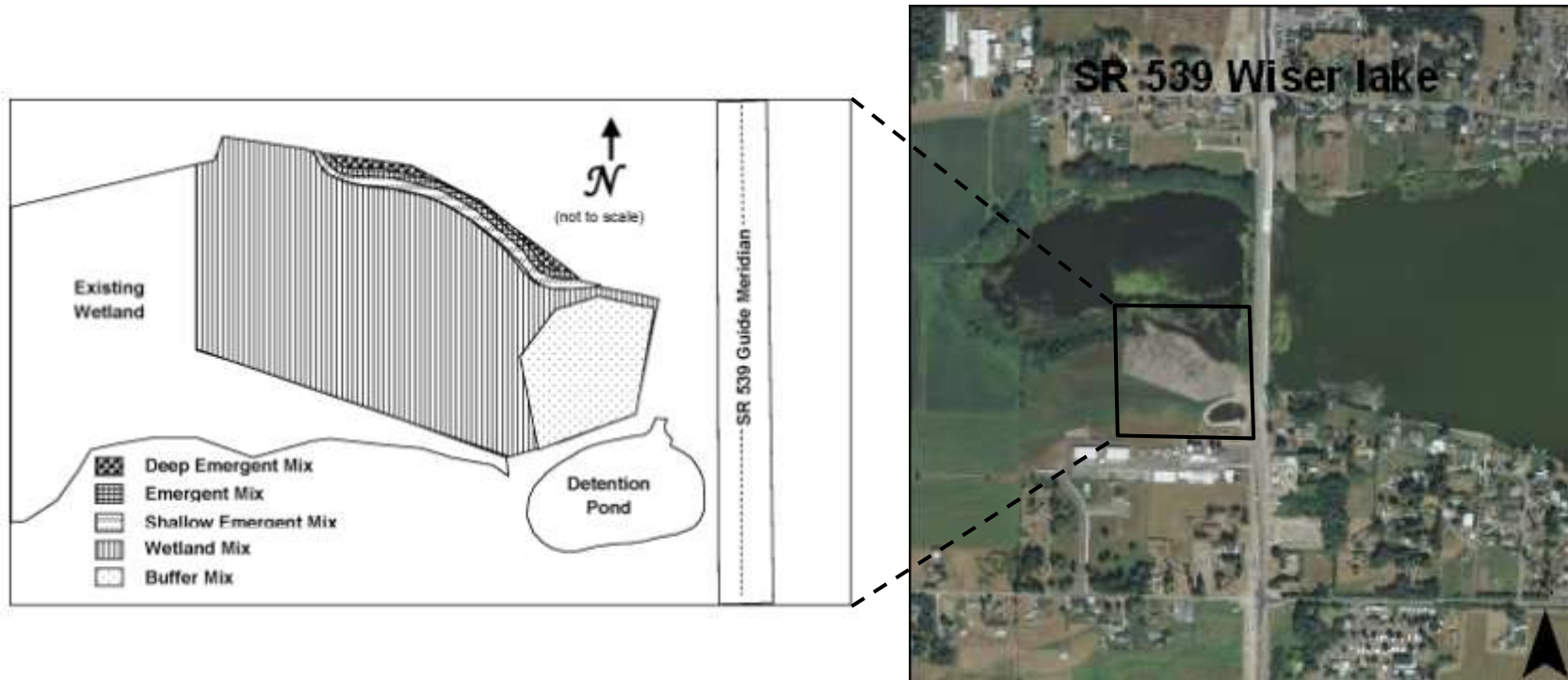


Figure 1 Site Sketch

The SR 539 Wisner 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.

What are the performance standards for this site?

Performance Standard 1

Planted woody species (trees and shrubs) will have 100 percent survival at the end of the of the first year plant establishment period. If all dead woody plantings are replaced, the performance measure will be met.

Performance Standard 2

Emergent planted species on the Wisser Lake Mitigation Site will have 30 percent cover composed of 80 percent of the planted species by the end of first year.

