



**Carla Cudmore**

14860 Orchard Knob Road  
Dallas, Oregon 97338

Phone: 503-510-1781  
E-mail: [cjcodmore@gmail.com](mailto:cjcodmore@gmail.com)

Consulting"

"Environmental, Wetland and Land Use

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## MEMORANDUM

**DATE:** February 5, 2016  
**TO:** DSL and ACOE  
**RE:** Mud Slough Mitigation Bank  
**FROM:** Carla Cudmore

Attached is the Phase 4 Monitoring Report and Phase 3 Credit Sales Report for Mud Slough Wetland Mitigation Bank. If you have any questions please contact Mark Knaupp at 503-559-0223 or Carla Cudmore at 503-510-1781.

**Mitigation Monitoring Report Cover Sheet**  
**Oregon Department of State Lands**

**Block 1: Report Information**

DSL Permit Number: 446225	COE Permit Number: NWP-1999-1585	Permittee: <i>Knaupp</i>
County: <i>Polk</i>	Report Date: 1/27/16	Monitoring Year 1 2 3 4 <u>5</u>
Date Removal-Fill Activity Completed:		
Date mitigation was completed Grading: 11/2010 Planting: 10/2010 and 2/2011		
Report submitted by: <i>Mark Knaupp</i>		

**Block 2: Monitoring Report Purpose**

This monitoring report is for monitoring a project that includes: (check all that apply):

- G  Compensatory **freshwater** wetland mitigation for permanent wetland impacts.
- G  Compensatory **estuarine** wetland mitigation for permanent wetland impacts.
- G  **Only non-wetland** compensatory mitigation.
- G  **Only mitigation for temporary** impacts that has a monitoring requirement.
- G  Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) not funded with money from our wetland mitigation revolving fund.
- G  Voluntary wetland enhancement, creation or restoration (General authorization or individual permit) funded with money from **our wetland mitigation revolving fund**.
- G  **Mitigation Bank** Report
- G  Other: *Phase 4 Monitoring Report – February, 2016*

**Block 3: Results**

	Success Criteria	Met? (Y/N)	Comments/Reasons for Failure*
1.	Wet Prairie and Emergent Vegetation	4 of 4	
2.	Upland Knoll	2 of 2	

Remedial work recommended Yes      No X

Deed Restriction or other protection instrument attached (noted: if a filed deed restriction was a required as a permit condition, please attach a copy: Yes      No X

*\*The Conservation Easement is in the Bank Document. We are waiting for official approval from DSL and the ACOE and will then submit a signed copy.*

Final Detailed Monitoring Report? Yes X      No

*\* Future submissions will be less detailed annual report until all credits are sold.*

Requesting release or partial release of bond? Credits? Yes X      No

*\*See report for detailed information*

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# Mud Slough Wetland Mitigation Bank

## Phase 4 - 2015 Monitoring Report and Phase 3 – Credit Sales Report

Submitted by:  
Mark Knaupp and Carla Cudmore

February, 2016

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**LIST OF ATTACHMENTS**

Attachment	1	Monitoring Point Location Map
Attachment	2	Sample Plot Monitoring Data
Attachment	3	Monitoring Photos
Attachment	4	COE Phases 3 Closure Letter



## 1.0 REGULATORY BACKGROUND

The purpose of this report is to summarize the progress of Phase 4 of the Mud Slough Wetland Mitigation Bank (Bank) located at 1875 N. Greenwood Road, Rickreall, Polk County, Oregon. This report will also report on the credit sales from Phase 3 of the Bank.

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. All 41.5 Phase 3 credits have been released for sale. The last annual monitoring report Phase 3 was submitted in 2013. The credit sales for Phase 3 are reported on in Section 7.0.

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 8.0).

Phase 4 Bank credits:

<u>Acres</u>	<u>Mitigation Type</u>	<u>Credit Ratio</u>	<u>Credits Earned</u>
40.10	Restoration of cropped wetland	1:1	40.10
1.77	Creation	1 ½:1	1.18
1.24	Enhancement of cropped wetland	2:1	0.62
<u>4.09</u>	Upland knoll	6:1	<u>0.68</u>
47.20	Total Site		42.58

## 2.0 WORK SUMMARY

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. 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 half of the wet prairie was seeded with mix predominantly comprised of forbs, sedges and rushes. Slough grass was the only grass species widely planted in the initial planting. The site was seeded with a mulch-seed mixture planted in a zone planting for individual species. The seed blend has been sorting itself out into different zones by moisture tolerance and topography in the subsequent years. 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. This method has been and continues to be very successful as is indicated in the results section (Section 5).

