

**Highway 101 Jimmycomelately Estuary (Eng Property)
Mitigation Site**

USACE NWP (27) 200500512

Olympic Region

2010 MONITORING REPORT

Wetland Assessment and Monitoring Program

Issued March 2011



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Highway 101 Jimmycomelately Estuary (Eng Property) Mitigation Site

USACE NWP (27) 200500512

	General Site Information	
	USACE NWP 27 Number	200500512
	Mitigation Location	SR 101, Jimmycomelately Creek, Blyn, Clallam County
	LLID Number	1230053480221
	Construction Date	2005-2006
	Monitoring Period	2006-2015
	Year of Monitoring	5 of 10
	Area of Project Impact	0.69 acre ¹
	Type of Mitigation	Tidal basin restoration, Stream Relocation, Wetland Establishment
	Mitigation Credit Area	1.83 acres ²

¹ This is an advanced mitigation site. The 0.69 acre of impact is from the Blyn Passing Lanes project.

² The site provides 3 acres of mitigation credit. Of those 3 acres, 1.17 acres was needed to mitigate for the Blyn Passing Lanes project impact.

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Summary of Monitoring Results and Management Activities (2010)

Performance Standards	2010 Results ³	Management Activities
Maintain a hydrological connection between Jimmycomelately Creek (JCL) and the associated estuary	Present and functioning	
80% of the large woody debris (LWD) present	78% present	
Document estuarine vegetation with photo points, site observations, and a plant list	See Appendix 2 for a plant list and Appendix 5 for photos	
Native planted woody vegetation in the buffer will achieve a minimum of 30% aerial cover (75% in year-10)	77% cover (CI _{80%} = 71-84%)	Installed plants and bark mulch
Less than 20% aerial cover of noxious weeds over the entire site. The site shall contain less than 5% aerial cover by specific species ⁴ .	3% cover on entire site and 2% of target species	Hand pulling and herbicide application of non-native and invasive species.

Report Introduction

This report summarizes Year-5 monitoring activities at the Highway 101 Jimmycomelately Estuary Mitigation Site. Final Year (Year-10) standards are the same as Year-5 with the exception of the woody cover in the buffer and can be applied to this year’s results. Included are a site description, the performance standards, an explanation of monitoring methods, and an evaluation of site development. Monitoring activities including vegetation surveys, photo-documentation, salinity measurements, and assessments of hydrologic connectivity occurred on August 3rd and 4th, 2010.

³ Estimated values are presented with their corresponding statistical confidence interval. For example, 77% cover (CI_{80%} = 71-84%) means we are 80% confident that the true aerial cover value is between 71% and 84%.

⁴ See Appendix 1 for a complete list of target species.

What is the Highway 101 Jimmycomelately Estuary Mitigation Site?

This 6.34-acre mitigation site (Figure 1) consists of tidal basin restoration, creek channel relocation, and wetland creation. The mitigation site provides advanced mitigation for 0.69 acre of anticipated wetland impacts. This mitigation effort is part of a large collaborative project to restore lower Sequim Bay and JCL Creek.⁵ Mitigation site goals include restoration of the JCL Creek channel and estuary for waterfowl, shorebirds, shellfish, juvenile salmon, and the ESA-listed Hood Canal summer chum (*Oncorhynchus keta*).

