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**2014 MONITORING REPORT
for
MARION MITIGATION BANK
MARION, OR
(PHASE I, II, III)**

Submitted to
Oregon Department of State Lands
U.S. Army Corps of Engineers

Submitted by
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2014 MONITORING REPORT
for
MARION MITIGATION BANK
MARION, OR

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2013 (x)
2012 [x]

Marion Mitigation Bank Cover Sheet 2014

Met: Yes/No

Performance Standard

Areas of herbaceous vegetation dominated by more than 50% cover of FAC or wetter vegetation

Phase I

Yes
(all wetland habitats)

Phase II

Yes
(all wetland habitats)

Phase III

Yes
(all wetland habitats)

Scrub-shrub and forested areas will have no fewer than 3 woody species and will have a stem density of at least 100 stems per acre

554 plants per acre
(last sampled in 2008)

1363 plants per acre
(last sampled in 2008)

NA

No more than 15% cover of invasive, undesirable species

Yes

Yes

Yes

Percent FAC and better

70 Forested (69) [78]
93 Scrub-shrub (95) [91]
100 Emergent (98) [62]

83 Forested (87) [84]
98 Scrub-shrub (95) [95]
100 Emergent (100) [99]

99 Emergent (99) [100]

Percent native

↓ 42 Forested (47) [55]
↑ 75 Scrub-shrub (64) [59]
↑ 85 Emergent (71) [70]

↑ 68 Forested (67) [60]
78 Scrub-shrub (85) [82]
96 Emergent (94) [95]

↑ 96 Emergent (89) [87]



2014 MONITORING REPORT
for
MARION MITIGATION BANK
MARION, OR
(Phases I, II & III)

This is the fourteenth monitoring report for the Marion Mitigation Bank Site near Marion, OR. Construction of Phase I of the site restoration was completed in 2001, Phase II was completed in 2003, and Phase III was completed in October of 2008. Maureen Stellrecht and Richard Novitzki prepared this report and designed and participated in monitoring activities. Maureen Stellrecht conducted or supervised weed management and other site maintenance and the routine monitoring of pond, and ground water levels. Ground water levels were measured at least once per month and the depth of water in selected ponds was measured when ponding occurred. Michael Bollman conducted the vegetation monitoring in May and June. Wildlife data were collected by Courtenay Brasier in January and June.

Phase I Phase II, and Phase III achieved and exceeded hydrology and vegetation performance standards in each habitat type. An aggressive weed management program, initiated in 2005 was continued through 2014. Reed canary grass was a primary focus of weed management efforts this year. Velvet grass, blackberry, scott's broom, Canadian thistle, and other non-natives were sprayed, pulled, or mowed, as appropriate.

With six of twelve months being dryer than the 30 year average, 2014 was a continuation of dry conditions that we have observed on site in the past. Despite the dry conditions, the plant community was able to maintain itself with little or no loss from levels achieved in 2013, confirming the success of the restoration.

Main focuses of management for 2015 will be the continued improvement on reducing blackberry and Reed Canary Grass, development of buffers with planting 25+ stems/ acre and mowing twice a year as discussed with the IRT, and continuation of seed & stem planting on the hill- specifically more blue wild rye and inoculated oaks.

Hydrology Monitoring

Ground water levels were measured in 17 observation wells (Figure 1) and data are presented in Table 1. Wells 1 through 9 have been measured since December 1999. Wells 10 through 13 have been measured since January 2003, and Wells 14 through 17 have been measured since January 2004. Shallow wells S1 through S7 have been measured since April 2003. Shallow wells S8 through S11 have been measured since March 2005. Data from the shallow well measurements taken throughout 2014 are presented in Table 2.

Wells 7-13 are located in Phase I. Shallow wells S1-S7 are also within Phase I and wells S1, S2, S3, and S4 have a water level within 12 inches of the surface for more than 15 days during the growing season, thus meeting hydrology criteria (they are highlighted in Table 2).

Wells 1-3 and 14-17 are located in Phase II and of these, wells 2, 14, 15, 16, and 17 have a water level within 12 inches of the surface for more than 15 days during the growing season, thus meeting wetland hydrology criteria (they are highlighted in Table 1). Shallow wells S8-S11 are also within Phase II and all four of these meet hydrology criteria (they are highlighted in Table 2).

Wells 4, 5, and 6 are located in phase III. Since completing construction in 2008, wells 5 and 6 are meeting hydrology criteria (highlighted in table 1).

