

SR 525, SR 99 I/C Joint Wetland (Manor Way) Mitigation Site

USACE NWP (26) 98-4-02126

USACE NW (??) 1999-4-00222

USACE NW (14) 2000-4-01504

Northwest Region

2010 MONITORING REPORT

Wetland Assessment and Monitoring Program

Issued March 2011



Environmental Services Office

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SR 535, SR 99 I/C Joint Wetland (Manor Way) Mitigation Site

USACE NWP (23) 98-4-02126
 USACE NW (??) 1999-4-00222
 USACE NW (14) 2000-4-01504

	General Site Information	
	USACE NWP 23 Number	98-4-02126
	USACE NW (??) Number	1999-4-00222
	USACE NW 14 Number	2000-4-01504
	Mitigation Location	East of Manor Way, Snohomish County
	LLID Number	1222690478612
	Construction Date	2000
	Monitoring Period	2001-2010
	Year of Monitoring	10 of 10
	Area of Project Impact¹	0.97 acre
Type of Mitigation	Wetland Establishment	
Area of Mitigation²	1.29 acres	

¹The original planned and permitted project wetland impacts totaled 1.36 acres. Only three of the five projects were constructed resulting in less wetland impacts as listed above. (See Appendix 4 for details)

²Additional mitigation to compensate for the project impacts is being provided by SR 99 Lincoln Way.

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Summary of Monitoring Results and Management Activities (2010)

Performance Criteria	2010 Results ³	Management Activities
Performance Standard		
Water is above, at or near the surface of the land for a minimum of 12.5 percent of the growing season	Not present in all intended areas.	
The wetland areas will be delineated using the current methodology to assure that the site contains 1.29 acres of new wetland.	1.37 acres	
The wetlands maintain 75% aerial coverage of native emergent species in the emergent zones.	Emergent zone has developed as scrub/shrub	
Aerial cover of native woody species in the forested/scrub-shrub zone combined will be 50% and consist of facultative or wetter native species.	92% (CI _{95%} = 87-98% cover)	
Permit Requirement		
Inspect wetland for stranded fish	None Observed	

Report Introduction

This report summarizes final-year (Year-10) monitoring activities at the SR 535, SR 99 I/C Joint Wetland (Manor Way) Mitigation Site. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site success. Monitoring activities included vegetation surveys, photo-documentation, assessments of wetland hydrology, and a wetland delineation. Hydrology visits were conducted February 23rd, March 8th and March 23rd. Vegetation monitoring occurred on July 12th through the 14th. The wetland delineation was conducted on June 2nd.

³ Estimated values are presented with their corresponding statistical confidence interval. For example, 92% (CI_{95%} = 87-98% cover) means we are 95% confident that the true aerial cover value is between 87% and 98%.

What is the SR 99 Manor Way Mitigation Site?

The Manor Way mitigation site is one of two mitigation sites created to compensate for the loss of 0.97 acre of wetlands resulting from three different projects that impact the Swamp Creek and Lake Serene watersheds. This mitigation site is located in a residential neighborhood just east of Manor Way in Snohomish County (Figure 1). Pre-existing conditions at the mitigation site include three scrub-shrub or forested wetlands and a disturbed emergent wetland in the center of the site. The mitigation site is intended to connect the pre-existing wetlands into one complex, provide contaminant buffering, and improve both wildlife habitat and flood attenuation. Sources of hydrology include groundwater interception and flood flows from an on-site stream.

