

# Mud Slough Wetland Mitigation Bank - Phases 3 & 4

# 2012 Monitoring Report

Submitted by:

Mark Knaupp and Ridgeline Resource Planning

July, 2012

### TABLE OF CONTENTS

1.0	REGI	III.ATOR	RY BACKGROUND	1
2.0			MARY	
	2.1		3	
	2.2		4	
3.0			ANS	
4.0			DROLOGY PERFORMANCE STANDARDS, METHODOLOGY, AND	
•••	RE	SULTS		3
5.0	PHAS	SE 4 HYI	DROLOGY PERFORMANCE STANDARDS, METHODOLOGY, AND	
10000000	RE	SULTS		4
	5.1	Perfor	mance Standards	4
	5.2	Metho	odology	4
	5.3		S.	
6.0	1,000		GETATION PERFORMANCE STANDARDS, METHODOLOGY AND	
0705070	RE	SULTS		5
	6.1	Perfor	mance Standards	5
	6.2	Metho	odology	6
	6.3		3 Vegetation Monitoring Results	
	2000.000	6.3.1	Emergent Vegetation	
		6.3.2	Wetland Prairie	
		6.3.3	Shrub and Forest	
7.0	PHAS	SE 4 VEC	GETATION PERFORMANCE STANDARDS, METHODOLOGY AND	
,,,,	RI	SULTS		9
	7.1.	Perfor	mance Standards	9
	7.2		odology	
	7.3		4 Vegetation Monitoring Results	
	7.0	7.3.1	Wet Prairie and Emergent Vegetation	
		7.3.2	Upland Knoll	
8.0	PHO	1, 3, 40, 3, 500	T MONITORING	
9.0			ES SUMMARY	
10.0			EASE REQUEST	
11.0			SIGNMENT REQUEST	
12.0	END	OWMEN	T AND LONG TERM STEWARD	13
			LIST OF ATTACHMENTS	

Attachment	1	Phase 4 Hydrology Concurrence - Email
Attachment	2	Monitoring Point Location Maps
Attachment	3	Sample Plot Monitoring Data
Attachment	4	Monitoring Photos

### 1.0 REGULATORY BACKGROUND

The purpose of this report is to summarize the progress of Phases 3 and 4 of the Mud Slough Wetland Mitigation Bank (Bank) located it 1875 N. Greenwood Road, Rickreall, Polk County, Oregon. Phase 3 of the Bank is located in Township 7S, Range 4W, Section 20, Tax Lot 300. Phase 3 occupies 81.5 acres of the 413 acre tax lot. The MOA for Phase 3 was approved in July 2008. In December 2008, the first 30% (12.45 credits) of Phase 3 were released for sale. The second release of 20% (8.3 credits) was released in 2009. The ACOE released the credits in September and DSL followed in December 2009. The third release of 30% (12.45 credits) was released in November 2010. The final 20% (8.3 credits) were released in December 2011. All Phase 3 credits have been released for sale.

The primary goals of Phase 3 are to enhance 80 acres of cropped wetlands to emergent and wet prairie and restore 1.5 acres of upland to wet prairie habitat. Phase 3 totals 81.5 acres.

Bank credits:	Acres	Mitigation Type	Credit Ratio	Credits Earned
	80.0	Enhancement of cropped wetland	2:1	40.0
	1.5	Restoration	1:1	1.5
	81.5	Total Site		41.5

The MOA for Phase 4 was approved in June 2011. Phase 4 of the Bank includes 47.2 acres in Township 7S, Range 4W, Section 17, portions of Tax Lots 400 and 500. The primary goals for Phase 4 are to create 1.77 acres, enhance 1.24 acres and restore 40.1 acres of wet prairie and emergent wetland habitat. The Bank also includes a 4.09 acre upland knoll to provide varied wildlife habitat within the Bank. No credits have been released (see Section 10.0).

### 2.0 WORK SUMMARY

### 2.1 Phase 3

Phase 3 began with herbicide applications late 2007 with initial grading following in the summer of 2008. Grading included removing the surface drain system and construction of four low berms (2 foot max height, 10 foot wide tops, 10:1 side slopes). The average pond area created by the berms is 0.7 acres. Overflows are around the upper end of the dikes to avoid erosion. All excavation work was done with irregular boundaries and shape mimicking natural features. Two areas, approximately five and six acres each of shallow water/emergent zones, were created in the naturally existing lower portions of the site.

Limited additional grading occurred in August 2009. At this time the northern most berm on the east side of the railroad was extended slightly to help prevent water from going around the edge of the berm. At the same time, a section of tile was removed that allowed water to seep from the western most pond, on the west side of the railroad. Both of these procedures produced the desired results. In the past year no additional maintenance activities have occurred.

Grass and forb species were seeded in early October 2008 with the trees and shrubs following in February 2009. Seed was applied by both drilling and broadcast in a zone planting for individual species to optimize the different hydrological zones (i.e. emergent, wet prairie). Phase 3 was seeded with a wide variety of species, in particular forbs, to increase the diversity of the plant species on site. The forested and shrub/shrub areas were planted with a mixture of less aggressive wetland herbaceous species to provide slightly less competition for the trees and shrubs. The shrub areas are scattered throughout Phase 3 in small plantings, mimicking naturally occurring shrub areas.

Phase 3 has undergone a similar tufted hairgrass die off as occurred four years ago in a previous phase of the Bank, when hairgrass fell over and smothered itself out. This occurrence is on a smaller scale in Phase 3 and unlike the previous occurrence where there was a problem with non-native annuals establishment, this time the growth appears to be native grasses. This appears to be part of a natural hairgrass cycle.

Spot treatment of individual plants and seed heads has continued over the past year. The primary species targeted have been velvet grass (*Holcus lanatus*) and pennyroyal (*Mentha pulegium*), and reed canary grass (*Phalaris arundinacea*).

### 2.2 Phase 4

Herbicide applications occurred in October 2009 and in January, May and July 2010. Between August and November 2010, the drainage system was made inoperable and the drainage ditch in the southeast corner filled. The drain system was made inoperable by disconnecting all of the laterals of the system. This was accomplished by removing 15 to 20 feet of pipe at the lower end of the system where they enter the main lines. Some minimal grading was done during this time to fill shallow ditches allowing for inundation of low areas.

Primary seeding of the site was conducted in October 2010. Some additional seeding of fragrant and scouler's popcorn flower (*Plagiobothrys figuratus and Plagiobothrys scouleri*) was done in early February 2011. The trees and shrubs were planted on the upland knoll in February 2011. A total of 46 native species were planted.

Vegetation establishment in Phase 4 is unique from the previous phases of the Bank. The entire emergent and wet prairie was seeded with mix predominantly comprised of forbs, sedges and rushes, with slough grass being the only grass species widely planted. The site was seeded with a mulch-seed mixture planted in a zone planting for individual species. The seed blend then sorted itself out into different zones by moisture tolerance and topography. Individual species seeding was also done for the more dominate species.

This planting method is an effort to increase the forbs present in the prairie. There are some concerns that this method may slow the bank establishment and increase air born invasive species. Air born invasive species, such as sow thistle (*Sonchus asper*) and

prickly lettuce (*Lactuca serriola*) will have open ground to gain an initial foothold, without the wetland grass coverage. To date these have been kept to a minimum, but will continued to be monitored by the sponsor.

Small additional seeding was done in October 2011, including spike bentgrass (*Agrostis exarata*), meadow barley (*Hordeum brachyantherum*), slender hairgrass (*Deschampsia elongata*), northwest cinquefoil (*Potentilla gracilis*), and wooly sunflower (*Eriophyllum lanatum*).

Manual removal of weeds along with spot spraying of weeds continues on Phase 4. The targeted species includes prickly lettuce, sow thistle, tansy ragwort (Senecio jacobea), St.John's-wort (Hypericum perforatum), Himalayan blackberry (Rubus discolor), tall fescue (Festuca arundinacea), meadow foxtail (Alopecurus pratensis), parentucellia (Parentucellia viscosa), wild carrot (Daucus ssp.), false dandelion (Nothocalais ssp.) and velvet grass. No additional maintenance activities have been necessary.

Normal Spot spraying and hand plant removal will continue. Due to the success of the site, no additional plantings are planned.

### 3.0 AS-BUILT PLANS

Phase 3 as-built plans were submitted to DSL and the ACOE in December 2008. No as-built plans were required or submitted for Phase 4 due to the lack of substantial grading changes made in Phase 4.

# 4.0 PHASE 3 HYDROLOGY PERFORMANCE STANDARDS, METHODOLOGY, AND RESULTS

The Phase 3 hydrology objective is to create areas that will hold precipitation to create seasonal saturation and inundation and meet the criteria defined in the 1987 Corps of Engineers Wetlands Delineations Manual (1987 Wetland Delineation Manual).

The hydrology delineation was conducted in March 2010 and reported on in the 2010 Monitoring Report. Due to some timing concerns with the 2010 monitoring, further monitoring was conducted in March and April 2011 on the 1.5 acres of upland, that existed prior to the construction of Phase 3. This was reported on in the 2011 Monitoring Report. The results of this final monitoring indicate that each of the monitoring locations had standing water a maximum of 12" below the surface during the entire two months of monitoring, even though the average rain year was slightly below normal.

July 2012

# 5.0 PHASE 4 HYDROLOGY PERFORMANCE STANDARDS, METHODOLOGY, AND RESULTS

### 5.1 Performance Standards

The hydrology objective is to create areas that will hold precipitation to create seasonal saturation and inundation and meet the criteria defined in the 1987 Corps of Engineers Wetlands Delineations Manual (1987 Wetland Delineation Manual) and regional supplements.

### 5.2 Methodology

Hydrology monitoring will be performed in the restoration and creation portion of the Bank. Sufficient data shall be collected to demonstrate that the area possesses wetland hydrology for a minimum of two weeks during the spring growing season of one year with below normal or normal precipitation. Visual observations will be recorded of the water table depth and depth to saturated soils. If standing water is found at 12" or less in the monitoring tubes, no soil saturation levels will be required. Hydrology data shall be collected a minimum of every few days over a two week period during the months of February 1 through April 31, depending on the determined growing season for that year. This hydrology monitoring is to establish that the hydrology has been restored by taking out the drain tiles so the initial credits can be released. Monitoring points have been plotted to verify that the hydrology has been restored and shown on Figure 10 - Hydrology Monitoring Map. The monitoring points, designed to show duration of saturation, will consist of transects of three monitoring tubes placed within separate elevation contours on the north, east, south and west sides of the upland knoll and three sets of three tubes within the upland area delineated along the west side of the northern portion of Phase 4.

### DELINEATION LITE

On any portion of the Bank, that after the hydrology monitoring indicates it is still upland, a "Delineation Lite" will be conducted between years two and year four after planting. This delineation will more finely tune the area of the Bank not meeting the hydrology standards (1987 US Army Corps of Engineers Wetland Delineation Manual and regional supplements).

The Delineation Lite will show duration of saturation using the same hydrology monitoring protocols as described in the Hydrology Monitoring Section. In addition, these same plots would be evaluated for vegetation utilizing paired plots, to indicate if there is a dominance of hydrophytic vegetation present to support the hydrology monitoring data.

### 5.3 Results

**Delineation:** The one time hydrology delineation was conducted between February 6 and April 30, 2011. The hydrology monitoring included 12 monitoring tubes in the 4.09 acres of the upland knoll, nine monitoring tubes in the 1.77 acres of creation, and 10 monitoring tubes (every third monitoring point) across Phase 4. The results of the 2011 monitoring indicated the upland knoll area (except for one monitoring location – Tube #4) did not qualify as jurisdictional wetland which is as expected. The hydrology of the remainder of the site all qualified as jurisdictional wetland, with standing water at a maximum of 12" below the surface.

Due to some questions with the upland knoll 2011 results, additional monitoring of this area occurred in March 2012. The results of this monitoring obtained very similar results to the 2011 monitoring. Jamie Davis (USACE) and Dana Field (DSL) reviewed both the monitoring results and the site itself. They determined that there was a slight

variation in the upland knoll perimeter from the original determination but the change in the acreage was negligible, so the original determination acreage was acceptable. (See Attachment 1- Email Concurrence.) Table 1 includes the results of the 2012 upland knoll monitoring. The monitoring point locations are included in Attachment 2.

