

March 25, 2016

To: Dana Field, Oregon Department of State Lands
Tom Taylor, Michael LaDoucer, U.S. Army Corps of Engineers

cc: Elton Kemnitz, Garret Creek Mitigation Bank, LLC
Steve Binns, Garret Creek Mitigation Bank, LLC

From: Brent Haddaway, PWS

Subject: Garret Creek Mitigation Bank, Supplemental Mitigation Monitoring Results

Dana, Tom, and Michael,

The purpose of this memorandum is to document the results of supplemental vegetation monitoring performed at the Garret Creek Mitigation Bank (Bank) on July 27, 2015. Performance monitoring has been conducted at the bank for 5 years, and all performance standards have been achieved, with two exceptions: aerial cover and diversity of woody species. The performance standards were met for the “south field” portion of the site, but woody vegetation in the “north field” had developed more slowly.

Year 5 monitoring results were discussed with the Oregon Department of State Lands (DSL) and the Portland District of the U.S. Army Corps of Engineers (Corps) (collectively, the Interagency Review Team [IRT]) at a site visit on July 1, 2014; bank sponsors and IRT agreed to perform supplemental monitoring in the north field in 2015 (Year 7 of site development), to allow the vegetation community additional time to develop. This memo reports the results of supplemental monitoring performed at the site, summarizes overall site performance, and references monitoring results from Year 5 to address overall site performance.

Project Background

The Bank is owned and operated by Garret Creek Mitigation Bank, LLC, in Molalla, Clackamas County, Oregon. The mitigation bank lies at the confluence of Garret and Rock Creeks and was developed to offset unavoidable impacts to wetlands of the U.S. and State due to development in the Molalla – Pudding watershed, Hydrologic Unit Code 17090009.

The Bank is located at 33711 S. Dryland Road, between Molalla and Canby, in Clackamas County, Oregon. The Bank is contained within three tax lots: 51E2300500, 51E2300501 and 51E2300502 and located within Section 23, Township 5 South, Range 1 East.

The Garret Creek Mitigation Bank Instrument (MBI) was signed by the DSL and the Corps in July 2008, and the site was graded the same summer. The site was planted during winter 2008-2009, and the first year of formal monitoring began during the spring of 2009. The site includes an access road that extends from the Kemnitz Farms facilities to the existing irrigation pond near the north field. The road was originally proposed to bisect the 50' buffer along the north field, but was relocated to

the upland edge of the buffer during construction. The change has no impact on total site area, but establishes more contiguous buffer area, but this detail had not been previously reported – the attached Garret Creek Monitoring Map shows the updated location, along with the location of sampled transects. The Bank is eligible to earn 15.49 wetland mitigation credits and 220 stream credits (each credit is equivalent to 1 cubic yard of fill below the ordinary high water mark). Mitigation bank development included wetland restoration, wetland enhancement, riparian enhancement, stream restoration, and upland buffer enhancement. Table 1 summarizes the areas for each mitigation activity type; detailed explanations of mitigation activities can be found in the Garret Creek MBI, produced by Jones & Stokes Associates in 2008.

Table 1. Mitigation Area Summary¹

Treatment Area	Area	Activities	Functions
Creek restoration	1,205 linear feet	Remove or breach berms, restore tributary channel	Hydrologic, water quality, habitat
Wetland restoration	10.68 acres	Disable tile, fill ditches, planting	Hydrologic, water quality, habitat
Cropped wetland enhancement	7.52 acres	Disable tile, fill ditches, planting	Hydrologic, water quality, habitat
Wetland enhancement	0.77 acres	Disable tile, planting	Habitat, hydrologic
Wetland buffer enhancement	0.79 acres	Protection	Habitat, hydrologic, water quality
Upland riparian enhancement	2.80 acres	Preservation, planting	Habitat
Upland buffer enhancement	1.72 acres	Preservation, planting	Buffering, habitat
Upland buffer preservation*	4.57 acres	Preservation	Buffering, habitat
Riparian Buffer	0.70 acres	Remove adjacent berm, protection	Habitat, buffering

*Does not generate mitigation credit

Monitoring Methods

The physical, hydrologic, and vegetative conditions of the mitigation site were monitored relative to the MBI goals, objectives, and performance standards. As stated above, all performance standards for the site except woody vegetation aerial cover and diversity in the north field were achieved by Year 5; for further details, please refer to the *Garret Creek Mitigation Bank Year 5 Mitigation Monitoring Report* submitted in 2013. The following monitoring methods were used during the most recent sampling event to document project performance. These methods follow the sampling approach described in the original MBI and were applied only to the areas of the site that did not meet performance standards in Year 5.