Performance Standard 3

No more than 20 percent cover by non-native invasive species as listed in Table 24 in the buffer communities across the entire mitigation site. Japanese knotweed and purple loosestrife shall not be tolerated on the mitigation site. The presence of Japanese knotweed or purple loosestrife will initiate the invasive species contingency measures.

Appendix 1 provides the complete text of the performance standards for this project, and Appendix 3 shows the planting plan (Grant 2007).

How were the performance standards evaluated?

To evaluate standards for woody survival, the region staff completed a total count of planted species and replaced the dead individuals (Performance Standard 1).

Emergent cover and non-native invasive species cover were assessed qualitatively (Performance Standards 2 and 3) due to the low amount of cover present.

How is the site developing?

The woody species on site are becoming established and appear to be thriving. The distribution of woody species in the scrub-shrub wetland is slightly patchy due to a variety of small gradual depressions that appear to collect water. This might have inhibited the establishment of woody species and has encouraged the recruitment of species such as soft rush (*Juncus effusus*).

The emergent zone has suffered higher mortality than the scrub-shrub wetland and buffer zones. As documented in the As-built, this area of the site was not graded according to plan. The lake bed is very soft and there was difficulty in constructing a gradual grade from the scrub-shrub wetland down to lake for the emergent zone. Instead, the bank drops off into the lake. Some of the planted species show signs of foraging by waterfowl and others were crowded out by non-native and invasive species.

WSDOT Northwest Region has plans to remove the non-native and invasive species and replant the emergent zone in the spring of 2011 to bring this site back into compliance. It should be on track to achieve the Year 3 density and cover performance standards after work is complete.

Results for Performance Standard 1

(100% survival of native woody plants in the buffer and scrub-shrub wetland):

Survival of woody species in the scrub-shrub wetland and buffer is 89% (Photo1). Dead plants were replaced in March 2010 to achieve 100% survival. The dominant species in the buffer include roses (*Rosa* spp.), snowberry (*Symphoricarpos albus*), salmonberry (*Rubus spectabilis*), and western serviceberry (*Amelanchier alnifolia*). Dominant species in the scrub-shrub wetland include hardhack (*Spiraea douglasii*), salmonberry (*Rubus spectabilis*), and twinberry honeysuckle (*Lonicera involucrata*).

Results for Performance Standard 2

(30% cover of native emergent species in the emergent zone composed of 80% planted species):

Cover of herbaceous species in the emergent zone is qualitatively estimated at five percent. The dominant planted species in this zone is slough sedge (*Carex obnupta*). Other planted species observed include longhair sedge (*Carex comosa*), soft-stem bulrush (*Schoenoplectus tabernaemontani*), and hardstem bulrush (*Schoenoplectus acutus*). As documented in the As-built, the grading in this zone was not completed to plan due to conditions on site. The emergent area is smaller than intended and the shoreline is much more abrupt (Photo 2).



Photo 1
Woody cover in the Buffer (July 2010)



Photo 2
Emergent cover in Wetland (July 2010)

Results for Performance Standard 3

(No more than 20% cover of non-native invasive species):

Total cover of invasive species across the site is estimated to be between 5 – 10 percent. Species observed include poison hemlock (*Conium maculatum*), Himalayan blackberry (*Rubus armeniacus*), reed canarygrass (*Phalaris arundinacea*), and thistles (*Cirsium* spp.). The majority of invasive species observed are concentrated in the NW and NE corners of the site. The remaining species observed are encroaching for the edges of the site.

What is planned for this site?

Ongoing weed control through the 2011 growing season. Replanting of emergent area at western portion of site where the grades are more gradual.

Appendix 1 – Goals and Performance Standards

The following excerpt is from the *SR 39: Tenmile to Badger Road (SR 546) Widening (MP 5.90 to MP 12.62) Final Wetland Mitigation Report* (WSDOT 2007). The performance criteria addressed this year are identified in **bold** font.

Objectives, Interim Performance Measures, and Success Standards

The following list describes the thresholds that will determine site success and guide management for the Potter Road and Wisner Lake Mitigation Sites.

Objective 1 – Hydrology

The Potter Road mitigation site will possess ground and/or surface water inundation or saturation sufficient to support the wetland sites.