Table 1 - Phase 4 2012 Upland Knoll Monitoring Tube Results

Tube #				April					
	2	6	13	16	19	22	2	7	13
1	8	9	6	8	10	5	12	12	D
2	9	10	6	8	10	5	D	D	D
3	12	12	10	12	12	10	D	D	D
4	0	0	0	0	0	0	0	0	0
5	5	5	3	4	6	2	8	6	6
6	12	12	9	12	12	10	D	D	D
7	7	7	2	4	8	1	12	12	12
8	8	8	2	4	10	3	D	D	D
9	10	10	6	6	10	4	D	D	D
10	12	12	10	8	12	6	D	D	D
11	D	D	12	D	D	12	D	D	D
12	12	12	11	12	D	10	12	12	13
13	12	12	9	10	12	7	12	12	12
14	10	10	2	7	10	2	10	10	13
15	D	D	12	D	D	12	D	D	D
16	D	D	11	12	D	12	D	13	13
17	11	12	5	10	12	7	12	12	12
18	7	8	2	4	8	0	10	9	10

Data is depth in inches below the surface, "0" = water at the surface. SW= standing water

# 6.0 PHASE 3 VEGETATION PERFORMANCE STANDARDS, METHODOLOGY AND RESULTS

### 6.1 Performance Standards

### A. Emergent Herbaceous

- 1. A minimum of 55% of the relative plant cover is comprised of native species. These densities will be a combination of planted individuals and natural recruitment.
- No more than 15% of the relative plant cover is comprised of non-native invasive species as defined below.
- The wetland's moisture index is less than 3.0.
- 4. By year 5, there will be a minimum of 4 obligate species represented in the monitoring plots.

\*Non-native invasive species to be included: reed canary grass (*Phalaris arundinacea*), purple loosestrife (*Lythrum salicaria*), Himalayan blackberry (*Rubus discolor*), Japanese knotweed (*Polygonum cuspidatum*), Eurasian water milfoil (*Myriophyllum spicatum*), climbing nightshade (*Solanum dulcamara*), yellow-flag iris (*Iris pseudacorus*), Queen Anne's lace (*Daucus carota*), Canadian thistle (*Cirsium arvense*), bull thistle (*Cirsium vulgare*), orchard grass (*Dactylis glomerata*) annual ryegrass (*Lolium multiflorum*), penny royal (*Mentha pulegium*), and spatulaleaf loosestrife (*Lythrum portula*).

### **B.** Wetgrass Prairie

- 1. At least 10 wetgrass prairie species are present
- Tufted hairgrass (Deschampsia cespitosa) is represented by 5% or greater relative plant cover in year 1 and 25% by year 5.

- 3. At least 50% of the relative plant cover is comprised of native species. These densities will be a combination of planted individuals and natural recruitment.
- No more than 15% of the relative plant cover is comprised of non-native invasive species as defined above.
- 5. The prairie's moisture index should be between 2.0 and 3.0.
- 6. No more than 5% relative plant cover is composed of shrubs or trees.

### C. Overstory and Scrub-Shrub

- 1. Relative plant cover, of all layers, is comprised of a minimum of 55% native species.
- 2. The moisture index is equal or less than 3.0.
- 3. There will be a minimum of 150 trees per acre and 300-400 shrubs per acre in all years 1-5.
- 4. No more than 5% of the relative live stem count should be comprised of non-native species.
- 5. These densities will be a combination of planted individuals and natural recruitment.
- 6. No more than 15% of the relative plant cover, of all layers, is comprised of non-native invasive species.

### 6.2 Methodology

Transect and sample plot locations are laid out in a stratified arrangement with approximately 300' between each transect and sample plot. Due to the low percentage of overstory and shrub areas, two additional plots (#42, #43) within the overstory/shrub areas were added to provide better coverage. The transects run east to west on the west side of the railroad, and north to side on the east side of the railroad. The sample plots are permanently identified in the field and are plotted on a site map. One plot (#41), outside of the mapped transects was included to monitor the small 1.5 acre upland, which did not fall within plots transects (See Attachment 2 - Monitoring Point Location Map).

Each sample point is the center of a circular plot, ten feet diameter for the herbaceous layer and 30 feet for the scrub/shrub and overstory layers. The center point for the herbaceous, shrub and overstory radius are the same. Each sample plot was evaluated for species, indicator status, native/non-native and invasive status, and the percent cover of each species present.

### 6.3 Phase 3 Vegetation Monitoring Results

Vegetation monitoring was conducted June 22, 2011 by Mark Knaupp. Attachment 3 includes spread sheets with the results of the sampling. Forty-four monitoring plots were examined. The spread sheets include the botanical names, common names, indicator status, origin (native or non-native), moisture index, and if it was planted or a volunteer species. The Plant Species list includes all species found within Phase 3 within the plots or found while walking between sample plots.

Table 2 includes a general species summary of just the species found within the monitoring plots.

Table 2 - Phase 3: 2009, 2010, 2011 and 2012 Monitoring Plot Species Summary

	<b>2009</b> 68		<b>2010</b> 51		<b>2011</b> 52		<b>2012</b> 61	
Number of Species Identified								
Number and % of Native Species	37	54%	38	75%	38	73%	46	75%

As is seen Table 2, both the number and percentage of native plant species in Phase 3 continues in an upward trend.

### 6.3.1 Emergent Vegetation

Twenty-two native species were identified in the emergent plot which is an increase from 2011 with 16 native species.

The two most abundant species in 2012 were fragrant popcorn flower at 22.86% and creeping spikerush (*Eleocharis palustris*) at 18.29%. This is a change from 2011, when tufted hairgrass (*Deschampsia cespitosa*) at 8.1% was the second most common species. The decrease in the tufted hairgrass was discussed in Section 2.2.

The performance criteria for **emergent wetland** were met for all 4 of the requirements.

**Required:** A minimum of 55% of the relative plant cover is comprised of native species. These densities will be a combination of planted individuals and natural recruitment. *Met, the emergent plots are comprised of 82.5% native species cover.* There is a combination of dead grass and water or bareground due to recent inundation covering 13.3% of the emergent plots.

**Required**: No more that 15% of the relative plant cover is comprised of non-native invasive species. *Met with 1.67% of non-native invasive species. The only non-native invasive species present is water-purslane (Lythrum portula*).

**Required**: The wetland's moisture index is less than 3.0. *Met with an average moisture index of 1.61*.

**Required**: By year five, there will be a minimum of four obligate species represented in the monitoring plots. *Met*, there are 11 obligate species in the monitoring plots, with seven of those in greater than trace amounts.

### 6.3.2 Wetland Prairie

Native herbaceous/grass cover averaged 75.5% throughout the wetland prairie with 20 native species identified in the 33 prairie plots. This percentage increases to 95.7% when included the areas of dead tufted hairgrass (see Section 2.1) which had new growth underneath that is too young to identify completely. The two most common herbaceous species are hairy willow-herb (*Epilobium ciliatum*) at 11% and Spanish clover (*Lotus purshianus*) at 14.2%. The two most common grass species are meadow barley at 20% and slender hairgrass at 7.2%. The performance criteria for **wetland prairie** were met for 5 of the 6 of the requirements.

Required: At least 10 wetgrass prairie species are present. *Met. Twenty-one wet grass prairie/vernal pool species have been identified within the prairie plots.*This is a 31% increase in the number of wetgrass and vernal pool species since 2011.

**Required**: Tufted hairgrass is represented by 5% or greater relative plant cover in year 1 and 25% by year 5. *Did not Meet*. Tufted hairgrass is present 70% of the plots, varying from trace amounts to 10%, with an overall average of 0.55%. This is a significant decrease from the 2011 of 39.3%. This could be due to the cyclic nature of heavy tufted hairgrass vegetation concentrations whereby hairgrass falls over and smothers itself out.

**Required**: At least 50% of the relative plant cover is comprised of native species. *Met. Native species accounted for 75.5 of the vegetative cover.* 

**Required**: No more that 15% of the relative plant cover is comprised of non-native invasive species. *Met*, with 0% of non-native invasive species.

**Required:** The wetland prairie moisture index is between 2.0 and 3.0. *Met.* The average moisture index is 2.10.

**Required**: No more than 5% relative plant cover is comprised of shrubs or trees. *Met.* No trees or shrubs occurred in the wet prairie.

### 6.3.3 Shrub and Forest

Both the planted and volunteer Oregon ash (*Fraxinus latifolia*) has done well. The tree and shrub diversity remains intact and the overall numbers of both trees and shrubs is well within the performance standard levels.

The performance criteria for **shrub forest wetland** were met for all 5 of 5 of the requirements.

**Required**: Relative plant cover, of all layers, is comprised of a minimum of 55% native species. *Met*, with 88% of the herbaceous and 100% of the tree and shrub cover being native.

**Required**: There will be a minimum of 150 trees per acre and 300-400 shrubs per acre in all years 1-5. *Met* with mean trees per acres at 881 (includes the seedlings) or 111 without seedlings. The average shrubs per acre is 940.

**Required:** No more than 5% of the relative live stem count should be comprised of non-native species. *Met*, with 0% of the live stem count comprised of non-native species.

**Required**: No more than 15% of the relative plant cover, of all layers, is comprised of non-native invasive species. *Met, with 6.0% of non-native invasive species*.

**Required**: The wetland's moisture index is less than 3.0. *Met*, with an average moisture index of 1.57.

# 7.0 PHASE 4 VEGETATION PERFORMANCE STANDARDS, METHODOLOGY AND RESULTS

### 7.1. Performance Standards

### A. HERBACEOUS PERFORMANCE STANDARDS

- 1. The cover of native species is at least 60%. These densities will be a combination of planted individuals and natural recruitment.
- The cover of invasive species is no more than 10%.
- 3. The wetland's prevalence index is less than 3.0.
- 4. By Year 3 and thereafter, there are at least six different native species or groupings of native species. To qualify, a species must have at least 5% average cover in the habitat class, and occur in at least 10% (three or more based on 31 plots) of the plots sampled. To qualify as a grouping of native species, each member of the grouping must have between 1 and 4% average cover. The grouping, will total 5% average cover and occur in at least 10% (three or more based on 31 plots) of the plots sampled.
- 5. Bare substrate represents no more than 20% cover.

\*Non-native invasive species to be included: any plant species that appears on the current Oregon Department of Agriculture Noxious Weed list, plus known problem species including Phalaris arundinacea, Mentha pulegium, Holcus lanatus, Anthoxanthum odoratum, and the last crop plant if it is non-native. Beginning in year two of monitoring, DSL may consider a non-native plant species invasive if it comprises more than 15% cover in 10% or more of the sample plots in any habitat class, and increases in cover or frequency from the previous monitoring period. Plants that meet this definition should be considered invasive for all successive years of monitoring,

### B. UPLAND KNOLL PERFORMANCE STANDARDS

- 1. The cover of native species is at least 60%.
- The cover of invasive species is no more than 10%.

### 7.2 Methodology

Transect and sample plot locations were laid out in a stratified arrangement with equal distance between each transect and sample plot (See Attachment 1 - Monitoring Point Location Map). Transects were laid out in a stratified arrangement along one baseline with equal distance between each transect (approximately 400'). Transects run north to south with the sampling plots predetermined and systematically plotted on transects at equal distance from each other; the location of the first was randomly chosen. The starting points of the sample plots were staggered in order to cover a broader area. The sample plots were permanently identified in the field and are plotted on a site map. The upland knoll was monitored with five sample plots.

Each sample point is the center of a circular plot, the radius of which will be five feet for the herbaceous layer and 30 feet radius for the overstory layer within the upland knoll, with center point for the herbaceous and overstory radius being the same. Each sample plot will be evaluated for species, indicator status, native/non-native and invasive status, the percent cover of each species present. If a plot includes bare soil, the reason for the bare soil will be noted and the percent it covers of each plot included. The number of stems for each tree species will be counted

### 7.3 Phase 4 Vegetation Monitoring Results

Vegetation monitoring was conducted June 21, 2011 by Mark Knaupp. Attachment 3 includes spread sheets with the results of the sampling. Thirty-six monitoring plots were examined. The spread sheets include the botanical names, common names, indicator status, origin (native or non-native), moisture index, and if it was planted or a volunteer species. The plant species list includes all species found within Phase 4 within the plots or found while walking between sample plots. Phase 4 is continues to have a remarkable diverse native forb population. It is anticipated that with time the diversity will change as both the planted and volunteer species sort themselves out in the restored wetland.