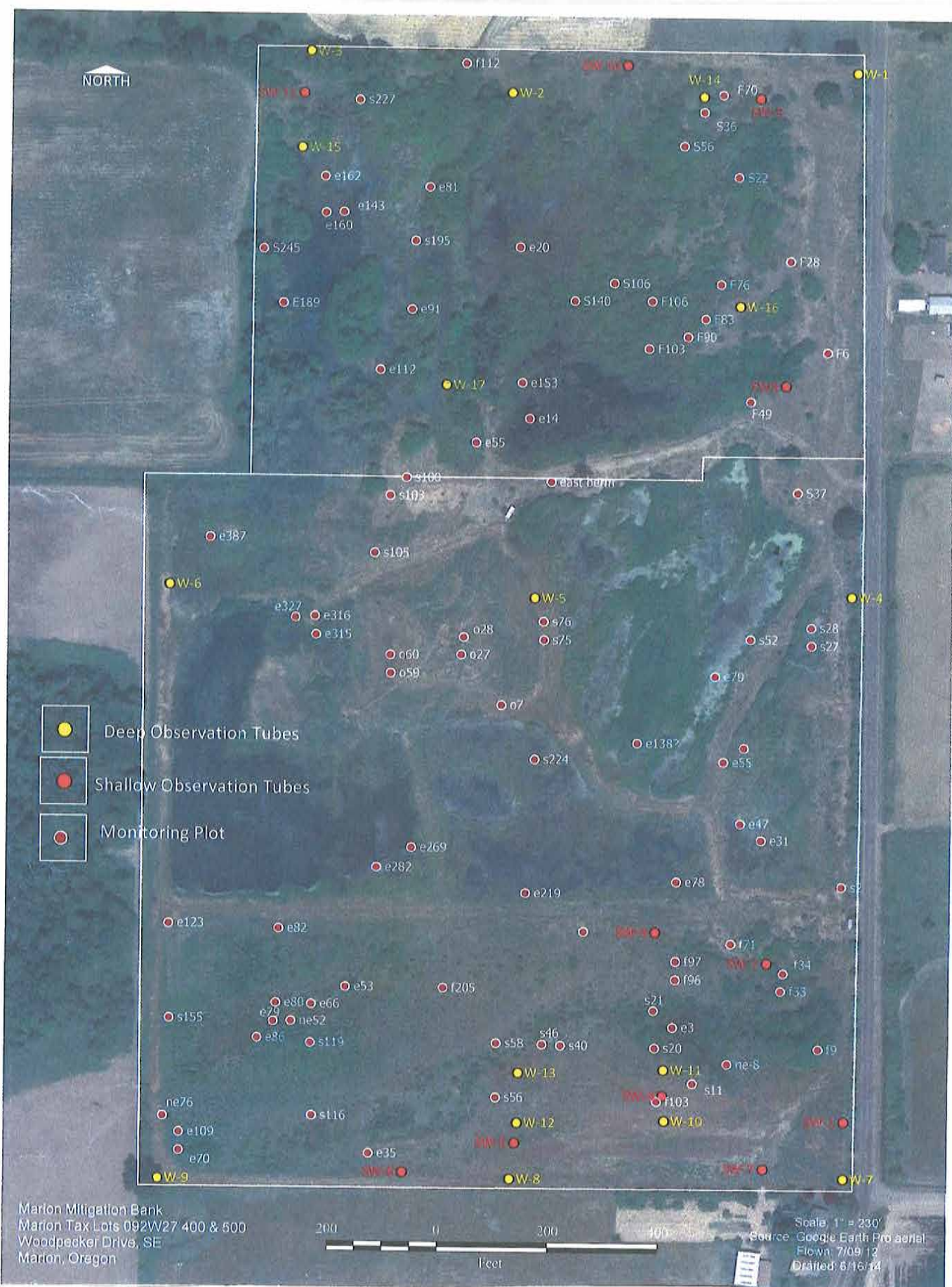


Figure 1. Ariel photo of Marion Mitigation Bank, taken in 2012, showing preliminary wetland boundaries, vegetative monitoring plots, and observation well locations

Observation Well Number

Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1/16/14	41	8	12	21	8	+4	4	43	14	18	13	15	10	0	7	9	+4
2/15/14	26	4	15	26	6	+7	2	29	+3	15	6	4	5	+1	9	7	+2
3/13/14	36	8	15	22	0	+6	0	26	+6	9	0	+3	+3	+4	7	8	+1
4/1/14	32	6	+3	18	7	+6	1	31	+1	15	4	1	1	+2	4	6	+2
4/14/14	41	9	7	19	10	+5	16	39	3	20	13	11	6	+2	9	11	+4
5/1/14	36	8	9	21	17	+5	9	35	12	20	14	12	8	2	4	9	0
5/16/14	44	12	17	17	14	+3	27	51	18	29	21	22	17	4	10	11	1
6/16/14	53	11	19	28	21	20	39	46	39	46	30	39	28	6	14	16	4
7/15/14	50	8	21	25	18	37	74	64	50	49	46	48	47	8	13	18	3
8/15/14	56	10	35	29	27	22	87	57	51	65	64	28	29	25	7	32	1
9/15/14	47	12	19	37	26	31	81	67	42	64	27	37	38	12	9	17	5
10/15/14	42	9	16	30	23	31	27	51	24	54	10	25	23	1	3	6	2
11/15/14	45	8	8	14	9	+3	+2	36	6	8	7	9	3	0	12	7	+5
12/16/14	40	9	12	20	9	+3	2	37	5	15	9	6	3	3	6	12	+4

Table 1. Depth to water (in inches) below land surface in observation wells (figure 1).

