I-405, SR 520 to SR 522 Stage 1 (Kirkland Stage 1) (Forbes Lake West) Mitigation Site

USACE IP 200401410

Northwest Region

2014 MONITORING REPORT

Wetlands Program

Issued March 2015

Washington State Department of Transportation

Environmental Services Office

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USACE IP 200401410

General Site Information				
USACE IP Number	200401410			
Mitigation Location	Adjacent to Forbes Lake in Kirkland, King County			
LLID Number	1221811476844			
Construction Date	2007-2008			
Monitoring Period	2008-2017			
Year of Monitoring	7 of 10			
Type of Project Impact	Wetland			Buffer
Area of Project Impact[1]	1.56 acres			2.91
Type of Mitigation[2]	Wetland Establishment	Wetland Enhancement	Wetland Preservation	Upland Habitat Enhancement
Area of Mitigation	0.26 acre	0.46 acre	0.74 acre	0.75 acre

[1]Area of project impact and area of mitigation numbers taken from 2009 February 18 e-mail from Ken Sargent to Tony Bush; unreferenced.
[2]Additional mitigation is provided by Thrasher's Corner and Forbes Lake East Mitigation Sites

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Summary of Monitoring Results and Management Activities (2014)

Performance Standards (Year-10)	2014 Results	Management Activities
Wetland Hydrology	Not present in all intended areas	
Aerial cover of native woody species will be at least 80 percent in the forested and scrub-shrub wetlands, of this area no more than 30 percent will be volunteer red alder.	85 percent cover of native woody vegetation. 20 percent cover of red alder	
At least three native, non-invasive facultative or wetter plant species will achieve a minimum of 8 percent relative cover for each species in the emergent wetland zone by Year 10.	4 native herbaceous species provide 8 percent or more relative cover	
At least three native, non-invasive facultative or wetter plant species will achieve a minimum of 10 percent relative cover for each species in the forested and scrub-shrub wetland zones by Year 10.	5 native woody species provide 8 percent or more relative cover	
Species identified as King County-listed noxious and obnoxious weeds, including, but not limited to, reed canarygrass, non-native blackberries, purple loosestrife, Scot's broom, and Japanese knotweed will not exceed 20 percent aerial cover in the wetland creation areas. If this cover threshold is exceeded, weed control measures will be implemented. Emergent areas will be planted with trees and shrubs if invasive plant management is unsuccessful in the emergent zones.	5 percent cover of target invasive and noxious species	5 weed control visits occurred in 2014 between April and December

Report Introduction

This report summarizes seventh-year (Year-7) monitoring activities at the Interstate (I) 405 Forbes Lake West 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 surveys occurred on June 2, and wetland hydrology assessments occurred on March 3, March 24, and April 14, 2014.

What is the I-405 Forbes Lake West Mitigation Site?

This 2.2-acre mitigation site (Figure 1) was established as partial compensation for impacts to 1.56 of wetland and 2.91 acres of buffer due to road improvements along I-405 between State Route (SR) 520 and SR 522. The site was primarily designed to mitigate for lost wetland habitat functions.

Two other mitigation sites provide additional compensation for project impacts: I-405 Forbes Lake East and I-405 Thrasher's corner. To view a table detailing mitigation acreage at the three projects, see Appendix 3, Table 1.