### 7.3.1 Wet Prairie and Emergent Vegetation

Thirty nine native species were identified within the wet prairie and emergent vegetation plots. The three most abundant herbaceous species are autumn willowherb (*Epilobium paniculatum*) at 11.45%, Fragrant popcorn flower at 8.55%, and toad rush (*Juncus bufonius*) at 7.97%. The most common grass species is American sloughgrass (*Beckmania syzigachne*) at 15.68%.

The performance criteria for herbaceous wetland were met for all five of the requirements met.

**Required:** The cover of native species is at least 60%. These densities will be a combination of planted individuals and natural recruitment. *Met*, with 94.2% of the total ground cover (including bareland) being native species.

**Required**: The cover of invasive species is no more than 10%. *Met, with no non-native plant cover*.

**Required:** The wetland's prevalence index is less than 3.0. *Met, with a moisture index of 1.73*.

**Required**: By Year 3 and thereafter, there are at least six different native species or groupings of native species. To qualify, a species must have at least 5% average cover in the habitat class, and occur in at least 10% (three or more based on 31 plots) of the plots sampled. To qualify as a grouping of native species, each member of the grouping must have between 1% and 4% average cover. The grouping will total 5% average cover and occur in at least 10% (three or more based on 31 plots) of the plots sampled. **Met** with nine individual species with 5% or more average cover in at least 10% of the plots.

**Required:** Bare substrate represents no more than 20% cover. *Met with 4.52% bareground, all of which was due to recent inundation.* 

### 7.3.2 Upland Knoll

The native herbaceous cover in the upland knoll averaged 100% of the total vegetation present with no non-native species present. There were 15 native species identified in the five upland knoll plots.

The most common native species is farewell spring (*Clarkia amaena*) at 29.6%. There are four other species present ranging from 14% to 18% coverage including Meadow barley, California oatgrass (*Danthonia californica*), wooly sunflower, and western yarrow (*Achillea millefolium*).

Two hundred and thirty-five native trees and shrubs were planted within the upland knoll. Since there are no performance standards for tree and shrub planting or survival, no specific overstory monitoring was conducted.

The performance criteria for **upland knoll** were met for two of the two requirements.

**Required**: The cover of native species is at least 60%. *Met with 100% native vegetation*.

Required: The cover of invasive species is no more than 10%. *Met*, with no non-native species.

### 8.0 PHOTO POINT MONITORING

Photos from each of the established six photo points for Phase 3 and six points for Phase 4 are included as Attachment 4. Photos were taken on June 22, 2012.

### 9.0 CREDIT SALES SUMMARY

Table 3 – Credit Sales Summary

Date	Name	DSL Permit#	ACOE Permit #	Credits Purchased
11/20/09	Advantage Precast, Inc	ENF6899	NA	1.567
12/1/09	State of Oregon	34119-FP	2004-803	0.40
12/14/09	Central School District	42503-RF	2009-00253	1.70
12/14/09	GreenTree, LLC	39251	2007-842	0.44
12/23/09	ODOT	10008-RF	1996-00016	1.46
12/23/09	Pfeiffer Roofing, Inc.	ENF-6902	NA	0.19
2/3/10	Windigo Properties, LLC	42654	2009-302	0,89
4/5/10	State of Oregon	43698-RF	2009-337	0.27
8/3/10	3510 Lancaster LLC	4145552-RF	2008-586	0.57
8/10/10	City of Salem	4925-ENF 4926-ENF	NA	0.22

	Total Phase 3 Cr	edits Sold		12.772
То	tal Phase 3 Credit Sales in Jul	y 2011 thru June	25, 2012	1.878
6/11/12	MWSH Salem, LLC	48938-RF	2012-37	0.05
5/28/12	Pac Trust	49112	2012-48	0.41
3/31/12	ODOT	48392	2011-466	0.05
12/16/11	ODOT	48315	2011-487	0.042
11/14/11	Brian Sparks	47906 RF	2011-348	0.17
10/11-3/12	Sean Tyler Keys LLC	35920-RF	2010-402	0.34
10/17/11	Eyvette and Loran Davidson	ENF6612	N/A	0.25
7/14/11	City of Wilsonville	45448-FP	2010- 40	0.40
7/5/11	City of Salem	46653-GP	2010-129	0.166
	Total Phase 3 Credit Sa	les in Nov. 2009 t	hru June 2011	10.894
6/23/11	Investors Brokerage, Inc.	46715-RF	2006-348	0.29
6//6/11	City of Salem	46640-GP	2011-98	0.14
2/12/11	The Lenity Group	45110	2009-654	1.65
12/28/10	Eyvette & Loran Davidson	6612-ENF	NA	0.07
12/14/10	City of Oregon City	44900	2010-32	0.24
11/22/10	City of Dundee	45474-RF	2010-154	0.64
8/12/10	Les Toth dba Kathleen Manor	6994-ENF	NA	0.64
8/19/10	Troy and Gina Bundy	7014-ENF	NA	0.03
		4927-ENF 4928-ENF 4929-ENF		

There are 41.5 credits available for Phase 3, all of which have been released. Of these 41.5 credits, 12.772 have been sold leaving 28.728 credits released and unsold.

### 10.0 CREDIT RELEASE REQUEST

All 41.5 credits of Phase 3 have been released.

No credit release for Phase 4 is being requested due to slow sales and the lack of need for credits at this time. However, Phase 4 is eligible for credit releases #1, #2 and #3 totaling 50% release of the total credits, as soon as the restrictive covenant and access easement are recorded and financial assurance is submitted.

### 11.0 BOND REASSIGNMENT REQUEST

A \$51,853 bond was posted for Phase 3. To date, 70% of the bond has been released (releases 1, 2 and 4) totaling \$36,297. No further bond release is due at this time.

### 12.0 ENDOWMENT AND LONG TERM STEWARD

The sponsor has signed a conservation easement on Phase 3 with The Wetland Conservancy. New amended language has been finalized with the IRT and The Wetland Conservancy and has been recorded by the regulatory agencies.

The Wetland Conservancy has agreed to act as the long-term steward for Phase 4. No easement is yet in place, but the amended language for Phase 3 should be usable for Phase 4 as well. A complete draft, long term management plan, including funding information, will be submitted to the IRT for approval, prior to the release of the 25% credit release dedicated to the Long Term Management Plan and Conservation Easement.

# **Attachment 1**

# PHASE 4 HYDROLOGY CONCURRENCE – EMAIL

### Carla Cudmore

FW: Hydrology monitoring-upland knoll, Phase 4 (UNCLASSIFIED) Subject: Scan0011.pdf; Scan0012.pdf; Scan0013.pdf Attachments: From: Mark Knaupp [mailto:wetlandbank@msn.com] Sent: Friday, July 13, 2012 12:03 PM To: Cudmore Subject: FW: Hydrology monitoring-upland knoll, Phase 4 (UNCLASSIFIED) > From: Jaimee.W.Davis@usace.army.mil > To: dana.field@state.or.us; wetlandbank@msn.com > Subject: RE: Hydrology monitoring-upland knoll, Phase 4 (UNCLASSIFIED) > Date: Wed, 11 Jul 2012 23:50:45 +0000 > Classification: UNCLASSIFIED > Caveats: NONE > I also took a look at your data and the precip, records and I agree with your red line, Mark. However I believe you said you did not want to spend the money to get that line surveyed since the difference in area is relatively small. If I misunderstood you, please let me know. If you do not want to survey that line and want to stick with the original delineation, the Corps is fine with that. Just let us know what you want to do. > > Thanks, > -Jaimee > Jaimee W. Davis, CPSS > Mitigation Program Manager > U.S. Army Corps of Engineers - Portland District > PO Box 2946 > Portland, OR 97208-2946 > 503-808-4390 (phone) > 503-808-4375 (fax) > ----Original Message----> From: FIELD Dana [mailto:dana.field@state.or.us] > Sent: Wednesday, July 11, 2012 3:53 PM > To: Mark Knaupp > Cc: Davis, Jaimee NWP > Subject: RE: Hydrology monitoring-upland knoll, Phase 4 > Hi Mark, > I pulled up the precip records; no surprise they show March was really wet but April was close to normal. As you pointed out, there is very little change in acreage between the pre-project delineation and your April line. DSL is OK if we just keep the original delineation acreage of 4.09 ac of uplands in the knoll. > Dana Field > Mitigation Specialist > Oregon Dept. of State Lands > 775 Summer St NE > Salem OR 97301 > 503-986-5238 voice > 503-378-4844 FAX

> DSL website: www.oregonstatelands.us < http://www.oregonstatelands.us/>

- > From: Mark Knaupp [mailto:wetlandbank@msn.com]
   > Sent: Thursday, July 05, 2012 1:26 PM
   > To: Jamie Davis; Dana Field

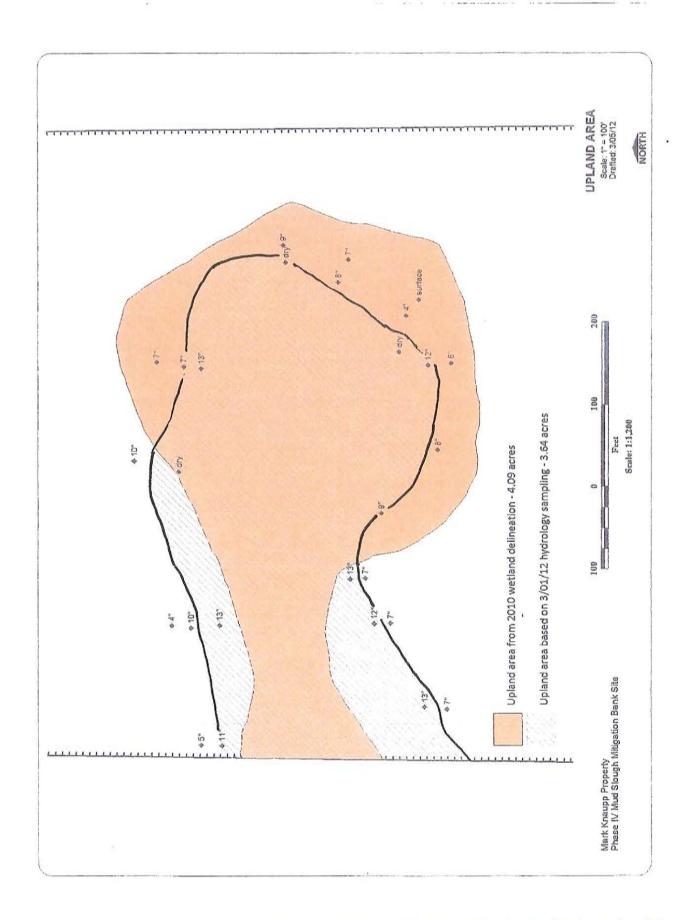
- > Subject: Hydrology monitoring-upland knoll, Phase 4
- > Jamie and Dana:

> Attached is the data we looked at this morning. Let me know if you're good with the original delineated numbers. That would allow me to avoid more expense, since the line seems to change very little.

