

Tarlatt Slough Mitigation Site

USACE NWS-2009-048

Southwest Region

2014 MONITORING REPORT

Wetlands Program

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Tarlatt Slough Mitigation Site

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	General Site Information				
	USACE #	2009-048			
	Mitigation Location	Southwest corner of Willapa Bay, Pacific County			
	Construction Date	2013			
	Monitoring Period	2014-2023			
	Year of Monitoring	1 of 10			
	Area of Project Impact¹	17.4 acre			
	Type of Mitigation	Wetland Re-establishment	Wetland Rehabilitation	Buffer	Tidal channel Re-establishment
	Planned Area of Mitigation	1.45 acre	41.68 acre	6.13 acre	13,700 linear feet

¹Impact acreage source WSDOT SW Region accounting ledger (Appendix 4). Mitigation acreage source WSDOT (2010).

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Summary of Monitoring Results and Management Activities (2014)

Performance Standards	2014 Results	Management Activities
Natural tidal cycles occur across the restored tidal wetland	Photo documentation (see Photo 1)	
Natural channel processes and development	Photo documentation (see Appendix 2)	
Restored channel network development	13,812 linear feet (Appendix 3)	
Natural recruitment and re-colonization of salt marsh vegetation	Photo documentation (see Appendix 2)	
Development of salt marsh plant community	120 permanent plots set up; Dominant species: inland saltgrass (<i>Distichlis spicata</i>) and tufted hairgrass (<i>Deschampsia caespitosa</i>)	
Density of at least 4 native woody plants/100ft ² in all planted buffer areas	5.7 plants/100ft ²	
Class A noxious weeds eradicated and Pacific County-designated Class B noxious weeds controlled	No Class A weeds observed; Class B weed tansy ragwort (<i>Jacobaea vulgaris</i>) observed on inland edge of wetland.	
Cover of non-designated Class B noxious weeds and non-native blackberries (<i>Rubus</i> species) less than 20% in upland buffer	Visually estimated at 10%	
Cover of non-designated Class B noxious weeds and non-native blackberries less than 10% in the wetland	Visually estimated at 5%	

Report Introduction

This report summarizes first-year (Year-1) monitoring activities at the Tarlatt Slough 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 tide and channel hydrology on July 14-16, 2014.

What is the Tarlatt Slough Mitigation Site?

This 49.26 acre mitigation site (Figure 1) is a re-established wetland that was historically part of the tidal wetland/marsh system at the mouth of Tarlatt Slough at the southernmost end of Willapa Bay. Significant improvements to the ecosystem functions of this site will be used to mitigate in advance for anticipated highway construction impacts in the Willapa Bay area. The re-established wetland, wetland rehabilitation area, buffer area, and tidal channel re-establishment are designed to improve water quality and water quality functions, wildlife habitat, and aquatic habitat.