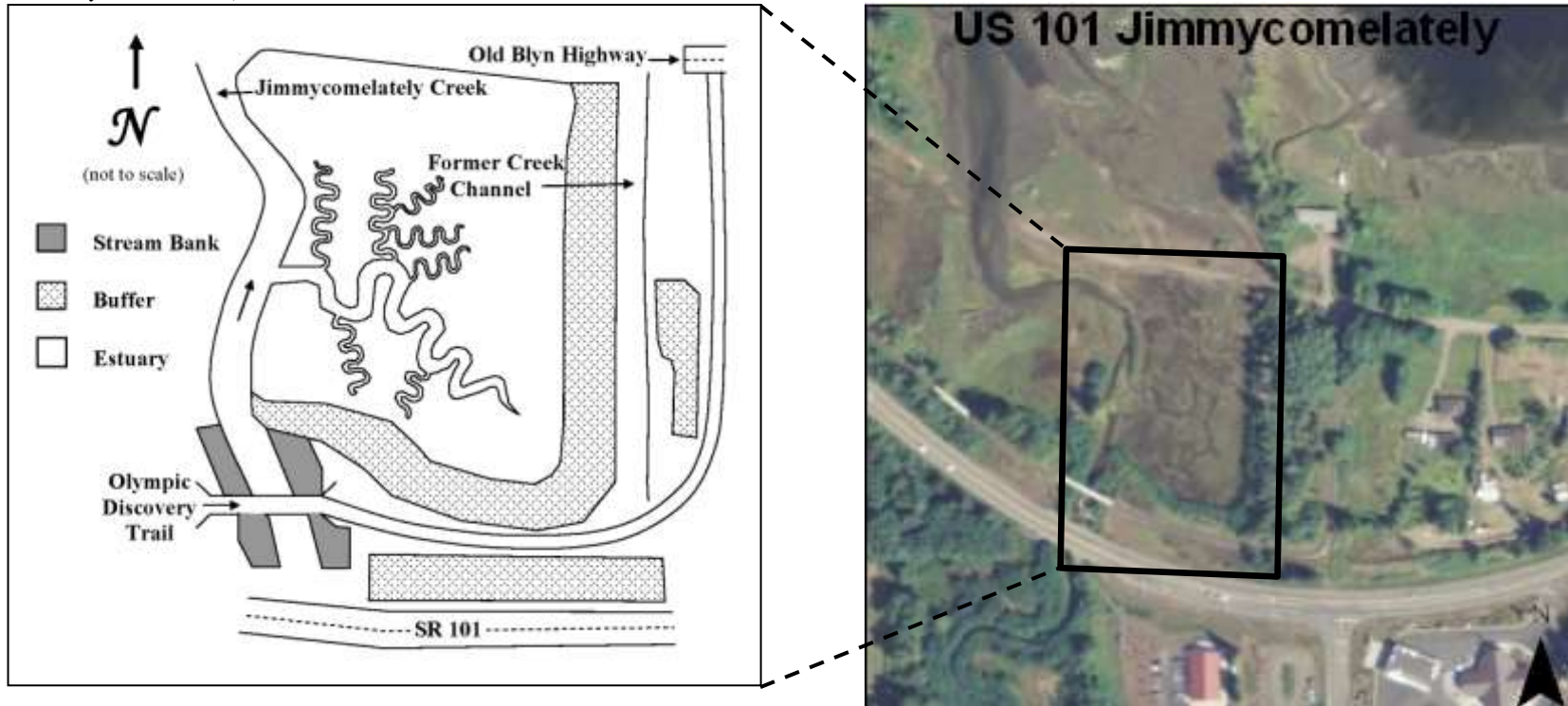


Figure 1 Site Sketch

The site is located along US 101 on the north side of the replacement bridge spanning JCL Creek. Wetland buffer surrounds the tidal basin with sinuous channels connecting to JCL Creek.

⁵ See the complete Highway 101 Jimmycomelately Estuary (Eng Property) Mitigation Plan (WSDOT 2005) for more information on restoration efforts by other parties.

What are the performance standards for this site?

Performance Standard 1

A functioning hydrological connection shall be restored and self-maintaining between JCL Creek and the estuary.

Performance Standard 2

Eighty percent or more of the LWD placements should be present in Years 1-10.

Performance Standard 3

The natural recolonization of estuarine vegetation shall be documented with photo points and general site observations, including a plant list.

Performance Standard 4

Native planted woody vegetation in the buffer will achieve a minimum of 30 percent aerial cover (75 percent in Year-10)

Performance Standard 5

Noxious weeds will not exceed 20 percent aerial cover over the entire site. The site shall contain less than 5 percent aerial cover by *Cirsium arvense* (Canada thistle), *Cirsium vulgare* (bull thistle), *Cytisus scoparius* (Scot's broom), *Lythrum salicaria* (purple loosestrife), *Phalaris arundinacea* (reed canarygrass), *Phragmites australis* (common reed), *Polygonum bohemicum* (Bohemian knotweed), *Polygonum cuspidatum* (Japanese knotweed), *Polygonum polystachyum* (Himalayan knotweed), *Polygonum sachalinense* (giant knotweed), and *Spartina alterniflora* (smooth cordgrass).

Appendix 1 provides the complete text of the performance criteria for this project, and Appendix 4 shows the planting plan (Beall 2005).

How were the performance standards evaluated?

To evaluate the hydrologic connection between JCL Creek and the estuary, the channel was visually assessed, noting any obstructions by sediments or debris (Performance Standard 1).

To assess LWD presence, locations, and areal cover, the Global Positioning System (Trimble Geo XH data logger) was used to delineate the borders of each LWD pile (Performance Standard 2). Area covered by LWD in 2010 was compared to baseline data collected in 2006.

Re-colonization of estuarine vegetation was evaluated using photo documentation, species lists, and qualitative estimates (Performance Standard 3).

To evaluate cover of native woody species in the buffer (Performance Standard 4), a 306 meter baseline was established along the edges of the buffer (Figure 2). Twenty-six sampling transects were placed twelve meters apart perpendicular to the baseline using the systematic random method. Twenty-seven ten meter long line intercept sampling units were used to determine woody cover in this area. Aerial cover of noxious weeds was qualitatively estimated using visual estimates (Performance Standard 5).

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 in the next column 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