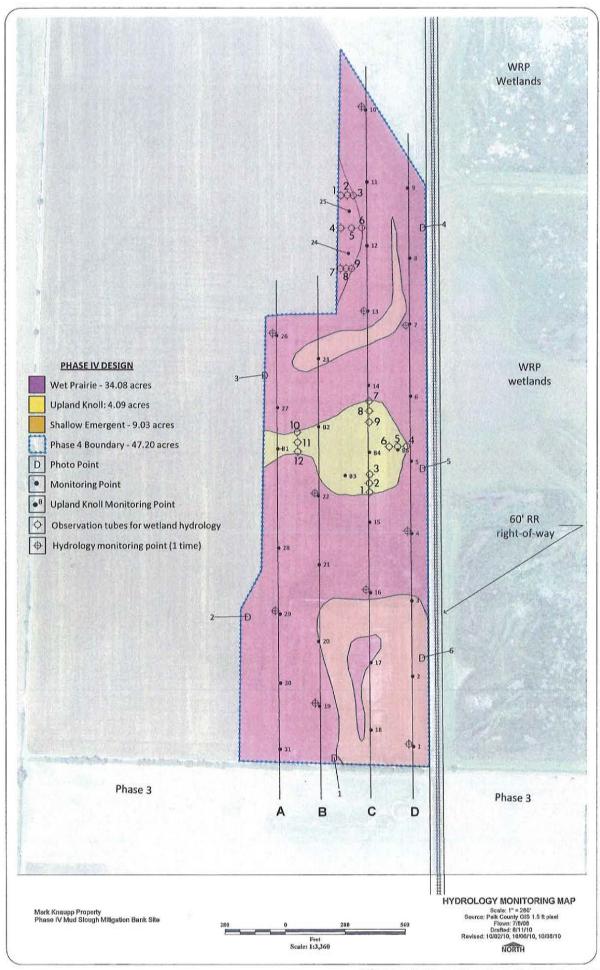
- > Thanks,
- > Mark

# **Attachment 2**

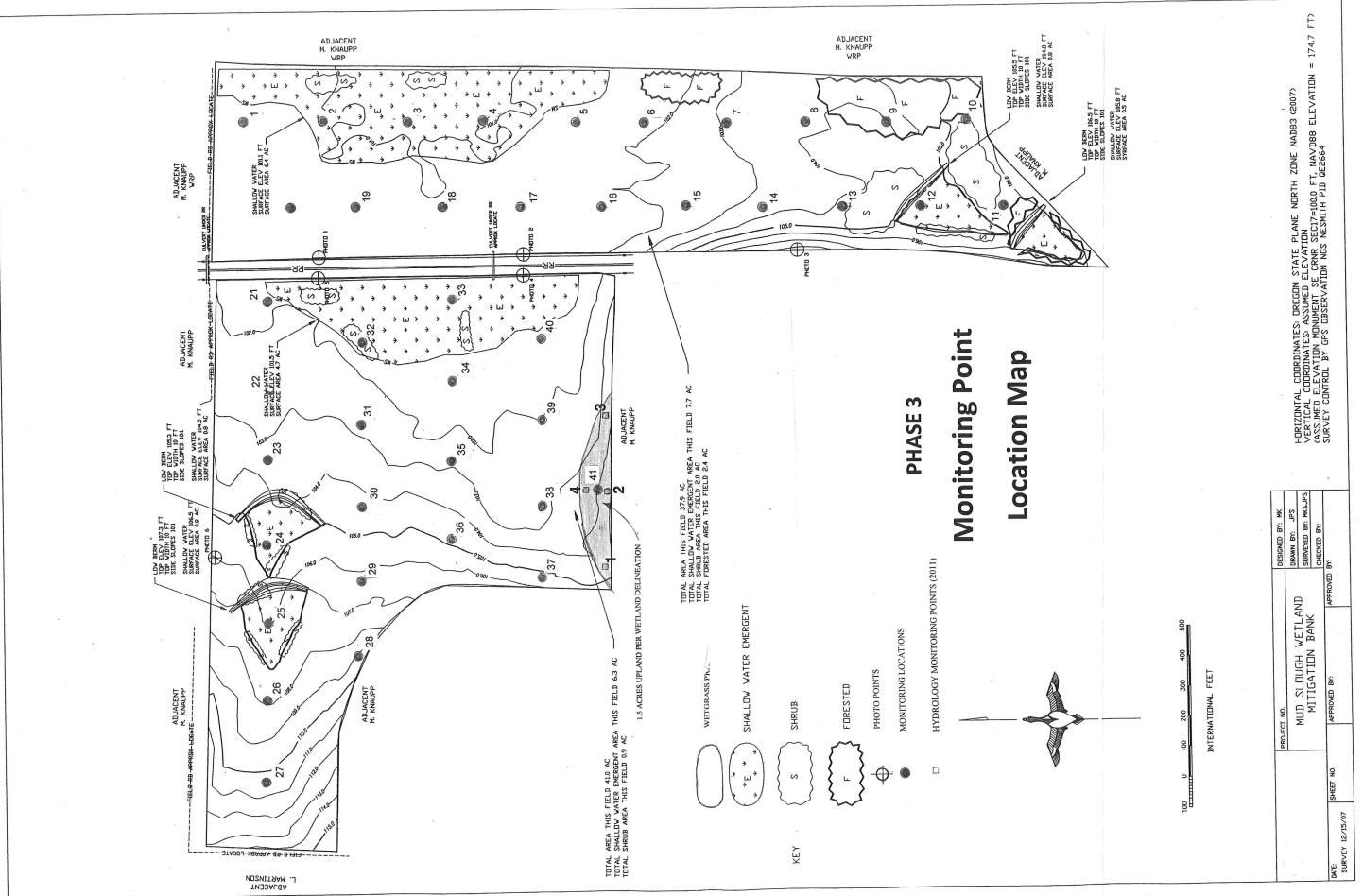
# **MONITORING POINT LOCATION MAPS**



Phase 4 - 2012 Limited Hydrology Monitoring Point Location Map



**Phase 4 Monitoring Point Location Map** 



**Phase 3 Monitoring Point Location Map** 

# **Attachment 3**

# SAMPLE PLOT MONITORING DATA

### Phase 3 Mud Slough Wetland Mitigatigation Bank Plant Species List June, 2012

Includes species identified in monitored plots, planted or found while walking between sample plots

		01-1	Outsile	Wet Prairie	Moisture	Diantod
Common Name	Botanical Name	Status	Origin	Vernal pool	Index	Planted
Overstory and Scrub/shi				Species	E CONTROL DE LA CONTROL DE	
Crataegus douglasii	Black hawthorne	FAC	native		3	
Fraxinus latifolia	Oregon ash	FACW	native		2	X
Pyrus fusca	Pacific crabapple	NOL	native		3	X
Rosa nutkana	Nootka rose	FAC	native	Yes	3	X
Salix lasiandra	Pacific willow	FACW	native		2	Х
Salix sitchensis	Sitka willow	FACW	native		2	Х
Spiraea douglasii	Douglas spirea	FACW	native		2	Х
Herbaceous Species						
Alisma plantago	Water plantain	OBL	native		1	
Asclepias speciosa	Showy milkweed	FAC	native		3	Х
Aster hallii	Hall's aster	FAC	native	Yes	3	Х
Bidens cernua	Nodding beggars-tick	FACW	native		2	Х
Bidens frondosa	Leafy beggars-tick	FACW	native		2	Х
Boisduvalia densiflora	Dense spike-primrose	FACW	native	Yes	2	Х
Briza minor	Little quaking-grass	FAC	introduced		3	
Camassia quamash	Common camas	FACW	native	Yes	2	Х
Carex densa	Dense sedge	OBL	native	Yes	1	X
Carex feta	Green-sheath sedge	FACW	native	Yes	2	X
Carex ssp	Sedge ssp.		native			
Carex unilateralis	One-sided sedge	FACW	native	Yes	2	X
Centaurium umbellatum	Common centuary	FAC	introduced		3	
Cerastium vulgatum	Mouse-ear chickweed	FACU	introduced		4	
Cirsium arvense	Canada thistle	FACU	introduced		4	
Cirsium vulgare	Bull thistle	FACU	introduced		4	
Convolvulsu arvensis	Bindweed	NOL	introduced			
Crepis setosa	Bristly Hawksbeard	NOL	native			
Daucus carota	Queen Anne's Lace	NOL	introduced			
Downingia elegans	Showy downingia	OBL	native	Yes	1	Х
Eleocharis ovata	Ovoid spikerush	OBL	native	Yes	1	X
Eleocharis palustris	Creeping spike rush	OBL	native	100	1	
Epilobium ciliatum	Hairy willow-herb	FACW	native	Yes	2	
Epilobium paniculatum	Autumn willow-herb	UPL	native	Yes	5	
Eriophyllum lanatum	Wolly sunflower	NOL	native	Yes		X
		OBL	native	Yes	1	X
Eryngium petiolatum	Rush leaf coyote thistle Wall bedstraw	UPL	introduced	103		
Galium parisiense		FAC	native	Yes	3	
Ghaphalium palustre	Lowland cudweed	FACW	native	Yes	2	X
Grindelia integrifolia	Willamette Valley gumweed	FAC	native	165		
Heracleum lanatum	Cow parsnip				4	
Hypochaeris radicata	Cat's ear dandelion	FACU	introduced native	Yes	2	
Juncus bufonius	Toad rush	FACW		res	2	
Juncus ensifolius	Dagger leaf rush	FACW	native	Vac	2	V
Juncus nevadensis	Sierra rush	FACW	native	Yes	2	X
Juncus tenuis	Slender rush	FACW	native	Yes		_ ^
Kickxia elatine	Sharppoint fluvelin	UPL	introduced		4	-
Lactuca serriola	Prickly lettuce	FACU	introduced		4	- V
Lomatium nudicaule	Barestem desert-parsley	NOL	native	Yes		X
Lotus purshianus	Spanish clover	NOL	native	Yes		Х
Ludwigia palustris	Water pursalane	OBL	native		1	
Lupinus micranthus	Minature lupine	NOL	native			1
Lupinas polyphyllus	Bigleaf lupine	FAC	native	Yes	3	Х
Lythrum portula	Water-purslane	NOL	introduced			

Black medic Pennyroyal Common monkey flower	FAC OBL OBL	introduced introduced native	Vas	3	
Common monkey flower			Vas		
Common monkey flower	OBL	native	Vac		
			Yes	1	
Needle-leafed navarretia	FACW	native	Yes	2	
Skunkweed	NOL	native	Yes		
	FACW	native	Yes		Х
Scouler's popcorn flower	FACW	native	Yes		Х
	FACU	introduced			
10000	FAC	native			Х
	FACU	native			Х
	FACW	native	Yes		
	OBL	native			
	OBL	native	Yes		
	FAC	introduced			
	OBL	native		1	Х
	FACU	introduced		4	
	FAC	native		3	Х
		introduced		3	
	FACU	introduced		4	
		native		1	
		introduced			
A STATE OF THE STA			Yes	1	
				1	
Sierider Vetcii	1102				
Control of the Contro	CONTRACTOR OF THE				
Cnike hentgrass	FACW	native	Yes	2	Х
				1	
				1	Х
				2	
			Yes	1	Х
	NOL	III oddood			
	NO	native	Yes		Х
				2	Х
					Х
			100		
		And the second live of the secon			
				1	
					Х
		native	Yes	2	X
Meadow barley	FACW	introduced	103		,
	I INCIL	muoduced			
Annual ryegrass		notive	Vac	1	1
Common witchgrass	FACU	native	Yes	4	
Common witchgrass Annual bluegrass	FACU FAC	introduced	Yes	3	
Common witchgrass	FACU		Yes		
1	Fragrant popcorn flower Scouler's popcorn flower Common plantain Northwest cirquefoil Self-heal Straight beaked buttercup Cellery leaf buttercup Western yellowcress Curly dock Bulrush Tansy ragwort Nelson's checker-mallow Prickly sow-thistle Sand spurry Dandelion Cat-tail Ventenata Purslane speedwell Marsh speedwell Hairy vetch Slender vetch Slender vetch Spike bentgrass Short-awned foxtail Water foxtail Meadow foxtail Meadow foxtail American sloughgrass California brome Soft brome Ripgut brome Brome ssp California oatgrass Tufted hairgrass Slender hairgrass Barnyard grass Tall fescue Barren fescue Northern mannagrass Velvet grass	Fragrant popcorn flower Scouler's popcorn flower Common plantain Northwest cirquefoil Self-heal Straight beaked buttercup Cellery leaf buttercup Cellery leaf buttercup Western yellowcress Curly dock Bulrush Tansy ragwort Nelson's checker-mallow Prickly sow-thistle Sand spurry Dandelion FACU Cat-tail Ventenata NOL Purslane speedwell Marsh speedwell Hairy vetch Slender vetch NOL Spike bentgrass FACW Short-awned foxtail Water foxtail Water foxtail NOL Soft brome Ripgut brome Brome ssp California oatgrass TACW Slender hairgrass FACW Sarnyard grass FACW Tall fescue FAC Barren fescue NOL Northern mannagrass Velvet grass FAC Velvet grase FAC Velvet gr	Fragrant popcorn flower Scouler's popcorn flower Common plantain Northwest cirquefoil Self-heal Self-heal Straight beaked buttercup Cellery leaf buttercup Curly dock Bulrush Tansy ragwort Nelson's checker-mallow FACU FACU FACU FACU FACU FACU FACU FAC	Fragrant popcorn flower Scouler's popcorn flower Scouler's popcorn flower FACW Self-heal Self-heal FACU Self-hadive Fes Self-heal FACU Self-hadive	Fragrant popcorn flower         FACW scouler's popcorn flower         FACW native Yes         2           Common plantain         FACU introduced         4           Northwest cirquefoil         FAC native         Yes         3           Self-heal         FACU native         Yes         4           Straight beaked buttercup         FACW native         Yes         2           Cellery leaf buttercup         OBL native         1         1           Western yellowcress         OBL native         1         1           Curly dock         FAC introduced         3         3           Bulrush         OBL native         1         1           Tansy ragwort         FAC introduced         4         1           Nelson's checker-mallow         FAC native         3         3           Prickly sow-thistle         FAC introduced         4         4         4           Cat-tail         OBL native         1         4         4         4         4         <