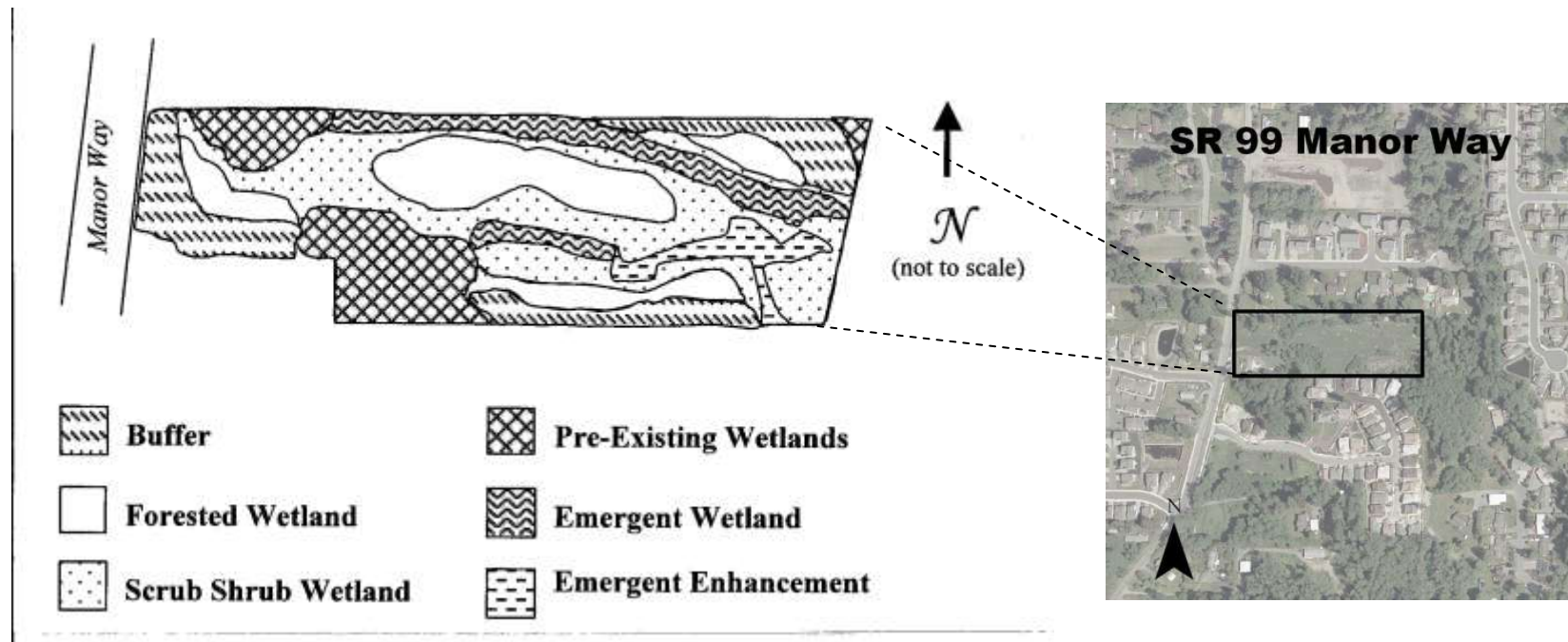


Figure 1 Site Sketch

The SR 99 Manor Way Mitigation Site contains pre-existing wetlands linked by forested and scrub-shrub wetlands.

What are the performance standards for this site?

Performance Standard 1

Water is above, at or near the surface of the land for a minimum of 12.5 percent of the growing season (30 consecutive days from March through October).

Performance Standard 2

The wetland areas will be delineated using the current methodology to assure that the Manor Way site contains 1.29 acres of new wetland.

Performance Standard 3

The wetlands maintain 75% aerial coverage of native emergent species in the emergent zones.

Performance Standard 4

Aerial cover of native woody species in the forested/scrub-shrub zone combined will be 50% and consist of facultative or wetter native species.

Permit Requirement 1

The monitoring program shall include inspection for stranded fish during seasons when the wetland is drying up, and at times of the year when the water of the wetland approaches 70 degrees Fahrenheit.

Appendix 1 provides the complete text of the performance standards for this project, and Appendix 5 shows the planting plan (WSDOT 1999).

How were the performance standards evaluated?

WSDOT staff collected hydrology data using methods described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) (Performance Standard 1). Seven permanent hydrology pit locations were established and recorded on a map. During each monitoring visit, visual observations are made to determine the extent of inundation and surface saturation. Depth and location of standing water was recorded. At each pit location, in the absence of inundation or surface saturation, subsurface observations were made.

A wetland boundary on the site was delineated (Performance Standard 2) using the methods described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997), *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory 1987), and the *Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains Valleys and Coasts Region* (USACE 2008).

To evaluate woody cover in the scrub/shrub and forested wetland, a baseline was established on northern border of the site (Figure 2). Twenty sampling transects were randomly placed perpendicular to the baseline. The point intercept method was used to estimate woody cover (Performance Standard 4).

For additional details on the methods, see Appendix 2 of this report or view the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).

