

NATURAL RESOURCES DAMAGE ASSESSMENT PROJECT

YEAR 1 MONITORING REPORT

A. PROJECT OVERVIEW

1. U.S. ARMY CORPS OF ENGINEERS REFERENCE NUMBER

NWS-2009-0064-WRD and Washington Department of Fish and Wildlife Hydraulic Project Approval No. 115825-2.

2. RESPONSIBLE PARTY

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3. PARTY RESPONSIBLE FOR MONITORING

Jim Shannon and Dana Giffen of Anchor QEA conducted a monitoring site visit on August 7 through 9, 2012.

4. PROJECT PURPOSE SUMMARY

The project purpose of the Natural Resources Damage Assessment (NRDA) Restoration Action is to provide equal or greater ecological value to injured natural resources of Commencement Bay by supporting and improving existing riparian environments along the lower Hylebos Creek corridor. The construction of intertidal habitat, tidal channels, and freshwater marsh; the restoration of riparian upland habitat along Hylebos Creek; and the preservation of existing forested riparian habitat, buffer habitat, and open water habitat each support the project goals of increasing complex and continuous high quality habitat for juvenile salmonids and avian species. These efforts help provide habitat for wildlife and minimize invasive species coverage. This area comprises 14.25 acres of the entire 25 acres of Place of Circling Waters.

5. DESCRIPTION OF MITIGATION SITE LOCATION

The Property is located east of Tacoma and east of State Route (SR) 509 from downtown Tacoma, southeast of Hylebos Waterway. The Property address is 1621 Marine View Drive in Tacoma, Washington.

6. DIRECTIONS TO MITIGATION SITE

Access to the Property is achieved by travelling east on SR-509 approximately 4.0 miles from downtown Tacoma. The Property is found on the east side of SR-509, approximately 0.20 miles north of the intersection of SR-509 and Taylor Way East.

7. DATES OF COMPENSTATORY MITIGATION

Construction of the consolidated habitat site including the NRDA elements started in June 2010. Planting of the site began in September 2010 and was completed in May 2011.

8. STATEMENT REGARDING ACHIEVEMENT OF PERFORMANCE STANDARD

This is the first year of monitoring for this wetland. All Year 1 performance standards have been achieved. Aerial coverage of wetland and buffer vegetation is on track to meet the project goals. Minimal invasive species were found on site and manmade refuse was absent. No areas of excessive erosion were observed. In general, the site is in good condition.

9. DATES OF ANY RECENT CORRECTIVE OR MAINTENANCE ACTIVITIES

There is ongoing plant and invasive species maintenance by the contractor.

10. SPECIFIC RECOMMENDATIONS FOR ADDITIONAL CORRECTIVE OR REMEDIAL ACTIONS

Some areas of the upland buffer are in need of more irrigation. This summer has been very dry, and irrigation should continue to increase the chance of buffer vegetation survival.

B. REQUIREMENTS

Performance standards and methods for determining success were established in the monitoring and performance standards provided in the Construction Maintenance and Monitoring Plan (CMMP) (Grette Associates 2010) and the NRDA Restoration Action As-built report (Grette Associates 2012). Monitoring was conducted using the techniques and procedures described below to quantify the successful establishment of the emergent wetland, wetland buffer, and vegetative buffer on the site. Monitoring was conducted to determine achievement of the performance standards listed in Table 1 using methods described in Horner and Raedeke (1989).

Table 1
Natural Resources Damage Assessment Performance Standards
Sampling Method and Success by Monitoring Year

Performance Standard	Sampling Method	Year 1 (Achieved/ Failed)	Year 2 (Achieved / Failed)	Year 3 (Achieved / Failed)	Year 4 (Achieved / Failed)	Year 5 (Achieved / Failed)
1. No more than 5% areal coverage by invasive weed species at Years 1–2 No more than 10% areal coverage by invasive weed species Years 3–5	Areal coverage and species composition –visual walk through	Achieved – <5 % invasive weed species documented in visual walk through (about 2% estimated).	-	-	-	-
2a. Salmonid and avian species use	Snorkel, shoreline, and bird survey– presence	n/a	-	-	n/a	-
2b. Minimum of 10% areal coverage of emergent vegetation after Year 1, 20% after Year 3, and 30% after Year 5 and between +10 and +12.5 feet MLLW	Random plots (marsh plots) – areal coverage	Achieved – Average aerial coverage of native emergent species equals 35%	-	-	-	-
3a. Minimum of 10% areal coverage of native shrub species after Year 1, 20% after Year 2, 30% after Year 3, 40% after Year 4, and 50% after Year 5 and in areas not covered by existing mature tree canopies	Line-intercept method – areal coverage and species composition	Achieved – Average aerial coverage of native species equals 29%	-	-	-	-