## Phase 3 Mud Slough Wetland Mitigatigation Bank Emergent Marsh (PEMC) Plot Data - June 22, 2012

Species Observed			STATE OF THE PARTY	CONTRACTOR DESCRIPTION		Committee of	STOREST PROPERTY.	attionated.	STATE OF STREET	10000	er
Botanical Name	Common Name	Status	Origin	Index	Ave, % Cover	1	2	3	4	32	33
Herbaceous Species - percent cov	er				ea. Species	2007/201000			CONTRACTOR OF THE PARTY OF THE	2020///5/2	ENVERYOR S
Bidens cernua	Nodding beggars-tick	FACW	native	2	2.50	Т		15	т	Т	
Bidens frondosa	Leafy beggars-tick	FACW	native	2	0.83	Т	2	Т			3
Carex unilateralis	One-sided sedge	FACW	native	2	0.00					т	
Downingia elegans	Showy downingia	OBL	native	1	4.17	5	5	5	10		-
Eleocharis ovata	Ovoid spikerush	OBL	native	1	0.83			5			
Eleocharis palustris	Creeping spike rush	OBL	native	1	21.33	3		40	35		50
Epilobium ciliatum	Hairy willow-herb	FACW	native	2	1.67	1.25				10	
Eryngium petiolatum	Rush leaf coyote thistle	OBL	native	1	0.00	Т					
Ghaphalium palustre	Lowland cudweed	FAC	native	3	2.50			15			
Grindelia integrifolia	Willamette Valley gumweed	FACW	native	2	0.00			Т	Т		
Hypochaeris radicata	Cat's ear dandelion	FACU	introduced	4	1.67					10	
Juncus bufonius	Toad rush	FACW	native	2	3.33	erconn.				20	
Juncus nevadensis	Sierra rush	FACW	native	2	0.33	2					
Ludwigia palustris	Water pursalane	OBL	native	1	0.00	Т			la concerne		
Lythrum portula	Water-purslane	NOL	introduced		1.67	Т	т	10		Т	
Mentha pulegium	Pennyroyal	OBL	introduced	1	0.00		Т				
Plagiobothrys figuratus	Fragrant popcorn flower	FACW	native	2	26.67	40	90	Т	30	Ť	
Rorippa curvisiliqua	Western yellowcress	OBL	native	1	0.00			Т			
Rumex crispis	Curly dock	FAC	introduced	3	0.00						
Typa latifolia	Cat-tail	OBL	native	1	0.33						2
Grass Species			1.00								
Agrostis exarata	Spike bentgrass	FACW	native	2	2.50					15	
Alopecurus aequalis	Short-awned foxtail	OBL	native	1	0.83			5			
Alopecurus geniculatus	Water foxtail	OBL	native	1	0.83	Т			5		
Beckmania syzigachne	American sloughgrass	OBL	native	1	13.00	50	3	Т	20	Т	5
Deschampsia cespitosa	Tufted hairgrass	FACW	native	2	0.83			v/Icca		5	
Echinochloa crus-gall	Barnyard grass	FACW	introduced	2	0.83			5			
Water/bareground due to recent inund	Manager 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1				6.67					3.70.90 20.70	40
Dead grass			100000000000000000000000000000000000000		6.67					40	
Relative Percent Native Cover	Mean =	82.50				100	100	85	100	50	60
Relative Percent Non-Native Cover	Mean =	4.17				0	0	15	0	10	0
Relative % non-native invasive canon		1.67		- II A		0	0	10	0	0	0
Moisture Index	Mean =	1.61				1.40	1.92	1.56	1.40	2.30	1.05
Total # of Native Species: 21				came Santo Shall							
				. 10							
*Non-native invasive species to Himalayan blockberry (Rubus disco	be included: reed canary grass (Phalar olor), Japanese knotweed (Polygonum	ris arundina cuspidatum	i <i>cea</i> ), purple l ), Eurasian wa	oosestrife (/ ter milfoil (	Lythrum salicaria), Myriophyllum spica	tum),					
climbing nightshade (Solanum dulc	amara), yellow-flag iris (Iris pseudacor ird grass (Dactylis glomerata) annual r	us), Queen A	Anne's lace (Da	aucus carot	a), Canadian thistle	(Cirsium a	uvense),				

# Phase 3 Mud Slough Wetland Mitigatigation Bank Planted Shrub/Forest (PFO) Sample Plot Monitoring Results

Jur	10	22	201	2

Species Observ	hed	84/68/52	-5.0 State (1974)	Moisture	per plot				
Botanical Name	Common Name	Status	Origin	Index		11	12	42	43
Planted Overstory Species stem count wit								9897	1000
Crataegus douglasii	Black hawthorne	FAC	native	3	1				4
Jalaegus douglasii	Oregon ash	FACW	native	2	0.5		<b>经</b> 等語	2	ploye.
Taxinus fatirolla	O(logon doi)				12.5			50	
Ash seedlings  vrus fusca Pacific crabapple		FAC	native	3	0.25	MARIA M			1
100 100 20		FAC	native	3	8.5	1			34
TOSA HURAHA	Pacific willow	FACW	native	2	1.5	6		126647	257.5
Sanx rasiandra	Douglas spirea	FACW	native	2	5.25	8	13		
Spiraea douglasii	Douglas spirea	<b>沙路</b> 罗路				\$4.50 M			
Total Stems per plot:		Name at Addition		Contract Contract		14	13	52	39
Average Trees per Plot =	14.3	SERVE OF	geografication and a	100000000000000000000000000000000000000	0.000000000	SERVINESCO.	GENERAL GRADE	00 V 4 B III	W.CO.W.L.
Average trees per Plot (w/o) seedlings=	1.8			Carrier and Archer	. Hampsonoon b	m6600000000	X SOSSESSIONS	SIGNICATION	1/5185401
Mean Trees/Acre =	881 or 111 without seedlings	(0.000)	11.63 (0.07.61	HE PARTIES	E 1921G-128/9909-19	STREET, STREET	57/5007#		2727553
Average shrubs per plot =	15.25					DESCRIPTOR	A92944E9A	90/91/00	TUSTONIA
Mean Shrubs/Acre =	940	20075-120	0.544		Ave.%		(F) (S) (F)		10/22
					Cover ea		E 1 1 3 1		Date Des
Herbaceous Species - percent cover		50.00			Species	1500	•		2000
Bidens cernua	Nodding beggars-tick	FACW	native	2		T	3		2000000
Boisduvalia densiflora	Dense spike-primrose	FACW	native	2		T			State and
Carex unilateralis	One-sided sedge	FACW	native	2		Т	Т		177115012
Downingia elegans	Showy downingla	OBL	native	1	1.5	3	T	25.53	ke dise
Eleocharis palustris	Creeping spike rush	OBL	native	1	37.5	40	35		25-1207
Epilobium ciliatum	Hairy willow-herb	FACW	native	2	0.0	T	T	11192	9000
Epilobium ciliatum Epilobium paniculatum	Autumn willow-herb	NOL	native			Т			
Eryngium petiolatum	Rush leaf coyote thistle	OBL	native	76.71	0.0	T	Т		(3198)6
Eryngium petiolatum Lactuca serriola	Prickly lettuce	FAC	introduced	3		are-during h	5		
Lythrum portula	Water-purslane	NOL	introduced		6.0	2	10		
Lythrum portuia	Pennyroyal	OBL	introduced		0.0		Т		
Mentha pulegium	Fragrant popcorn flower	FACW	native	2	12.5	25	T	144 (15)	
Plagiobothrys figuratus	Curly dock	FAC	introduced	3	1.0		2		
Rumex crispis	Prickly sow thistle	FAC	introduced	3		T	5	8/0/8	
Sonchus asper	Cat-tail	OBL	native	1	0.0		Т		
Typa latifolia	Purslane speedwell	OBL	native	1			10		
Veronica peregrina		NOL	introduced			Υ			
Vicia tetrasperma	Slender vetch	NOL	miroduced	155000		10000000			
Grass Species	HARDON SAN STANSAN AND SHEEKS TO SEE SEE SHADE	STATE OF PROPERTY					7733440	778st=3030s	E MERCHAN
Agrostis exarata	Spike bentgrass	FACW	native	2	0,0	Interestable Services	T	er eress	S AND S
Alopecurus pratensis	Meadow foxtail	FACW	introduced			T	(0-100 <b>-</b> 100 )	AH90000	A RESIDE
Beckmania syzigachne	American sloughgrass	OBL	native	1	2.5	Т	5	1000	0.500
Hordeum brachyantherum	Meadow barley	FACW	native	2	27.5	30	25	P20019-10	Contraction Co.
Poa trivialis	Rough bluegrass	FACW	introduced	2	0.0	Т	10000	200	0.02380
Bareground	The state of the s						47000000000		F 1.000
Water						ESTRACT.		57755	10000
Relative % non-native canopy cover:	Mean =					2	22	Claire Co.	
% of Total Vegetation that is Native:	Mean =	88.00				98.00	78.00		¥ 9365
Relative % Non-native Invasive Canopy Ccov	Mean =	6.00		7		2	10	220000	the second
Sample plot average moisture index		1.57				1.56	1.58	100000	MANAGE
Total # of native Species: 19			3						