Some 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 tansy ragwort (*Senecio jacobea*), Himalayan blackberry (*Rubus discolor*), meadow foxtail (*Alopecurus pratensis*) and velvet grass (*Holcus lanatus*). In addition, approximately 4000 black hawthorn (*Crataegus douglasii*) have been removed in the past two years. They were naturally seeded. 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**

No as-built plans were required or submitted for Phase 4 due to the lack of substantial grading changes made.

### **4.0 PHASE 4 HYDROLOGY PERFORMANCE STANDARDS, METHODOLOGY, AND RESULTS**

The Phase 4 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.

A one-time hydrology delineation was conducted between February 6 and April 30, 2011. The monitoring included 31 monitoring tubes over the 47.2 acres of Phase 4. The results of the 2011 monitoring indicated the upland knoll area (except for one monitoring location) 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. All Phase 4 hydrology monitoring requirements have been met and approved.

### **5.0 PHASE 4 VEGETATION PERFORMANCE STANDARDS, METHODOLOGY AND RESULTS**

#### **5.1. 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.



2. 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%.
2. The cover of invasive species is no more than 10%.

### **5.2 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 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.

### **5.3 Phase 4 Vegetation Monitoring Results**

Vegetation monitoring was conducted June 4 and 18, 2015 by Mark Knaupp and John Knaupp. Attachment 2 includes spread sheets with the sample point results of the 2015 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 planted or volunteer status. The plant species list includes all species found within Phase 4 within the plots or found while walking between sample plots throughout the entire year. Phase 4 continues to have a remarkable diverse and extensive native forb population. In 2013, there were six different native species or groupings of native species, in 2014 there were 10 species or groupings and this year there were nine.

### 5.3.1 Wet Prairie and Emergent Vegetation

Thirty-nine native species were identified within the wet prairie and emergent vegetation plots in 2015. The ground cover of Phase 4 is comprised of 51.35% herbaceous species, 48.65% grass species. The herbaceous vegetation is maintaining over 50% of the total vegetation cover. The three most abundant herbaceous species are one-sided sedge (*Carex unilateralis*) at 13.55%, woolly sunflower at 9.06%, and creeping spike rush at 7.97%. The most three common grass species are meadow barley (26.71%), American sloughgrass at 7.52% and spike bentgrass at 6.45%.

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

**Required:** The cover of native species is at least 60%. These densities will be a combination of planted individuals and natural recruitment. **Met, with 95.9% of the total ground cover (including bareland) being native species.**

**Required:** The cover of invasive species is no more than 10%. **Met, with 0.1% of non-native invasive plant cover.**

**Required:** The wetland's prevalence index is less than 3.0. **Met, with a moisture index of 1.89**

**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/groupings with 5% or more average cover in at least 10% of the plots.**

**Required:** Bare substrate represents no more than 20% cover. **Met with 0.0% bareground and 0.0 dead grass.**

### 5.3.2 Upland Knoll

The number of native species in the five upland knoll plots has fluctuated in the past years. In 2013 there were 13 native species, in 2014 20 native species and this year there are 12 native species.. The most common native species are meadow barley (*Hordeum brachyantherum*), northwest cinquefoil (*Potentilla gracilis*) and woolly sunflower (*Eriophyllum lanatum*).

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 0% non-native invasive species.*

## 6.0 PHOTO POINT MONITORING

Photos from each of the established six photo points Phase 4 are included as Attachment 3. Photos were taken on June 24, 2015.

## 7.0 PHASE 3 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	0.057
8/10/10	City of Salem	4925-ENF 4926-ENF 4927-ENF 4928-ENF 4929-ENF	NA	0.22
8/19/10	Troy and Gina Bundy	7014-ENF	NA	0.03
8/12/10	Les Toth dba Kathleen Manor	6994-ENF	NA	0.64
11/22/10	City of Dundee	45474-RF	2010-154	0.64
12/14/10	City of Oregon City	44900	2010-32	0.24
12/28/10	Eyvette & Loran Davidson	6612-ENF	NA	0.07
2/12/11	The Lenity Group	45110	2009-654	1.65
6/6/11	City of Salem	46640-GP	2011-98	0.14
6/23/11	Investors Brokerage, Inc.	46715-RF	2006-348	0.29
<b>Total Phase 3 Credit Sales in Nov. 2009 thru June 2011</b>				<b>10.894</b>
7/5/11	City of Salem	46653-GP	2010-129	0.166
7/14/11	City of Wilsonville	45448-FP	2010- 40	0.40
10/17/11	Eyvette and Loran Davidson	ENF6612	N/A	0.25
10/11-3/12	Sean Tyler Keys LLC	35920-RF	2010-402	0.34
11/14/11	Brian Sparks	47906 RF	2011-348	0.17