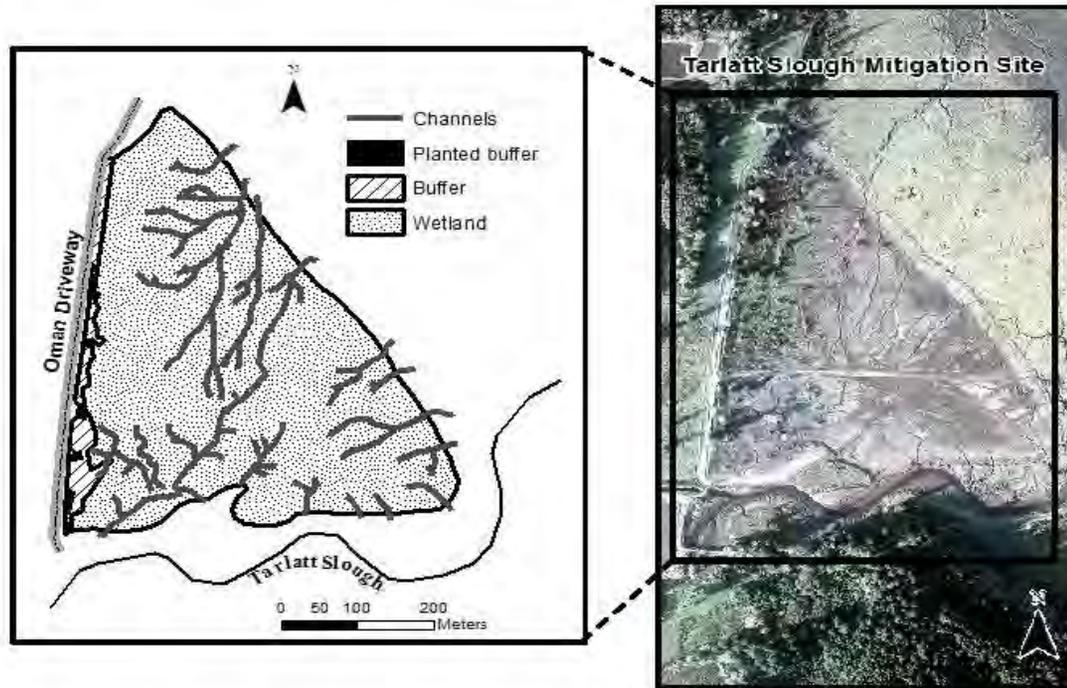


Figure 1 Site Sketch

The Tarlatt Slough Mitigation Site contains an upland buffer area along the west side with five planting areas, and channels running through the re-established and rehabilitated wetland. Appendix 2 includes site directions.

What are the performance standards for this site?

Performance Standard 1

Natural tidal cycles will occur across the restored tidal wetland.

Performance Standard 2

During monitoring years 1, 3, 5, 7, and 10, visually assess channel development.

Performance Standard 3

At monitoring years 1, 3, and 5 the restored channel network will be mapped to assess channel development.

Performance Standard 4

During the growing season, wetland vegetation establishment will be visually assessed.

Performance Standard 5

At monitoring years 1, 3, 5, 7, and 10, vegetation will be surveyed to assess plant community development.

Performance Standard 6

At monitoring years 1 and 3, there will be a minimum density of four native woody plants/100ft² in all planted buffer areas.

Performance Standard 7

In all monitoring years, Washington State-listed Class A noxious weeds must be eradicated and Pacific County-designated Class B noxious weeds must be controlled. All occurrences shall be immediately reported to the site manager and an eradication program (in the case of Class A weeds) or control measures (in the case of Class B-designate weeds) will be initiated within 30 days of the report.

Performance Standard 8

The cover of non-designated Class B weeds and non-native blackberries in the upland buffer will not exceed 20 percent.

Performance Standard 9

The cover of non-designated Class B weeds and non-native blackberries in the wetland will not exceed 10 percent.

Appendix 1 shows the as-built planting plan (WSDOT 2013).

How were the performance standards evaluated?

Several methods were used to evaluate vegetation at the site. Permanent photo points were established for photo documentation of wetland vegetation establishment during the growing season (Performance Standard 4) (Appendix 2). To assess plant community development, 120 permanent plots were set up across the site to monitor the vegetation community over time (Performance Standard 5) (Figure 2). All plant species were identified. Density in the planted buffer was calculated by counting all native woody plants within the planted areas and dividing that number by the area of the planted buffer zone (Appendix 1) (Performance Standard 6). Class A weeds and Pacific County-designated Class B weeds were searched for and identified (Performance Standard 7). Cover of non-designated Class B weeds and non-native blackberries in the upland buffer and wetland was visually estimated (Performance Standards 8 and 9).