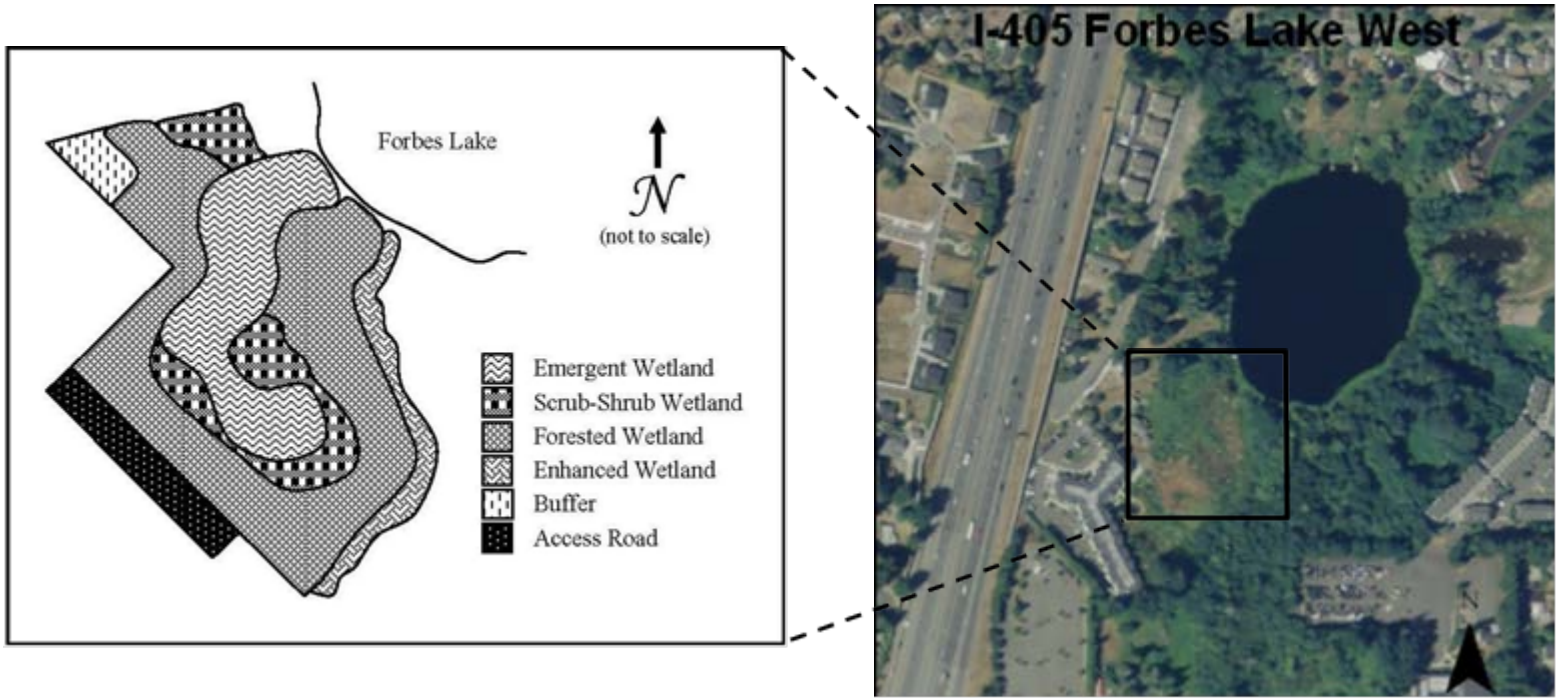


Figure 1 Site Sketch

The I-405 Forbes Lake West Mitigation site is adjacent to Forbes Lake on the southwest shoreline. An emergent area runs from the lakeshore down the center of the site, with a scrub-shrub zone bordering the southern half. The rest of the site is planted as forested wetland except for a small upland buffer area located in the northwestern corner. Appendix 2 includes site directions.

What are the performance standards for this site?

Year 10 (2017)

Performance Standard 1
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 at least 2 consecutive weeks (5 percent) of the growing season in years when rainfall meets or exceeds the 30-year average, or hydrology will be present sufficient to support facultative or wetter vegetative species within the wetland as demonstrated by the vegetative performance measures.

Performance Standard 2
After 10 years, aerial cover of native woody species will be at least 80 percent in the forested and scrub-shrub wetlands, of this area no more than 30 percent will be volunteer red alder.

Performance Standard 3
At least three native, non-invasive facultative or wetter plant species will achieve a minimum of 8 percent relative cover for each species in the emergent wetland zone by Year 10.

Performance Standard 4
At least three native, non-invasive facultative or wetter plant species will achieve a minimum of 10 percent relative cover for each species in the forested and scrub-shrub wetland zones by Year 10.