12/16/11	ODOT	48315	2011-487	0.042
3/31/12	ODOT	48392	2011-466	0.05
5/28/12	Pac Trust	49112	2012-48	0.41
6/11/12	MWSH Salem, LLC	48938-RF	2012-37	0.05
<b>Total Phase 3 Credit Sales in July 2011 thru June 25, 2012</b>				<b>1.878</b>
6/27/12	NorPac Foods	50096-FP	NA	0.33
8/3/12	NorPac Foods	50096-FP	2011-373	0.50
8/20/12	City of Wilsonville	49456-RF	2012-68	.033
8/31/13	NW Freedom Corp	7125-ENF	NA	0.14
10/1/12	Wells Fargo Bank	50180-RF	2010-402	0.165
10/16/12	Eyvelle Davidson	ENF6612	NA	0.25
11/21/12	City of Salem	51517	2012-458	.31
4/27/13	City of Wilsonville	52665-RF	2013	.01
<b>Total Phase 3 Credit Sales June 27, 2012 thru July 1, 2013</b>				<b>1.738</b>
7/16/13	Chehalem Park & Rec	7275-ENF	NA	0.14
10/15/13	Eyvette Davidson	6612-ENF	NA	0.25
12/26/13	Meriwether Farms	25566-RP	NA	0.75
3/20/14	Baker Rock	14933-RP, 16275-PR	98-1454	0.99
4/3/14	J.C. Compton Co.	7395-ENF	NA	2.40
4/9/14	Mt. West Investment	54536-RF	2013-295	0.063
4/17/14	OR Pride Nurseries	25818-RF	NA	0.14
8/12/14	Eyvette Davidson	6612-ENF	NA	0.25
8/23/14	Calais at Villebois	55979-FP	NA	0.37
<b>Total Phase 3 Credit Sales July 1, 2013 – August 31, 2014</b>				<b>5.353</b>
9/4/14	Polygon at Villebois	56185-FP	2014-153	0.03
9/4/14	Polygon at Villebois	56009-FP	2014-133	0.82
10/17/14	City of Salem	56309	2014-195	0.02
11/21/14	City of Wilsonville	56093	2014-134	4.45
11/21/14	ODOT	50098-RF	2012-145	0.841
3/4/15	Kashmir Business Park	56812-RF	2014-339	0.212
4/2/15	Fife Group	56149-RF	2014-288	0.79
4/2/15	Fife Group	56688-RF	2014-288	0.29
7/29/15	Washington County	57032	2014-462	1.11
10/30/15	City of Salem	59016-RF	2015-230	0.472
<b>Total Phase 3 Credit Sales September 1, 2014 – December 31, 2015</b>				<b>9.035</b>
<b>Total Phase 3 Credits Sold</b>				<b>28.898</b>

There are 41.5 credits available for Phase 3, all of which have been released. Of these 41.5 credits, 28.898 have been sold leaving 12.602 credits released and unsold.



## **8.0 CREDIT RELEASE REQUEST**

I would like to request the release of all available Phase 4 credits as soon as possible. This includes credit releases #1, #2, #3, #4 and #5 totaling 75% release of the total credits (75% of the 42.58 total credits is 31.935 credits).

The requirements for the final 25% credit release (10.645 credits) include signing the conservation easement (approved and included in the Phase 4 instrument) and adding Phase 4 to the long term management plan.

The management plan approved for Phases 1-3, was approved to include Phase 4 when it was ready to be included. The Wetlands Conservancy and I determined that an additional \$50,000.00 be added to the endowment with the Wetlands Conservancy, would be adequate to maintain Phase 4. We are planning to fund the endowment completing the final requirement within the next few months. I have decided to increase the agreed upon endowment by 20% to \$60,000.00 in order to provide some additional security. Phase 4 could be placed under long term management upon completion of these final steps.

We request that the requirement for a financial assurance bond to cover any default, be waived as is set out in the Bond Release Schedule of “Exhibit J Financial Assurance” of the MBI. All monitoring has been completed and the 5<sup>th</sup> season performance standards have met.

I am requesting your approval of these measure and release of all credits as soon as possible.