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

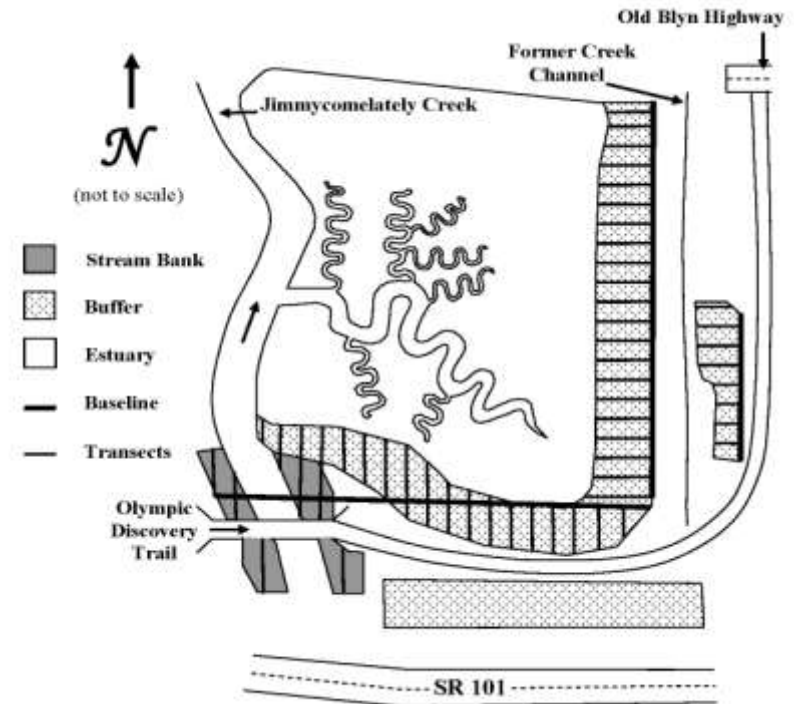


Figure 2 Site Sampling Design (2010)

How is the site developing?

This site is meeting nearly all of the Year-5 performance standards. A functioning hydrological connection between the estuary and Jimmycomelately creek was observed at the time of monitoring. Salinity measurements were made throughout the site and the results ranged from one to seventeen parts per thousand (ppt) (Results table and sampling location map in Appendix 2). Results from sampling points one through ten range between one ppt to five ppt indicating an oligohaline environment and classifying this system as Estuarine (Cowardin et al, 1979). Eighteen salt tolerant herbaceous species were also observed indicating a continuous hydrological connection between the estuary and the creek.

The vegetation communities on this site are thriving. The cover of woody species in the buffer is dense and easily meets both the Year-5 and Year-10 standards and the herbaceous community in the estuary continues to become more diverse every year.

The only area that appears to be struggling is the area between the bike path and Highway 101, meant to serve as a buffer to the wetland area. This area was not included in the sample design when sampling for woody cover during the 2010 monitoring season. Survival of plant species is low and many non-native species have taken over. The region has amended the soil with bark mulch and has replanted the area with 50 oceanspray (*Holodiscus discolor*), 30 Nootka rose (*Rosa nutkana*), and 100 snowberry (*Symphoricarpos albus*).

Wildlife signs were plentiful onsite. Many species of birds were observed including five Least Sandpipers (*Calidris minutilla*) and a Killdeer (*Charadrius vociferous*) nest with hatched eggs. Bullfrogs, snakes, elk and deer tracks, coyote scat and mole mounds were noted on site and crabs and fish were also observed in and around the creek.

Results for Performance Standard 1

(Maintain a hydrological connection between Jimmycomelately Creek (JCL) and the associated estuary):

A functioning hydrologic connection between Jimmycomelately creek and the adjacent estuary was observed at the time of monitoring (Photo 1). The channels in the estuary were inundated at a depth of approximately twelve to eighteen inches.

Results for Performance Standard 2

(80% of the large woody debris (LWD) present):

Large woody debris piles were placed on site to provide habitat, cover and foraging sites for wildlife species and it appears that they are performing these functions. The location and cover of the LWD piles were recorded in Year-1 (2006). This baseline data was used to determine percent cover of LWD on-site in Year-5 (2010) (Appendix 3). Cover of large woody debris (measured in square footage) is estimated at 78 percent of the original baseline data (Photo 2), falling just short of the target for Year-5. In 2008, the LWD was estimated at 129 percent of the baseline data. The variation of these data, however, are likely due more to fluctuation in the arrangement of the LWD on the site and the difficulty in establishing an accurate and reliable method for estimating this attribute, than to an actual large change in the amount of LWD on site. Visual observations and photo documentation suggest that the amount of LWD on site has changed very little since it was placed there and is not blocking the waterway nor is it posing any threat to structures.



Photo 1
Hydrological connection (August 2010)



Photo 2
LWD in the wetland (August 2010)

Results for Performance Standard 3

(Document estuarine vegetation with photo points, site observations, and a plant list):

The number of species observed in the tidal flat has increased from previous years. Twenty-five salt and freshwater tolerant plant species provide an estimated 75 percent aerial cover (Photo 3). Twenty of the twenty-five herbaceous species observed are native. Eighteen species are salt-tolerant (Hutchinson 1988). Natural colonization continues to increase species diversity. See Appendix 2 for a list of species recorded, and Appendix 5 for photo points.

Results for Performance Standard 4

(Native planted woody vegetation in the buffer will achieve a minimum of 30% aerial cover [75% in Year-10]):

The cover of native woody species in the buffer is 77% ($CI_{80\%} = 71-84\%$). Dominant species observed in this area include red alder (*Alnus rubra*) and willows (*Salix* spp.), ranging in height from approximately five to twelve meters (Photo 4 – next page). This estimate does not include the buffer area between the bike trail and US 101, which was originally planted in 2008. At the time of monitoring, this area was dominated by grasses and weedy herbaceous species, but since then, planting and soil amendments have occurred. This cover value does include all of the originally planted buffer areas (the estuary buffer, the riparian banks, and the Smith property).