¹ Areas are based on MBI estimates for post restoration. Delineation results from 2013 indicate an overall increase in wetland area; mitigation types and mitigation ratios will be updated through consultation with the IRT.

Vegetation development was monitored using transects to measure woody plant species survival, plant density, and aerial cover to address performance standards. Baselines are established along the boundary of the wetland and buffer areas. Transects were established perpendicular to the baselines extending into both wetlands and upland buffers to establish sampling areas. Transects are located every 150 feet along the baseline and oriented north-south to extend into planting areas. Transect distribution is regular, from a random starting point. Line-intercept samples for this monitoring event were presumed to be of adequate size based on previous sample size results and because the full length of all transects was sampled in Year 5. Sampling was performed as described in *Measuring & Monitoring Plant Populations*.²

- **Aerial cover** for woody and invasive species is measured using the line-intercept method along the full transect length. The length of intercept for each sample and total length of transects is used to calculate the aerial cover for species.³
- **Diversity** of woody species is measured by calculating the percent cover by species across all transects.

Monitoring Results

Monitoring data were collected June 27, 2015, in the north field portion of the site. Photos were taken from the permanent photo stations and are included as Appendix A to this report. Data collected in the field are included as Appendix B. The Bank credit ledger is included as Appendix C. Note that performance standards listed below refer to conditions across the entire site; therefore, 2013 south field results are also reported below to determine site-wide results. Qualitative observations of the south field development indicate that aerial coverage in the south field is currently much higher than reported here; therefore, site-wide values reported below are assumed conservative.

Table 2. 2015 Monitoring Results

Performance Standards	Monitoring Results
<i>Performance Standard 2.2</i> —Native woody species within the wetland restoration/ enhancement areas and stream restoration areas will have an aerial cover of 50% in Year 5.	North field: 47% South field (2013): 54% Total site-wide average: 51%
<i>Performance Standard 2.4</i> — <i>Phalaris arundinacea</i> , <i>Polygonum cuspidatum</i> , <i>Rubus armeniacus</i> , <i>Crataegus laevigata</i> , <i>Hedera helix</i> , <i>Solanum dulcamara</i> , <i>Polygonum cuspidatum</i> , <i>Lythrum salicaria</i> , and any other Oregon Department of Agriculture-listed noxious weed will collectively cover less than	North field: 6% South field (2013): 3% Total site-wide average: 5% <i>Phalaris arundinaceae</i> , <i>Rubus armeniacus</i> , <i>Rubus laciniatus</i> , and <i>Cirsium arvense</i> combine for an

² Elzinga, C.L., D.W. Salzer, and J.W. Willoughby. 1998. *Measuring and Monitoring Plant Populations*. Bureau of Land Management. BLM Technical Reference 1730-1.

³ Ibid.

Performance Standards	Monitoring Results
30% of the combined wetland restoration, wetland enhancement, wetland buffer enhancement, cropped wetland enhancement, riparian buffer, upland riparian enhancement, and upland buffer enhancement areas.	invasive species cover of 6%. Invasive species are being controlled with herbicide.
<i>Performance Standard 2.5</i> —At least four native woody species will provide 5% or more of the living plants or aerial cover in each of the wetland restoration, wetland enhancement, and tributary enhancement areas in Years 1, 2, 3, and 5.	<i>Populus balsamifera</i> (21%), <i>Fraxinus latifolia</i> (18%), and <i>Salix lasiandra</i> (9%) all exceeded 5% aerial cover in the north field. <i>Salix sitchensis</i> (3%) and <i>Rosa nutkana</i> (2%) contributed the next highest aerial cover percentages. Species are diverse site-wide and stem density greatly exceeds performance standards.
<i>Performance Standard 3.2</i> —Woody species within the enhanced upland buffer areas will have an aerial cover of 35% in Year 5.	North field: 53% South field (2013): 43% Total site-wide average: 48% <i>Note: North field results incorrectly reported as 3%, rather than 30%, in 2013.</i>