Performance Standard	Sampling Method	Year 1 (Achieved/ Failed)	Year 2 (Achieved / Failed)	Year 3 (Achieved / Failed)	Year 4 (Achieved / Failed)	Year 5 (Achieved / Failed)
3b. Minimum of 5% areal coverage of native tree species after Year 1, 10% after Year 2, 15% after Year 3, 20% after Year 4, and 30% after Year 5	Belt-transect method – areal coverage and species composition	In progress – Not applicable in Year 1 due to age of trees	-	-	-	-
4a. Minimum of 10% areal coverage of native shrub species after Year 1, 20% after Year 2, 30% after Year 3, 40% after Year 4, and 50% after Year 5 and above +13 feet MLLW in areas not covered by existing mature tree canopies.	Line-intercept method – areal coverage and species composition	Achieved – Areal coverage of native shrub and tree species equals 14.2%	-	-	-	-
4b. Minimum of 5% areal coverage of native tree species after Year 1, 10% after Year 2, 15% after Year 3, 20% after Year 4, and 30% after Year 5 above +20 feet MLLW	Belt-transect method – areal coverage and species composition	In progress – Not applicable in Year 1 due to age of trees	-	-	-	-
4c. Provide maturing vegetation communities within the restored forested riparian habitat	Marsh plots –vegetation succession	Achieved – Maturing vegetation in marsh plots	-	-	-	-
4d. Terrestrial and avian species use in restored riparian habitat	Presence – visual walk through	Achieved – Species use observed	n/a	-	n/a	-
5a. Minimum of 80% areal coverage by native shrub and tree species within the disturbed buffer habitat at Year 5	Areal coverage – line-intercept, belt-transect methods	In progress – Average, areal coverage by tree species is 50% and areal coverage by shrub species is 14%	-	-	-	-
5b. Wildlife species use in preserved riparian habitat	Presence – visual walk through	Achieved – Species use observed	n/a	-	n/a	-

Notes:

MLLW = mean lower low water

n/a = not applicable

C. SUMMARY DATA

The summary data for each performance standard is presented below.

Performance Standard 1: No more than 5% areal coverage by invasive weed species at Years 1–2; no more than 10% areal coverage by invasive weed species Years 3–5

This parameter was measured by a visual walk through during Year 1. Invasive weeds noted in the visual walk-through include small patches of Himalayan blackberry (*Rubus armeniacus*) located near Transect T-7 and a large clump uphill of Transect T-5. A single Scotch broom (*Cytisus scoparius*) plant was noted along Transect T-5 in the restored riparian habitat zone. Overall, invasive plants comprised less than 5% areal coverage of the NRDA mitigation action area when measured in the quadrat and visual walk-through methods.

Performance standard 2a: Salmonid and avian species use

This parameter is not applicable in Year 1. It will be determined in Years 2, 3, and 5 through snorkel, shoreline, and bird surveys.

Performance standard 2b: Minimum of 10% areal coverage of emergent vegetation after Year 1, 20% after Year 3, and 30% after Year 5 and between +10 and +12.5 feet mean lower low water (MLLW)

This parameter was measured on August 7, 2012, using the quadrat method in four marsh plots, each 0.25 meters square (marsh plots 7, 8, 9, and 10). Native emergent species in the marsh plots included pickleweed (*Salicornia depressa*), and rush species (*Juncus* spp.). Brass buttons (*Cotula coronopifolia*) was also found in the marsh plots but is not native. (Table 2).