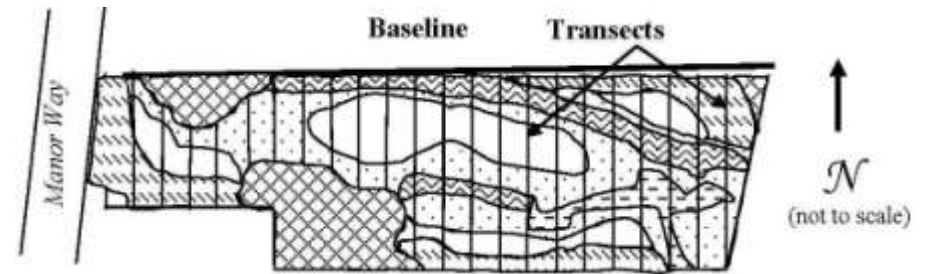


Figure 2 Site Sampling Design (2010)

Is this site a success?

In 2008, neighbor complaints triggered a site evaluation that uncovered the stream on site was not built per plan. The stream was never fully re-aligned and the old channel never filled which resulted in seasonal flooding on the neighbor's property. An adaptive management strategy called for the re-alignment of the stream away from the neighbor's property line. As a result of the stream re-alignment the intended emergent area on site began to develop as scrub/shrub and is currently more appropriately classified as scrub/shrub.

The site was intended to provide wildlife habitat and food chain support, and it appears that both functions are supported. Thirty-four species of birds were observed during the 10-year monitoring period, three which are wetland dependent and three others that are wetland associated (Appendix 4). American Robin and Spotted Towhees have been observed nesting on site, providing evidence for structurally diverse habitat as towhees are ground nesters and robins typically nest at heights between 10 and 20 feet (Ehrlich et al 1998). Deer have been observed browsing vegetation on the site, and rodents and birds have been observed using the habitat structures. Raccoon, opossum, garter snakes, chorus frogs, rabbits and coyote scat have also been observed during monitoring visits.

Contaminant buffering and flood attenuation were other functions intended for this site. These functions were to be achieved through increasing the density of vegetative cover. This was also accomplished by the re-alignment of the stream from a straight ditch, into a sinuous waterway that was re-vegetated with native emergent and woody species. Since 2003, the first year woody cover in the scrub/shrub and forested wetland was sampled; there has been an increase in native woody cover of 70 percent (Photo 1). This increase has likely enhanced these functions.

Manual and herbicide weed control efforts occurred in March, April, May, July, Aug., and Sept. in 2010.



Photo 1. Ortho-photo on the left illustrating woody cover on site following construction (2002) and the ortho-photo on the right illustrating the increase in woody cover in 2009.

Results for Performance Standard 1

(Water is above, at or near the surface of the land for a minimum of 12.5 percent of the growing season):

Based on our three hydrology visits in the months of February and March, 2010, we did not achieve the hydrology standard this year. On all three visits monitoring pit number 7, located in the upper western half of the palustrine forested wetland, failed to show signs of inundation or saturation (see results in Appendix 3).

Results for Performance Standard 2

(The wetland areas will be delineated using the current methodology to assure that the site contains 1.29 acres of new wetland.):

A wetland delineation was completed on June 2nd, 2010 to determine total wetland acreage on this site. The result is 1.37 acres of wetland present on site. This includes created and enhanced wetlands. A delineation is planned for the spring of 2011 to determine the distinction between created and enhanced wetlands.

Results for Performance Standard 3

(The wetlands maintain 75% aerial coverage of native emergent species in the emergent zones.):

There is a thriving community of emergent native species within the stream channel composed of soft rush (*Juncus effusus*), creeping buttercup (*Ranunculus repens*), broadleaf cattail (*Typha latifolia*), small-fruited bulrush (*Scirpus microcarpus*), and slough sedge (*Carex obnupta*). In this area the aerial coverage of native emergent species is

qualitatively estimated at 80 percent (Photo 2). There are also small patches of native emergent species scattered throughout the northwest corner and the southern portion of the site. The area in the central portion of the site that was intended as emergent establishment has developed as a scrub/shrub community. This is a result of the stream re-alignment that occurred on site in 2008.



Photo 2
Emergent cover in stream channel (July 2010)

Results for Performance Standard 4

(Aerial cover of native woody species in the forested/scrub-shrub zone combined will be 50% and consist of facultative or wetter native species.):

The cover of woody species in the combined scrub-shrub and forested wetland is 92 % (CI95% = 87-98% cover). This value significantly exceeds the performance standard target (Photo3). The central area of the site is continuing to develop at a slower pace and provides less cover in comparison to other areas of the site. There are two distinct layers, with the upper canopy dominated by *Alnus rubra* (red alder) at heights up to nine meters. The lower canopy is dominated by *Lonicera involucrata* (twinberry) and *Cornus sericea* (redosier dogwood) at heights up to three meters.