Summary and Recommendations

With the exception of woody species diversity, the bank site has met all performance criteria set in the MBI. Aerial cover performance standards were met site wide, and invasive species contributed only 5 percent aerial cover within the mitigation bank site. Performance standards for diversity of woody plants fell short, although previous monitoring work has shown that site plantings were successful. Failure to meet this standard is likely due to native volunteers out-competing planted woody plants. Three species exceeded the 5 percent cover standard, and two additional species (*Salix sitchensis* and *Rosa nutkana*) combine for 5 percent cover. The bank sponsors suggest the “intent” of the performance standard has been achieved, and that the site is on a trajectory to continue developing into a mature forested wetland.

Wetland delineation monitoring resulted in 21.04 acres of wetland, exceeding the expected restored wetland area. Bank design estimates were generated using mapped hydric soil unit boundaries, which accounts for the discrepancy between the estimated wetland area and the formal results of the post- construction delineation performed for compliance monitoring. Wetland delineation focused on areas where the IRT had expressed concerns that wetland conditions were not clearly observable. The IRT reviewed the delineation results in the field during summer 2013.

Garret Creek Mitigation Bank LLC will continue to perform routine management of invasive species at the site and provide access to the IRT on an annual basis for inspection. Reports qualitatively describing site development along with site photos will be provided annually as well.

Garret Creek Mitigation Bank LLC requests release of 85 percent of the total mitigation credits generated at the site, without financial assurances (the remaining 15 percent of credits to be released upon reaching formal agreement with a permanent site steward, per the Garret Creek MBI). It is our understanding that we have achieved the mitigation goals set out in the MBI and the site is now on track to maturity without the need for substantial management. The bank sponsor

also requests an opportunity to discuss the implications for the larger wetland area delineated and procedures for generating additional credits if applicable. The bank sponsors have worked cooperatively with the IRT to achieve a successful project and are proud of the site development. We look forward to continued cooperation with DSL and Corps staff to provide mitigation in our service area.

If you require additional information or clarification regarding this project, please contact Brent Haddaway at 503-522-0855 or bhaddaway@cascadeenv.com.

Sincerely,

Brent Haddaway

Attachments:

- Figure 1. Monitoring Map
- Appendix A. Site Photographs
- Appendix B. Vegetation Data
- Appendix C. Credit Ledger