Results for Performance Standard 5

(Less than 20% aerial cover of noxious weeds over the entire site. The site shall contain less than 5% aerial cover by specific species):

Cover of noxious weeds across the site is estimated at three percent. Cover of specific species mentioned in Appendix 1 is estimated at two percent. The most common species observed include reed canarygrass (*Phalaris arundinacea*), bull thistle (*Cirsium vulgare*), and Robert geranium (*Geranium robertianum*).



Photo 3
Emergent cover in Wetland 1 (August 2010)



Photo 4
Woody cover in the buffer (August 2010)

What is planned for this site?

The region plans to continue with weed control efforts.

Appendix 1 – Goals and Performance Standards

The following excerpt is from the *Highway 101 Jimmycomelately Estuary (Eng Property) Wetland Mitigation Plan* (WSDOT 2005). The performance criteria addressed this year are identified in **bold** font.

GOALS

The following goals were excerpted from the Jimmycomelately Creek-Lower Sequim Bay Estuary Restoration Project: Estuary Monitoring Plan (Shreffler 2004). These goals and objectives were identified by the EDG and pertain to the whole JCL estuary restoration project. The performance criteria listed under each objective in the next section were developed by WSDOT to directly focus on the restoration efforts at the Eng site, not the entire project. These criteria are consistent with the overall goals and objectives of the entire restoration effort.

1. Restore the southern end of Sequim Bay (lower Sequim Bay), including the tidal flats and channels, the historic salt marsh, the Dean Creek channel, and the estuary of JCL and Dean Creek for resident migratory waterfowl and shorebird feeding, refuge, and breeding as well as habitat for juvenile salmon and shellfish.
2. Restore the ESA-listed summer chum salmon population so that it is naturally self-sustaining after completion of restoration activities in the JCL and the estuary.
3. Develop rigorous monitoring requirements (pre-project, during construction, and post project), maintenance actions, contingency actions, and reporting requirements to track and achieve the above goals of this program.
4. Develop this project as a model for stream and estuary restoration and management, to be used as a guide for larger-scale restoration efforts, especially restoration of estuaries and the fluvial-tidal transition zone.

OBJECTIVES AND PERFORMANCE CRITERIA

Objective 1 – Hydrology

Restore the natural channel and estuary of Jimmycomelately Creek (JCL) (approximately 2.86 acres) by realigning JCL into a sinuous channel, creating a network of tidal channels, and removing channel constriction in the estuary (i.e., roads, fill, etc.) to restore semi-diurnal tidal fluctuations. The tidal fluctuations will improve organic matter flow, nutrient cycling and detritus, and sediment transport.

All Years

Interim Performance Measure/Final Success Standard

A functioning hydrological connection shall be restored and remain self-maintaining between JCL and the estuary.

Methods:

Site will be constructed per plan.

Monitoring:

Visual observations of hydrological connectivity between the creek and estuary will be recorded during site visits. As-built plans will be included in monitoring reports. If observations of stranded fish are made during anytime of the year, management actions will be taken immediately.

Contingency:

The site will be regarded or altered in order to maintain hydrological connectivity.

Objective 2 – Large Woody Debris

Improve physical and biological processes within the estuary by installing large woody debris (LWD).

All Years

Interim Performance Measure/Final Success Standard

Eighty percent or more of the LWD placements should be present in Years 1-10.

Methods:

LWD piles will be placed throughout the estuary.

Monitoring:

Track movement of log jams annually using fixed photo points and GPS positions. General observations will be made to ensure that LWD has not moved to locations where it poses a threat to infrastructure, properties or the channel morphology.

Contingency:

LWD shall be replaced if at least 80% or more of the placements are not present in years 1-10. If the movement of LWD threatens any infrastructure, property, or channel morphology, the pieces that are causing the threat shall be moved to a different location within the estuary or removed.

Objective 3 – Estuarine Vegetation

Estuarine vegetation shall naturally recolonize within the restored estuary at elevations capable of supporting wetland vegetation.

All Years

Interim Performance Measure/Final Success Standard

The natural recolonization of estuarine vegetation shall be documented with photo points and general site observations, including a plant list.

Methods:

Site will be constructed per plan. The site will not be disturbed unless conducting contingency activities, to allow the recolonization of estuarine vegetation.

Monitoring:

At least 4 photo stations will be located throughout the site. Each photo station will consist of a permanent marker where photographs will be taken to capture a panoramic view of the site in all years during the height of the growing season (July 15 to August 1). These photos will be included in the annual monitoring reports in years 1, 3, 5, 7, and 10. Species composition and aerial cover will be measured in years 1, 5, and 10 using point-line, point-frame, or other appropriate methods.

Contingency:

If site conditions allow and recolonization has not occurred within three years in areas capable of supporting wetland vegetation, planting of native estuarine vegetation may take place.

Objective 4 – Upland Buffer Vegetation

Improve wildlife habitat by establishing native woody vegetation within the upland buffer areas.

Year 1

Interim Performance Measure 1

Native planted woody vegetation in the buffer will achieve 90% survival at the end of the first year plant establishment period. If all dead woody plantings are replaced, the performance measure will be met.