Photo documentation and mapping were used to assess tidal and channel performance standards. WSDOT staff photographed the extent of tidal inundation during a high tide event predicted by NOAA (2014) to exceed nine-and-a-half feet above sea level at the Tarlatt Slough Tide Station (Performance Standard 1) (Photo 1). Photo points were established to record and assess natural channel processes and development (Performance Standard 2) (Appendix 2). The restored channel network was mapped using a 2013 aerial photograph to determine the total length of tidal channel present (Performance Standard 3) (Appendix 3).

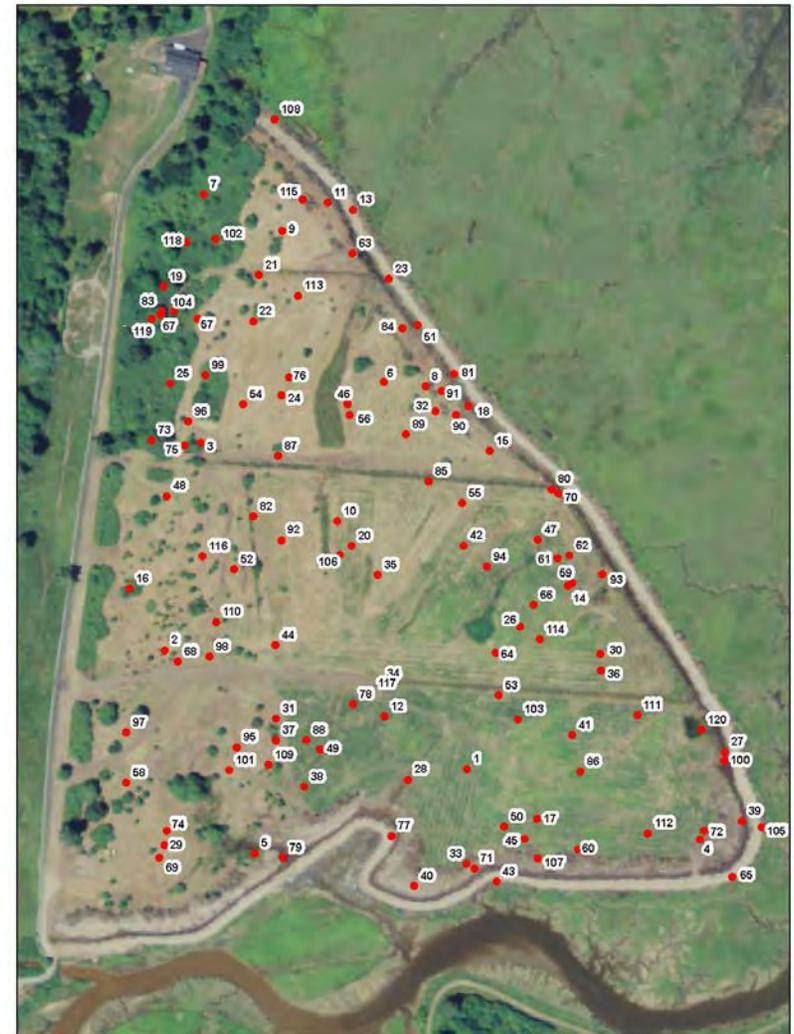


Figure 2 Site Sampling Design (2014)

How is the site developing?

This site is developing well, continuing to transition from freshwater to saltwater/brackish conditions. Natural tidal cycles and channel network have been restored. Density of woody species in the buffer meets the performance standard this year, though it may be a struggle to meet this standard in year 3. The native woody species appear stressed, possibly due to salt water inundating the area during the highest tides. Roses (*Rosa* species) were the main species observed. Many wildlife signs were observed including: bear, elk, deer prints, coyote scat, and birds' nests with chicks.

Results for Performance Standard 1
(Natural tidal cycles):

Evidence of natural tidal cycles across the restored tidal wetland was found (Photo 1). High-tide occurred at 4:32 PM on July 14, and was 8.85 feet above sea level at the Tarlatt Slough Tide Station (NOAA 2014). Photo 1 was taken at the Tarlatt Slough mitigation site at 3:31 PM, when the tide was approximately 8.00 feet above sea level.