Table 2
Percent Coverage of Plant Species Observed in Marsh Plots

Common Name	Species Name	Percent Cover				
		Marsh Plot 7	Marsh Plot 8	Marsh Plot 9	Marsh Plot 10	Average
Bare ground	n/a	70	50	20	35	43.75
Brass buttons	<i>Cotula coronopifolia</i>	20	5	10	50	21.25
Pickleweed	<i>Salicornia depressa</i>	5	0	0	0	1.25
Rush	<i>Juncus</i> spp.*	5	45	70	15	33.75

Notes:

**Juncus* sprouts were too small to positively identify to species.

n/a = not applicable

Brass buttons had the most aerial coverage but is not native. Average aerial coverage of native emergent species was 35%. Rush species were too small to identify at the species level, so were grouped by genus. Some bare ground was present in each plot (Figure 2). This performance standard was achieved for Year 1.

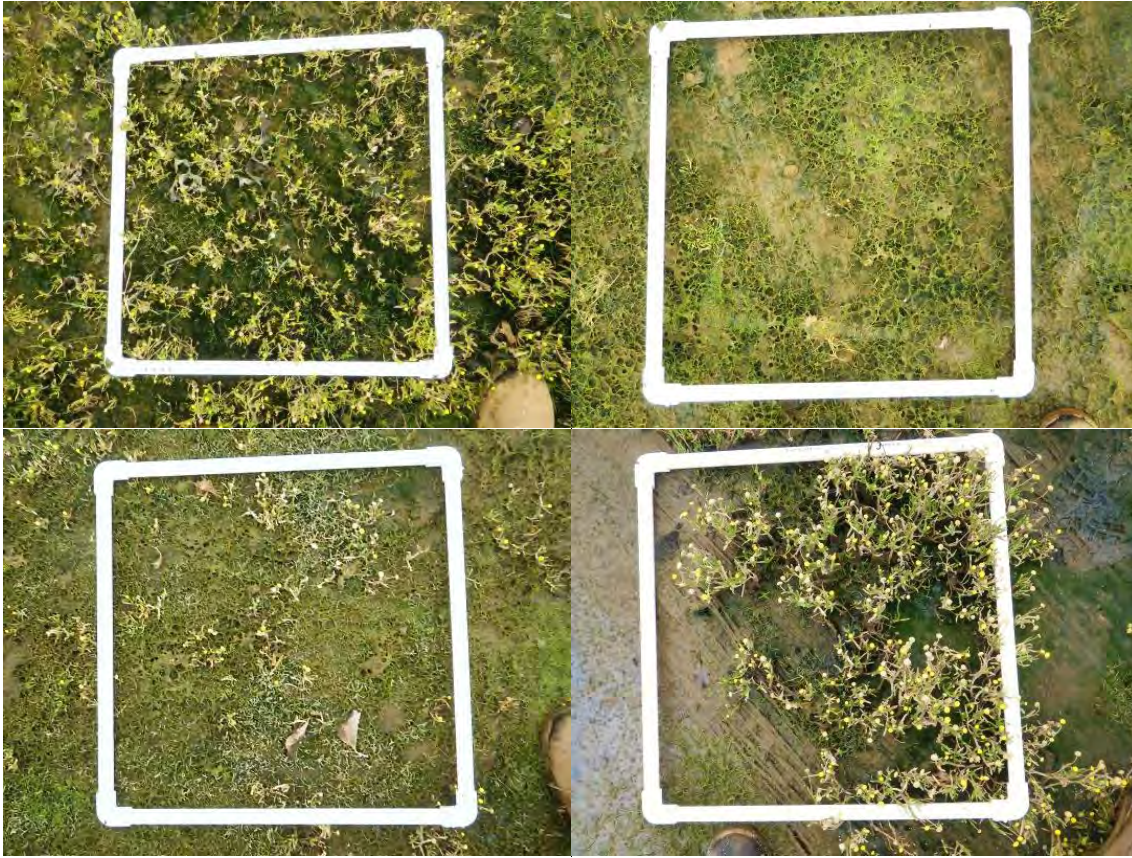


Figure 2

Marsh Plots 7, 8, 9, and 10

Performance standard 3a: Minimum of 10% areal coverage of native shrub species after Year 1, 20% after Year 2, 30% after Year 3, 40% after Year 4, and 50% after Year 5 and in areas not covered by existing mature tree canopies

This parameter was measured using the line-intercept method for Transect 5b. Transect 5b measures 38.7 meters and extends from Transect 5 (south end) to photo point 9. Areal coverage of native shrub and tree species was 29 percent (Table 3). This performance standard was achieved for Year 1.