Methods:

Native woody species will be planted throughout the buffer during plant installation.

Monitoring:

A total count, belt transects, or other appropriate methods will be used to measure the survival of native woody vegetation. Survival information will be collected between July 1 to mid-September. The results will be collected by species and recorded as alive, stressed, or dead.

Site inspections/qualitative monitoring will also occur several times during the summer months to evaluate management needs.

Contingency:

Replanting will be conducted to replace all dead woody plantings. Management activities such as weed control and watering will also be conducted as necessary to ensure continued woody species survival.

Year 3

Interim Performance Measure 1

Native woody vegetation in the buffer will achieve a minimum of 20% aerial cover.

Methods:

Native woody species will be replanted within the buffer areas as necessary.

Monitoring:

The point-line, line-intercept, or other appropriate methods will be used to measure the aerial cover of native woody vegetation.

Contingency:

Management activities such as replanting, weed control, and watering will be conducted as necessary.

Year 5

Interim Performance Measure 1

Native woody vegetation in the buffer will achieve a minimum of 30% aerial cover.

Methods:

Native woody species will be replanted within the buffer as necessary.

Monitoring:

The point-line, line-intercept, or other appropriate methods will be used to measure the aerial cover of native woody vegetation.

Contingency:

Management activities such as replanting, weed control, and watering will be conducted as necessary.

Year 7

Interim Performance Measure 1

Native woody vegetation in the buffer will achieve a minimum of 50% aerial cover.

Methods:

Native woody species will be replanted within the buffer areas as necessary.

Monitoring:

The point-line, line-intercept, or other appropriate methods will be used to measure the aerial cover of native woody vegetation.

Contingency:

Management activities such as replanting, weed control, and watering will be conducted as necessary.

Year 10

Final Success Standard 1

Native woody vegetation in the buffer will achieve a minimum of 75% aerial cover.

Methods:

Native woody species will be replanted within the buffer areas as necessary.

Monitoring:

The point-line, line-intercept, or other appropriate methods will be used to measure the aerial cover of native woody vegetation.

Contingency:

Management activities such as replanting, weed control, and watering will be conducted as necessary.

Objective 5 – Noxious Weeds

All Class A, Class B, and Class C noxious weeds on the State or County Weed list will be chemically and/or mechanically controlled on the entire site to insure that they do not out compete or interfere with the development of desirable vegetation.

All Years

Interim Performance Measure/Final Success Standard 1

Noxious weeds will not exceed 20% aerial cover over the entire site. The site shall contain less than 5% aerial cover by *Cirsium arvense* (Canada thistle), *Cirsium vulgare* (bull thistle), *Cytisus scoparius* (Scot's broom), *Lythrum salicaria* (purple loosestrife), *Phalaris arundinacea* (reed canarygrass), *Phragmites australis* (common reed), *Polygonum bohemicum* (Bohemian knotweed), *Polygonum cuspidatum* (Japanese knotweed), *Polygonum polystachyum* (Himalayan knotweed), *Polygonum sachalinense* (giant knotweed), and *Spartina alterniflora* (smooth cordgrass).

Methods:

Noxious weeds will be controlled to insure that they do not out compete or interfere with development of desirable vegetation.

Monitoring:

The point-line or other appropriate methods will be used to measure the aerial cover of noxious weeds during years 1, 3, 5, 7, and 10. Qualitative monitoring will be conducted during years 2, 4, 6, 8, and 9.

Contingency:

Chemical and/or mechanical weed control will be conducted as necessary to meet the performance measure/final success standard.

Appendix 2 – Data Tables

Table 1 - Species Observed in Tide Flat at Jimmycomelately (August 2010)

Scientific Name	Common Name	Wetland Indicator Status	Nativity	Salt Tolerance
<i>Argentina anserina</i>	Silverweed cinquefoil	OBL	Native	Moderately tolerant
<i>Atriplex patula</i>	spear saltbush	FACW	Native	Very tolerant
<i>Carex lyngbyei</i>	Lyngbye's sedge	OBL	Native	Tolerant
<i>Cotula coronopifolia</i>	common brassbuttons	FACW+	Non-Native	Very tolerant
<i>Distichlis spicata</i>	inland saltgrass	FACW	Native	Very tolerant
<i>Eleocharis palustris</i>	common spikerush	OBL	Native	Moderately tolerant
<i>Elymus repens</i>	quackgrass	FAC-	Non-native	Moderately tolerant
<i>Grindelia integrifolia</i>	Puget Sound gumweed	FACW	Native	Very tolerant
<i>Holcus lanatus</i>	common velvetgrass	FAC	Non-Native	Sensitive
<i>Isolepis cernua</i>	low-bulrush	OBL	Native	Moderately tolerant
<i>Juncus articulatus</i>	jointleaf rush	OBL	Native	Sensitive
<i>Juncus bufonius</i>	toad rush	FACW+	Native	Moderately tolerant
<i>Juncus effusus</i>	soft rush	FACW	Native	Sensitive
<i>Juncus ensifolius</i>	daggerleaf rush	FACW	Native	Tolerant
<i>Myosotis laxa</i>	bay forget-me-not	OBL	Native	Very sensitive
<i>Plantago maritima</i>	goose tongue	FACW+	Native	Very tolerant
<i>Polypogon monspeliensis</i>	annual rabbitsfoot grass	FACW	Non-Native	Moderately tolerant
<i>Puccinellia nuttalliana</i>	Nuttall's alkaligrass	FACW+	Native	Very tolerant
<i>Salicornia depressa</i>	pickleweed	OBL	Native	Very tolerant
<i>Schoenoplectus acutus</i>	hardstem bulrush	OBL	Native	Moderately sensitive
<i>Schoenoplectus maritimus</i>	seacoast bulrush	OBL	Native	Very tolerant
<i>Scirpus microcarpus</i>	small-fruited bulrush	OBL	Native	Sensitive
<i>Triglochin maritima</i>	seaside arrow-grass	OBL	Native	Very tolerant
<i>Typha angustifolia</i>	narrowleaf cattail	OBL	Non-Native	Tolerant
<i>Typha latifolia</i>	broadleaf cattail	OBL	Native	Sensitive