Photo 3
Woody cover in the forested/scrub shrub wetland (July 2010)

What is planned for this site?

This document includes results from the last year of planned monitoring. WSDOT will preserve the site in perpetuity. Maintenance will be performed by WSDOT personnel and consist of repairing vandalism, erosion damage, minor re-vegetation (if necessary), trash collection, and weed control.

Appendix 1 – Goals and Performance Standards

The following success standards are excerpted from the *Joint Wetland Mitigation Plan for SR 524: (196th St./Filbert Road) 24th to SR 527, SR 405: Bothell to Swamp Creek, Stage 2, SR 525: I-5 to SR 99 Widening, SR 525 Swamp Creek Park and Ride Extension, and SR 525: SR 99 Interchange* (WSDOT 1999). The standards addressed this year are identified in **bold** font

Goals

The goal of the proposed compensatory mitigation is to replace wetland types, acreage, and functions, which will be lost due to wetland impacts associated with the proposed projects. The proposed mitigation intends to create a total of 2.96 acres of wetland with plantings of native vegetation to achieve palustrine emergent, scrub-shrub, and forested vegetative classes as mitigation for the loss of 1,357 acres. A wetland buffer of 25 feet minimum is proposed at each site, creating 0.45 acres of buffer at Manor Way and 0.75 acres at Lincoln Way. The created wetlands are anticipated to provide the following functions and values:

- wildlife habitat – through increasing the available shrub and tree cover and habitat structures;
- flood attenuation – through increasing density of vegetative cover,
- contaminant buffering – by providing a well vegetated wetland area to intercept sediment and contaminants.

Objectives and Performance Standards

WSDOT will use the following objectives and performance standards as specific criteria to measure the mitigation site’s success.

Objective 1 - Hydrology

The mitigation sites will provide ground or surface water inundation or saturation sufficient to support a long-term wetland site.

Performance Standards

One-Tenth Year:

- a. **Water is above, at or near the surface of the land for a minimum of 12.5 percent of the growing season (30 consecutive days from March through October).**

Fifth Year:

- b. First through tenth year standard applies

Tenth Year:

- c. **First through tenth year standard applies.**

- d. **The wetland areas will be delineated using the current methodology to assure that the Manor Way site contains 1.29 acres of new wetland and the Lincoln Way site contains 1.67 acres of new wetland.**

Objective 2 - Vegetation

The compensatory mitigation sites will include a total of approximately 2.96 acres of emergent, forested, and scrub-shrub wetland vegetation and 1.20 acres of planted wetland buffer. The proposed Lincoln Way wetland will have an initial planting of 6% emergent, 30% scrub shrub, and 64% forest vegetation. Manor Way would have 22% emergent, 34% scrub-shrub, and 44% forested.

Performance Standards

One year:

- a. During the first year plant establishment, planted species that are dead or unsatisfactory shall be replaced. Maintaining a one foot radius weed free condition around each woody plant and irrigation as necessary to ensure continued growth shall be accomplished.

Third year:

- b. The emergent zones will have 70% relative areal coverage of facultative-wet or wetter native (i.e., excluding reed canarygrass or purple loosestrife) emergent vegetation, comprised of minimum of three native species. The scrub-shrub and forested zones combined will have 15% areal cover by native facultative or wetter woody species, comprised of at least three species each.
- c. The buffer will have 15% areal coverage of native woody species.

Fifth year:

- d. The emergent zones will have 75% or greater relative areal coverage of native facultative-wet or wetter species. The scrub-shrub and forested zones combined will have 25% areal cover by native facultative or wetter woody species, comprised of at least three species each.
- e. The buffer will have 35% areal cover of native woody species.

Tenth year:

- f. **The wetlands maintain 75% areal coverage of native emergent species in the emergent zones. Areal cover of native woody species in the forested/scrub-shrub zone combined will be 50% and consist of facultative or wetter native species.**

Objective 3 - Wildlife

Wildlife cover and forage availability for birds and small mammals should increase substantially. The addition of fruit bearing shrubs and stumps, logs, and brush piles will increase habitat diversity and structure in the newly vegetated areas.

Overall, creating an emergent and scrub-shrub wetland is intended to provide feeding, breeding, and resting habitat for birds, small mammals, and amphibians.

Performance Standards

First year:

- a. Habitat structures identified in the plans have been placed on the site.