Date	Shallow Well Number										
	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11
1/16/14	4	7	5	3	16	26		5	4	2	+1
2/15/14	0	5	8	4	11	9	3	2	+1	3	1
3/13/14	2	4	6	3	2	10	10	+1	+2	3	0
4/1/14	2	7	2	4	2	12	7	8	5	1	0
4/14/14	15	10	9	3	12	23	13	6	6	3	0
5/1/14	14	9	6	3	15	21		5	25	1	1
5/16/14	21	12	16	3	18	26		16	10	6	3
6/16/14	17		21	8	13	26		15	9	4	6
7/15/14	20		24	3	17			11	12	8	8
8/15/14			25					16	17	14	7
9/15/14			18	19		25	13	17	19	14	2
10/15/14	12	16	4	13		26	13	12	8	10	4
11/15/14	1	5	+1		11	18	9	4	2	1	0
12/16/14	5	8	5		10	16	13	5	7	3	+1

Table 2. Depth to water (in inches) below land surface in shallow observation wells (figure 1).

Water levels have been measured in the reference pond (renumbered "2-1") since May 2000. The Phase I regrading created seven small depressions and water levels in 5 of the 7 resulting ponds have been recorded since July, 2001. The Phase II regrading created three major ponds. One pond includes the former reference pond and the staff gage at that location has been renumbered "2-1". A new staff gage was installed in the larger pond to the west (2-2 on Figure 1) in December 2003. The completion of construction of phase III in 2008 created three new ponds (3-1, 3-2, 3-3). Water levels for these ponds has been collected since November 2008. The water level data are presented in Table 3.

Date	Pond Number									
	1-1	1-2	1-3	1-4	1-5	2-1	2-2	3-1	3-2	3-3
1/16/14	0.92	2.15	0.35	2.12	2.18	2.3	2.45	1.54	1.83	2.15
2/15/14	1.24	2.2	1.98	2.76	2.4	1.9	2.2	2.08	2.08	2.5
3/13/14	1.7	2.12	2.78	2.76	2.4	2.38	2.26	1.86	2.4	2.74
4/1/14	1.34	2.7	2.7	2.4	2.46	2.18	1.6	1.68	2.24	2.28
4/14/14	1.02	2.4	2	2.56	2.64	2.28	2.42	1.48	1.98	2.1
5/1/14	1.92	2.18	1.7	2.28	2.36	1.82	1.2	1.52	1.88	1.18
5/16/14	1.32	1.14	0.08	1.72	1.8	2.12	2.2	1.4	1.86	2.04
6/16/14	0.06	0.46		1.14	1.6	2.3	1.82	0.62	0.7	1.16
7/15/14						1.84	2.12	0.85		0.75
8/15/14	0.4					1.3	2.06	0.7	0.56	0.5
9/15/14	0.72	0.4			0.08	1.52	1.28	0.42	0.46	0.64
10/15/14	1.64	1.36	1.32	1.68	2	1.78	1.4	0.9	1.3	1.92
11/15/14	2.2	2.24	1.78	2.3	2.38	2.5	2.56	1.58	1.86	2.28
12/16/14	1.12	2.66	2.34	2.86	2.96	2.48	2.45	1.64	2.08	2.24

Table 3. Depth of Water (in feet) in ponds in 2014 at the Marion Bank. Ponds (Figure 1) are identified by two digits: the first refers to phase 1, 2, or 3; the second is the relative position west of Woodpecker Drive (1 is closest and 5 is furthest to the west).

Precipitation was below average for half of the year (Table 4). Five of the ponds contained water through most of the year. These data confirm the success of the hydrologic restoration. Hydrologic performance criteria (Novitzki 2001 a, page 16) require that "...in most years (i.e., 3 out of 5) ...emergent habitats shall be saturated or shallowly ponded for more than 60 days (i.e., end of April) into the growing season" (that begins March 1--Morlan, 1999). The ponded conditions observed in 2013 comfortably exceed performance standards.