Performance Standard 5
Species identified as King County-listed noxious and obnoxious weeds, including, but not limited to, reed canarygrass, non-native blackberries, purple loosestrife, Scot's broom, and Japanese knotweed will not exceed 20 percent aerial cover in the wetland creation areas. If this cover threshold is exceeded, weed control measures will be implemented. Emergent areas will be planted with trees and shrubs if invasive plant management is unsuccessful in the emergent zones.

Appendix 1 shows the as-built planting plan (Myers 2008).

How were the performance standards evaluated?

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).

The cover of native woody vegetation (Performance Standards 2 and 4), the relative cover of native herbaceous species in the emergent wetland (Performance Standard 3), and the cover of noxious and invasive species (Performance Standard 5) were estimated qualitatively because there are no formal year-7 vegetation performance standards.

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

How is the site developing?

Vegetation communities at this site have developed as intended. All final—year performance standards related to vegetation have been achieved for two consecutive years. Established and existing wetland communities are thriving. Emergent cover is extremely dense throughout the center of the site with several native herbaceous species represented. Scrub-shrub and forested wetland communities are also diverse and well established in both establishment and enhancement areas. The planted vegetation in the small upland buffer area is extremely dense and likely provides one hundred percent cover.

Results for Performance Standard 1
(Wetland Hydrology):

All wells, with the exception of well number five, met wetland hydrology criteria on all three visits. Well number five, which is located on a slight mound very close to Forbes Lake, met hydrology criteria only on the first hydrology visit (Photo 1) (Appendix 3, Tables 2 and 3).

Results for Performance Standard 2
(Aerial cover of native woody species will be at least 80 percent in the forested and scrub-shrub wetlands, of this area no more than 30 percent will be volunteer red alder):

The cover of native woody species in the scrub-shrub and forested wetlands is qualitatively estimated to be 85 percent. Dominant woody species in the forested wetland include Sitka spruce (*Picea sitchensis*), black cottonwood (*Populus balsamifera*), red alder (*Alnus rubra*), and Oregon ash (*Fraxinus latifolia*). Dominant woody species in the scrub-shrub wetland include Nootka rose (*Rosa nutkana*), Pacific ninebark (*Physocarpus capitatus*), and willows (*Salix spp.*) (Photo 2). Within this area red alder is estimated to provide 20 percent cover.

Photo 1 Shallow inundation and saturated soils in the forested wetland (March 2014)

Photo 2 Dense woody vegetation in the forested and scrub-shrub wetlands (June 2014)

Results for Performance Standard 3
(At least three native, non-invasive facultative or wetter plant species will achieve a minimum of 8 percent relative cover for each species in the emergent wetland zone by Year 10):

Four native herbaceous species provide eight percent or more relative cover. These species include soft rush (*Juncus effusus*), broadleaf cattail (*Typha latifolia*), small-fruited bulrush (*Scirpus microcarpus*), and soft-stem bulrush (*Schoenoplectus tabernaemontani*) (Photo 3).

Results for Performance Standard 4
(At least three native, non-invasive facultative or wetter plant species will achieve a minimum of 10 percent relative cover for each species in the forested and scrub-shrub wetland zones):

Five native species including Pacific ninebark, willows (*Salix spp.*), Nootka rose (*Rosa nutkana*), black cottonwood, and red alder each provide at least eight percent relative cover within the scrub-shrub and forested wetlands.

Results for Performance Standard 5
(Species identified as King County-listed noxious and obnoxious weeds, including, but not limited to, reed canarygrass, non-native blackberries, purple loosestrife, Scot's broom, and Japanese knotweed will not exceed 20 percent aerial cover in the wetland creation areas):

The cover of target invasive and noxious species in the created wetland is qualitatively estimated at five percent. Species observed included purple loosestrife (*Lythrum salicaria*) and reed canarygrass (*Phalaris arundinacea*). Several weed control visits occurred in 2014 and weed control will continue in 2015.