Third year:

- b. Habitat structures identified in the pans are still in place.
- c. After three years, increases in wildlife cover and forage species will improve habitat structure. This is expected to provide a corresponding increase in wildlife use.
- d. Vegetation standards in Objective 2 apply.

Fifth year:

- e. After five years wildlife cover and forage species will be established to where habitat structure will change from a single layer of vegetation to multiple layers.
- f. Vegetation standards in Objective 2 apply.

Tenth year:

- g. **Vegetation standards in Objective 2 apply.**

Contingency Plans

Mitigation goals should be accomplished through successful completion of the planting plan. Contingency plans will ultimately consist of replanting the site in the case of planting failure or other unforeseen problems. The natural recruitment of native wetland species and upland species (to the buffer) throughout the mitigation site will assist any revegetation contingency plan.

In the event that the areal coverage of forest wetland or forested buffer plants falls short of the listed performance standards, additional measures will be employed to assure the establishment of these plant communities at the site(s). In the event that by year three the hydrology standard is not met for 2.96 acres of the sites, agencies shall be consulted and remedial actions shall be employed to assure establishment of wetland hydrology at the site(s).

The following schedule summarizes how we assure achievement of performance standards and mitigation goals:

The site does not meet the standards of success for vegetative cover after the third growing season, additional planting will be performed. Sprigs, cuttings, seeds or live plant material is necessary will be replanted and monitored to assure that coverage meets performance standard criteria. If required, remedial grading will occur if the hydrology standard is not met for two years of non-drought conditions.

If the site does not meet the standards of success for vegetative cover after the fifth growing season, resource agencies will be consulted to discuss further measures to remedy the problems at the site. The monitoring program will be extended and remedial measures will be performed as necessary to establish appropriate wetland vegetation. WSDOT will perform all measures considered necessary to establish and maintain a functioning wetland system.

The mitigation plan is designed to utilize and promote the growth of native vegetation. Attempts will be made to limit the spread of exotic or noxious species and they will not be allowed to dominate the site. Noxious and invasive species identified in Snohomish County's Critical Area Regulation will be eliminated immediately if found occurring on the site, before large populations can establish. A weed control program will be implemented if more than 10% of the wetland is invaded by invasive exotic species (e.g., reed canarygrass or purple loosestrife).

Operations and Maintenance

The goal of the wetland mitigation site is to create a functional self-sustaining system that should require very little maintenance. Once the vegetation establishes minimum disturbance will occur. WSDOT will retain the site in perpetuity. Maintenance will be performed by WSDOT personnel and would be confined to repairing vandalism, erosion damage, minor revegetation (if necessary), trash collection, and weed control.

Monitoring

The site will be monitored by WSDOT for a minimum of ten years following mitigation construction and planning. Formal monitoring will be performed according to procedures outlined in WSDOT's Monitoring Methods (1996 Wetland Mitigation Monitoring Report) during the first, third, fifth, seventh and tenth year after planting. Informal monitoring will occur in the second, fourth, sixth, eighth and ninth years. Monitoring reports will be issued annually to the Corps of Engineers, Department of Ecology, Snohomish County and other resource agencies or local governments for review and comment. Successful mitigation will be measured by attainment of performance standards listed in the goals and objectives section of this document.

PERMIT REQUIREMENTS

WDFW HPA Permit 00-D7276-02

The monitoring program shall include inspection for stranded fish during seasons when the wetland is drying up, and at times of year when the water of the wetland approaches 70 degrees Fahrenheit. This monitoring shall be accomplished every year that plant monitoring is conducted. If fish are found to be stranded in wetland pools or other areas of the project at these times, wetland modification to solve the problem shall be proposed by WSDOT and accomplished under a separate HPA. Reports of monitoring for fish shall be forwarded to the appropriate WDFW biologist.

Appendix 2 – Methods

WSDOT staff collected hydrology data using methods described in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) (Performance Standard 1). Seven permanent hydrology pit locations were established and recorded on a map. During each monitoring visit, visual observations are made to determine the extent of inundation and surface saturation. Depth and location of standing water is recorded. At each pit location, in the absence of inundation or surface saturation, subsurface observations are made.

Wetland boundaries within the SR 99 Manor Way mitigation site were delineated using the routine methods described in the:

- Washington State Wetlands Identification and Delineation Manual (Ecology 1997),
- Corps of Engineers Wetlands Delineation Manual (Environmental Laboratory 1987), and
- Interim Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains Valleys and Coast Region (USACE 2008).