Table 4. Monthly Precipitation in inches in 2014 at the National Weather Service Station in Salem, OR.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Observed	2.78	7.01	7.32	2.71	2.07	0.64	0.46	0.35	1.20	5.80	4.87	6.87	42.08
Normal	5.96	4.56	3.99	2.81	2.22	1.55	0.46	0.45	1.28	3.03	6.50	6.86	39.67

(Based on 1981-2010 period)

Vegetation Monitoring

Phase I

The plant community observed in 2014 is indicative of a successful transition from grass seed production to restored wetland. The boundaries of the habitat types were revised in October 2005 as suggested by the MBRT to better reflect the as-built conditions achieved in Phase I (Figure 2). Sample plot locations have been marked with a permanent identification tag as well as located with GPS and documented for future management of the site. This will allow the IRT to locate and identify each sample plot during the annual field inspection. The plant species in each habitat type are presented in Appendix 1. The percentage of FAC or wetter cover in each habitat type was: Emergent - 100%; Scrub-shrub - 93%; and Forested - 67%. The percentage native cover in each habitat type was: 85% Emergent, 75% Scrub-shrub, and 42% forested. The dominant plant species in Phase I were: Slough sedge (*Juncus obnupta*), jointed rush (*Juncus articulatus*), marsh seedbox (*Ludwigia palustris*), common spike rush (*Eleocharis palustris*), Sitka willow (*Salix sitchensis*), and Tufted hairgrass (*Deschampsia cespitosa*).

The plant community in the emergent habitat remained excellent. The plant community in both the scrub-shrub and forested habitats improved significantly since 2010, apparently responding to wetness that persisted throughout much of the year as well as continued management of blackberry and other undesirable species. The herbaceous community in the scrub shrub habitat has improved significantly due to the increase in woody vegetation. A stem density count was initiated in 2008 and continues to be done every 5 years in order to better document this change in density. Results of the 2013 survey are presented in Table 5.

Percentage of Plant Community FAC or wetter in Phase I

Habitat	New	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Emergent	54	93	91	88	98	91	100	99	100	98	100	100
Scrub/shrub	48	68	80	84	90	85	90	97	91	95	93	93
Forested	27	49	57	58	72	75	63	77	78	69	70	70

In 2009, we discussed with the MBRT the failure of the extreme southeast corner of Phase I to achieve performance standards. Through the course of several meetings, including two on-site inspections, we developed a remedial design that was completed in summer/ fall.

After excavation was completed in August 2009, we distributed a layer of wood compost. In October 2009, the area was seeded with a mix of slough grass, toad rush, and meadow barley. Already we have seen growth of many of the desirable grasses which were planted. In 2011, we planted a mix of spirea, alders, willows, and nootka rose, for a total of 1,000 trees and shrubs.

Vegetation Monitoring - Phase II

The plant communities observed in each habitat in 2014 represents a dramatic change from grass seed production to wetland. The boundaries of the habitat types were revised in October 2005 as suggested by the MBRT to better reflect the as-built conditions achieved in Phase II (Figure 3). In 2014 the percentage of FAC or wetter cover in each habitat type was: Emergent - 100%; Scrub-shrub - 98%; and Forested - 83%. The percentage native cover in each habitat type was: 96% Emergent, 78% Scrub-shrub, and 68% forested. Many desirable species are well established including soft rush (*Juncus effuses*), mexican mosquito-fern (*Azolla Mexicana*), common spike rush (*Eleocharis palustris*), marsh seed box (*Ludwigia palustris*), and spotted lady's thumb (*Polygonum persicaria*).

Percentage of Plant Community FAC or wetter in Phase II

Habitat New	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
Emergent	83	70	88	90	96	98	99	100	99	100	100
Scrub/shrub	66	70	66	67	79	87	94	92	95	95	98
Forested	61	53	83	80	78	99	75	77	85	87	83

Vegetation Monitoring- Phase III

Vegetation sampling in Phase III began in 2010. The majority of this phase (other than the hill upland) is emergent with open water. As a preliminary result of the 2013 delineation of phase III, habitat boundaries between upland and wetland were modified. For 2014, we will consider all wetland sampling stations as emergent, including most of the previous scrub-shrub sample plots. No forested plots were sampled at this time. The FAC and wetter species made up 99% of the emergent cover. The native cover made up 96% of the emergent habitat. The emergent habitat was dominated by soft rush (*Juncus effuses*), mexican mosquito-fern (*Azolla Mexicana*), common spike rush (*Eleocharis palustris*), and duckweed (*Lema Minor*). Also in 2012, a woody species density survey was conducted in Phase III. Seven sample plots were surveyed for an average of 18,237 stems per acre- far exceeding the goal of 100 stems per acre. Results of this survey are displayed in Table 5.

Percentage of Plant Community FAC or wetter in Phase III

Habitat	New 2010	2011	2012	2013	2014
Emergent	100%	100%	100%	99	99

Recognizing the importance of species' diversity to a healthy ecosystem, we have listed the number in each Phase.

Vegetation Species Diversity

	2013	2014
Phase I	71	71
Phase II	57	57
Phase III	59	59

Wildlife Monitoring

Wildlife monitoring had been conducted from 1999 through 2008 before it was suspended. Recognizing the value of those data for assessing the success of the wetland restoration the monitoring program was reinstated in 2013. Five permanent wildlife observation stations at both the bank site and the USFWS reference site were sampled in Winter (January) and Spring (June) 2014 (Appendix 2).