Results for Performance Standard 2
(Development of natural channel processes):

Natural channel processes appear to be developing (Photo 2). Photo documentation was taken at fixed photo points (Appendix 2).

Results for Performance Standard 3
(Restored channel network development):

A total of 13,812 linear feet of restored natural channel was mapped from a 2013 aerial photo of the site (Appendix 3). This exceeds the performance standard target.



Photo 1
One hour before high-tide (July 14, 2014)



Photo 2
Restored natural channel (July 2014)

Results for Performance Standard 4
(Wetland vegetation establishment):

Vegetation in the wetland is recolonizing and becoming established (Photo 3). Photo documentation was taken at fixed photo points (Appendix 2).

Results for Performance Standard 5
(Plant community development):

Dominant species are inland saltgrass (*Distichlis spicata*) and tufted hairgrass (*Deschampsia caespitosa*) (Photo 3).

Results for Performance Standard 6
(Minimum density of 4 native woody plants/100ft² in buffer):

Density in the buffer is 5.7 native woody plants/100ft² (Photo 4). This value exceeds the performance standard target. Nootka rose (*Rosa nutkana*) is the dominate species, and Sitka spruce (*Picea sitchensis*) and Pacific crabapple (*Malus fusca*) were also observed.



Photo 3
Wetland vegetation (July 2014)



Photo 4
Density in buffer (July 2014)

Results for Performance Standard 7

(Class A noxious weeds eradicated and Pacific County-designated Class B noxious weeds controlled):

No Class A noxious weeds were observed at the time of monitoring. Tansy ragwort (*Jacobaea vulgaris*), a Pacific County-designated Class B noxious weed was observed on the inland edge of the wetland during monitoring activities and reported to the region.

Results for Performance Standard 8

(Cover of non-designated Class B noxious weeds and non-native blackberries in the upland buffer less than 20%):

Invasive cover in the buffer is visually estimated to be 10 percent. This value is below the performance standard threshold. Species present include Himalayan blackberry (*Rubus armeniacus*), cutleaf blackberry (*Rubus laciniatus*), and bull thistle (*Cirsium vulgare*).

Results for Performance Standard 9

(Cover of non-designated class B weeds and non-native blackberries in the wetland will not exceed 10%):