# Phase 3 Mud Slough Wetland Mitigatigation Bank Wetland Prairie Plot Data 6/22/2012

Species O	oserveu	S.O. 10 (10 COM	UST #45.8979.83	Wet/Prairie	Moisture	Ave. %	100000																Plot#s			(\$19.6%)						24155	416035	20	37	20	20 1	40
Botanical Name	Common Name	Status	Origin	Pool	Index	Species		6	7	8	9	10	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	34	35	36	31	38	39	40
				Species			1000			2606.25		9,70,99	2500000	NAME OF THE PARTY	9,52986	193.53.59	SPECIE	QUE 975 (G.C.)	muse trace	PAR-04-02-03	teste (Aberla	250000000			277/10/200					7								
aceous Species			responsible and a	4-27-22-E	1	0.00	e constant	6718AHA	ANGER AND	ketasi I		77,925	15174761	357353	955		T																					
sma plantago	Water plantain	OBL	native native	Yes	3	0.00			Committee Committee			CALL COLUMN		and the second	1000													5	Т								84.019 A.	September 190
er hallii	Hall's aster	FAC		res	2	0.13	T	575553		166	Heliotic Co	a Halanda	Sanari Sanari				ing data	20	T	T	and the											2						
lens cernua	Nodding beggars-tick	FACW	native native	Yes	2	0.76		C/6-C/C-754	2,532,553	et same to	20					T	5																200000000000000000000000000000000000000		are Crossroul		- ALIENSON ALI	2040000000
isduvalia densiflora	Dense spike-primrose	FACW	native	165	7000140	0.06	Т	1548783		0/5/75			Т		Т	T			T	T	T	T	T	T						2		1	AMERICA	T		2.4l	53,14,15	T
arex ssp	Sedge ssp.	NOL	introduced		3 (Annual Co. 8)	0.15	2 32-22 522-22	300000000000000000000000000000000000000																						VILLEGIS AND D	10-301×1000×10	SULFUL SULF	eranera en eran	43.0000043.4	5	4394351459	9109222 PA	7
onvolvulsu arvensis	Bindweed	OBL	native	Yes	1	0.09	1 6000	557.55	(4015) BB					and in		(251 L 197)												5000	200				059740	2022	OR RESIDEN	GPACES S	20	3
owningia elegans	Showy downingia	FACW	native	Yes	2	11.03	5	T	T	10	5	5	50	40	7	T	15	10	2	T	25	30		30	T				T	40	25	10	15		2000 <b>-</b> 2000 F	3000000000	20	20
pilobium ciliatum	Hairy willow-herb	UPL	native	Yes	5	1.21	5	T	Т	Т	T	10		T	T	5	T				13.33	T							T	5		365600	15	T	T	AN SHOULD		5000000
pilobium paniculatum	Autumn willow-herb	NOL	native	Yes	<b>V</b>	0.15		1																	5						rangerous a	7.6640.574.764	C. (100 (100 (100 (100 (100 (100 (100 (10	Sharran	energy design	and the same of	17 2 17 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1	accepta Lei
riophyllum lanatum	Wooly sunflower	UPL	introduced	163	5	0.00					200	T			7				252						0.00			3.F332F			7274	303447	050405		30000 China	ADSOLUTE S	- T	198321150
alium parisiense	Wall bedstraw	FAC	native	Yes	3	0.06																							2			9100-025-040	10002-100	and the same		Sections	T	215221224 0415
haphalium palustre	Lowland cudweed	FACU	introduced		4	0.45		13045.75		Sarah ya	7.10.133																	T				_	T	15	30007	(6335S)E	-	40
ypochaeris radicata	Cat's ear dandelion	FACW	native	Yes	2	3.39		5			10		25	5		T	T	20	10	15	5	T										2	P43.537940	375000,107500		otp.://www.in-17	5	10
ıncus bufonius	Toad rush	FACW	native	Yes	2	0.15												a saba		3776			1000		5000				0001000	25072	110250	20-17-5	200000		5	Hanned	276562345	31001100
uncus tenuis	Slender rush	FACU	introduced		4	0.00			T		T	T	T			T			T	T									_				T	2000 <b>-</b> 2000	T	FA	2042.60204.20	erimae i Pala
actuca serriola	Prickly lettuce	NOL	native	Yes	respectations.	14.24		0.000	80	40														20	50	60	70	20	5		11.25.76			5	60	50	00	20
otus purshianus	Spanish clover	NOL	introduced	-		1.58	er all reset and top											T		T	T											2	T-9022 2 0 100	E-TESTANDA C	100000000000000000000000000000000000000	2007.0000000	20	30
ythrum portula	Water-purslane	NOL	native	S 5245 Y 585	agrae donte.	0.00	0.0000				0.000	Т															Selana I			0.00		2000	A Epitol	265730		Appleading 1	000000	20
fladia sativa	Coast tarweed		native	Yes	2	4.42	10	A PROPERTY OF THE PROPERTY OF	100000000000000000000000000000000000000		10	Т		20	50	30	5	5	2	T	2	T								17.7°00,000	5	254572 004	27 20 30 40	-A-10-120-42-25-4	trebucketes	ed appropria	5	2
Plagiobothrys figuratus	Fragrant popcorn flower	FAC	native	Yes	3	1.06		1/40/File	giritiga s	oangawa.		(4)													5													
Potentilla gracilis	Northwest cirquefoil	FACU	native	Yes	4	1.82																						60	W 100 - 100				-	*:C.+/*******	COURT TO SE	\$75-55.27C <del>1</del> 7	arealy re	0.0000000000000000000000000000000000000
Prunella vulgaris	Self-heal	FACW		Yes	2	0.12		100000	600000				T				T	Т			2	T								2			T			ALC: U	5835745	
Porippa curvisiliqua	Western yellowcress	A STANCE PROPERTY	native	103	3	0.00		STADIO STAD	2.50.534.3555.5																T						_			200200200	ar the state of the state of	Environment of	ASSESSED BY	accepted soc
idelcea nelsoniana	Nelson's checker-mallo	FAC	introduce	4	3	0.48			GÖT GÖ		400000	Т	T						T	T	T	T		T		5	T		10	1	T		33153	200				
onchus asper	Prickly sow-thistle	NOL	introduce		1000 <b>4</b> 200	0.15																											2007-1007-1007-1	5	or the state of the	200200200	100 AF 100 D	0.03900 Bets
/entenata dubia	Ventenata	OBL	native	Yes	77 T	0.21		T		NEEKS E	Ŧ						T	3	2	2						4						T.				AND S		
/eronica peregrina	Purslane speedwell	NOL	introduce			0.00		3 10 10 10 10 10 10 10 10 10 10 10 10 10				T																					NAME OF TAXABLE		Service of P	Santana C	PER DEPOSIT	27202
licia tetrasperma	Slender vetch	INOL	miroduce			31 4 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1									2000			Control of		0.00											99.98.88			S238933	8555650	5464544	12 F F F F F	
Grass Species		0.0000000000000000000000000000000000000	Constant September														40	80.87 <b>-</b> 70.75	10		15	10	5	5	ECO-10075 (7)	Т	т	C 5486	3	04659Fa6	10	10	10	5		5	15	5
Agrostis exarata	Spike bentgrass	FACW	native	Yes	2	5.79	10	15		5		T	T	20	- 8	10	10	Ţ		5	10	10	9	. 0	25.55	or back	L.	27.67.65	3	635427	10	, io		450 <b>9</b> 430 F	500000000000000000000000000000000000000			DE MERCHANIA
Alopecurus geniculalus	Water foxtail	OBL	native		1	0.55	5			T	T				3	5	57777555	1	2			EES/146-040	(80.02.45		ACHERIL NO	Т	T	V. 1965-196	3	65,572,5	365686	Ť		Serve Section		SHEELER T	5164.6551.6	15555
Alopecurus pratensis	Meadow foxtail	FACW	introduce	d	2	0.00													2594033		1	5		100000	9.73578	1234	T		2	5	т	15	T	23777220	ASSESSMENT OF THE PARTY OF THE	200.0000000	15	5
Beckmania syzigachne	American sloughgrass	OBL	native	Yes	1	1.88				T	T		T	T			- 5	2	600000000	5	50599844	5	S-87-5338		7	500000	Name of the last	AT KINGS	1000		No. Section	GEZ/5267		and the second	200		(4.5° c) 1	100
Bromus carinatus	California brome	NOL	native			0.00																						77 H. 1834				70 3 0 1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0	2000 CO	AVAISTICS:			10 - 10 - 10 - 10 - 10 - 10 - 10 - 10 -	000000000000000000000000000000000000000
Bromus ssp	Brome ssp.	71.				0.00		T	T					-		Tours of the Control	Television and the	rando entre est	este de afre-	SECTION AND ADMINISTRA		001-5014E	3974000	Supplement of	400000	200.00	S2224233	100	124000000	W 14 4 5 1 2 2 1	ORIENSES	4882.644		0.000000000		ASSESSED F	Til Hill	705FE 876
	California oatgrass	NOL	native	Yes		0.00			0.70 (0.27)	0.000							1805040	40		83535		T		T	T		SET 100 F	Т	т	Т	logical test	25-24-25-1	Т	т	100000000000000000000000000000000000000	25575035		42505 BO
Danthonia californica Deschampsia cespitosa	Tufted hairgrass	FACW		Yes	2	0.55		T	T		T	T	T	T	T	T	1	10	5	T	29942559345	T	F1350 4250 9	30	TT	40	9499484	12425604	25	5	15	25323	15	35	5	5	10	1205E
	Slender hairgrass	FACW		Yes	2	7.18	10	10	T	5	15	Т	20	10	7	- 5	10.000					1	000000000000000000000000000000000000000	30	201007	10			20	0	10		10	- 55	- 3	- 3	10	
Deschampsia elongata	Western mannagrass	OBL	native		1	0.00					T						hear a trace	C11911 x 15%	4.5342544751	592,5030	-25W2.19H	at make	5.5539 H.S.F	200000000000000000000000000000000000000	mgs/cs/c	ARSONEI I	Gaggess.	27 (2820)	\$159A857	elegeot.	0.50.9180		55392555	25835661	10,630,735	ELISTEN ELISTE	ARREST S	a see les
Glyceria occidentalis	Velvet grass	FAC	introduce	d	3	0.00					(Capella)	T			311		1200	0.5702		207 (1994	FO.		20	45	25	20	30	15	50	40	25	5	15	30	25	40	10	
Holcus lanatus	Meadow barley	FACW		Yes	2	20.00	0		15	30	10	70	5	T	L T	200000000000000000000000000000000000000	leonom	SUSTAINED TO	anginosisi	15	50	50	30	15	25	20	<b>3</b> ∪	Total Company of the	50	40	20	J	I O	5	75 T	T T	10	HARREN RY
Hordeum brachyantherum	Rough bluegrass	FACW	THE RESERVE OF THE PARTY OF THE	d	2	0.76			5	Т	T	Т						2 3 10 15	10000000	5111945				T	46	5	т	T	250,750,740			4.000	194550000	3		450 E364 E		2/2/22/25
Poa trivialis	Rat-tail fescue	FAC	St. Commence of the Commence o		3	0.76													100164-01	the east	a a figure a	Mary Program	05	57590279	15	213,5250	9903272	J. (6) 12/2	83.55max	selectives b	20	54	30	Distance	1535500	estmissir		25
Vulpia myuros	Ivat-tall leadue	1,7,0		G Endivision		20.12	2 50	70	0.0000	10	30	15		5		45	60		67	58	400	5	65	100	100	100	100	100	100	100	100	54 100		100	100	100	100	
Dead grass			100000000000000000000000000000000000000	1			100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
TOTAL %  Bareground Mean =	0.00	E CORRES	CONTRACTOR		1 10 10 10 10 10 10 10 10 10 10 10 10 10					70										6		501-3016	_	_	0	_	0	0	0	0	0	0	0	0	0	0	0	0
		1=0	0,0			0.0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0					5	0	20	30
Relative % non-native invas	ve canopy cover. Wear	4.3			4.3		0	.0	5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15	10	0	0	10	1	0	2	0 70	25 75	95	100	80	45
Relative % non-native cano		75.5	200000000000000000000000000000000000000	0.0000.0000.0000.0000.0000.0000.0000.0000	75.5		50	30	95	90	70	85		95	75	55	40		33	42	100	95	35	100	85	90	100	100	90	99	80	44			95	. 100	80	70
% of Total Native Vegetation	t and the second	95.7		0.000	95.7		100		95	100		100						100	100	100	100	100	100		85	90	100	100	90	99	100	98	100	75				1.86
% Vegetation Native/Dead	7104	2.10			2.1		2.16	2.00	2.00	2.00	2.00	2.35	2.00	2.00	1.96	2.18	1.88	1.93	1.88	1.79	1.99	1.95	2.00	2.15	2.44	2.13	2.00	3.56	2.07	2.09	2.00	1.66	2.64	2.42	2.00	2.00	1.01	1.00
Sample plot average moistu			et Praire or V	emal Pool				3 14665	4 141						100				2040A	Non-St			dunie.	ne total		35785	659933 B	2/12/02/0	6,000	(TOROTH)		Ergizona.	1000000	2000000	325 E	20000000		g saugh gió
Total # of native Species: 29 Total number of Species Sa	mpled: 42 Total Number of			1 301	1	1																												$\vdash$	$\longrightarrow$			_
otal number of Species Sa	Inpleu: 42 Total Number C	Jumpier	1	_	+	_																						-					$\overline{}$	$\vdash$	$\longrightarrow$	$\rightarrow$		
WAT	ive species to be included: reed	ranary orace (	Phalaris arun	dinacea), pu	rple loosest	trife (Lythrus	m salicaria	1),										-												_			$\overline{}$	$\vdash$	$\longrightarrow$	-+		
1 11 11	(Dubus dissalar) Innanasa ku	atweed (Poly	conum cuspid	atum). Eurasi	ian water m	ilfoil (Myno	ophyllum sp	picatum),										-															$\vdash$	$\vdash$	-	$\rightarrow$		
Himalayan blackber	y (Rubus discolor), Japanese kri (Solanum dulcamara), yellow-fla	a irie (Irie per	endacorne) On	een Anne's 1	lace (Dancu	is carota). Ca	anadian this	stle (Cirsiu	m arvense).																								$\sim$	$\vdash$	$\vdash$	$\rightarrow$		
climbing nightshade	(Solanum dulcamara), yellow-fla vulgare), orchard grass (Dactylis	g nis (IIIs pse	nnual recordes	(Lolium mul	tiflorum) r	penny roval (	(Mentha pel	lugium), a	nd																								-	$\vdash$	$\vdash$	$\rightarrow$	-	
bull thistle (Cirsium	vulgare), orchard grass (Dactylis	giomeraia) ai	inium i yeginss	(Echan ma	1	1		J																						-				$\vdash$	$\overline{}$	$\rightarrow$	$\rightarrow$	
spatulaleaf looses																																						