Performance Measures

Years 1-9—The soils will be saturated to the surface, or standing water will be present in a monitoring well at 12 inches below the surface or less, for a consecutive number of days greater than or equal to 10% of the growing season when rainfall meets or exceeds the 30-year average.

Year 5—The wetland areas will be delineated using current methods. The Potter Road Site will contain 1.74 acres of created wetland.

Success Standards

Year 10—The wetland areas will be delineated using current methods. The Potter Road mitigation site will contain 1.74 acres of created wetland.

Objective 2 – Wetland Vegetation

The Potter Road and Wisner Lake Mitigation Sites will include areas of scrub-shrub and forested wetland communities and scrub-shrub, respectively. The Wisner Lake Mitigation Site will include an aquatic bed and emergent community along the lake fringe.

Performance Measures

Year 1—**Planted woody species (trees and shrubs) will have 100 percent survival at the end of the of the first year plant establishment period. If all dead woody plantings are replaced, the performance measure will be met. Emergent**

planted species on the Wisner Lake Mitigation Site will have 30 percent cover composed of 80 percent of the planted species by the end of first year.

Year 3—The native woody species will maintain a minimum average density of four plants per 100 square feet in scrub-shrub and forested wetland communities. Native colonizing vegetation will be included in this coverage calculation. Emergent species on the Wisner Lake Mitigation Site will achieve a minimum of 50 percent cover including naturally recruited native species.

Year 5—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. Emergent species on the Wisner Lake Mitigation Site will achieve a minimum of 70 percent cover including naturally recruited native species.

Year 7—Native facultative or wetter woody species will achieve a minimum of 50 percent coverage in the forested and scrub-shrub wetland communities. Native colonizing vegetation will be included in these coverage calculations. Emergent species on the Wisner Lake Mitigation Site will achieve a minimum of 90 percent cover including naturally recruited native species.

***Years 1-9*— No more than 20 percent cover by non-native invasive species (Table 24) across the entire mitigation site. Japanese knotweed and purple loosestrife shall not be tolerated on the mitigation site. The presence of Japanese knotweed English ivy, purple loosestrife, and Eurasian water milfoil will initiate the invasive species contingency measures.**

Success Standards

Year 10—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. Emergent species on the Wisner Lake Mitigation Site will achieve a minimum of 90 percent cover including naturally recruited native species.

Year 10— No more than 20 percent cover by non-native invasive species as listed in Table 24 across the entire mitigation sites. Japanese knotweed and purple loosestrife shall not be tolerated on the mitigation site. The presence of Japanese knotweed, English ivy, purple loosestrife, and Eurasian water milfoil will initiate the invasive species contingency measures.

Table 1. Non-native invasive species.

Scientific Name	Common Name
Buddleia alternifolia	Fountain butterfly bush
Cirsium arvense	Canadian thistle
Cirsium vulgare	Bull thistle
Cytisus scoparius	Scot's broom
Hedera helix	English ivy
Ilex aquifolium	English holly
Iris pseudoacorus	Yellow flag iris
Lythrum salicaria	Purple loosestrife
Myriophyllum spicatum	Eurasian water milfoil
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

Objective 3 – Buffer Vegetation

The Potter Road Mitigation Site will include a total of approximately 4.77 acres of enhanced buffer vegetation that will apply to this project. The Wisner Lake Mitigation Site will include 2.09 acre of buffer, a majority of which is enhanced wetland area that provides buffer functions. Therefore, the performance standards provided under the Objectives 1 and 2 are applied to the buffer areas of the Wisner Lake Mitigation Site.

Performance Measures

Year 1—The vegetation will achieve 100 percent survival of planted woody species at the end of the of the first year plant establishment period. If all dead woody plantings are replaced, the performance measure will be met.

Year 3—The native woody species will maintain a minimum average density of four plants per 100 square feet in buffer communities.

Year 5—Native woody species will achieve a minimum of 30 percent coverage in the buffer community. Native colonizing vegetation will be included in this coverage calculation.

Year 7—Native woody species will achieve a minimum of 40 percent coverage in the buffer community. Native colonizing vegetation will be included in this coverage calculation.