## **9.0 ENDOWMENT AND LONG TERM STEWARD**

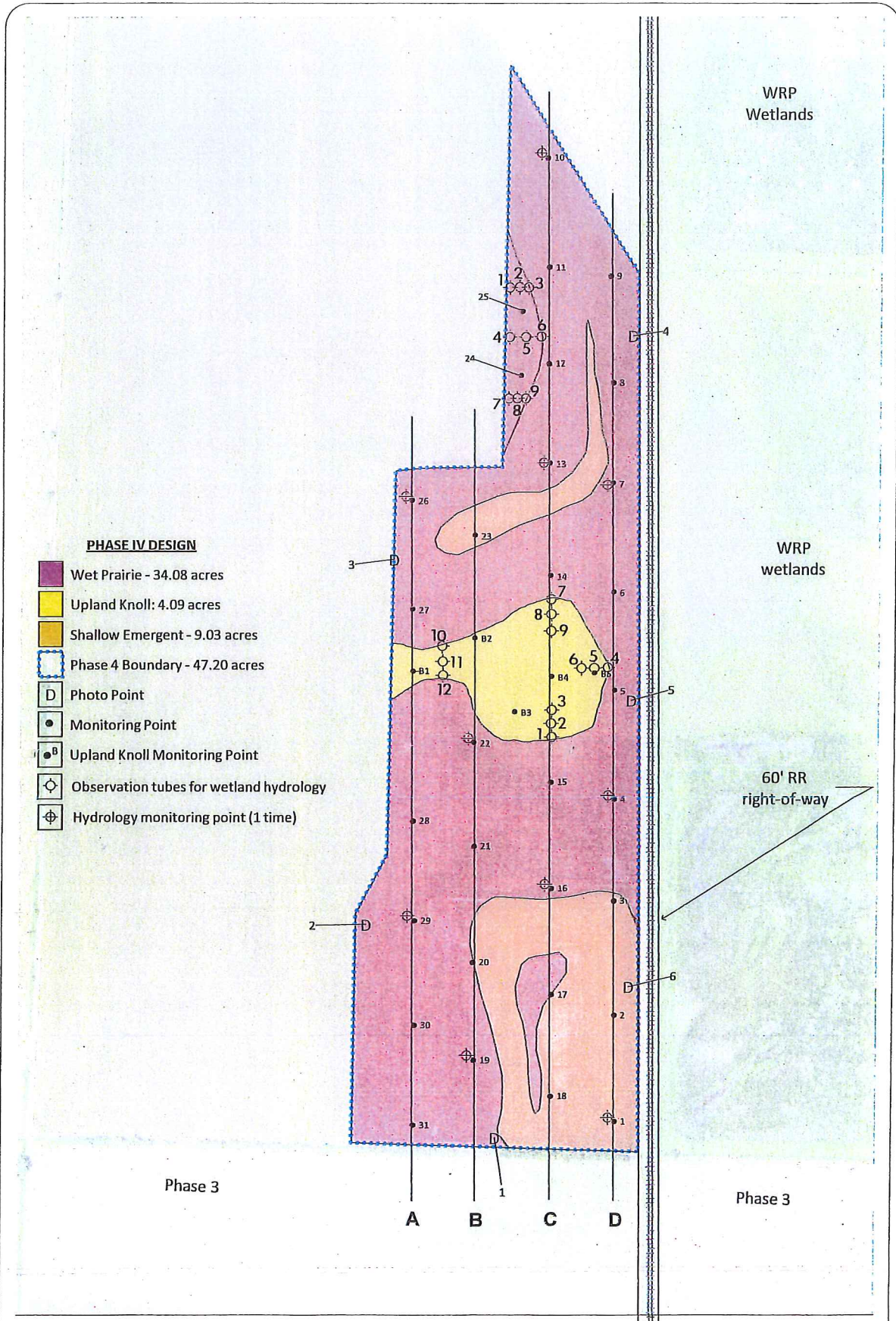
The Wetlands Conservancy has agreed to act as the long-term steward for Phase 4. We will sign the approved conservation easement for Phase 4 upon agency approval. Please submit the long term management plan to the IRT for approval.

## **10.0 PHASE 3 BANK CLOSURE**

DSL approved closure of Phase 3 of the Bank in a letter dated March 19, 2014. The COE signed the Phase 3 closure letter on March 9, 2015 (see Attachment #4.)

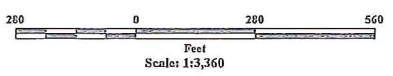
## **11.0 PHASE 4 – MONITORING REPORT SUMMARY**

This is the fifth and final monitoring report for Phase 4 since all performance standards have been met. A less detailed report as defined in the Phase 4 Banking Instrument will be submitted until the last credit is sold.