Table 3
Species Areal Coverage Using the Line-intercept Method at Transect 5b (38.7 meters long)

Common Name	Species	Coverage Start Point (m)	Coverage End Point (m)	Coverage Distance (m)	Coverage
Pacific ninebark	<i>Physocarpus capitatus</i>	38.4	37.6	0.8	2.0%
Pacific willow	<i>Salix lucida</i>	32.9	32.8	0.02	0.1%
Pacific willow	<i>Salix lucida</i>	32.5	32.3	0.2	0.4%
Pacific willow	<i>Salix lucida</i>	24.0	22.8	1.2	3.1%
Pacific willow	<i>Salix lucida</i>	21.1	20.8	0.3	0.8%
Hooker willow	<i>Salix hookeriana</i>	20.4	19.8	0.6	1.4%
Pacific willow	<i>Salix lucida</i>	18.5	18.3	0.3	0.7%
Pacific willow	<i>Salix lucida</i>	17.3	17.2	0.02	0.1%
Pacific willow	<i>Salix lucida</i>	16.3	15.0	1.3	3.3%
Black cottonwood	<i>Populus trichocarpa</i>	15.0	14.5	0.5	1.3%
Hooker willow	<i>Salix hookeriana</i>	13.8	13.2	0.6	1.6%
Hooker willow	<i>Salix hookeriana</i>	12.5	10.4	2.1	5.5%
Scouler willow	<i>Salix scouleriana</i>	9.4	9.3	0.1	0.3%
Red osier dogwood	<i>Cornus sericea</i>	8.3	7.2	1.1	2.8%
Scouler willow	<i>Salix scouleriana</i>	5.7	4.9	0.8	2.0%
Hooker willow	<i>Salix hookeriana</i>	1.8	0.5	1.4	3.5%
Total					29.0%

Note:
m = meters

Performance standard 3b: Minimum of 5% areal coverage of native tree species after Year 1, 10% after Year 2, 15% after Year 3, 20% after Year 4, and 30% after Year 5

The method to determine areal coverage is the belt-transect method along Transect 5b. However, this method requires trees that are greater than 2 meters in height. During Year 1, planted trees did not exceed 2 meters in height. Therefore, this method was not used during Year 1 monitoring. This performance standard is in progress and will be reassessed during Year 2.

Performance standard 4a: Minimum of 10% areal coverage of native shrub species after Year 1, 20% after Year 2, 30% after Year 3, 40% after Year 4, and 50% after Year 5 and above +13 feet MLLW in areas not covered by existing mature tree canopies

This performance standard was assessed using the line-intercept method along Transect 6, which measures 45.1 meters. Areal coverage of native shrub and tree species was 14.2% for Transect 6 (Table 5). This performance standard was achieved for Year 1.

Table 5
Species Areal Coverage Using the Line-intercept Method at Transect 6 (45.1 meters long)

Common Name	Species Name	Coverage Start Point (m)	Coverage End Point (m)	Coverage Distance (m)	Coverage
Red osier dogwood	<i>Cornus sericea</i>	0.3	0.5	0.2	0.5%
Pacific ninebark	<i>Physocarpus capitatus</i>	0.5	0.7	0.2	0.3%
Red osier dogwood	<i>Cornus sericea</i>	0.7	0.7	0.1	0.2%
Pacific ninebark	<i>Physocarpus capitatus</i>	2.0	2.1	0.2	0.4%
Red osier dogwood	<i>Cornus sericea</i>	2.6	3.4	0.8	1.7%
Pacific ninebark	<i>Physocarpus capitatus</i>	3.4	3.7	0.3	0.7%
Pacific willow	<i>Salix lucida</i>	8.1	8.2	0.1	0.3%
Pacific willow	<i>Salix lucida</i>	12.6	12.9	0.3	0.6%
Pacific willow	<i>Salix lucida</i>	13.5	14.6	1.1	2.4%
Red osier dogwood	<i>Cornus sericea</i>	15.2	15.3	0.1	0.3%
Pacific willow	<i>Salix lucida</i>	17.1	17.1	0.1	0.2%
Pacific willow	<i>Salix lucida</i>	17.2	17.4	0.2	0.3%
Red osier dogwood	<i>Cornus sericea</i>	23.4	23.7	0.3	0.6%
Scouler willow	<i>Salix scouleriana</i>	24.7	24.9	0.2	0.3%
Scouler willow	<i>Salix scouleriana</i>	25.1	25.1	0.1	0.2%
Cluster rose	<i>Rosa pisocarpa</i>	32.9	33.7	0.8	1.7%
Oceanspray	<i>Holodiscus discolor</i>	36.5	36.8	0.3	0.6%
Pacific willow	<i>Salix lucida</i>	37.4	37.8	0.4	0.9%
Red osier dogwood	<i>Cornus sericea</i>	37.9	38.3	0.4	0.8%
Pacific willow	<i>Salix lucida</i>	41.4	41.5	0.1	0.3%
Scouler willow	<i>Salix scouleriana</i>	42.7	43.2	0.4	0.9%
T-6 Total					14.2%