***Years 1-9*—No more than 20 percent cover by non-native invasive species as listed in Table 24 in the buffer communities across the entire mitigation site. Japanese knotweed and purple loosestrife shall not be tolerated on the mitigation site. The presence of Japanese knotweed or purple loosestrife will initiate the invasive species contingency measures.**

Success Standards

Year 10—Native woody species will achieve a minimum of 50 percent coverage in the buffer communities. Native colonizing vegetation will be included in this coverage calculation.

Year 10—No more than 20 percent cover by non-native invasive species as listed in Table 24 in the buffer communities across the mitigation sites.

MONITORING PLAN

The monitoring site will be monitored for a minimum of ten years. Formal monitoring procedures will be performed in years one, three, five, seven, and ten after initial acceptance of the mitigation construction. The site should be evaluated informally the summer following plant installation to evaluate survival rates and document the presence of non-native invasive species. Informal (qualitative) monitoring will occur in years two, four, six, eight, and nine. Monitoring reports will be submitted to the Corps of Engineers, Ecology, Whatcom County, and other resource agencies for review and comment. Monitoring reports will be completed by April following the previous monitoring activities occurring in years one, three, five, seven, and ten. Mitigation success will be measured by the attainment of performance standards.

Plant Survival and Condition

During the first year of monitoring and prior to the end of the 1-year plant guarantee period, the survival of all plants installed at the mitigation sites will be assessed. The landscape contractor will replace any shrub and tree plantings that die within the first year. Seeded areas and dense emergent plantings may be assessed as a whole by estimating percentage of cover rather than identifying individual plants. The contractor will reseed any areas of bare soil or poorly established grasses within the first year.

Plant substitutions will be agreed upon by the project biologist and landscape architect. Plants damaged or destroyed by vandalism or wildlife grazing (by waterfowl, rodents, or ungulates) will also require replacement. The landscape contractor has the option of protecting the plants from vandalism or herbivore grazing but must replace any dead plants during the guarantee period.

Reporting

Post-construction monitoring reports will be produced at the end of each monitoring period (during years 1, 3, 5, 7, and 10) and submitted to Whatcom County, the U.S. Army Corps of Engineers, and Ecology. These monitoring reports will include data obtained from monitored vegetation coverage along transects, ground water wells, and photographs taken at permanent photographic viewpoints.