Table 4 - Salinity Data	
Points	Salinity
1	5 parts per thousand (ppt)
2	4 ppt
3	3 ppt
4	2 ppt
5	2 ppt
6	1 ppt
7	1 ppt
8	3 ppt
9	2 ppt
10	2 ppt
11	17 ppt

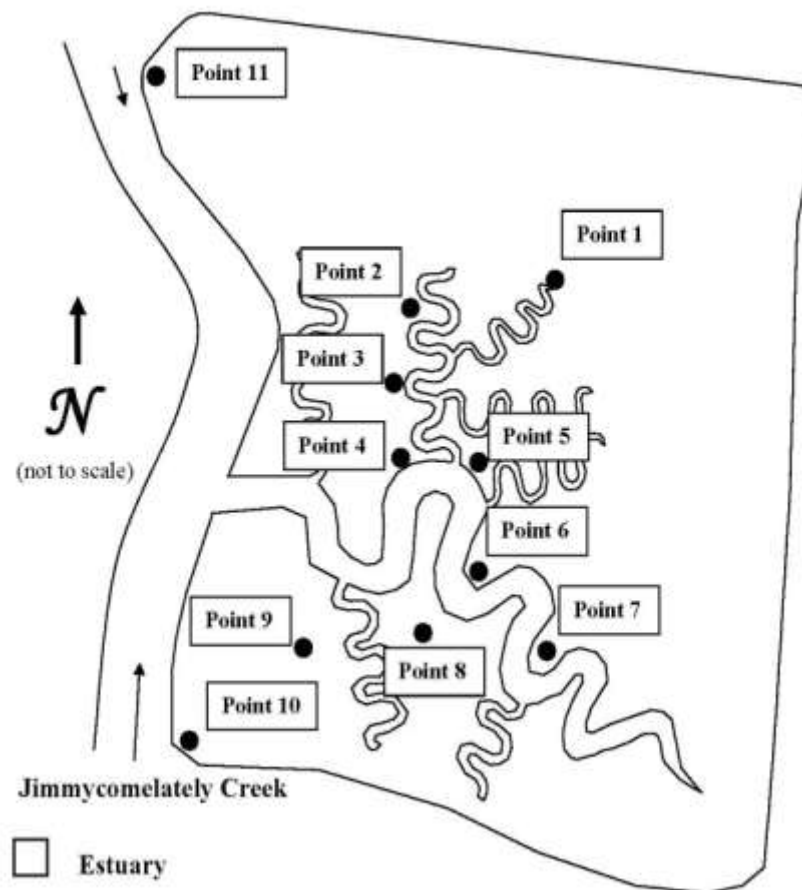


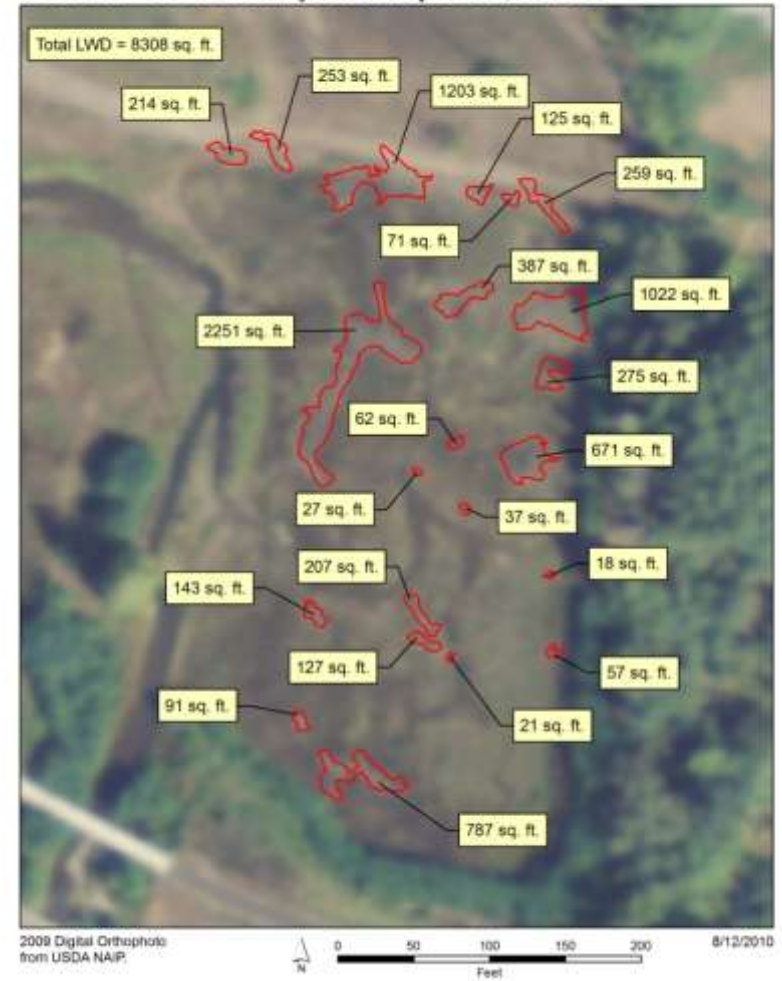
Figure 3 – Salinity sampling locations (August 2010)