Note:
m = meters

Performance standard 4b: Minimum of 5% areal coverage of native tree species after Year 1, 10% after Year 2, 15% after Year 3, 20% after Year 4, and 30% after Year 5 above +20 feet MLLW

The method to determine areal coverage is the belt-transect method along Transect 5a. Transect 5a measures 67.4 meters, and it starts at Transect 5 (north end) and ends at photo point 9. However, this method requires trees that are greater than 2 meters in height. During Year 1, planted trees did not exceed 2 meters in height. Therefore, this method was not used during Year 1 monitoring. This performance standard is in progress and will be reassessed during Year 2.

Performance Standard 4c: Provide maturing vegetation communities within the restored forested riparian habitat

This performance standard was measured using photo point 11 (Figure 3). This performance standard was met for Year 1, and it is expected that further maturation of the vegetation will occur over time.



Figure 3
Maturing Vegetation at Photo Point 11

Performance standard 4d: Terrestrial and avian species use in restored riparian habitat

This performance standard was measured through a visual walk through. Avian species observed in Zone 1 include Canadian geese (*Branta canadensis*), American goldfinch (*Spinus tristis*), and a belted kingfisher (*Megasceryle alcyon*). Signs of terrestrial species include Canadian beaver (*Castor canadensis*) markings (i.e., visible mud trail from the water to shore and small willow stumps with teeth marks) observed near photo point 9.

Performance standard 5a: Minimum of 80% areal coverage by native shrub and tree species within the disturbed buffer habitat at Year 5

This performance standard was measured using the belt-transect and line-intercept methods. It is not applicable until Year 5; however, at Year 1 monitoring, areal coverage by tree species is 50% and areal coverage by shrub species is 14% in Transect 7 (Tables 6 and 7).

Table 6
Species Areal Coverage Using the Belt-transect Method for Transect 7 (33.2 meters long)

Common Name	Species Name	DBH (m)	Areal Coverage
Bigleaf maple	<i>Acer macrophyllum</i>	1.21	28%
Bigleaf maple	<i>Acer macrophyllum</i>	0.55	14%
Red alder	<i>Alnus rubra</i>	0.25	5%
Douglas fir	<i>Pseudotsuga menziesii</i>	0.25	5%
Total			50%

Note:

DBH = diameter at breast height

m = meters

Table 7
Species Areal Coverage Using the Line-intercept Method for Transect 7 (33.2 meters long)

Common Name	Species	Coverage Start Point (m)	Coverage End Point (m)	Coverage Distance (m)	Coverage
Indian plum	<i>Oemleria cerasiformis</i>	29.0	28.7	0.3	0.9%
Vine maple	<i>Acer circinatum</i>	23.9	23.6	0.3	0.9%
Vine maple	<i>Acer circinatum</i>	18.9	18.4	0.5	1.4%
Salmonberry	<i>Rubus spectabilis</i>	18.0	17.5	0.5	1.4%
Salmonberry	<i>Rubus spectabilis</i>	16.2	15.5	0.8	2.3%
Salmonberry	<i>Rubus spectabilis</i>	14.3	13.9	0.4	1.3%
Vine maple	<i>Acer circinatum</i>	12.5	11.8	0.7	2.2%
Western hemlock	<i>Tsuga heterophylla</i>	11.5	10.7	0.8	2.5%
Vine maple	<i>Acer circinatum</i>	3.8	3.6	0.2	0.6%
Total					13.7%