- PHASE IV DESIGN**
- Wet Prairie - 34.08 acres
  - Upland Knoll: 4.09 acres
  - Shallow Emergent - 9.03 acres
  - Phase 4 Boundary - 47.20 acres
  - D Photo Point
  - Monitoring Point
  - B Upland Knoll Monitoring Point
  - X Observation tubes for wetland hydrology
  - + Hydrology monitoring point (1 time)

Mark Knaupp Property  
Phase IV Mud Slough Mitigation Bank Site



**HYDROLOGY MONITORING MAP**  
Scale: 1" = 280'  
Source: Polk County GIS 1.5 ft pixel  
Flown: 7/8/08  
Drafted: 8/11/10  
Revised: 10/02/10, 10/08/10, 10/08/10  
NORTH

Phase 4 Monitoring Point Location Map









**Phase 4 Mud Slough Wetland Mitigation Bank  
Plant Species List  
June, 2015**

Includes species identified in monitored plots, planted, or found while walking between sample plots throughout the entire year.

		Status	Origin	Wet Prairie	Moisture	Planted
Overstory				Vernal pool	Index	
<i>Crataegus douglasii</i>	Black hawthorne	FAC	native		3	
<i>Pinus ponderosa</i>	Willamette V. ponderosa pine	FACW	native		2	X
<i>Populus trichocarpa</i>	Black cottonwood	FAC	native		3	
<i>Pyrus fusca</i>	Pacific crab apple	NOL	native			X
<i>Quercus garryana</i>	Oregon white oak	NOL	native			X
<i>Salix sitchensis</i>	Sitka willow	FACW	native		2	
<i>Tsuga heterophylla</i>	Western red cedar	FACU	native		4	X
Shrubs						
<i>Amelanchier alnifolia</i>	Serviceberry	FACU	native		4	X
<i>Oemleria cersiformis</i>	Indian plum	FACU	native		4	X
<i>Symphoricarpos albus</i>	Snowberry	FACU	native		4	X
Herbaceous Species						
<i>Achillea millefolium</i>	Western yarrow	FACU	native		4	X
<i>Alisma plantago</i>	Water plantain	OBL	native		1	
<i>Allium amplexans</i>	Slimleaf onion	NOL	native	Yes		X
<i>Aster halii</i>	Hall's aster	FAC	native	Yes	3	X
<i>Bidens cernua</i>	Nodding beggars-tick	FACW	native		2	X
<i>Bidens frondosa</i>	Leafy beggars-tick	FACW	native		2	X
<i>Boisduvalia densiflora</i>	Dense spike-primrose	FACW	native	Yes	2	X
<i>Camassia quamash</i>	Common camas	FACW	native	Yes	2	X
<i>Castilleja tenuis</i>	Hairy Indian paintbrush	NOL	native			
<i>Cerastium vulgatum</i>	Mouse-ear chickweed	FACU	introduced		4	
<i>Carex densa</i>	Dense sedge	OBL	native	Yes	1	X
<i>Carex feta</i>	Green-sheathed sedge	FACW	native	Yes	2	X
<i>Carex unilateralis</i>	One-sided sedge	FACW	native	Yes	2	X
<i>Centaurium umbellatum</i>	Common centuary	FAC	introduced		3	
<i>Cerastium vulgatum</i>	Mouse-ear chickweed	FACU	introduced		4	
<i>Cirsium arvense</i>	Canada thistle	FACU	introduced		4	
<i>Cirsium vulgare</i>	Bull thistle	FACU	introduced		4	
<i>Clarkia amoena var caurina</i>	Farrwell to spring	NOL	native			X
<i>Crepis setosa</i>	Bristly hawksbeard	NOL	native			
<i>Daucus carota</i>	Queen Anne's lace	NOL	introduced			
<i>Downingia elegans</i>	Showy downingia	OBL	native	Yes	1	X
<i>Eleocharis acicularis</i>	Needle spike-rush	OBL	native	Yes	1	
<i>Eleocharis ovata</i>	Ovoid spikerush	OBL	native	Yes	1	X
<i>Eleocharis palustris</i>	Creeping spike rush	OBL	native		1	
<i>Eryngium petiolatum</i>	Rush leaf coyote thistle	OBL	native	Yes	1	X
<i>Epilobium angustifolium</i>	Fireweed	FACU	native		4	
<i>Epilobium ciliatum</i>	Hairy willow-herb	FACW	native	Yes	2	
<i>Epilobium paniculatum</i>	Autumn willow-herb	NOL	native	Yes		
<i>Eriophyllum lanatum</i>	Woolly sunflower	NOL	native	Yes		X
<i>Galium trifidum</i>	Small Bedstraw	FACW	native		2	
<i>Galium parisiense</i>	Wall bedstraw	UPL	introduced		5	
<i>Ghaphalium palustre</i>	Lowland cudweed	FAC	native	Yes	3	
<i>Grindelia integrifolia</i>	Willamette Valley gumweed	FACW	native	Yes	2	X
<i>Hypochaeris radicata</i>	Cat's ear dandelion	FACU	introduced		4	
<i>Juncus bufonius</i>	Toad rush	FACW	native	Yes	2	
<i>Juncus effusus</i>	Common rush	FACW	native		2	
<i>Juncus nevadensis</i>	Sierra rush	FACW	native	Yes	2	
<i>Juncus tenuis</i>	Slender rush	FACW	native	Yes	2	X
<i>Kickxia elatine</i>	Sharppoint fluvelin	UPL	introduced		5	
<i>Lactuca serriola</i>	Prickly lettuce	FACU	introduced		4	
<i>Lathyrus sphaericus</i>	Grass pea-vine	NOL	introduced			
<i>Lamium amplexicaule</i>	Henbit	NOL	introduced			