During the Winter survey 17 species were observed at the bank site and 11 at the reference site. The abundance of birds at the bank site (921) exceeded that at the reference site (285). Also, several water birds (Green-Winged Teal, Mallard, and Surf Scoter) and several other notable species (great Blue Heron, Belted Kingfisher, Red-Tailed Hawk, and Spotted Towhee) were observed only at the bank site.

During the Spring survey 39 species were observed at the bank site and 29 at the reference site. The abundance of birds at the bank site (455) exceeded those at the reference site (191).

In every survey conducted since 1999 the number of species and abundance of birds at the bank site are comparable to or exceed those at the reference site.

Abundance of birds at the bank site increased over 2013, primarily because of a large increase of Canadian Geese in the Winter and Spring surveys. A thriving Heron rookery adjacent to the bank site resulted in a large increase in Heron abundance. During the Winter survey the Santiam River was flooding much of the USFW Reference site so locations as close as feasible to the permanent stations were surveyed. This may have influenced survey results somewhat. Beaver and beaver cutting have been observed at the bank site. Deer and/or deer tracks are observed occasionally at both sites.

A contractor trapped nutria on the site harvesting 27 in January and February and 29 in November and December.

These results confirm that the bank site is fully functioning and is a valuable component of the local ecosystem.

<u>Maarion Mitigaton Bank</u>			<u>USFWS Reference Site</u>	
	<u>Species</u>	<u>Individuals</u>	<u>Species</u>	<u>Individuals</u>
Winter	17	921	11	285
Spring	39	455	29	191

mi	Alder	Ash	Cottonwood	Dogwood	Hawthorn	Spirea	Twinberry	Willow_1	Willow_2	Willow_3	Total
0	16	0	1	13	16	0	10	2	2	58	
3	0	2	0	3	9	0	11	8	2	33	
0	0	1	0	0	5	0	3	4	4	13	
0	33	0	0	0	10	0	0	1	0	44	
0	34	0	0	0	9	0	0	2	1	45	
0	5	21	0	0	12	0	8	3	0	49	
0	0	14	0	0	10	0	8	2	0	34	
0	0	2	0	0	23	0	0	1	1	26	
0	18	5	0	0	8	0	40	5	0	76	
0	38	0	0	0	12	0	1	1	0	52	
total:	12	144	45	1	16	114	0	81	29	10	430
stare:	38	458	143	3	51	353	0	258	92	32	1369
acre:	15	165	58	1	21	147	0	104	37	13	554

ion	Alder	Ash	Cottonwood	Dogwood	Elderberry	Spirea	Twinberry	Willow_1	Willow_2	Willow_3	Total
0	47	6	0	0	4	1	12	8	0	78	
0	22	7	0	0	7	0	7	6	0	49	
4	39	4	3	0	6	0	14	60	0	116	
0	10	5	1	0	4	0	5	8	0	33	
0	0	1	0	0	5	0	5	4	3	15	
162	0	0	0	0	0	0	0	6	1	6	
217	4	2	0	0	0	0	0	2	0	8	
3	4	28	0	0	13	0	38	258	1	339	
0	0	15	0	0	4	0	10	362	12	391	
16	1	0	0	3	0	0	19	0	0	23	
total:	402	127	68	4	3	43	1	108	704	17	1059
stare:	1280	404	216	13	10	137	3	344	2241	54	3368
acre:	518	164	88	5	4	55	1	139	907	22	1363

		Stem Density Count			Fall 2012	
Black	Willow1	Willow2	Willow3	Total	Stems/ Acre	
Cottonwood						
4	48	311	0	367	22655	
12	60	572	10	654	40371	
2	104	248	28	382	23581	
0	7	0	0	7	432	
0	79	35	18	132	8148	
0	0	90	55	125	7716	
19	28	354	0	401	24754	
			average		18237	

e 5. Woody species density in the Marion Mitigation Bank Phases I, II, and III.

Summary

Emergent habitats (ponds) at the Marion Mitigation Bank site contained water through July. This meets (and exceeds) hydrologic performance criteria (Novitzki 2001 a, page 16) that "...in most years (i.e. 3 out of 5) ... emergent habitats shall be saturated or shallowly ponded for more than 60 days (i.e. end of April) into the growing season". Scrub-shrub and forested habitats also meet hydrologic criteria, exhibited by ground water levels within 12 inches of the surface for more than 15 days during the growing season. Ground water levels at the site fluctuated much like previous years.

In the Phase I restoration the emergent habitat plant community is 100% FAC or wetter, the scrub-shrub habitat is 93%, and forested habitat is 70%. We regraded an area in the southeast corner of Phase I to assure wetland hydrology as specified in the Banking Instrument as discussed with the MBRT.

In the Phase II restoration the emergent habitat is 100% FAC or wetter, the scrub-shrub habitat is 98%, and the forested habitat is 83%.

In the Phase III restoration, the emergent habitat is 99% FAC or wetter. Percent Native in the emergent habitat is 96%.

