SR 525 Fish Road Vic. to Honeymoon Bay Road Mitigation Site
C5805

USACE NWP (23) 98-4-01983

Northwest Region

2005 MONITORING REPORT

Wetland Assessment and Monitoring Program

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SR 525 Fish Road Vic. to Honeymoon Bay Road Mitigation Site (SR 525 Fish Road)

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General Site Information	
USACE NW 23 Permit	98-4-01983
WSDOT Contract Number	C5805
Mitigation Location	100 yards west of the SR 525/Fish Road intersection, Island Co.
Initial Monitoring Period	2001 to 2005
Year of Monitoring	5 of 5
Area of Project Impact	0.9 acres
Type of Mitigation	Enhancement/Creation
Mitigation Intended	0.59 acres

Summary of Monitoring Results and Management Activities (2005)

Performance Criteria	2005 Results	Management Activities
Success Standard		
80% or greater aerial cover of wetland species	21% cover ($CI_{80\%}$ = 17-25%)	Replanted in October 2005
Permit Requirement		
If invasive species coverage exceeds 20%, or other problems are identified through monitoring, appropriate action shall be taken.	3% cover (qualitative)	Annual weed control

Report Introduction

This report summarizes final year monitoring activities at the State Route (SR) 525 Fish Road Vicinity to Honeymoon Bay Road (SR 525 Fish Road) mitigation site. Included are descriptions of the site, the success standard and permit requirement, an explanation of how the site was monitored, and an evaluation of mitigation success. Monitoring activities in 2005 included vegetation surveys, photo-documentation, and assessments of wetland hydrology.

What is the SR 525 Fish Road mitigation site?

This created and enhanced wetland mitigation site is located near Freeland in Island County. The site was developed as compensation for the loss of wetland acreage and functions due to project impacts resulting from road improvements along SR 525. Native woody and emergent plantings have been established to provide improved wildlife habitat and water quality functions (sediment and toxicant retention). Seasonally saturated or inundated areas were created to provide ground water recharge and/or discharge.