Garret Creek Mitigation Bank - Monitoring Map

Appendix A. Site Photos

Photo Point #4, Looking North



Photo Point #4, Looking Northeast



Photo Point #5, Looking Northwest



Photo Point #5, Looking West



Photo Point #6, Looking West



Photo Point #6, Looking North



Photo Point #6, Looking East



Photo Point #6, Looking South



Photo Point #7, Looking North



Photo Point #7, Looking Northwest



Photo Point #7, Looking South



Photo Point #8, Looking West



Photo Point #8, Looking South



Photo Point #8, Looking East



Appendix B. Vegetation Data

Cover-Line Intercept for Community Mapping

Project Name: Kennitz Community: _____

Project Location: North Field

Notes: In meters 28 m transect

Date: 6/27/15 Observer(s): Kline, Haddaway

Transect #: 1 Transect coordinates: _____

Species/Code														
REG	start	0.0												
	stop	3.0												
SALA	start	0												
	stop	2.6												
FRLA	start	7.9	12.8	15.9	18.5	19.0	19.9	20.9	23.7	24.6				
	stop	9.3	13.4	16.3	18.8	19.5	20.1	22.0	24.0	24.9				
QUGA	start	23.4	26.6											
	stop	23.6	26.8											
	start													
	stop													
CIAR	start	1.9	10.8	28.0	28.9									
	stop	2.4	11.2	28.5	29.1									
Poes	start	17.1												
	stop	17.7												
SALA	start	18.6												
	stop	24.5												
FRLA	start	31.4	32.6	33.7	40.6	42.5	43.4							
	stop	31.7	33.3	39.2	42.1	42.8	44							
FRLA	start	2.4												
	stop	2.9												
SALA	start	5.0												
	stop	8.0												
PHAR	start	7.1	8.6											
	stop	7.3	9.5											
CIAC	start	7.4	9.4	10.2	31.2	32.7	32.9	33.5	35.0	35.7	36.7	34.5		
	stop	7.7	10	10.5	31.4	32.9	33.3	33.6	35.5	36.4	36.9	34.8		
RUDI	start	13.6	15.7	32.4										
	stop	13.8	16.7	32.8										
PNBA	start	16.2	24.6											
	stop	21.4	26.0											
ACMA	start	11.4	36.7											
	stop	17.9	39											
RJLA	start	22.0	26.9											
	stop	22.6	27.2											
PRVI	start	22.3												
	stop	23.0												

T2
0-44

3
(upland)
39 m

Cover-Line Intercept for Community Mapping

Project Name: _____ Community: _____

Project Location: _____

Notes: _____

Date: 6/27/15 Observer(s): _____

Transect #: _____ Transect coordinates: _____

Species/Code

POBA /	start	3.9	20.2	26.5	36.9	42.2	46.7	54.4	51.3	64.5	77.4	88.0	90.7
	stop	18.9	22.7	27.3	38.4	42.9	47.7	57.5	61.1	66.1	80.6	0.2	
FRLA /	start	8.4	11.0	16.4	22.5	24.3	30.4	30.2	40.2	43.0	48.6	52.5	
	stop	9.5	11.9	17.3	22.9	24.7	30.8	39.4	41.8	45.4	48.5	53.1	
SYAL /	start	10.4											
	stop	11.3											
SPDO /	start	26.9											
	stop	27.2											
RONU /	start	30.9	53.7	57.1	71.4	77.4	85.4	3.4	26.8	40.9	42.5	48.4	
	stop	31.1	54.4	58.0	73	78.2	85.9	3.9	27.9	42.2	43.0	49.6	
SALA	start	33.6	18.5	78.4									
	stop	33.6	19.6	79.5									
FRLA /	start	56.8	63.4	65.8	67.6	76.0	78.2	81.5	83.6	84.6	85.6	87.1	
	stop	57	63.7	66.1	68.0	76.9	78.8	82.6	83.8	84.9	86.2	87.7	
RUDI /	start	82.1											
	stop	82.6											
FRLA /	start	89.1	0	6.0	22.5	28.7	38.7	42.2	43.1	49.6	54.9	57.3	
	stop	89.5	1.4	6.6	22.8	29.1	39.1	42.5	43.7	50.2	55.5	58.5	
POBA /	start	60.9	9.9	13.6	19.9	29.0	36.6	46.0	60.5	64.8			
	stop	8.9	12.3	17.6	26.5	30.8	39.4	50.0	62.1	66.7			
FRLA /	start	60.0	60.7	62.5	64.7	66.1	67.9	69.5	70.7	71.8	72.5	73.5	
	stop	60.3	61.0	63.0	65.0	66.6	68.4	69.8	71.2	72.1	72.7	73.7	
RONU /	start	66.8	71.2	79.8	84.0								
	stop	47.6	72.2	80.6	85.0								
FRLA /	start	74.3	75.9	76.6	78.3								
	stop	75.1	76.2	76.9	79.2								
	start												
	stop												
	start												
	stop												
	start												
	stop												
	start												
	stop												
	start												
	stop												

T6

90 + 85

90 x 4 m

23.8
62.4
71.3

Cover-Line Intercept for Community Mapping

Project Name: Community:

Project Location:

Notes:

First 50m of T7 is upland buffer

Date: 6/27/15 Observer(s):

Transect #: Transect coordinates:

Species/Code

POBA /	start	0.8	20.6	29.4	42.0	58.2	74.8	81.2	87.5	0	5.3	6.7
	stop	15.2	24.5	31.6	44.0	62.3	76.2	87.6	90.0	2.0	6.4	7.4
RDI /	start	7.0	11.9									
	stop	7.3	12.4									
SALA /	start	7.2	11.8	24.9	32.2	56.6	71.2	89.1	0	36.4	46.1	49.3
	stop	8.5	16.5	25.5	33.3	56.7	71.9	90	0.7	40.1	47.4	51.5
FRLA /	start	8.6	27.1	36.9	40.4	43.5	48.5	50.0	53.0	62.5	64.5	65.5
	stop	9.2	27.3	37.4	40.9	44.9	49.4	50.8	54.7	63.0	65.1	66.6
PHAR /	start	27.5	37.6	80.7								
	stop	29.0	38.0	80.9								
FRLA /	start	66.6	69.9	72.4	73.7	75.2	77.3	1.1	2.5	8.5	14.6	18.1
	stop	67.8	70.4	73.0	74.0	75.9	79.1	1.6	3.2	1.0	15.3	18.7
RONU /	start	82.7	82.8	28.1	31.8	43.9	87.2					
	stop	83.3	23.2	29.1	32.4	44.8	87.9					
POBA /	start	8.8	16.0	34.5	41.8	46.6	63.2					
	stop	11.9	16.8	36.7	44.2	49.9	65.8					
FRLA /	start	25.0	26.8	28.5	29.4	32.6	52.7	66.1	71.6	77.0	81.1	
	stop	26.3	27.3	29.2	31.4	33.4	53.2	66.6	73.3	77.9	82.2	
RONU /	start	22.3										
	stop	23.6										
SPDO /	start	40.1	57.5	59.5								
	stop	41.6	58.4	60.4								
SALA /	start	69.4	74.9	80.0								
	stop	70.3	76.9	80.9								
CIAR /	start	84.2	87.6									
	stop	86.2	88.4									
	start											
	stop											
	start											
	stop											
	start											
	stop											
	start											
	stop											

T7

90 +
90

14.4
24.4
6.7
57.3

Cover-Line Intercept for Community Mapping

Project Name: _____ Community: _____

Project Location: _____

Notes: pulled tape from 'new road' to capture upland buffer 0.50m is upland

Date: _____ Observer(s): _____

Transect #: _____ Transect coordinates: _____

Species/Code

SASI /	start	5.9	12.1	71.8	76.7	79.8	83.2	85.0	1.3	16.9		
	stop	7.3	13.6	72.9	79.1	81.8	84.4	87.4	4.4	18.4		
DOBA /	start	0.	7.2	18.0	57.4	4.3	13.9	26.5	35.7	55.2	74.8	
	stop	1.9	9.0	22.9	59.8	5.0	17.1	29.4	37.8	56.9	76.4	
RONu ✓	start	9.5	41.6	56.4								
	stop	10.4	42.8	57.3								
KUDI /	start	10.6	87.5									
	stop	10.2	88									
FRLA /	start	10.7	18.6	27.3	32.4	36.7	43.2	43.9	48.4	52.1	54.5	60.6
	stop	11.6	19.6	29.2	34.0	41.5	43.7	46.1	50.1	53.4	55.0	61.3
CONu /	start	15.4	55.0	67.0	19.3	68.5						
	stop	16.4	55.8	68.1	20.2	69						
FRLA /	start	16.8	69.3	73.8	80.6	83.0	87.2	8.9	17.5	20.6	26.1	29.8
	stop	65.5	70.6	76.6	81.1	83.9	87.9	9.7	19.0	21.1	21.8	30.5
SALA /	start	67.9	71.1	13.1	21.5	39.5	57.6	82.6				
	stop	70.1	72.6	13.9	22.9	41.7	58.5	83.6				
SPDO ✓	start	2.7	4.9	51.5	57.1	71.1	83.9					
	stop	3.8	5.6	54.5	57.9	71.8	85.9					
FRLA /	start	31.7	32.8	34.3	38.5	45.9	49.5	59.4	61.1	72.8	74.5	79.0
	stop	32.3	33.7	34.8	39.0	48.6	51.7	60.1	65.7	73.7	75.0	79.5
PHAR /	start	30.7										
	stop	31.5										
FRLA /	start	83.5	86.0	89.0								
	stop	84	86.3	90.7								
LIAR /	start	86.2										
	stop	86.4										
	start											
	stop											
	start											
	stop											
	start											
	stop											
	start											
	stop											
	start											
	stop											