We initiated an aggressive weed management plan in 2005 to focus on reed canary grass, velvet grass, Himalayan blackberry, oxeye daisy and other non-natives. This has greatly increased FAC or wetter values shown in all 3 phases of the bank. We will continue to spray, cut, or pull non-natives until the native plant community is well established and less vulnerable to invasion by exotics. We have completed Phase III and regraded a small part of Phase I and Phase II to assure that we achieve wetland hydrology. We have introduced a stem density survey, which we will continue to conduct every five years, to more accurately document the maturation of the site. We will continue to strive to exceed the performance standards established with the MBRT in the banking instrument in 2001.

Completing construction of phase III and regrading some portions of phases I and II contributed to the successful remediation of the site.

2014 Credit Sales

Date	Credit	Purchase	Permit #	Impact Location
11-24-14	1.27	Carmax Auto Superstores West Coast, Inc.	54939-FP/2013- 405	T7S, R2W, Sec. 31 Tax lots 4900, 5400
9-9-14	1.19	R4 Sons, LLC	56146RF	T8S, R3W, Sec7C, Tax lots 1800, 2100
9-4-14	0.04	Marion Co. Public Works	56088RF/ 2014-123	T7S, R2W, sec 17
9-4-14	0.07	Linn Benton Community College	55680RF/ 2014 76	2000 W Oak St, Lebanon, OR
5-7-14	0.11	City of Salem, Public Works Dep	55892RF/ 2012-493	T7S, R3W, Sec 27, 28, 8 23
Balance:	0.11			

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Some photographic examples of the functioning ecosystem at the Marion Mitigation Bank



1. Phase III looking from the Hill, east toward Woodpecker Dr, demonstrating a thriving native plant community



Picture 2. Diversity of species of waterfowl using the ponds at the bank site in Fall 2014



Picture 3. Slough sedge(*Carex obnupta*) in Phase 1, filling in nicely under canopy of trees & shrubs



Picture 4. Demonstrating our establishment of native plant community in open water ponds. Species planted include Bullrush, Douglas spirea, Rice cut grass, spike rush, and willows.



Appendix 1
Vegetation Monitoring Report
2014



Marion Mitigation Bank Phase I Vegetation Monitoring - 2014

Introduction, Summary, and Methods

This report summarizes vegetation assessment and monitoring conducted at Phase I of the Marion Mitigation Bank (MMB) site on May 23rd and 24th 2014. The following table presents a summary of the 2014 vegetation sampling results:

MMB Phase 1 Habitats	Emergent	Scrub/Shrub	Forested
Percent FAC and better cover	100	93	70
Percent native cover	85	75	42
Percent vegetated (under canopy)	67	64	76

The approach and rationale for the sampling strategy used can be found in the 2001 report on vegetation monitoring at the MMB. Sampling was completed at the same locations as in 2013. There were 14, 13, and 12 locations in the Emergent, Scrub/Shrub, and Forested habitat types, respectively. Species found in a one-square meter rectangular quadrat placed at each of the sampling locations were recorded and the cover of each was estimated as a percent of the quadrat area. Estimates of bare ground and other non-vegetated space were made at each quadrat, and estimates of overstory cover (canopy) were also included, if present.

To calculate the relative proportion of typical wetland species, those with an indicator status of FAC or better were considered. Species were assigned the indicator status for the Northwest region from the USFWS 1996 list. The most conservative National indicator status was used when the indicator status for the Northwest region was "NI" or blank. In determining proportions of cover for FAC and better species, the cover of those species was calculated as a percentage of the total cover.

Calculations were also made which included: 1) the percentage of the total cover comprised of native taxa, and 2) a Soil Moisture Index (SMI). The SMI was calculated by weighting the cover of individual species by their fidelity to wetland habitats (i.e. OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5). All species not on the USFWS 1996 list, taxa identified only to genus, and unknown taxa were assigned a value of 5 for calculating the SMI. The sum of the weighted cover values for all taxa in the plot was then divided by the total un-weighted cover of all taxa in the plot. SMI values for a plant community can range from 1.0 (all plants present are obligate wetland species) to 5.0 (all plants present are upland species), and a value of 3.0 is considered to be the break-point between wetlands and uplands.

Vegetation in the Habitat Types in the Phase I Restoration Unit at the MMB

Vegetation sampling data for the different habitat types is in the attached tables. The following sections summarize the dominant vegetation within each of the habitat types. Unlike the reports for years prior to 2005, the three wetland types were not evaluated as a combined unit in later years. Each of the habitat types is evaluated only as a distinct unit.

Emergent Habitat Type

This habitat type was dominated by *Carex obnupta* (slough sedge), *Salix sitchensis* (Sitka willow), *Hordeum brachyantherum* (meadow barley), *Agrostis stolonifera* (creeping bentgrass), and *Beckmannia syzigachne* (American slough grass). FAC and better species made up 100% of the total cover. Native species accounted for about 85% of the total cover in this area. The moisture index for this habitat type was 1.58, and 67% of the area was vegetated.