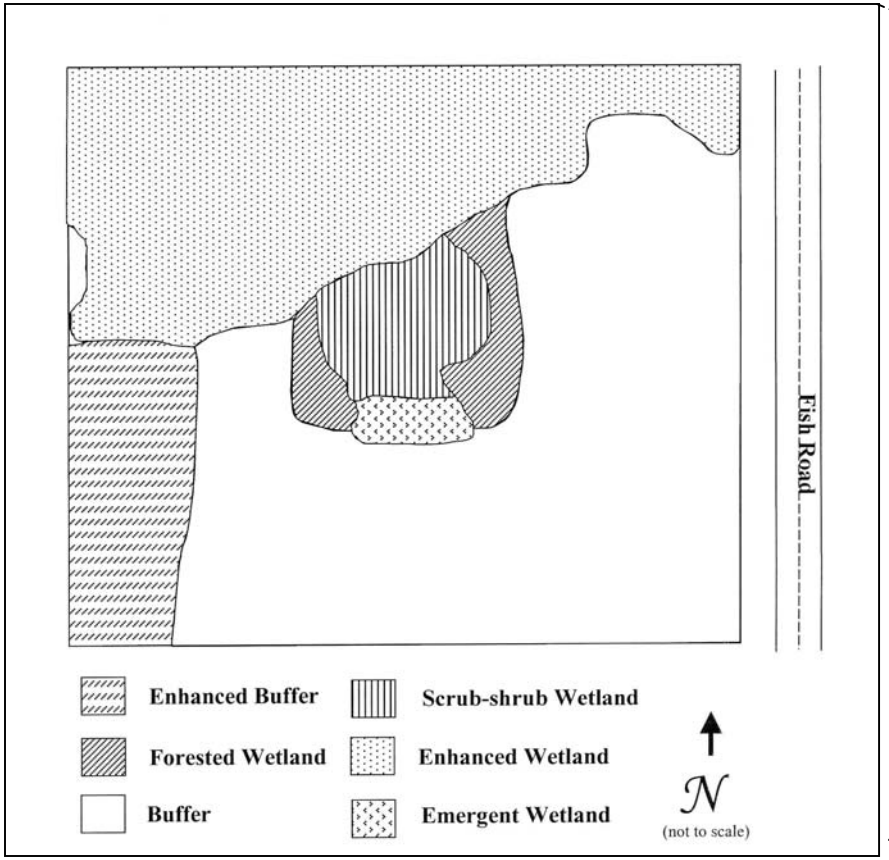


Figure 1 Site Sketch

The mitigation site includes enhanced and created wetlands and buffers west of Fish Road. Emergent, scrub-shrub, and forested areas are intended at this site.

What are the success criteria for this site?

Success Standard

Success should be determined by 80% coverage of wetland plant species by the end of the five-year monitoring period.

Permit Requirement

If invasive species coverage exceeds 20%, or other problems are identified through monitoring, appropriate action shall be taken.

Appendix 1 provides the complete text of the success standards and permit requirements for this project. Appendix 3 shows the planting plan (WSDOT 2003).

How were the success standards measured?

To evaluate vegetative success standards for the created wetland zones, a baseline was established parallel to Fish Road along the forested wetland (Figure 2). Twenty-eight transects were randomly placed perpendicular to the baseline.

The point-intercept method was used to estimate cover of native wetland plant species (Success Standard). Visual estimates were used to assess cover of non-native invasive species (Permit Requirement).

For additional details on the methods, see Appendix 2 of this report or view the WSDOT Wetland Mitigation Site Monitoring Methods at: http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf

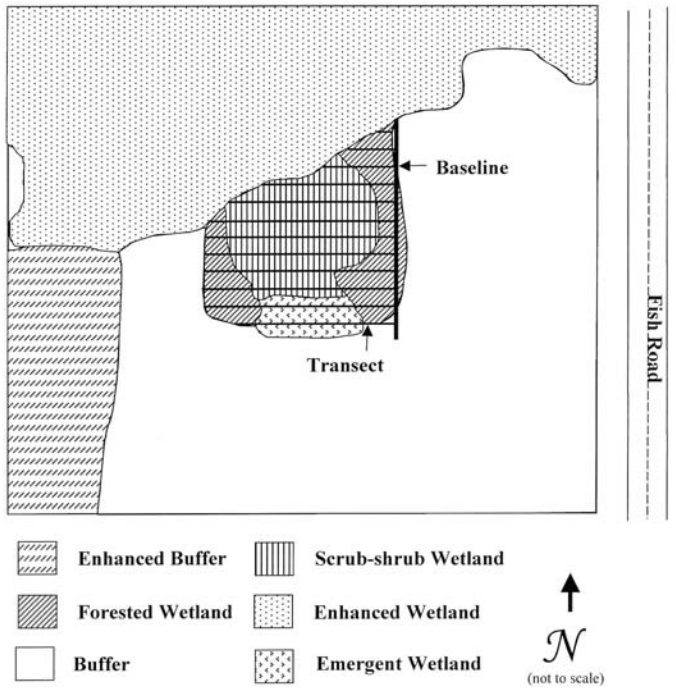


Figure 2 Site Sampling Design (2005)

Is the site a success?

The created wetland is a success in many respects. The wetland appears to provide the intended functions of improved wildlife habitat, sediment and toxicant retention, and ground water recharge. Three of the planted woody species provide food chain support for wildlife. Wetland hydrology is present in all of the intended areas, and weed control efforts have been successful at keeping invasive plant cover very low. Hydrology data and a list of observed woody species are presented in Appendix 4.

Survival of tree and shrub plantings on this site has been relatively good. However, the native wetland plant species cover requirement has not been achieved. Woody growth appears to be stunted and region staff are considering potential management options. *Fraxinus latifolia* (Oregon ash) and *Carex obnupta* (slough sedge) are the two dominant native facultative or wetter species in the created wetland. *Spiraea douglasii* (hardhack) and *Rosa* species (roses) dominate the enhanced wetland area.