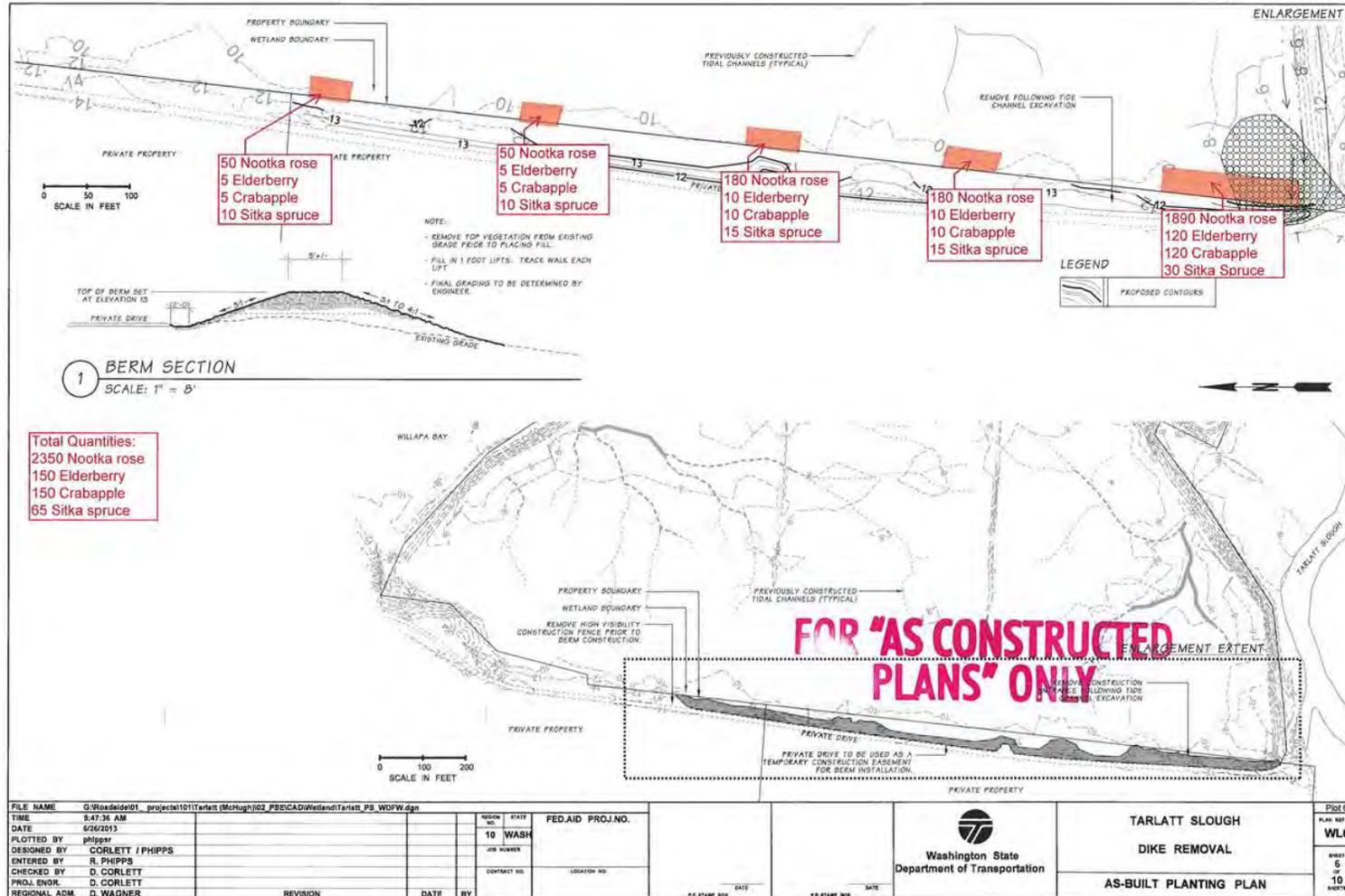
Invasive cover in the wetland is visually estimated to be five percent. This value is below the performance standard threshold. Species present include reed canarygrass (*Phalaris arundinacea*), Himalayan blackberry (*Rubus armeniacus*), and tansy ragwort (*Jacobaea vulgaris*).