Note:

m = meters

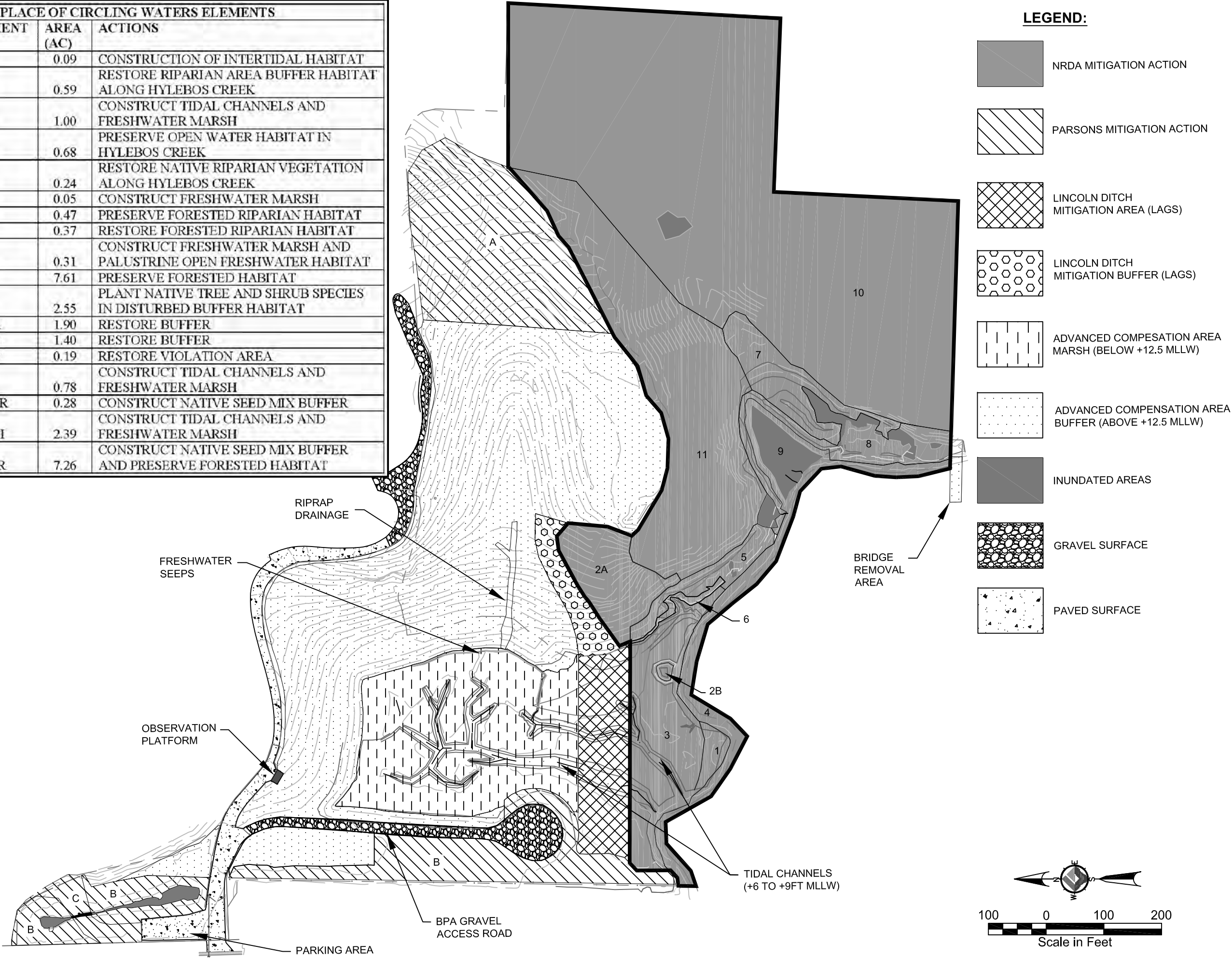
Performance standard 5b: Wildlife species use

This parameter was measured with a visual walk through. A Western red-backed salamander (*Plethodon vehiculum*) was observed near Transect 7. There were also signs of waterfowl predation, most likely from a coyote (*Canis latrans*) or raccoon (*Procyon lotor*).

D. MAPS

As-built plan maps are provided on the following pages.