Results for the Success Standard
(80% or greater aerial cover of herbaceous and woody, facultative and wetter wetland species):

The estimated cover provided by woody and herbaceous, facultative and wetter plant species in the created wetland areas is 21% ($CI_{80\%}$ = 17-25%). This estimate falls short of the 80% requirement. Native wetland species cover is particularly low in the created scrub-shrub and forest wetland zones with qualitative estimates of just 7% and 15% cover, respectively. However, the created emergent zone is qualitatively estimated to provide 50% cover of native wetland species. The dominant native woody species in the created wetland is *Fraxinus latifolia* (Oregon ash) (Photo 1). *Carex obnupta* (slough sedge) dominates the native herbaceous layer.

Photo 1

***Fraxinus latifolia* in the forested wetland (August 2005)**

Visual cover estimates suggest other areas of the site have greater native species cover than the created wetland areas. In the adjacent wetland enhancement area, cover of native wetland species is estimated to be 95%. Cover of native woody species is approximately 90% in the buffer enhancement area and 15-20% in the created wetland buffer.

Additional plantings were installed in October 2005. *Cornus sericea* (redosier dogwood) and *Salix scouleriana* (Scouler's willow) live stakes were planted in the scrub-shrub and forested wetland zones. These plantings should contribute to meeting the success standard for native wetland plant species cover in future years.

Photo 2

Invasive species cover is very low in the buffer (August 2005)

Results for the Permit Requirement
(Less than 20% cover of invasive species):

The cover of non-native invasive species across the entire site is estimated to be just 3%. The estimated cover is 1% and 4% in the created and enhanced wetland areas, respectively. Weed control has been very effective despite high cover of *Rubus armeniacus* (Himalayan blackberry) and *Rubus laciniatus* (cutleaf blackberry) just off site (Photo 2).

Appendix 1 – Goals, Success Standards and Permit Requirements

The following success standards are excerpted from the *SR 525 Conceptual Wetland Mitigation Plan*, (WSDOT no date). The standards addressed this year are identified in **bold** font.

Goals
The 0.99 hectares (*sic*)(0.2475 acres) of wetland impacts will be mitigated by enhancing wetlands of equal or greater size with equal or greater functions and values.[1] The mitigation ratio is dependant on the category of wetland impacted, and will range from 1.5:1 to 3:1 in-kind replacement of wetlands impacted. The total area to be enhanced equals 0.23 hectare (0.59 acre). Functions of the mitigation wetland will include, at a minimum, improved wildlife habitat, sediment/toxicant retention, and ground water recharge/discharge.

Vegetation
Undisturbed native wetlands nearby will be used as a reference for vegetation and structure. Patches of hydrophytic shrubs will be planted to create diversity. Fruit bearing shrubs will be planted to enhance bird use.

Contingency Plan
Should the site fail to attain the vegetative cover intended, a contingency planting plan would be installed. The plan would consist of acquiring replacement plants or substitute species for those that fail to grow.

Standards of Success
Species composition may vary from those planted, if natural recruitment of non-invasive native plants occurs, however the mitigation wetland should approximate the intended outcome, and will at a minimum be comparable to the impacted wetlands. Success should be determined by 50% aerial coverage of wetland plant species after the first growing season, and **80% coverage by the end of the five year monitoring period.**

[1] The impact acreage agreed upon in the USACE permit was 0.25 acres or 0.101 hectares not the 0.99 hectares as stated in this Conceptual Mitigation Plan.

Maintenance
Maintenance of the mitigation site would begin after completion of construction and continue for five years. After initial planting acceptance by WSDOT, the construction contractor will be responsible for planting survival for at least one year, including impacts by wildlife. After this period, maintenance will be performed by state forces and will be confined to repairing vandalism, repairing erosion damage, minor revegetation and **noxious weed control.**

Monitoring and Reporting
The mitigation site will be monitored annually for five years by WSDOT biologists using WSDOT wetland monitoring protocol. An annual report will be prepared for review by interested agencies and the public.

PERMIT REQUIREMENTS

The following excerpt is from the Island County Community Development Permit CAA 362/99. Requirements addressed this year are identified in **bold** font.