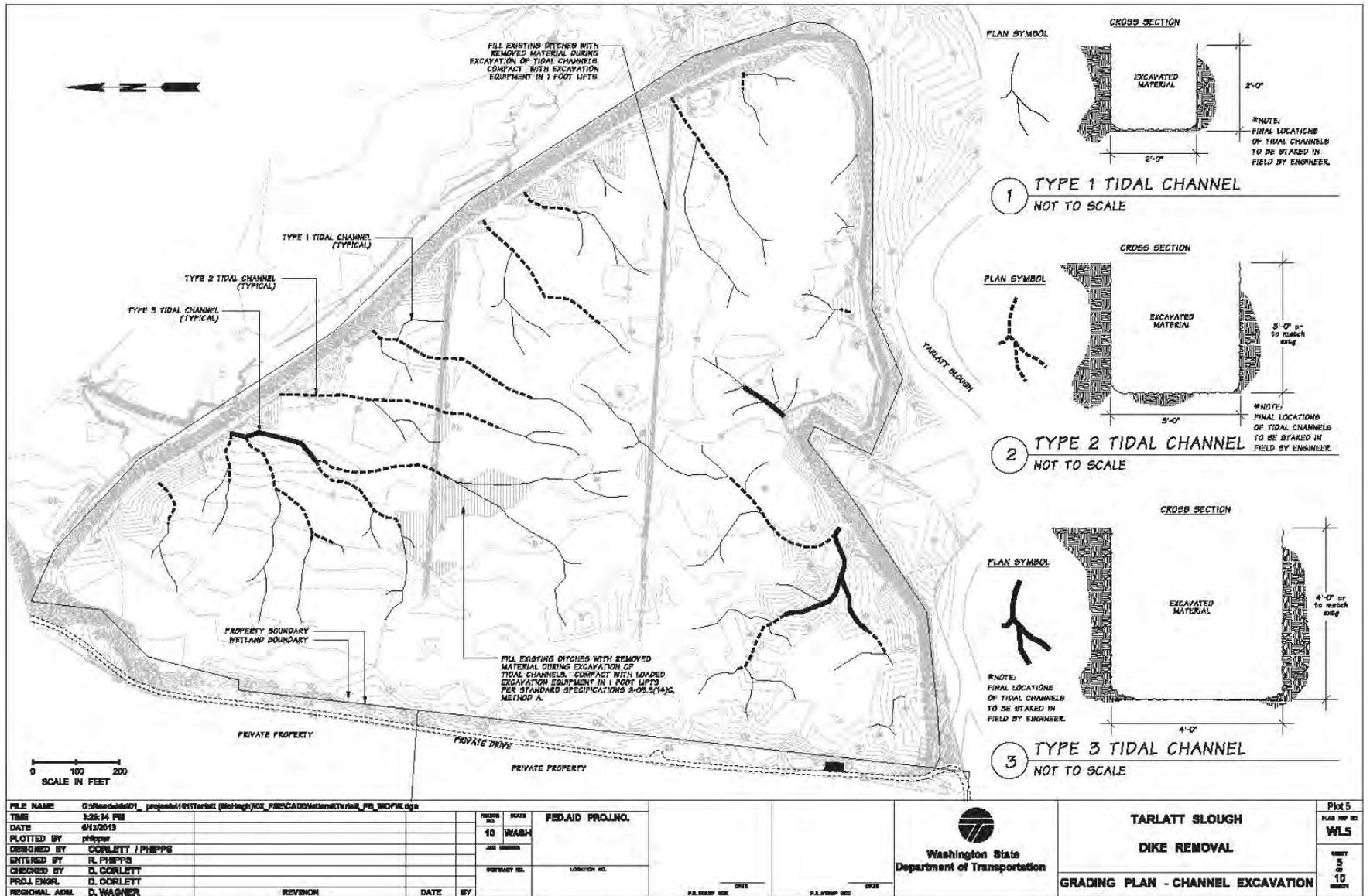
What is planned for this site?