T8
90+90

19.3
32.9
33.3
20.1

Cover-Line Intercept for Community Mapping

Project Name: Community:

Project Location:

Notes: *Transect 90 50' upland buffer, transect v. thick CLPA + Typha; very wet; wapato*

Date: Observer(s):

Transect #: Transect coordinates:

Species/Code

FRLA /	start	4.8	7.5	17.0	19.6	25.8	29.5	32.7	46.6	60.9	0	7.5
	stop	5.4	8.2	17.6	19.5	26.3	31.4	33.1	46.5	61.5	0.6	8.2
RONU /	start	6.9	34.3									
	stop	7.8	35.0									
POBA /	start	10.5	32.4	78.5	39.5	52.9	59.2	68.1				
	stop	11.9	34.4	79.3	40.8	56.1	61.4	69.0				
TONU /	start	12.6	23.5	41.5	46.6	61.7	91.9					
	stop	13.5	24.1	41.8	46.8	70.2	82.3					
SASI /	start	20.4	30.8	64.7	3.8	17.0	23.8	65.7				
	stop	21.9	32.3	66.9	5.6	17.8	24.5	67.2				
SALA /	start	26.6	37.9	39.4	58.6	68.7	73.6	77.7	82.4	6.6	8.7	11.1
	stop	27.5	39.1	40.3	51.0	71.6	74.5	78	84.3	7.3	9.8	13.2
PHAR /	start	35.0	84.4	88.0	1.0							
	stop	37.7	87.1	89.5	1.6							
FRLA /	start	10.4	25.6	41.1	43.8	49.9	65.5	75.1	76.7	79.9	81.0	83.2
	stop	11.0	26.2	41.7	44.1	50.3	66.3	75.3	78.0	80.4	81.5	83.5
SALA /	start	13.8	17.1	35.2	48.1	72.3	88.4					
	stop	14.9	19.4	36.6	49.2	72.9	90					
FE /	start	84.9	87.4	90.0								
	stop	85.3	88.1	92.0								
FRLA /	start	0.5	19.1	20.9	51.0	55.7	66.0	5.0	13.4	14.7	17.6	19.0
	stop	0.9	19.7	21.6	51.7	56.6	66.4	5.5	13.8	15.1	17.9	19.5
SASI /	start	6.6	59.0	61.0	1.1							
	stop	8.0	60	65.0	2.7							
RONU /	start	7.6										
	stop	7.9										
POBA /	start	12.0	67.1	75.9	0	11.1						
	stop	12.9	69.2	77.0	1	11.8						
PHAR /	start	20.0	21.5	24.4	44.5	46.9	51.4	69.2	72.0			
	stop	21.2	23.3	26.0	46.1	47.3	52.8	69.9	72.4			
CIAR	start	23.6	47.3									
	stop	23.9	47.8									
SALA /	start	34.0	37.1	65.2	3.5	5.8	7.3	17.7	22.7	36.4		
	stop	34.5	37.5	66.3	4.8	6.8	9.7	18.7	23.9	38.5		
IOSE	start	16.4	39.4	41.4								
	stop	16.7	44.3	41.8								

T9

90+
92

T10

77+
53

22
18.8
12.8
2
6.5

11.1
13.3
5.4
4
9.6

Garret Creek Mitigation Bank Credit Ledger

	Client	Wetland	Stream	Date
Released Credits		2.34	33	9/22/2011
	Granada Land	0.09		10/12/2009
	City of Woodburn	0.41		10/8/2010
	Sean Tyler Keys, LLC		50	9/30/2011
	ODOT	0.21		3/13/2012
	City of Woodburn	0.026		9/4/2012
	ODOT	0.53		12/22/2012
	Clackamas County DTD	0.29		9/3/2013
	OPRD	0.25		12/12/2015
	Total Debits	1.806	50	
	Net Credit Available	0.534	-17	