### Phase 4 Mud Slough Wetland Mitigatigation Bank Plant Species List

June, 2012

Includes species identified in monitored plots, planted, or found while walking between sample plots

		Status	Origin	Wet Prairie	Moisture	Planted
Overstory				Vernal pool	Index	
Crataegus douglasii	Black Hawthorne	FAC	native		3	
Pinus ponderosa	Willamette V. Ponderosa Pine	FACW	native		2	Х
Pyrus fusca	Pacific Crab apple	NOL	native			X
Quercus garryana	Oregon White Oak	NOL	native			X
Salix sitchensis	Sitka willow	FACW	native		2	X
Tsuga heterophylla	Westen Red cedar	FACU	native			X
Shrubs					1906	
Amelanchier alnifolia	Serviceberry	FACU	native		4	X
Oemleria cersiformis	Indian Plum	FACU	native		4	X
Symphoricarpos albus	Snowberry	FACU	native		4	X
Herbaceous Species						4.34
Achillea millefolium	Western yarrow	FACU	native			X
Alisma plantago	Water plantain	OBL	native		1	
Allium amplectens	Slimleaf onion	NOL	native	Yes		Х
Anthemis cotual	Mayweed chamomile	FACU	introduced		4	
Aster halii	Hall's aster	FAC	native	Yes	3	Х
Bidens cernua	Nodding beggars-tick	FACW	native	CHARLES CONTRACTOR CONTRACTOR	2	Х
Bidens frondosa	Leafy beggars-tick	FACW	native		2	Х
Boisduvalia densiflora	Dense spike-primrose	FACW	native	Yes	2	X
Brodiaea hyacinthina	Hyacinth brodiaea	NOL	native	Yes		X
Camassia quamash	Common camas	FACW	native	Yes	2	X
Castilleja tenuis	Hairy Indian paintbrush	NOL	native	PISELING A. S. CARGALIA	Salamaya <del>la</del> sajajia	Flathurger-my/di
Cerastium vulgatum	Mouse-ear chickweed	FACU	introduced		4	
Carex densa	Dense sedge	OBL	native	Yes	1	X
Carex feta	Green-sheathed sedge	FACW	native	Yes	2	X
Carex unilateralis	One-sided sedge	FACW	native	Yes	2	X
Carex ssp.	Sedge ssp.	IACV	native	103		
Centaurium umbellatum	Common centuary	FAC	introduced		3	_
Cirsium arvense	Canada thistle	FACU	introduced		4	
Cirsium vulgare	Bull thistle	FACU	introduced	e Marchare Name Nacification	4	Playeta stilled
Clarkia amoena var caurina		NOL	native			X
	Farrwell to spring Wavy fleabane	NOL	introduced			_^
Conyza bonayiensis	Canadian Horseweed	FACU	native			
Conyza canadensis		NOL	native			
Crepis setosa Daucus carota	Bristly Hawksbeard	NOL	introduced	0.090.21040773727409		WINGEL (NO.
Control of the Contro	Queen Anne's Lace			Voc	1	~
Downingia elegans	Showy downingia	OBL	native	Yes Yes	1	X
Eleocharis ovata	Ovoid spikerush	OBL	native	res	1	_^
Eleocharis palustris	Creeping spike rush	OBL	native	V	1	~
Erynigium petiolatum	Rush leaf coyote thistle	OBL	native	Yes	2	Х
Epilobium ciliatum	Hairy willow-herb	FACW	native	Yes		90.00192707523
Epilobium paniculatum	Autumn willow-herb	NOL	native	Yes	Control of the Control	h the selection
Eriophyllum lanatum	Wooly sunflower	NOL	native	Yes		Х
Galium parisiense	Wall bedstraw	UPL	introduced		-	
Ghaphalium palustre	Lowland cudweed	FAC	native	Yes	3	- 7
Grindelia integrifolia	Willamette Valley gumweed	FACW	native	Yes	2	X
Hypericum perforatum	St. John's-wort	NOL	introduced		持续的發展	X-112 (1) (1) (1)
Hypochaeris radicata	Cat's ear dandelion	FACU	introduced		4	
Juncus bufonius	Toad rush	FACW	native	Yes	2	
Juncus tenuis	Slender rush	FACW	native	Yes	2	X
Kickxia elatine	Sharppoint fluvelin	UPL	introduced		5	
Lactuca serriola	Prickly lettuce	FACU	introduced		4	

athyrus sphaericus	Grass pea-vine	NOL	introduced			
amium amplexicaule	Henbit	NOL	introduced			
omatium nudicaule	Barestem desert-parsley	NOL	native	Yes		X
otus purshianus	Spanish clover	NOL	native	Yes		Х
upinus micranthus	Minature lupine	NOL	native		10.16 - S. M.	
upinas polyphyllus	Bigleaf lupine	FAC	native	Yes	3	X
ythrum hyssopifolia	Hyssop loosesstrife	OBL	introduced		1	
ythrum portula	Water-purslane	NOL	introduced			
Madia saliva	Coast tarweed	NOL	native			
Medicago lupulina	Black medic	FAC	introduced		3	
Mentha pulegium	Pennyroyal	OBL	introduced		1	distant.
Mimulus guttatus	Common monkey flower	OBL	native	Yes	1	
Vavarretia intertexta	Needle-leafed navarretia	FACW	native	Yes	2	
Parentucellia viscosa	Parentucellia	FAC	introduced		2	
Perideridia gairdneri	Gairdner's yampah	FAC	native	Yes	3	X
Plagiobothrys figuratus	Fragrant popcorn flower	FACW	native	Yes	2	X
Plagiobothrys scouleri	Scouler's popcorn flower	FACW	native	Yes	2	X
Plantago major	Common plantain	FACU	introduced		4	
Polygonaceae persicaria	Lady's thumb	FACW	introduced	The parameters as a	2	
Potentilla gracilis	Northwest cirquefoil	FAC	native	Yes	3	X
Prunella vulgaris	Self-heal	FACU	native	Yes	4	X
Ranuculus sceleratus	Cellery leaf buttercup	OBL	native		1	
Ranunculus occidentalis	Western buttercup	FAC	native	Yes	3	Х
Rorippa curvisiliqua	Western yellowcress	FACW	native	Yes	2	
	Curly dock	FAC	introduced		3	V.653.0554
Rumex crispis	Tansy ragwort	FACU	introduced	aceran contract beauty, as	4	THE PERSON OF TH
Senecio jacobea	Common groundsel	FACU	introduced			
Senecio vulgaris	Meadown checker-mallow	NOL	native			Х
Sidalcea campestris	Nelson's checkermallow	FAC	native		3	X
Sidelcea nelsoniana	Prickly sow-thistle	FAC	introduced		3	UPAKANSA
Sonchus asper		FACW	native	Yes	2	X
Sisyrinchium auguslifolium	Pointed blue-eyed grass	FACU	introduced	100	4	- ~
Taraxicum officinale	Dandelion	OBL	native		1	_
Typa latifolia	Cat-tail	OBL	native	Yes	1	-
Veronica peregrina	Purslane speedwell	NOL	introduced	163	Eurator Endocat	Calabase PA
Vicia hirsuta	Hairy vetch		introduced			Maria Maria
Vicia tetrasperma	Slender vetch	NOL			4	X
Wyethia angustifolia	Narrow-leaf mulesears	FACU	native		4	1
Grass Species						
Agrostis exarata	Spike bentgrass	FACW	native	Yes	2	X
Alopecurus aequalis	Short-awned foxtail	OBL	native		1	
Alopecurus geniculalus	Water foxtail	OBL	native		1	
Alopecurus pratensis	Meadow foxtail	FACW	introduced		2	
Beckmania syzigachne	American sloughgrass	OBL	native	Yes	1	X
Bromus carinatus	California brome	NOL	native			
Danthonia californica	California oatgrass	NOL	native	Yes		X
Deschampsia cespitosa	Tufted hairgrass	FACW	native	Yes	2	X
Deschampsia elongata	Slender hairgrass	FACW	native	Yes	2	X
Echinochloa crus-galli	Barnyard grass	FACW	introduced		2	
Festuca arundinacea	Tall fescue	FAC	introduced		3	
Festuca myuros	Rat-tail fescue	NOL	introduced			
Glyceria borealis	Northern mannagrass	OBL	native		1	
Glyceria occidentalis	Western Mannagrass	OBL	native		1	Х
Holcus lanatus	Velvet grass	FAC	introduced		3	
Hordeum brachyantherum	Meadow barley	FACW	native	Yes	2	X
Panicum capillare	Common witchgrass	FACU	native	Yes	4	
Poa annua	Annual bluegrass	FAC	introduced		2	
Poa trivialis	Rough bluegrass	FACW	introduced		2	
Vulpia myuros	Rat-tail fescue	FAC	introduced		3	

•

# Phase 4 Mud Slough Wetland Mitigatigation Bank Upland Knoll Plot Data - June 21, 2012

Species Obse	erved				Ave. %		Sam	nber		
Botanical Name	Common Name	Status	Origin	Index	Ave. % Cover	1	2	3	4	5
Herbaceous Species - percent c	over				ea. Species					
Achillea millefolium	Western yarrow	FACU	native		14.00	15	10	15	20	10
Clarkia amaena	Farewell to spring	NOL	native		29.60	20	28	20	30	50
Epilobium ciliatum	Hairy willow-herb	FACW	native	2	0.00	0.5			Т	Т
Eriophyllum lanatum	Wooly sunflower	NOL	native		15.60	28	20	15	5	10
Grindelia integrifolia	Willamette Valley gumwe	FACW	native	2	1.00	2		2	Т	1
Potentilla gracilis	Northwest cirquefoil	FAC	native	3	3.00	3	7	3	T	2
Prunella vulgaris	Self-heal	FACU	native	4	0.40		Т	175	Т	2
Grass Species										
Agrostis exarata	Spike bentgrass	FACW	native	2	0.40	2			Т	Т
Beckmania syzigachne	American sloughgrass	OBL	native	1	0.00		Т			
Bromus carinatus	California brome	NOL	native		0.00	Т				Т
Danthonia californica	California oatgrass	NOL	native		16.00	15	20	20	20	5
Deschampsia cespitosa	Tufted hairgrass	FACW	native	2	0.00					
Deschampsia elongata	Slender hairgrass	FACW	native	2	2.00				Т	10
Hordeum brachyantherum	Meadow barley	FACW	native	2	18.00	15	15	25	25	10
Panicum capillare	Common witchgrass	FACU	native	4	0.00					
Bareground	Mean =	0.00			0.00		y water		Tivit	
Relative Percent Native Cover	Mean =	100.00				100	100	100	100	100
Relative Percent Non-Native Cover	Mean =	0.00				0	0	0	0	0
% of Total Vegetation that is Native	=	100.0				0	0	0	0	0
Total # of Native Species: 15							100	1		