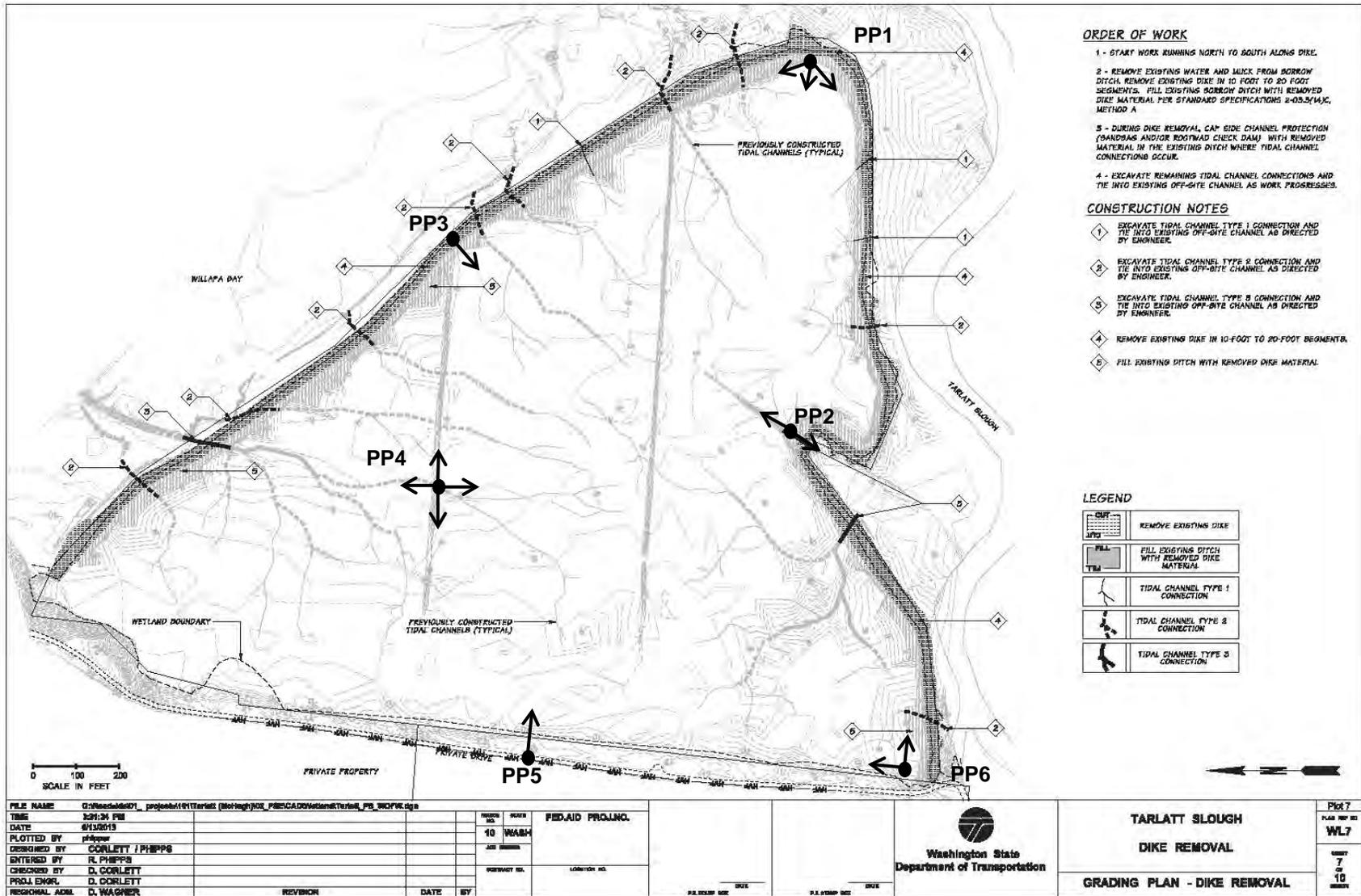
The region has plans to continue weed control as needed.

Appendix 1 – As-Built Planting Plan, Grading Plans with Photo Point Locations, and Buffer Planting Areas

(from WSDOT 2013)







Tarlatt Slough Buffer Planting Areas



Appendix 2 – Photo Points

The photographs below were taken from permanent photo-points on July 16, 2014 and document current natural channel processes and development and vegetation re-colonization and establishment across the site.