Wetland boundaries were delineated based on on-site observations of hydrology, soils and plant communities, in conjunction with background information (Performance Standard 2). Where there are differences in the technical criteria and indicators between the state and Corps manual, we used the indicators in the 2008 Corps supplement.

A Global Positioning System (GPS) GeoXH unit was used to record the wetland boundaries and sampling point locations shown in Photo 1. Wetland boundary points were recorded at regular intervals and at any change in direction along the boundary.

To assess vegetation standards, a 182-meter baseline was established parallel to the northern border of the site. Twenty temporary sampling transects were placed perpendicular to the baseline using a systematic random sampling method (Figure 2). Aerial cover of woody species in the scrub-shrub and forested zone (Performance Standard 4) was assessed using the point intercept method. Thirty-one 9-meter meter point-line sample units (20 points each) were randomly positioned along the sampling transects in these zones. To estimate cover of invasive species in the wetland, 49 randomly positioned 10-meter point-line sample units (20 points each) were placed along sampling transects across the site (Contingency Plan).

Sample size analysis confirmed sufficient sampling had been completed based on site sampling objectives and the desired level of statistical confidence. The sample size equation shown here (below) was used to perform the analysis on data collected

(Performance Standard 4). In this equation, the precision level (*B*) equals half the maximum acceptable confidence interval width multiplied by the sample mean.

$$n = \frac{(z)^2 (s)^2}{(B)^2}$$

n = unadjusted sample size
z = standard normal deviate
s = sample standard deviation
B = precision level

A site search was conducted to confirm no fish were stranded (Permit Requirement 1). Photographs were taken to illustrate standards and document site status.

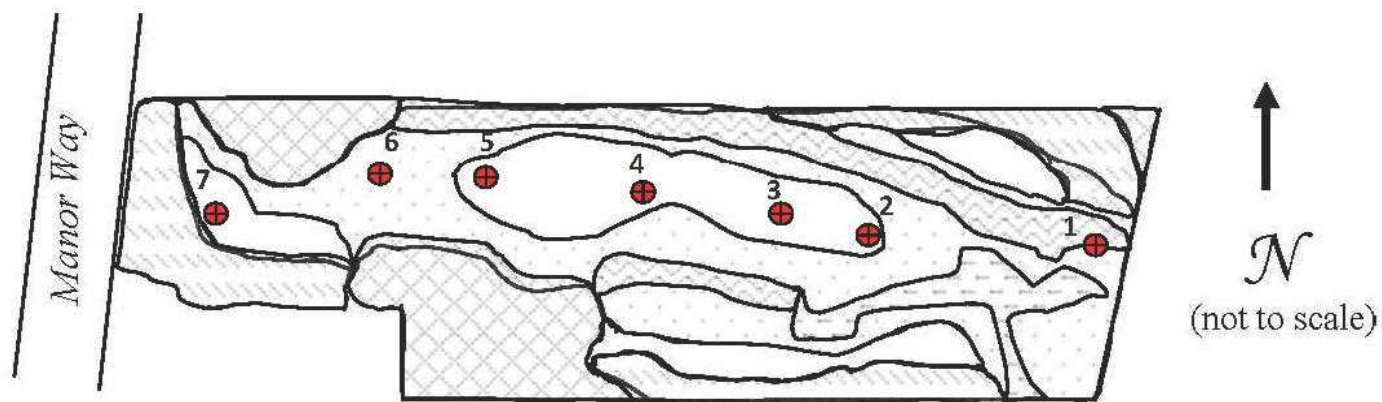
For additional details on the methods view the [WSDOT Wetland Mitigation Site Monitoring Methods Paper](#) (WSDOT 2008).