Scrub/Shrub Habitat Type

This habitat type was dominated by *Salix sitchensis* (Sitka willow), *Carex obnupta* (slough sedge), *Agrostis stolonifera* (creeping bentgrass), *Eleocharis acicularis* (needle spike-rush), and *Spiraea douglasii* (Douglas' spiraea). FAC and better species made up 93% of the total cover. Native species accounted for about 75% of the total cover in this area. The moisture index for this habitat type was 1.83, and 64% of the area was vegetated.

Forested Habitat Type

This habitat type was dominated by *Vicia pannonica* (Hungarian vetch), *Deschampsia cespitosa* (tufted hairgrass), *Agrostis castellana/capillaris* (dryland/colonial bentgrass), *Bromus hordeaceus* (soft brome) and *Equisetum arvense* (common horsetail). FAC and better species made up 70% of the total cover. Native species accounted for about 42% of the total cover in this area. The moisture index for this habitat type was 2.87, and 76% of the area was vegetated.

Marion Mitigation Bank Plant Monitoring, 2014 Phase 1

Habitat Station	Percent FAC and better										Percent native											
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
E E-003	86	100	100	100	100	100	100	100	100	100	100	85	89	56	80	95	55	71	100	100	100	100
E E-053	80	60	100	100	100	100	100	100	100	100	100	64	84	98	99	98	99	99	99	99	99	100
E E-066	99	100	100	100	100	100	100	100	100	100	100	43	48	50	56	29	52	35	50	22	51	51
E E-079	100	100	99	99	100	100	100	100	100	100	100	32	47	86	97	94	97	94	97	86	99	99
E E-080	100	100	96	99	100	99	100	100	100	100	100	39	60	78	82	72	69	55	92	94	99	99
E EN-008	N	100	58	100	100	100	100	100	100	100	100	N	82	31	76	61	41	40	64	51	83	83
E EN-052	N	100	68	100	100	100	100	100	100	100	100	N	98	64	83	69	58	54	66	70	86	86
E EN-070	N	82	99	90	36	99	90	97	85	100	100	N	48	90	68	27	14	27	66	48	84	84
E EN-076	N	87	100	100	100	R	100	100	100	97	100	N	48	95	23	R	8	2	1	12	6	6
E ENS-01	N	N	N	N	N	N	N	N	100	99	100	N	N	N	N	N	N	N	N	100	98	98
E ENS-02	N	N	N	N	N	N	N	N	99	98	100	N	N	N	N	N	N	N	N	99	88	88
E ENS-03	N	N	N	N	N	N	N	N	100	100	100	N	N	N	N	N	N	N	N	100	100	100
E ENS-04	N	N	N	N	N	N	N	N	99	98	100	N	N	N	N	N	N	N	N	97	93	93
E S-116	100	87	56	100	100	100	100	100	99	100	100	94	12	36	77	40	76	30	29	31	24	24
F E-082	N	90	86	91	98	93	99	100	20	97	100	M	63	57	72	68	73	82	74	13	20	20
F F-033	87	95	81	97	99	100	100	100	100	99	100	12	75	72	95	97	98	99	100	100	99	99
F F-034	81	87	93	100	98	98	100	99	100	100	100	42	91	90	98	98	98	100	100	100	100	100
F F-071	33	44	18	54	S	35	59	73	61	45	100	1	1	0	1	S	0	3	2	5	10	10
F F-096	53	50	67	55	63	59	91	97	57	91	99	14	26	28	29	43	55	86	94	54	88	88
F F-097	76	73	72	84	74	84	98	100	99	99	99	44	57	50	61	68	73	78	91	75	65	65
F F-103	38	59	62	95	R	22	38	16	29	15	100	1	1	0	0	R	2	1	0	0	1	1
F F-144	9	16	40	21	R	31	40	42	39	32	100	3	1	1	3	R	2	0	0	0	1	1
F F-149	77	65	63	61	R	45	81	87	88	49	100	42	62	11	54	R	50	74	82	74	45	45
F F-205	47	58	56	74	57	76	69	61	44	80	100	6	7	7	10	11	17	27	34	40	29	29
F S-056	13	69	68	88	72	84	95	97	91	95	100	0	18	29	27	31	62	61	66	66	75	75
F S-119	77	42	46	65	50	78	85	89	58	93	100	11	15	5	8	7	8	16	46	25	27	27
S E-035	26*	82	94	97	75	79	89	97	95	100	100	4	17	70	12	29	11	30	57	59	77	77
S E-052	100	98	100	100	89	100	100	100	100	100	100	61	22	83	73	81	79	85	94	88	88	88
S E-086	100	100	99	100	100	100	100	100	100	100	100	56	66	72	48	53	71	75	85	94	94	94
S E-109	100	86	99	99	90	93	99	100	99	100	100	33	16	39	43	52	37	31	44	38	69	69
S E-123	71	96	70	97	93	81	98	100	96	100	100	60	57	36	20	21	17	3	11	7	44	44
S F-009	21	39	95	95	97	99	98	67	97	65	100	3	14	39	47	53	48	49	52	57	62	62
S S-011	45	27	12	17	7	41	76	42	52	62	100	10	2	4	0	3	2	9	34	28	46	46
S S-020	80	90	99	100	100	100	100	100	100	100	100	88	47	81	65	83	31	48	65	66	62	62
S S-021	100	99	92	97	99	100	100	100	100	100	100	28	43	59	46	31	48	45	60	99	95	95
S S-040	100	98	99	100	100	100	100	100	100	100	100	42	42	81	59	50	53	48	63	50	87	87
S S-046	84	94	100	100	100	100	100	100	100	100	100	65	41	80	83	94	92	87	98	97	90	90
S S-058	68	97	89	100	100	100	100	100	100	100	100	59	20	78	34	76	51	24	63	65	90	90
S S-155	N	99	87	96	98	90	98	100	100	100	100	M	66	57	41	67	15	6	16	32	13	13