<i>Lomatium nudicaule</i>	Barestem desert-parsley	NOL	native	Yes		X
<i>Lotus purshianus</i>	Spanish clover	NOL	native	Yes		X
<i>Lupinus micranthus</i>	Minature lupine	NOL	native			
<i>Lupinus polyphyllus</i>	Bigleaf lupine	FAC	native	Yes	3	X
<i>Lythrum hyssopifolia</i>	Hyssop loosesstrife	OBL	introduced		1	
<i>Lythrum portula</i>	Spatulaleaf loosestrife	NOL	introduced			
<i>Madia sativa</i>	Coast tarweed	NOL	native			
<i>Medicago lupulina</i>	Black medic	FAC	introduced		3	
<i>Mentha pulegium</i>	Pennyroyal	OBL	introduced		1	
<i>Mimulus guttatus</i>	Common monkey flower	OBL	native	Yes	1	
<i>Navarretia intertexta</i>	Needle-leafed navarretia	FACW	native	Yes	2	
<i>Parentucellia viscosa</i>	Parentucellia	FAC	introduced		3	
<i>Perideridia gairdneri</i>	Gairdner's yampah	FAC	native	Yes	3	X
<i>Plagiobothrys figuratus</i>	Fragrant popcorn flower	FACW	native	Yes	2	X
<i>Plagiobothrys scouleri</i>	Scouler's popcorn flower	FACW	native	Yes	2	X
<i>Plantago major</i>	Common plantain	FACU	introduced		4	
<i>Polygonum amphibium</i>	Water smartweed	OBL	native		1	
<i>Polygonaceae persicaria</i>	Lady's thumb	FACW	introduced		2	
<i>Potentilla gracilis</i>	Northwest cirquefoil	FAC	native	Yes	3	X
<i>Prunella vulgaris</i>	Self-heal	FACU	native	Yes	4	X
<i>Ranunculus sceleratus</i>	Cellery leaf buttercup	OBL	native		1	
<i>Ranunculus occidentalis</i>	Western buttercup	FAC	native	Yes	3	X
<i>Rorippa curvisiliqua</i>	Western yellowcress	FACW	native	Yes	2	
<i>Rumex crispis</i>	Curly dock	FAC	introduced		3	
<i>Rumex salicifolius</i>	Willow dock	FACW	native		2	
<i>Senecio jacobea</i>	Tansy ragwort	FACU	introduced		4	
<i>Sidalcea campestris</i>	Meadow checker-mallow	NOL	native			X
<i>Sidalcea nelsoniana</i>	Nelson's checkermallow	FAC	native		3	X
<i>Sisyrinchium auguslifolium</i>	Pointed blue-eyed grass	FACW	native	Yes	2	X
<i>Sonchus asper</i>	Prickly sow-thistle	FAC	introduced		3	
<i>Taraxicum officinale</i>	Dandelion	FACU	introduced		4	
<i>Typa latifolia</i>	Cat-tail	OBL	native		1	
<i>Veronica americana</i>	American speedwell	OBL	native		1	
<i>Veronica peregrina</i>	Purslane speedwell	OBL	native	Yes	1	
<i>Veronica scutellata</i>	Marsh speedwell	OBL	native		1	
<i>Vicia hirsuta</i>	Hairy vetch	NOL	introduced			
<i>Vicia tetrasperma</i>	Slender vetch	NOL	introduced			
<i>Wyethia angustifolia</i>	Narrow-leaf mule's ears	FACU	native		4	X
<b>Grass Species</b>						
<i>Agrostis exarata</i>	Spike bentgrass	FACW	native	Yes	2	X
<i>Alopecurus aequalis</i>	Short-awned foxtail	OBL	native		1	
<i>Alopecurus geniculatus</i>	Water foxtail	OBL	native		1	
<i>Alopecurus pratensis</i>	Meadow foxtail	FACW	introduced		2	
<i>Beckmania syzigachne</i>	American sloughgrass	OBL	native	Yes	1	X
<i>Bromus carinatus</i>	California brome	NOL	native			
<i>Danthonia californica</i>	California oatgrass	NOL	native	Yes		X
<i>Deschampsia cespitosa</i>	Tufted hairgrass	FACW	native	Yes	2	X
<i>Deschampsia elongata</i>	Slender hairgrass	FACW	native	Yes	2	X
<i>Echinochloa crus-galli</i>	Barnyard grass	FACW	introduced		2	
<i>Elymus glaucus</i>	blue wild rye	FACU	native		4	
<i>Festuca arundinacea</i>	Tall fescue	FAC	introduced		3	
<i>Festuca myuros</i>	Rat-tail fescue	NOL	introduced			
<i>Glyceria borealis</i>	Northern mannagrass	OBL	native		1	
<i>Glyceria occidentalis</i>	Western mannagrass	OBL	native		1	X
<i>Holcus lanatus</i>	Velvet grass	FAC	introduced		3	
<i>Hordeum brachyantherum</i>	Meadow barley	FACW	native	Yes	2	X
<i>Panicum capillare</i>	Common witchgrass	FACU	native	Yes	4	
<i>Poa annua</i>	Annual bluegrass	FAC	introduced		3	
<i>Poa pratensis</i>	Kentucky bluegrass	FAC	introduced		3	
<i>Poa trivialis</i>	Rough bluegrass	FACW	introduced		2	
<i>Vulpia myuros</i>	Rat-tail fescue	FAC	introduced		3	