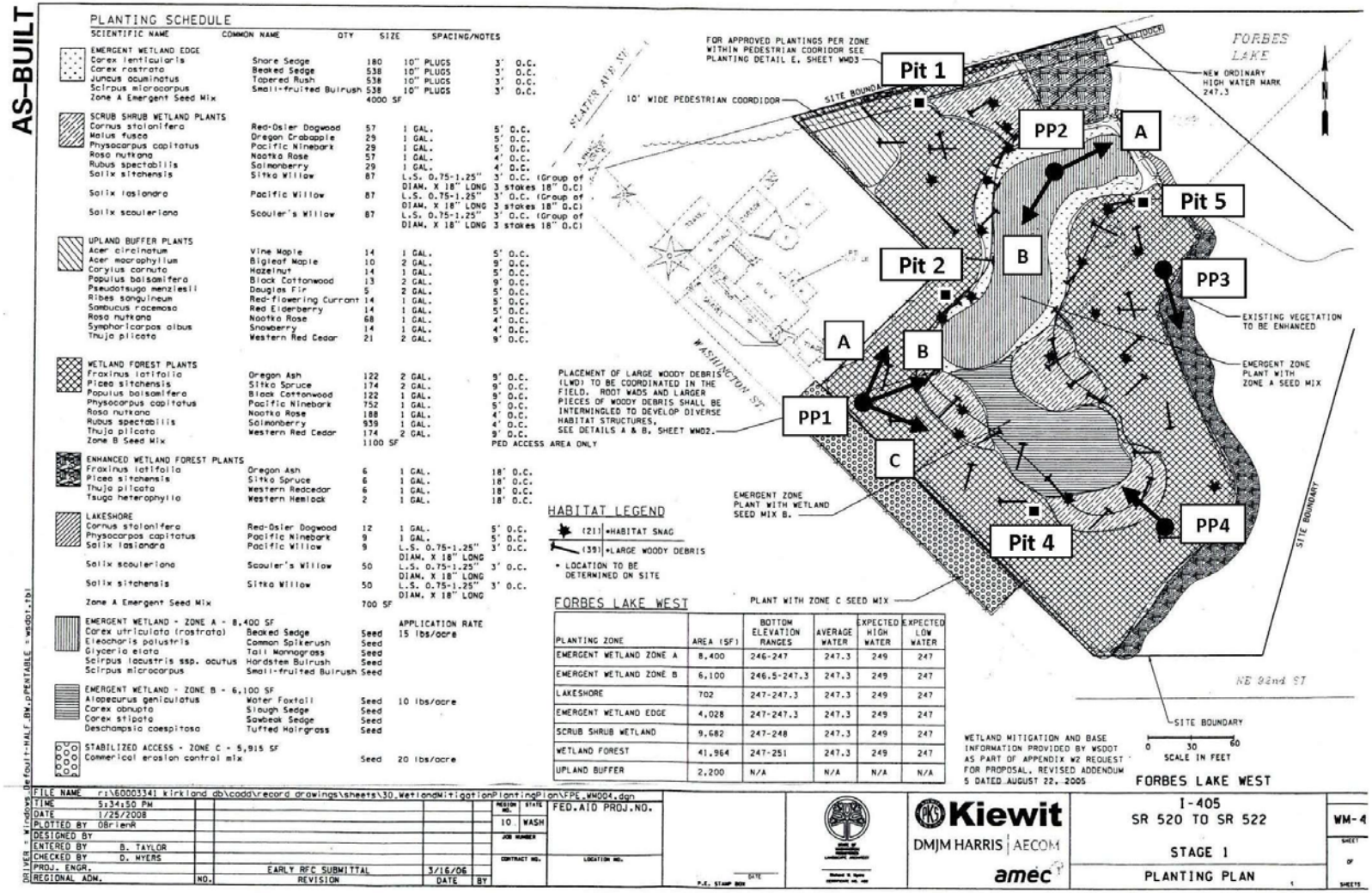
Photo 3
Herbaceous vegetation in emergent wetland (June 2014)

What is planned for this site?

Weed control, focusing particularly on any remaining or new purple loosestrife will continue in 2015.