PLACE OF CIRCLING WATERS ELEMENTS		
PROJECT ELEMENT IDENTIFIER	AREA (AC)	ACTIONS
NRDA 1	0.09	CONSTRUCTION OF INTERTIDAL HABITAT
NRDA 2	0.59	RESTORE RIPARIAN AREA BUFFER HABITAT ALONG HYLEBOS CREEK
NRDA 3	1.00	CONSTRUCT TIDAL CHANNELS AND FRESHWATER MARSH
NRDA 4	0.68	PRESERVE OPEN WATER HABITAT IN HYLEBOS CREEK
NRDA 5	0.24	RESTORE NATIVE RIPARIAN VEGETATION ALONG HYLEBOS CREEK
NRDA 6	0.05	CONSTRUCT FRESHWATER MARSH
NRDA 7	0.47	PRESERVE FORESTED RIPARIAN HABITAT
NRDA 8	0.37	RESTORE FORESTED RIPARIAN HABITAT
NRDA 9	0.31	CONSTRUCT FRESHWATER MARSH AND PALUSTRINE OPEN FRESHWATER HABITAT
NRDA 10	7.61	PRESERVE FORESTED HABITAT
NRDA 11	2.55	PLANT NATIVE TREE AND SHRUB SPECIES IN DISTURBED BUFFER HABITAT
PARSONS A	1.90	RESTORE BUFFER
PARSONS B	1.40	RESTORE BUFFER
PARSONS C	0.19	RESTORE VIOLATION AREA
LAGS	0.78	CONSTRUCT TIDAL CHANNELS AND FRESHWATER MARSH
LAGS BUFFER	0.28	CONSTRUCT NATIVE SEED MIX BUFFER
ACM MARSH	2.39	CONSTRUCT TIDAL CHANNELS AND FRESHWATER MARSH
ACM BUFFER	7.26	CONSTRUCT NATIVE SEED MIX BUFFER AND PRESERVE FORESTED HABITAT