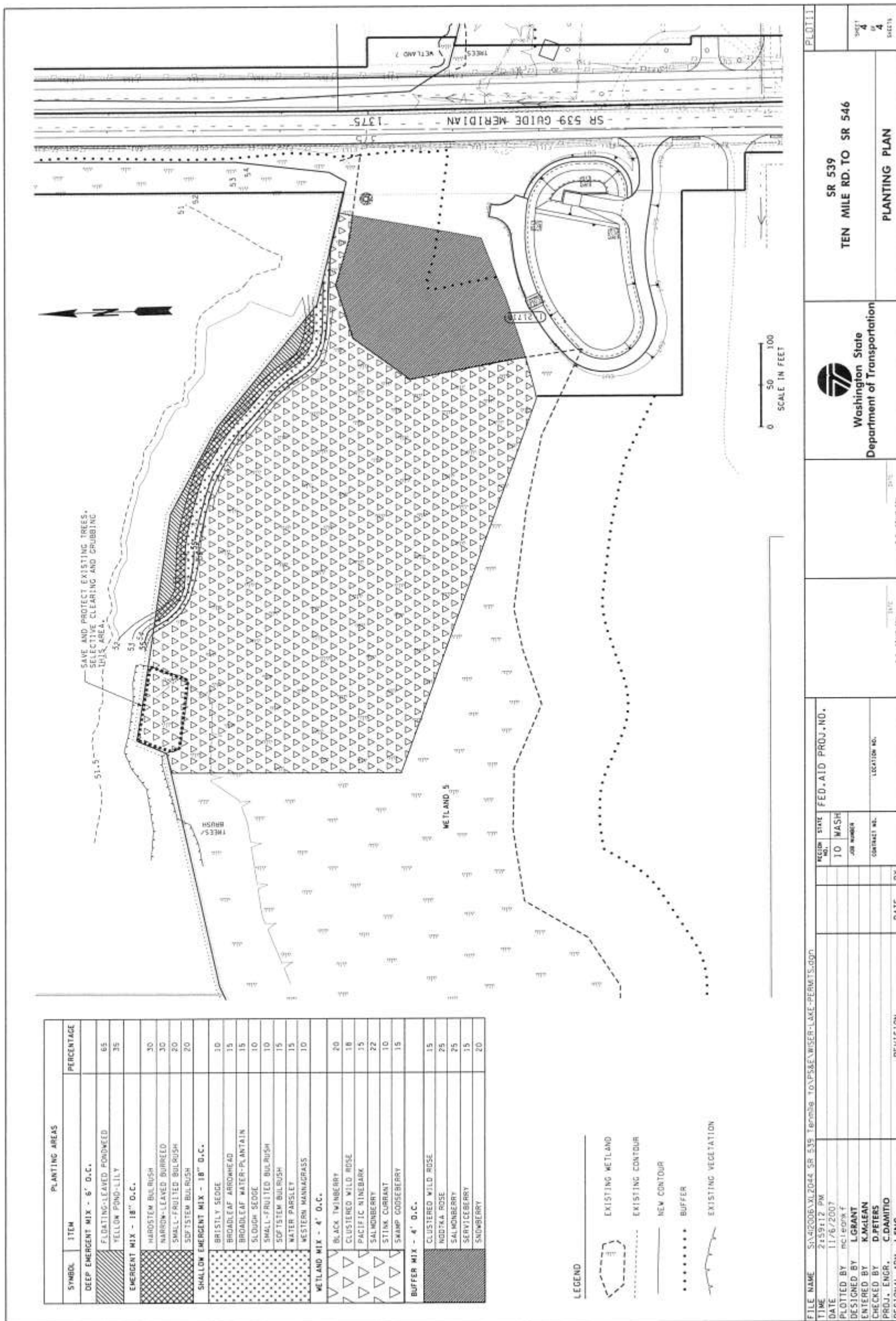
These monitoring reports will describe and quantify the level of success of this mitigation plan. Data collected will be compared to the mitigation performance standards in order to determine whether contingency actions are warranted.

Appendix 2 – Data Tables

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 Horton Road to Tenmile Road USACE #200500927					
Creation	7.66	0.00	0.00	0.37	8.03
Enhancement	3.57	6.26	0.00	1.12	10.95
Buffer Enhancement	4.47	4.37	0.00	0.10	8.94
SR 539 Tenmile 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
SR 542 CED East Church Mountain Rd USACE #NWS-2009-786					
Creation	0.13	0.00	0.00	0.00	0.13
Enhancement	0.26	0.00	0.00	0.00	0.26
Buffer Enhancement	0.00	0.00	0.00	0.00	0.00
Future Mitigation					
Creation	0.86	0.00	0.00	0.00	0.86
Enhancement	1.19	0.00	0.00	0.00	1.19

Appendix 3 – Planting Plan

(Grant 2007)



The photographs below were taken from permanent photo-points on July 21st, 2010 and document current site development.



Photo Point 1



Photo Point 2



Photo Point 3



Photo Point 4



Photo Point 5



Photo Point 6



Photo Point 7



Photo Point 8



Photo Point 9

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. WSDOT. Northwest Region, Seattle, WA.
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3. Washington State Department of Transportation (WSDOT), Northwest Region Environmental Services. 2007. Final Wetland Mitigation Report SR 539: Tenmile Road to Badger Road (SR 546 Widening (MP 5.90 to MP 12.62). WSDOT. Northwest Region, Seattle, WA.
4. Washington State Department of Transportation (WSDOT) WSDOT Wetland Mitigation Site Monitoring Methods (12 June 2008). <http://www.wsdot.wa.gov/NR/rdonlyres/C211AB59-D5A2-4AA2-8A76-3D9A77E01203/0/MethodsWhitePaper052004.pdf>