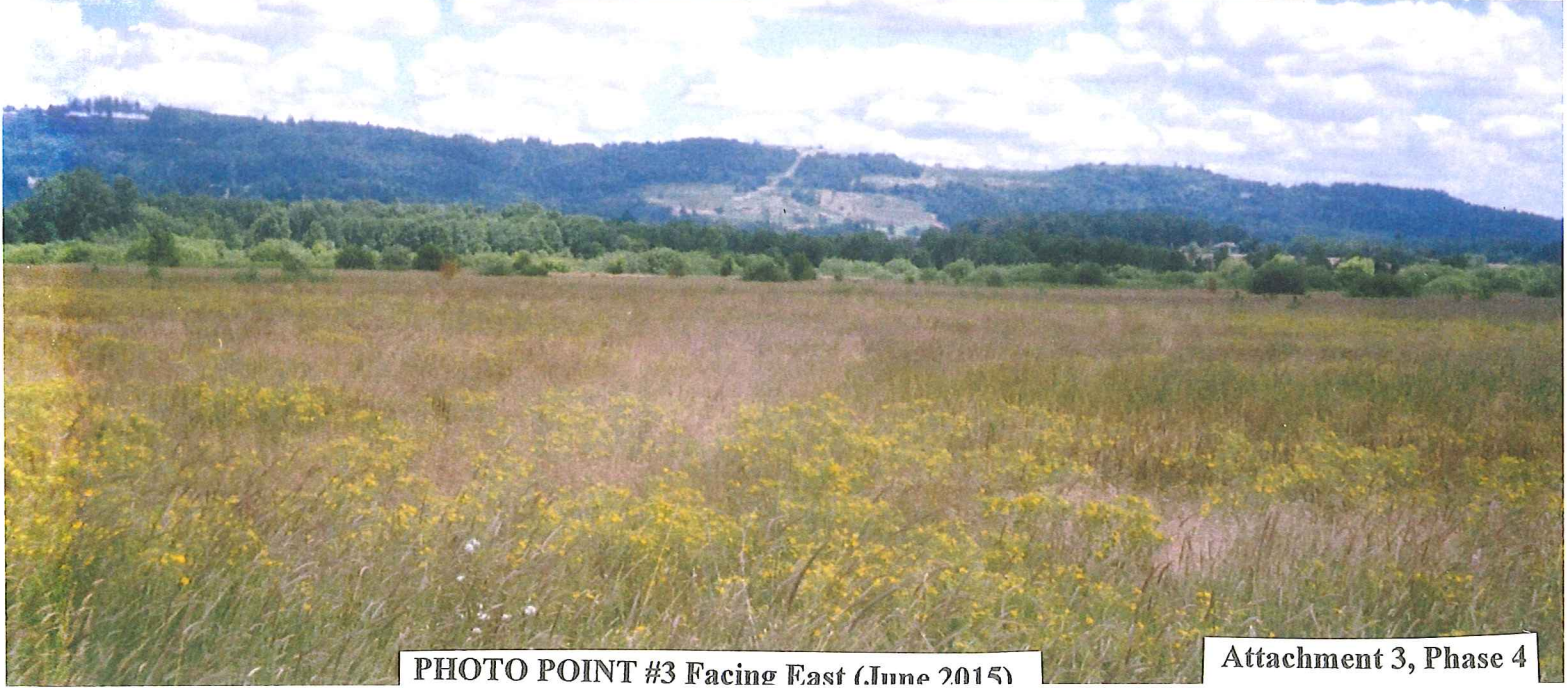




**PHOTO POINT #1 Facing North (June 2015)**



**PHOTO POINT #2 Facing East (June 2015)**



**PHOTO POINT #3 Facing East (June 2015)**





**PHOTO POINT #4 Facing West (June 2015)**



**PHOTO POINT #5 Facing West (June 2015)**



**PHOTO POINT #6 Facing West (June 2015)**





DEPARTMENT OF THE ARMY  
PORTLAND DISTRICT, CORPS OF ENGINEERS  
POST OFFICE BOX 2946  
PORTLAND, OREGON 97208-2946

March 9, 2015

Operations Division  
Regulatory Branch  
Corps No.: NWP-1999-1585

Mr. Mark Knaupp  
Mud Slough Wetland Mitigation Bank  
1875 North Greenwood Road  
Rickreall, Oregon 97371

Dear Mr. Knaupp:

The U.S. Army Corps of Engineers (Corps) has received your requests to close phases 2 and 3 of the Mud Slough Wetland Mitigation Bank. The requests were part of the July 2013 Phase 2 Annual Report and July 2013 Phases 3 and 4 Monitoring Report, respectively.

Per the Phase 3 Mitigation Banking Instrument (MBI) at Part VI. F, requirements for closure include completion of the formal monitoring period and satisfaction of the performance standards. Formal monitoring for phases 1 and 2 have been completed, and the credits for each, 28.12 and 45.7, respectively, have been sold out. Formal monitoring for Phase 3 required five years of reporting, which was completed in 2013. A credit balance remains for the Phase 3 bank, and credit sales continue. The performance standards for all three phases have been satisfied. By this letter the Corps certifies that you have met the conditions for bank closure.