4. The submitted application materials call for 5 years of monitoring with an informal evaluation of the site's success prepared at the conclusion of the monitoring period. Monitoring reports shall be submitted annually to Island County. **In the event** plant mortality exceeds 20%, **invasive species coverage exceeds 20%, or other problems are identified through monitoring, appropriate action shall be taken by the applicant.** Plans for any such remedial action shall first be submitted for Island County review and approval.

Appendix 2 - Methods

To evaluate vegetative success standards for the wetland zones, a 48-meter baseline was established parallel to Fish Road along the edge of the forested wetland (Figure 2). Twenty-eight transects were placed perpendicular to the baseline using a systematic random sampling method.

The point intercept method was used to estimate cover of native wetland plant species (Success Standard). Thirty-six point-line sample units (30 points each) were randomly placed along the sampling transects. The equation shown here (right) was used to perform sample size analysis on data collected.

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

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

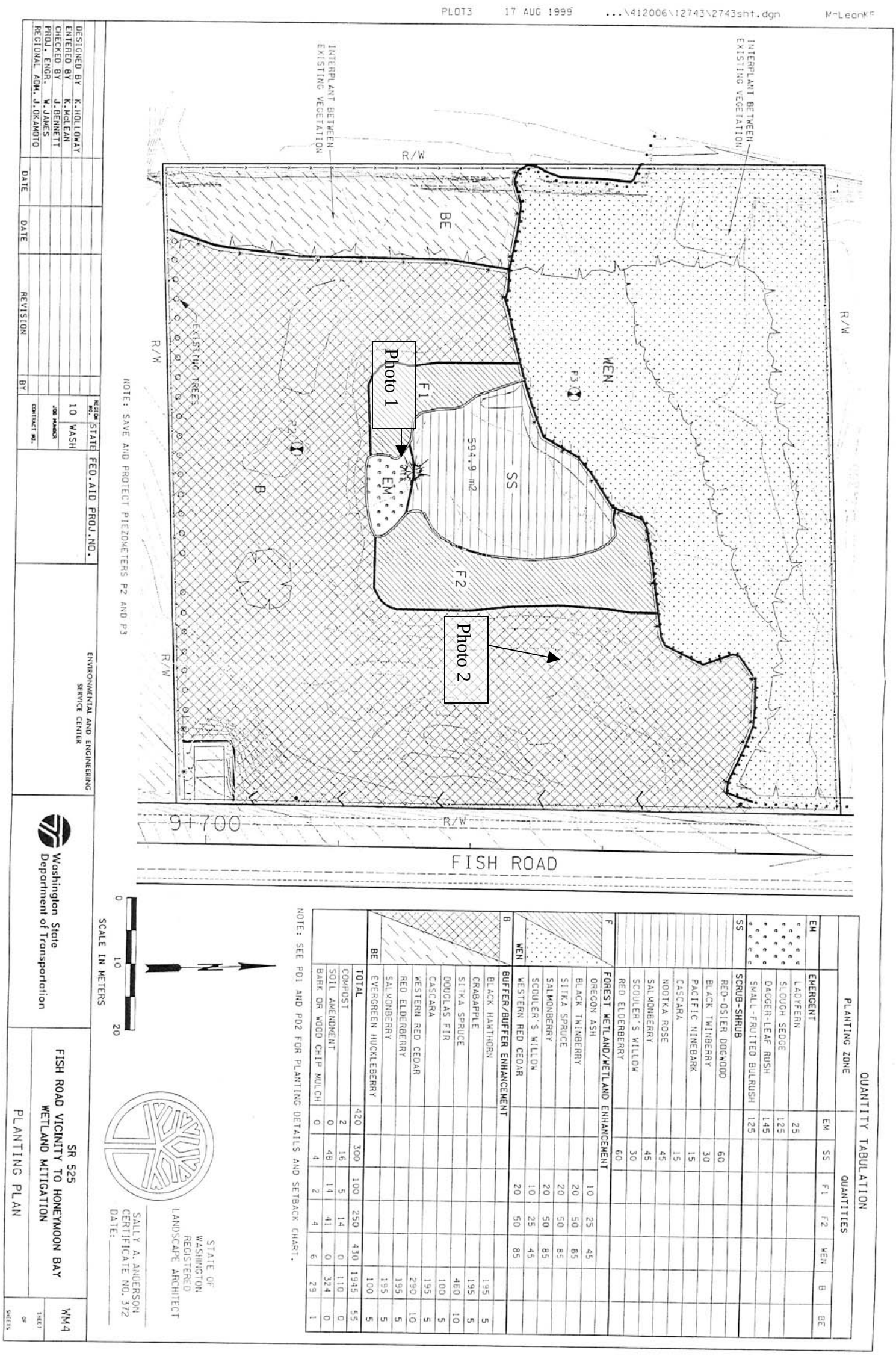
Qualitative observations were used to assess cover of non-native invasive species on site (Permit Requirement).