Appendix 1 – As-built Planting Plan with Photo Point and Hydrology Pit Locations

(Myers 2008)



PLANTING ZONE	AREA (SF)	BOTTOM ELEVATION RANGES	AVERAGE WATER	EXPECTED HIGH WATER	EXPECTED LOW WATER
EMERGENT WETLAND ZONE A	8,400	246-247	247.3	249	247
EMERGENT WETLAND ZONE B	6,100	246.5-247.3	247.3	249	247
LAKESHORE	702	247-247.3	247.3	249	247
EMERGENT WETLAND EDGE	4,028	247-247.3	247.3	249	247
SCRUB SHRUB WETLAND	9,682	247-248	247.3	249	247
WETLAND FOREST	41,964	247-251	247.3	249	247
UPLAND BUFFER	2,200	N/A	N/A	N/A	N/A

Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on June 2, 2014 and document current site development.

Photo Point 1a

Photo Point 1b

Photo Point 1c

Photo Point 2a

Photo Point 2b

Photo Point 3

Photo Point 4

Driving Directions:
Take I-405 north from Bellevue. Exit at NE 85th Street. At the end of the ramp turn right and head east. At the third intersection turn left and travel north on 124 Street NE. Turn left on 97th Street and then left again at Slater Ave. Follow Slater Ave. to the end and park at the cul-de-sac. Walk down the paved path, between the last house on the left side of the road and the retirement home at the end of the cul-de-sac to the site.

Appendix 3 – Data Tables

Table 1. Constructed Mitigation Acreage at Wetland Mitigation Sites Associated with the I-405, SR 520 to SR 522 Stage 1 (Kirkland Stage 1) Project

Wetland Mitigation Site	Mitigation Type	Proposed Mitigation (acres)	Changes to Proposed Mitigation (acres)	Constructed Mitigation (acres)
Forbes Lake West	Establishment	0.56	-0.30	0.26
	Enhancement	0.86	-0.40	0.46
	Preserve	0.74		0.74
	Buffer	0.05	0.70	0.75
Forbes Lake East	Establishment	1.62		1.62
	Enhancement	0.57		0.57
	Buffer	1.49		1.49
Thrasher's Corner	Establishment	0.21	-0.07	0.14
	Enhancement	0.72		0.72
	Preserve	3.22		3.22
	Buffer	0.00	0.07	0.07

Table 2. Hydrology monitoring observations for 2014

Date	Surface Observations	Well ID #	Water Level (inches below soil surface unless otherwise noted)
March 10, 2014	Inundated throughout the center of the site. Eastern PFO no saturation, saturated throughout the rest of the site.	Well 1	Inundated 1.5”
		Well 2	1.0
		Well 4	Saturated to the soil surface
		Well 5	8.0”
March 24, 2014	Inundated down the center, PFO to the east dry, all PSS and emergent areas inundated or saturated.	Well 1	3.5”
		Well 2	Saturated to the soil surface
		Well 4	Saturated to the soil surface
		Well 5	18.5”
April 14, 2014	Emergent area inundated. Most of PSS saturated to the surface.	Well 1	9.5”
		Well 2	8.0”
		Well 4	1.0”
		Well 5	17.5”

Table 3. Comparison of Observed and Normal Precipitation (NRCS 1997)

Monthly precipitation data for Seattle Tacoma International Airport, Washington.

		Long-term rainfall records[a]							
	Month	**3 yrs. in 10 less than**	**Average**	**3 yrs. in 10 more than**	**Rain fall[a]**	**Condition dry, wet, normal[b]**	**Condition Value**	**Month weight value**	**Product of previous two columns**
1st prior month	March	2.71	3.75	4.42	9.44	W	3	3	9
2nd prior month	Feb	2.65	4.18	5.04	6.11	W	3	2	6
3rd prior month	Jan	3.50	5.13	6.12	3.7	N	1	1	1
								Sum	**16**

[a]NRCS 2014

[b] Conditions are considered normal if they fall within the low and high range around the average.

Note: If sum is

- 6 - 9 then prior period has been drier than normal
- 10 - 14 then period has been normal
- 15 - 18 then period has been wetter than normal

Condition value:

- Dry (D) =1
- Normal (N) =2
- Wet (W) =3

Conclusions: Wetter than normal precipitation conditions were present prior to hydrology monitoring visits.

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