Appendix 3 – Hydrology

Table 1. Hydrology Observations For SR 99 Manor Way

Date	2/23/2010	3/8/2010	3/23/2010
Observer	TM, SP	KA, SP	TM, KA
Was wetland hydrology observed in intended areas	NO	No	No
Surface observation	Inundation and saturation in the far west portion of the site and in the far eastern portion of the site. Hydrology not present in all the intended areas	Hydrology was not observed in all intended areas but site seemed wetter than the last visit. Existing wetlands were wet as well as the east end of the site.	Hydrology not present in all intended areas. PFO appears to lack hydrology. As you work your way east the site progressively becomes wetter.
Subsurface Observations			
Pit 1	Not dug - saturated to the surface	Saturated to the surface	Surface saturation
Pit 2	Standing water at 17" saturated to 11"	Standing water at 17" and saturated to 12"	Standing water at 18" and saturation at 9.5"
Pit 3	Standing water at 15" saturated to 12"	Standing water at 14" and saturated to 10"	Standing water at 15.5" and saturation at 5"
Pit 4	Standing water at 16.5" saturated to 14.5"	Standing water at 12"	Standing water at 16" and saturation at 6"
Pit 5	Standing water at 16" saturated to 10"	Standing water at 9.5"	Standing water at 13" and saturation at 7"
Pit 6	Standing water at 16" saturated to 13.5"	Standing water at 15" and saturation at 13"	Standing water at 15" and saturation at 10" after 30 minutes
Pit 7	none	No standing water, but saturation was observed at 14"	none
water marks			
drift lines			
sediment deposits			
water-stained leaves	Yes	Yes	

Hydrology Pit Map



- | | | | |
|---|----------------------------|---|------------------------------|
|  | Buffer |  | Pre-Existing Wetlands |
|  | Forested Wetland |  | Emergent Wetland |
|  | Scrub Shrub Wetland |  | Emergent Enhancement |