Appendix 3 – Large Woody Debris Maps and Area

GPS Survey - Large Woody Debris in Jimmycomelately Estuary on 7/31/2006

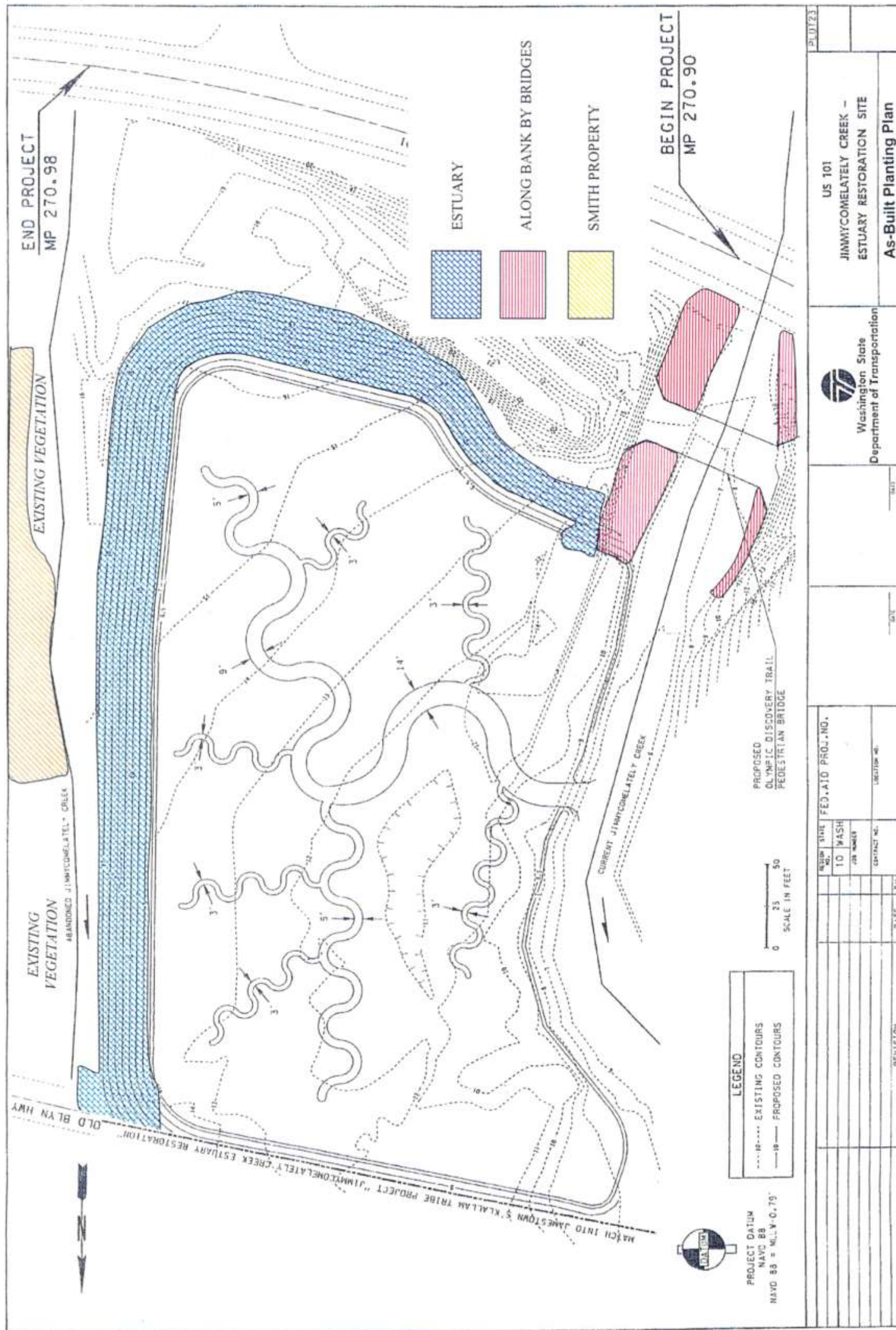


GPS data - SR 101 Jimmycomelately Creek, 8/3/2010



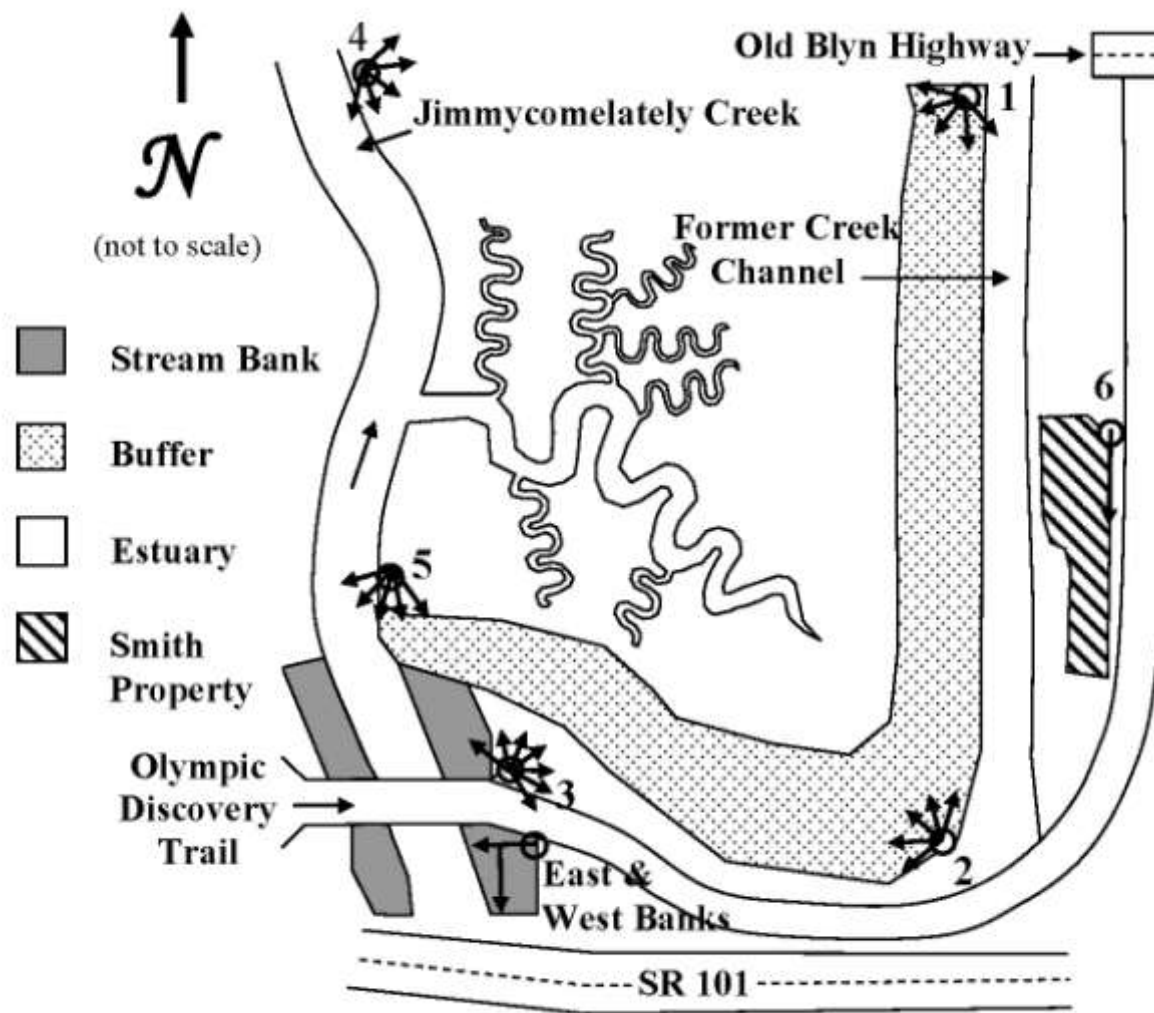
Appendix 4 – Planting Plan

(Beall 2005)



US 101 JIMMYCOMELATELY CREEK - ESTUARY RESTORATION SITE As-Built Planting Plan	
Washington State Department of Transportation	
REGION NO. STATE TO WASH JOB NUMBER	FEDERAL PROJ. NO. LOCATION NO.
CONTRACT NO. DATE BY	REVISION

Appendix 5 – Photo Points



The photographs below were taken from permanent photo-points on August 3rd, 2010 and document current site development.



Photo Point 1-1



Photo Point 1-2



Photo Point 1-3



Photo Point 1-4



Photo Point 1-5



Photo Point 2-1



Photo Point 2-2



Photo Point 2-3



Photo Point 2-4



Photo Point 2-5



Photo Point 3-1



Photo Point 3-2



Photo Point 3-3



Photo Point 3-4



Photo Point 3-5



Photo Point 3-6



Photo Point 3-7



Photo Point 4-1



Photo Point 4-2



Photo Point 4-3



Photo Point 4-4



Photo Point 4-5



Photo Point 5-1



Photo Point 5-2



Photo Point 5-3



Photo Point 5-4



Photo Point 5-5



Photo Point 6-1



Photo Point 6-2



West Bank Photo Point



East Bank Photo Point

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