REF: CORPS PERMIT # NWS-2009-0064-WRD
WDFW HPA # 115825-2

IN: TACOMA
COUNTY OF: PIERCE

STATE OF: WASHINGTON

APPLICATION BY: PORT OF TACOMA

DATE: 12 MARCH 2012

CREATED BY: GRETTIE ASSOCIATES

PLACE OF CIRCLING WATERS

NRDA AS-BUILT

PLAN VIEW

PROJECT: 121.006

SHEET: 1 OF 2

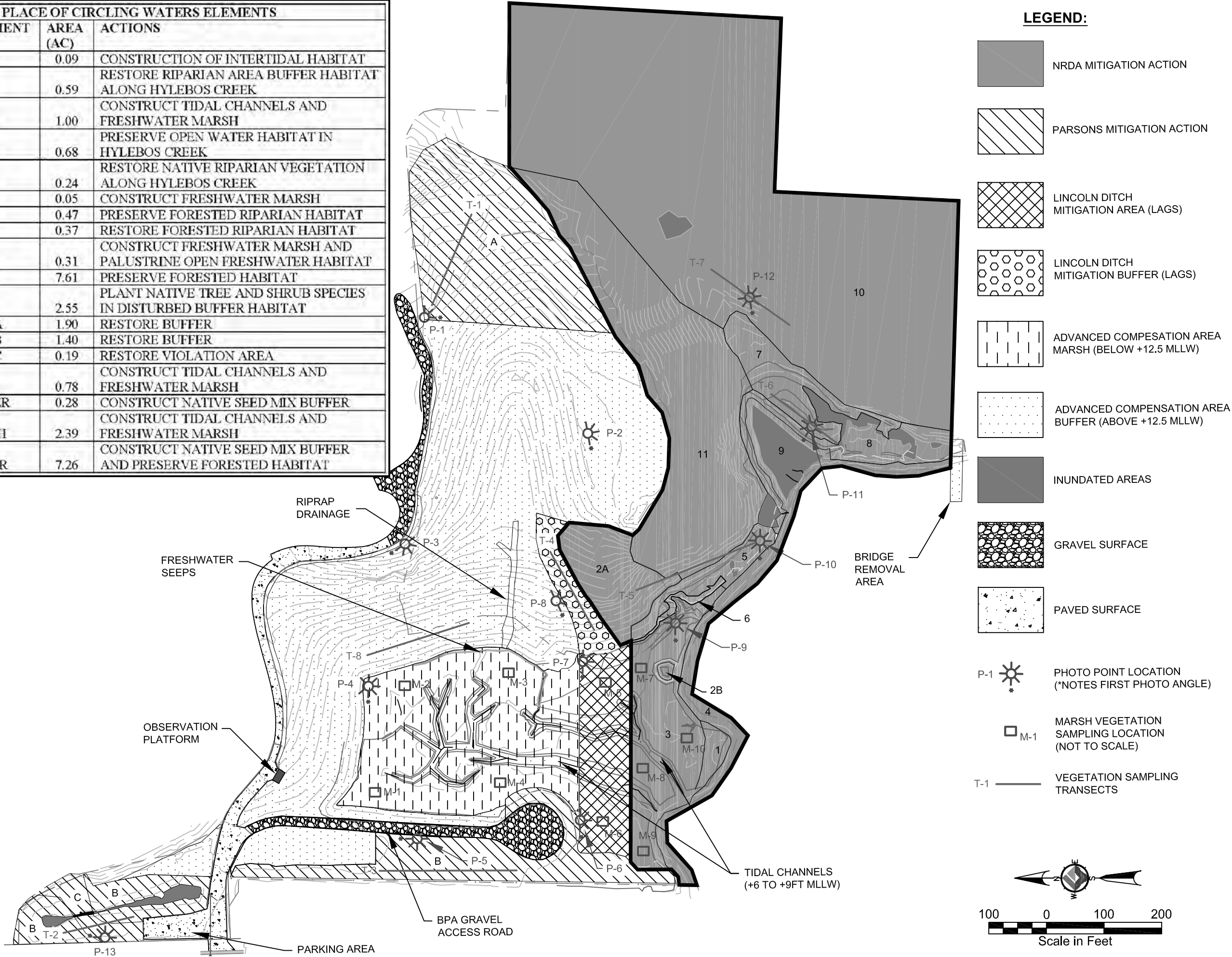
PURPOSE: PLACE OF CIRCLING WATERS AS-BUILT

FOR: PORT OF TACOMA
P.O. BOX 1837
TACOMA, WA 98401

OFFICE:TACO

MH CM RB

PLACE OF CIRCLING WATERS ELEMENTS		
PROJECT ELEMENT IDENTIFIER	AREA (AC)	ACTIONS
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ACM BUFFER	7.26	CONSTRUCT NATIVE SEED MIX BUFFER AND PRESERVE FORESTED HABITAT



PORT OF TACOMA U.S.A.

REF: CORPS PERMIT # NWS-2009-0064-WRD
WDFW HPA # 115825-2

IN: TACOMA
COUNTY OF: PIERCE
STATE OF: WASHINGTON

APPLICATION BY: PORT OF TACOMA
DATE: 12 MARCH 2012

CREATED BY: GRETTIE ASSOCIATES

PLACE OF CIRCLING WATERS

NRDA AS-BUILT

PHOTO POINT AND TRANSECT LOCATION MAP

PROJECT: 121.006 SHEET: 2 OF 2

PURPOSE: PLACE OF CIRCLING WATERS AS-BUILT

FOR: PORT OF TACOMA
P.O. BOX 1837
TACOMA, WA 98401

OFFICE:TACO

E. CONCLUSIONS

This is the first year of monitoring for this NRDA site. As described in section C, all Year 1 performance standards have been achieved. Minimal invasive species were found on-site and manmade refuse was nonexistent. No areas of excessive erosion were observed. In general, the site is in good condition. However, some areas of the buffer are in need of more irrigation. This summer has been very dry, and irrigation should continue to increase buffer vegetation survival.

REFERENCES

- Grette Associates, Inc., 2012. *Natural Resource Damage Assessment Restoration Action As-built Report*. Prepared for Port of Tacoma. March 2012.
- Grette Associates, Inc., 2010. *Parcel 88 Combined Habitat Project Construction Maintenance and Monitoring Plan*. Prepared for Port of Tacoma. May 2012.
- Horner, R., and K.J. Raedeke, 1989. *Guide for Wetland Mitigation Project Monitoring, Research Project GC8286*. Prepared for the Washington State Transportation Commission.