Appendix 4 – Data Tables: Table 3 - 2001-2010 Bird Checklist

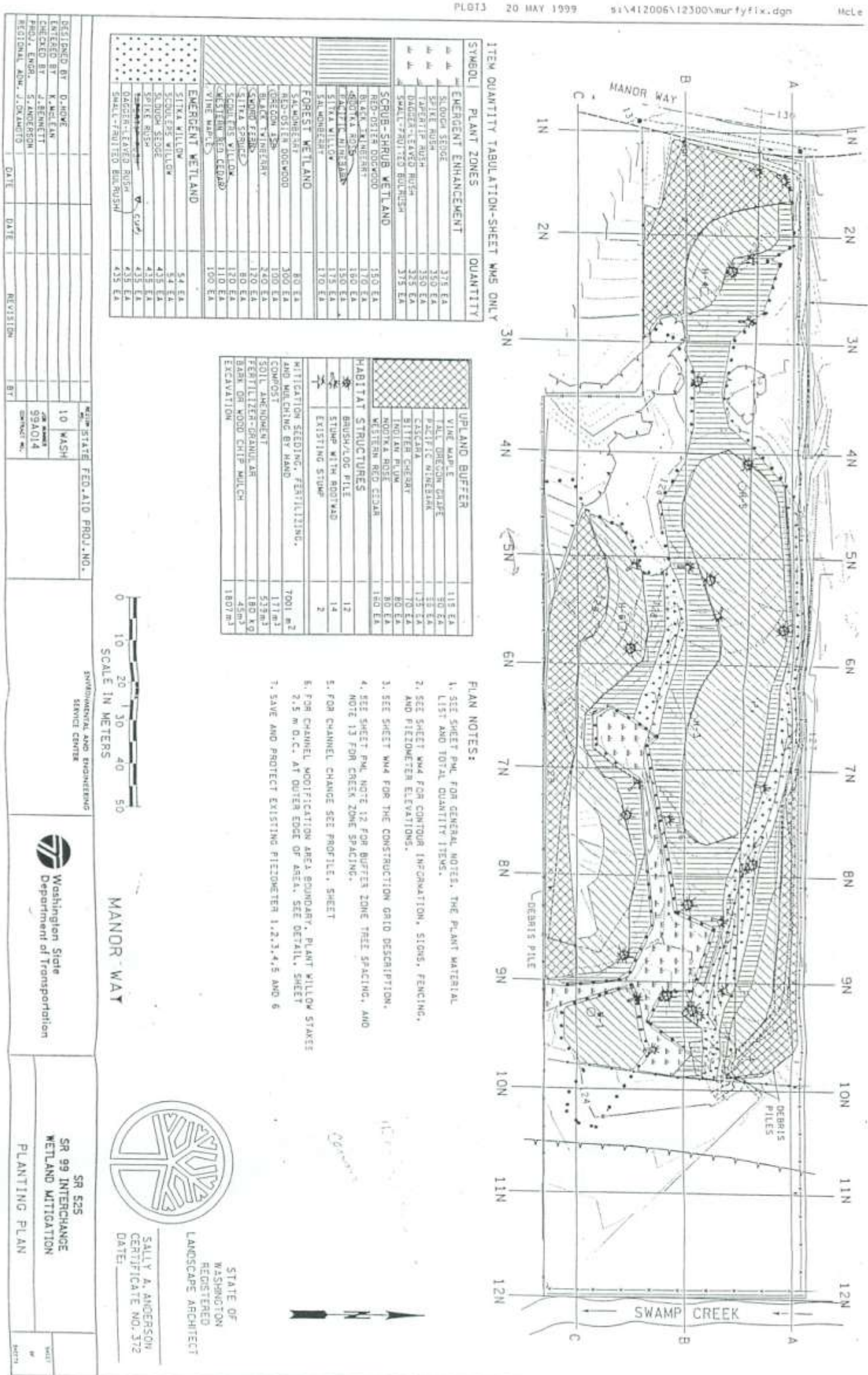
Common Name	Scientific Name	Common Name	Scientific Name
Waterfowl		Nuthatches	
Mallard	<i>Anas platyrhynchos</i> wetland-dependent	Red-breasted Nuthatch	<i>Sitta canadensis</i>
Quail		Wrens	
California Quail	<i>(Callipepla californica)</i> wetland-independent	Bewick's Wren	<i>Thryomanes bewickii</i> wetland-independent
Diurnal raptors		Thrushes	
Sharp-shinned Hawk	<i>Accipiter striatus</i>	Swainson's Thrush	<i>Catharus ustulatus</i> wetland-independent
Red-tailed Hawk	<i>Buteo jamaicensis</i>	American Robin	<i>Turdus migratorius</i> wetland-independent
Gulls		Starlings	
Glaucous Gull	<i>Larus hyperboreus</i>	European Starling	<i>Sturnus vulgaris</i> wetland-independent
Hummingbirds		Waxwings	
Rufous Hummingbird	<i>Selasphorus rufus</i>	Cedar Waxwing	<i>Bombycilla cedrorum</i> wetland-independent
Woodpeckers and Allies		Warblers	
Downy Woodpecker	<i>Picoides pubescens</i> wetland-independent	Common Yellowthroat	<i>Geothlypis trichas)</i> wetland-dependent
Northern Flicker	<i>Colaptes auratus</i> wetland-independent	Emberizids	
Flycatchers		Spotted Towhee	<i>Pipilo maculates</i> wetland-independent
Willow Flycatchers	<i>Empidonax traillii</i> wetland-associated	Chipping Sparrow	<i>Spizella passerina</i>
Pacific-slope Flycatcher	<i>Empidonax difficilis</i> wetland-independent	Savannah Sparrow	<i>Passerculus sandwichensis</i> wetland-independent
Crows and Allies		Song Sparrow	<i>Melospiza melodia</i> wetland-independent
American Crow	<i>Corvus brachyrhynchos</i> wetland-independent	Dark-eyed Junco	<i>Junco hyemalis</i> wetland-independent
Steller's Jay	<i>Cyanocitta stelleri</i> wetland-independent	Grossbeaks	
Swallows		Black-headed grossbeak	<i>Pheucticus melanocephalus</i> wetland-independent
Tree Swallow	<i>Tachycineta bicolor</i> wetland-associated	Blackbirds	
Barn Swallow	<i>Hirundo rustica</i>	Red-winged Blackbird	<i>Agelaius phoeniceus</i> wetland-dependent
Violet-green Swallow	<i>Tachycineta thalassina</i> wetland-associated	Brown-headed Cowbird	<i>Molothrus ater</i> wetland-independent
Barn Swallow	<i>Hirundo rustica</i>	Finches and Allies	
Chickadees		House Finch	<i>Carpodacus mexicanus</i> wetland-independent
Black-capped Chickadee	<i>Poecilo atricapillus</i> wetland-associated	American Goldfinch	<i>Spinus tristis</i> wetland-independent
Chestnut-backed Chickadee	<i>Poecile rufescens</i> wetland-independent		

Table 3- Wetland Impacts

Project	Permit	Impact area (acres)
I-405, Bothell to Swamp Creek (HOV) – Stage 2	USACE NW (??) 1999-4-00222)	0.009
SR 525, I-5 to SR 99 – Widening	USACE NW 14, #2000-4-01504)	0.25
SR 525, SR 99 Interchange	USACE NW 26 98-4-02126	0.747
	Total	0.97

Appendix 5 – Planting Plan

(from WSDOT 1999)



Appendix 6 – Photo Points

The photographs below were taken from permanent photo-points on July 14th, 2010 and document current site development.



Photo Point 1



Photo Point 2



Photo Point 3



Photo Point 4

Literature Cited

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