The Corps supports the Sponsor's efforts to provide permanent legal protection for the bank property through the Conservation Easement signed with The Wetlands Conservancy on May, 25, 2010. In addition, the provisions of the long-term management plan, secured in September 2013 with The Wetlands Conservancy and the Oregon Department of State Lands, are designed to ensure the bank property is managed, monitored, and maintained in perpetuity.

As noted in the Phase 3 MBI, less detailed long term annual reports must be submitted until 5 years after the last credit is sold. These reports are intended to ensure that performance standards are still being met so that remaining credits are market ready when a mitigation requirement arises.

The Corps appreciates your continued efforts to support and provide improved conditions for wetland ecosystems in Oregon. If you have any questions, please

contact Tom Taylor, Mitigation Program Manager, at the letterhead address, by telephone at (503)808-4386, or via email at [thomas.j.taylor@usace.army.mil](mailto:thomas.j.taylor@usace.army.mil).

Sincerely,

A handwritten signature in black ink, appearing to read "Shawn H. Zinszer", with a large, stylized flourish extending to the right.

Shawn H. Zinszer  
Chief, Regulatory Branch

Copy Furnished (electronically):

Oregon Department of State Lands (Field)  
Oregon Department of Environmental Quality (Nayar)  
U.S. Fish and Wildlife Service (Ginger)  
U.S. Environmental Protection Agency (Nadeau)  
Oregon Department of Fish and Wildlife (Vaughn)  
The Wetlands Conservancy (Lev)