Methods in the *Washington State Wetlands Identification and Delineation Manual* (Ecology 1997) were used to evaluate wetland hydrology and wetland area. A Global Positioning System (Trimble TSCI data logger) was used to record the wetland boundaries.

For additional details on the methods, see view the WSDOT Wetland Mitigation Site Monitoring Methods at: http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf

Appendix 3 – SR 525 Fish Road Planting Plan

(from WSDOT 1999)



Appendix 4 - Data Tables

Hydrology Observations 2005

Date	Surface Observations	Subsurface Observations
16 March 05	There were 5-6 puddles of water in the emergent and scrub-shrub wetland zones. Both of the forested wetlands were saturated to the surface. The wetland enhancement zone appeared to be saturated to the surface in some areas, but had no standing water. A pit was not dug in this area due to the dense cover of *Spiraea douglasii* (hardhack) and *Rosa* spp. (roses).	**Pit 1 –** Placed in the emergent zone, had water at 14". **Pit 2 –** Placed in the eastern-forested wetland zone,. **Pit 3 –** Placed in the southeast corner of the scrub-shrub zone, was saturated to within 12".
12 April 05	Emergent area, southern end of both forested wetlands and south end of scrub-shrub zone up until woody structure inundated to 2 dm. Surface saturation was present in all surrounding wetland areas. Wetland enhancement areas were either saturated to the surface or inundated to 2 dm.	**Observations in the same locations as 16 March 2005** **Pit 1-** Inundated to 2 dm, so no pit. **Pit 2-** Inundated to 1 dm, so no pit. **Pit 3-** Saturated to the surface with standing water at 4 inches below surface.
22 August 05	Observations did not suggest any saturation or inundation in the intended wetlands.	No pits dug.

Observed Tree and Shrub Species 2005

Scientific Name	Common Name	Fruit and Seed Producers (Cooke 1997)
Cornus sericea	redosier dogwood	X
Fraxinus latifolia	Oregon ash	
Picea sitchensis	Sitka spruce	
Populus balsamifera	black cottonwood	
Pseudotsuga menziesii	Douglas-fir	
Rosa species	roses	X
Spiraea douglasii	hardhack	X
Thuja plicata	western red cedar	

Literature Cited

1. Cooke, S. S., (ed.). 1997. A Field Guide to the Common Wetland Plants of Western Washington and Northwestern Oregon. Seattle Audubon Society, Seattle, WA.

2. Island County Community Development Division. 1999. Island County Community Development Division Permit 362/99 CAA. Coupeville, WA.

3. Washington State Department of Ecology (Ecology). 1997. Washington State Wetlands Identification and Delineation Manual. Washington State Department of Ecology. Publication #96-94, Olympia, WA.

4. Washington State Department of Transportation (WSDOT). No Date. SR 525: Conceptual Wetland Mitigation Plan. Northwest Region, Seattle, WA

5. _____. 2005. WSDOT Wetland Mitigation Site Monitoring Methods (25 May 2005). http://www.wsdot.wa.gov/environment/biology/docs/MethodsWhitePaper052004.pdf