									Phas	e 4 l	Vlud	Slou	gh W	letla:	nd M	itigat	igati	on B	ank															
						н				Wet	and				nerg	ent P	lot D	)ata																
												,	June	21,	2012												-		•		-			
Species Ol	oserved		Ave. %		orinan ovlina			avatal-sarata	201041708	nama saada	2002 (1202)	es parente co	PZ)VORIONIO	100000		P296-0015-000	22 (22)02 (42)	@#####################################	Plot #s	10390030	100000000	p13(10)-12(20)	egges Zak	CB756235	400314 OLY		974 (1974 C.)	946204/0				190000000000000000000000000000000000000	(Selenter)	9-20-29-27
Patanical Name	Common Name	Origin	Cover ea Species	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31
Botanical Name	Common Name	Origin	Opecies		715.719						9									2////2												2.02.7.0		
Herbaceous Species	,						V-200797943-70		25.000000000000000000000000000000000000		Stead (Special						98888888	na Newsani	e de la propio	2044 EW 40		8-15-25-25	17/45-57/40		T	0.000000000	Proceedings		layayana		SESSESSES	(S)		10.8) (18.00)
Achillea millefolium	Western yarrow	native native	0,00				T											30/1939/36							1				Heat, step 2					
Alisma plantago Allium amplectens	Water plantain	native	0.00		. A. S. G. G	M48246																								T			W 1 1 1 2 2	
Aster halii	Hall's aster	native	0.32								7-12 COM22	-	Desire Start	Die Griebenz		2.2.2.2.2	XXXXXXXX		62.000 V.000	100000000000000000000000000000000000000	46.0 pec. 3	93.00		24 A 57 A 57 A 5	# 000 TO 100 F 700	10	entestrous.	75.03768		1016427410	7.76.7046			
Bidens cemua	Nodding beggars-tick	native native	0.42	20		3	T			1000000		5	ATOM STO		58.55552	(40-17-14G)			0(46/3004)	0/96049	10	00548060	1190E091	50000000			10.00	92794600	ica da la caracte		0.0000000	90.036,975	0.0000000000000000000000000000000000000	
Bidens frondosa Boisduvalia densiflora	Leafy beggars-tick  Dense spike-primrose	native	3.42	20		5			T	- 5	2							10	17			15	5	40						2			5	151.1
Carex ssp	Sedge ssp.	native	1.65	Т		20	3		5	T	3	T						T	arasasa	5		555745555	15		SMETTERS A		en-Shi77e-Sid	lent of the	T	1	teroscentia.	N 6 AE 35 A 6	2000 DOA	7
Centaurium umbellatum	Common centuary	introduced	0.03	p described to				T 40		1					Т	Т	T		Т	5					Т	10			1000 <b>1</b> 000	l				Т
Clarkia amoena var caurina	Farrwell to spring Showy downingia	native native	1.77 5.77	5	35	2	10	T	25	2	20	- 5		T	leogige.		5			5	50		15									T.		
Downingia elegans Eleocharis ovata	Ovoid spikerush	native	0.65	-	5	Т					Т									10	5		T					1,0000000000000000000000000000000000000				ALS: 18 ALS: 18	W.C.SV.W.C.S.	- 11 TOV-10
Eleocharis palustris	Creeping spike rush	native	1.13		5		10		<i>T</i> 5	T	12 3	T 10		Т		15	2	T	Т	05.75 4.0	5	T	3	Т	т	Т	T	Т	Т	T		T	T	T
Epilobium ciliatum Epilobium paniculatum	Hairy willow-herb Autumn willow-herb	native native	1.13 11.45			T		5	J	50		10	5 -	5		15	30	10	10	Т		50		Ť	50	20			10	65	- 5	5	10	10
Epiloblum paniculatum Eriophyllum lanatum	Wooly sunflower	native	10.06	1000110098424085454	processory (200	racenzajiichi.	ar observable to the						2		75		Т	1	5		100000000000000000000000000000000000000	Т		T	5	15	68	70	Т	5	2		0.575.54.574	65
Erynigium petiolatum	Rush leaf coyote thistle	native	0.16	7.000	1200												т		Т	5			Т											<u> </u>
Galium parisiense	Wall bedstraw Lowland cudweed	introduced native	0.00	000000000000000000000000000000000000000	100000000000000000000000000000000000000	100000	10		10	i jedan je			15612.055			15		Т							0.000	ni ny tot		2000	150.52					
Ghaphalium palustre Grindelia integrifolia	Willamette Valley gumwe	Seat Committee of the Party State of the Party Stat	0.52		Т	5	2	Т	Т		Т						2	T	T	5		Т	2						77.72	5				
Juncus bufonius	Toad rush	native	7.97				Т			10	T	T				Т		35	30	10				50	24	25			10	19	2	25	_ 1 -	940.78GE/
Lactuca serriola	Prickly lettuce	introduced native	0.00 5.16					т					Т	25																	60	25	50	
Lotus purshianus Lythrum hyssopifolia	Spanish clover Hyssop loosesstrife	introduced	0.48	5	10200000	T	noce (dece	2020(202)		personne			ANGELS SECTION					0.0000000000000000000000000000000000000	1	5	5	C. No. C. and C. and C.	Т			5 Jan 17 Hay 25 and 25 and	100000000000000000000000000000000000000							
Lythrum portula	Water-purslane	introduced	0.81	10	5	T	T						_			5				T	5		Т			40								
Madia saliva	Coast tarweed	native	0.32	5-75-74-5-5-1-1-1-5	Planting.	10462066	istantice:	Friede Dec	Spice Spice	agreko argen	80246356	Code ac	T	- E 15 - E	H-SECTION I	hilipping.	i stanos	T	Davision)	75527759	039)295	i/payiiin.		Deforații		10	alego dibe	0.000	9.03 25 800	AC5600	langen.		847(0508)	620,569,0
Medicago lupulina Mimulus guttatus	Black medic Common monkey flower	introduced	0.00													5		*****	NA CENTRAL S					310000000000000000000000000000000000000			10000 0000			S. There exists	7.700.00	7 4 7 7 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5 5		
Navarretia intertexta	Needle-leafed navarretia	native	0.00															I								-							Т	
Perideridia gairdneri	Gairdner's yampah	native	0.00	35	T	15	60	Т	15	3	20	10		5	HUSS UPS	Т	5	T 35	30		10	Т	10	5	T	T	DESIGNATION OF THE PERSON OF T		5	T 2		Т		
Plagiobothrys figuratus Plagiobothrys scouleri	Fragrant popcorn flower Scouler's popcorn flower	native native	8.55	- 33	1	10	00	acjections	19	000400	20	10	C. C. C. C. C.	•		\$100 P. \$2.100	T									5 6126 9-02-		Probable of solution			ine to we had			A601270147704
Polygonum persicaria	Lady's thumb	introduced	0.00				Т											_																
Potentilla gracilis	Northwest cirquefoil	native	0.45	# N	0.0000000	1600,04000	00000000		200,000	e e e e e e e e e e e e e e e e e e e	6000646	\$509,0500	18	Т	i ne me	F-02-14-76	1	T	3		090000	i de la compania del compania del compania de la compania del compania de la compania de la compania del compania de la compania de la compania de la compania del compania	(4.050%)	T Indiana	2	5	F194.0504	1564 GRVA	2	1	10		5	aenege:
Prunella vulgaris Ranunculus occidentalis	Self-heal Western buttercup	native native	1.06 0.00					i grande (a a a a					10					200000000000000000000000000000000000000					1,310045360		Т	Т							,	
Ranunculus occidentalis Rorippa curvisiliqua	Western yellowcress	native	0.32	5			Ť	T	5	T		T				T			0.000,000	T		Т												English
Sonchus asper	Prickly sow-thistle	introduced	0.00		3 S. 200 (O. 20)		D.Strangers	New York and the		Sugrafiact.	F-17-14-14	(1. j. r. s. n. j. r.	MAKENIA II		E STATE OF STREET		T sectoros	1212 SUS	Т		14.765947E	1000 No. 10	1 32 32 22		Т	Т	105200588	No. To South	F-812052017	Т			Escribe	EN 48 EN 4
Sisyrinchium auguslifolium	Pointed blue-eyed grass Purslane speedwell	native native	0.00						Т		0.9800000						000000000	40,50,50	enedero.	19200900	e de terro	100000000	sour corre			2001209	10643-10642	i i consigna	Leginageyi	l cons	22642000			30033350
Veronica peregrina Vicia tetrasperma	Slender vetch	introduced	0.00											T					T															
Minimum September 1			v Armstyn Street, e.m.				1070-526000	Distribution from	to Production	2000200	825C-52556	estrone piec	maio estas	-abdress in	e la Grande de la G	Desgons	534425543	Differiore:	0004030	Estavo, con	Control (Control	Trible plants		nerooniti	a audito (ag		t Barrie	U. 6350 (163	1.00m. Htt	0.000000	200000		4 S (2) T (1955)	eyelgeler.
Grass Species	0.3-1		0.13					Т					Т		T	10.50 Sec. /2		T		Т		T		Т	1		2		Т		1	ness Heid	Т	T
Agrostis exarata Alopecurus aequalis	Spike bentgrass Short-awned foxtail	native native	0.13	Т.				1		000000								1000000 100000000000000000000000000000		- F. D. S. W. C.														
Beckmania syzigachne	American sloughgrass	native	15.68	5	Т	50	5		25	20	40			Т		30	55	10	5	50	10	25	50	5	5	5	0.000	T	20	5	T	8	3	T
Danthonia californica	California oatgrass	native	0.00					T						- 10/2 mg		20000000		F-186-57			033855	T			1						T		T	T T
Deschampsia cespitosa  Deschampsia elongata	Tufted hairgrass Slender hairgrass	native native	0.03 7.58			100000				5			60	50		Т						Ť		T	10				50	Т	15	35	10	Т
Hordeum brachyantherum	Meadow barley	native	6.19	3 925/20023	2000000			T		5			15	15	25	15		Т	Т			10	T. M. Price St. Company		2		30	30	3	C-19192227	5	2	10	25 .
Poa trivialis	Rough bluegrass	introduced	0.00											Т					h = 1 = 2								i de de la fina							acieros.
			4.52	10	50				10	die Kalair		70		100.700																		70,75		
Bareground recent inundation Relative % non-native invasions	ve canopy cover:	0.0	4.02	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Relative % non-native canor	by cover:	1.3		15	5	0	0	0	0	0	0	0	0	0	100.0	5	100.0	100.0		5	10	100.0	100.0	100.0	100.0		100.0	100.0		1	100.0	100.0	100.0	100.0
% of Total Vegetation that is	Native =	98.7 94.2		85.0 75.0	95.0 45.0	100.0	100.0	100.0	90.0	100.0	100.0	30.0	100.0	100.0	100.0	95.0	100.0	100.0	100.0	95.0	90.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	99.0	100.0	100.0	100.0	100.0
% of Ground Cover that is N Sample plot average moistu	auve vegetation=	1.73		1.81	1.00	1.35	1.84	1.00	1.53	1.56	1.26	1.83	2.39	2.00	2.00	1.75	1.16	2.00	1.98	1.17	1.21	1.50	1.20	1.55	1.93	2.22	2.00	2.00	1.80	1.90	2.61	1.89	2.18	2.00
Total # of native Species: 39	9																18,12,52,73					Circum.												
Total number of Species Sa	mpled: 49 Total Number o	of Sample Plo	ots: 31		-	-	-	-	-	-	-	-	-	-		-	-		-	+		+	-	-	-	+		-						
	*Non-native invasive spe	ecies to be in	cluded: a	ny plant s	pecies t	hat appe	ars on the	he curre	nt Orea	n Depa	rtment c	f Agricu	Iture No	xious W	leed list.																			
	plus known problem spe	ecies includin	ng Phalaris	arundina	cea. Me	ntha pul	egium, ł	Holcus la	anatus, A	Anthoxa	nthum o	doratum	, and th	e last cr	op plant																	1		
	if it is non-native. Begin cover in 10% or more of	ning in year	2 of monito	orina, DSL	_ may co	nsider a	non-na	tive spec	cies inva	sive if is	compri	ses mor	e than '	5%	-	-		-	-	-	-	-	-		-	-	-	-	-			-		
	Plants that meet this de	tine sample	piots in an	iy napitat d idered inv	asive for	all succ	essive v	ears of	monitori	ng.	Te previ	Jua IIIUI	I	Jenou.	+	-		<b>†</b>	<b>†</b>		-					+	1							
	h. ramo mar meer mie de	mindon onoun	~ 50 001101	IIIV		0400	, ,			<u> </u>			-	-	-		-	-	division make		-	***************************************	E. Value of the	-		-	-	the section of	CONTRACTOR OF STREET		to execute the			-

# **Attachment 4**

# **MONITORING PHOTOS**