Photo Point 1a



Photo Point 1b



Photo Point 1c



Photo Point 2a



Photo Point 2b



Photo Point 3



Photo Point 4a



Photo Point 4b



Photo Point 4c



Photo Point 4d



Photo Point 5



Photo Point 6a

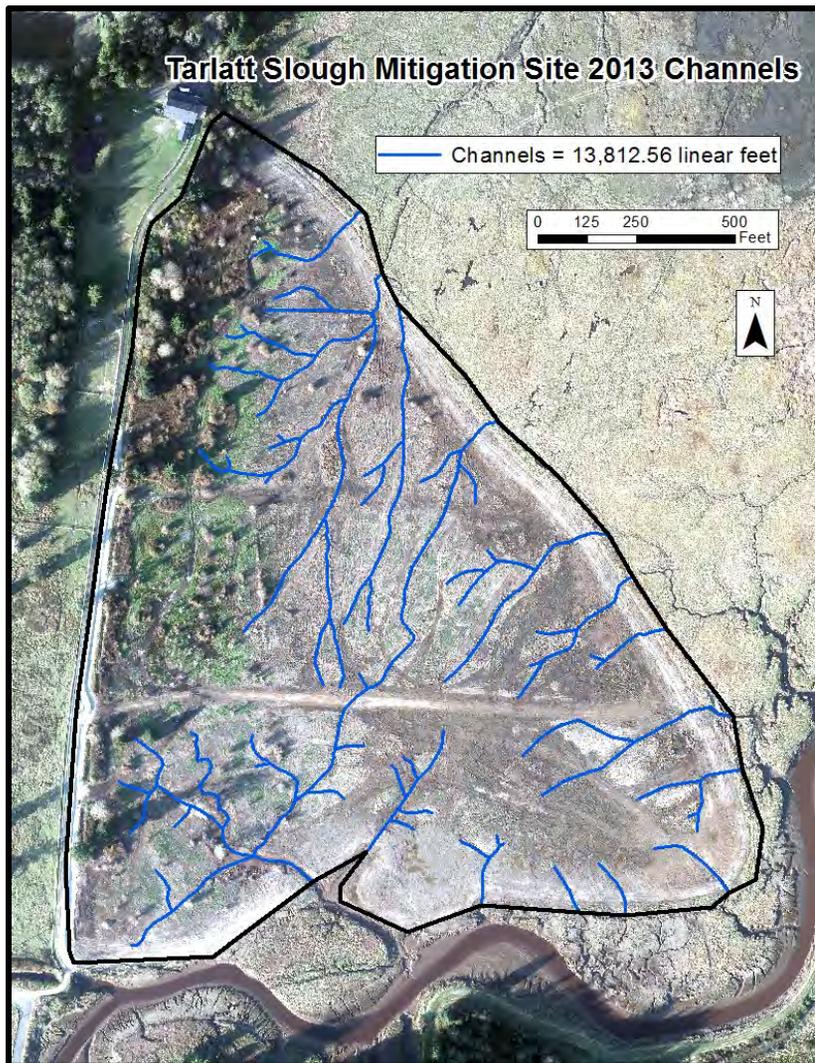


Photo Point 6b

Driving Directions:

Take US 101 towards Long Beach. Turn north on Sand Ridge Road. Approximately 2.5 mi north of US 101, turn east onto 95th (95th is the first street north of Pioneer Road). Travel east on 95th for approximately 0.5 mile to where the road T's and park. The Tarlatt Slough parcel is located east of the private drive that runs to the north from the "T" intersection.

Appendix 3 – Channel Analysis



Appendix 4 – Accounting Ledger

Literature Cited

1. [NOAA] National Oceanic and Atmospheric Administration (US) [Internet]. 2014. NOAA Online Weather Data. National
2. [USACE] US Army Corps of Engineers. 2010. Department of the Army Individual Permit Number 2009-048.
3. [WSDOT] Washington State Department of Transportation. 2010. Wetland Assessment and Advanced Mitigation Proposal Tarlatt Slough Mitigation Site. Vancouver (WA): Washington State Department of Transportation, Southwest Region.
4. [WSDOT] Washington State Department of Transportation. 2013. Tarlatt Slough Dike Removal As-built Planting Plan.
5. [WSDOT] Washington State Department of Transportation. 2008. WSDOT Wetland Mitigation Site Monitoring Methods. <http://www.wsdot.wa.gov/NR/rdonlyres/C211AB59-D5A2-4AA2-8A76-3D9A77E01203/0/MethodsWhitePaper052004.pdf>