*location error? N = no data R = remediated S = sprayed

difference in part due to *Salix sp. (NOL)* vs. *S. sitchensis (FACW)*

Average:	72	79	79	88	86	85	91	90	87	90	90	36	42	52	51	57	48	48	60	60	60	66
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Marion Mitigation Bank Plant Monitoring, 2014 Phase 1

Emergent Habitat Type	Cover (%)	Date(s) sampled: 5/23/14, 5/24/14										Sample Station	Mean											
		Wet	E-003	E-063	E-066	E-079	E-080	EN-008	EN-052	EN-070	EN-076			ENS-01	ENS-02	ENS-03	ENS-04	S-116						
Species	Indicator	MTI	Native	Common Name	Indicator	MTI	Wet	E-003	E-063	E-066	E-079	E-080	EN-008	EN-052	EN-070	EN-076	ENS-01	ENS-02	ENS-03	ENS-04	S-116	Mean		
Carex obtusata	OBL	1	yes	slough sedge	FACW	2	y	95	98	72	85	7											18.5	
Salix sitchensis	FACW	2	yes	Sitka willow	FACW	2	y	98		68			30				31	19	75	56			16.2	
Hordeum brechyanthrum	FACW	2	yes	meadow barley	FACW	2	y			1		10			10	93							12.9	
Agrostis stolonifera	FACW	2	yes	creeping bentgrass	FACW	2	y																8.1	
Beckmannia syzigachne	OBL	1	yes	American slough grass	OBL	1	y			7	1	17	33				48	50		4			7.3	
Ludwigia palustris	OBL	1	yes	marsh seedbox	OBL	1	y															5	4.5	
Eleocharis palustris	common [creeping] spike-rush																							
Mentha pulegium	OBL	1	yes	rush	OBL	1	y			8	1	2	15	35										4.4
Fraxinus latifolia	OBL	1	yes	pennyroyal	OBL	1	y			18	1	1	15	12	1	1						1	4.1	
Populus balsamifera ssp. trichocarpa	FACW	2	yes	Oregon ash	FACW	2	y						55										3.9	
Polygonum hydropiperoides	FAC	3	yes	black cottonwood	FAC	3	y					45	10										3.9	
Salix hookeriana	OBL	1	yes	waterpepper	OBL	1	y						2										2.3	
Plagiobothrys scouleri	FACW	2	yes	Hooker willow	FACW	2	y	30					25										1.8	
Salix lucida ssp. lasianдра	FACW	2	yes	Scouler's popcornflower	FACW	2	y						1										1.5	
Eleocharis acicularis	FACW+	2	yes	Pacific [red] willow	FACW+	2	y	5		1		15							2	8	5		1.5	
Lythrum portula	OBL	1	yes	needle spike-rush	OBL	1	y						15	5									1.4	
Juncus articulatus	OBL	1	yes	spatulateleaf loosestrife	OBL	1	y						5										1.4	
Juncus effusus	OBL	1	yes	jointed rush	OBL	1	y						15										1.3	
Deschampsia cespitosa	FACW	2	yes	soft rush	FACW	2	y			3			12										0.9	
Spiraea douglasii	FACW	2	yes	tufted hairgrass	FACW	2	y																0.6	
Alopecurus geniculatus	FACW	2	yes	Douglas' spirea	FACW	2	y	7				1											0.6	
Epilobium ciliatum	OBL	1	yes	water foxtail	OBL	1	y										1	3	2	1			0.5	
Veronica peregrina ssp. xalapense	FACW-	2	yes	fringed willowherb	FACW-	2	y																0.5	
Agrostis exarata	OBL	1	yes	hairy purslane speedwell	OBL	1	y								1								0.5	
Lactuca serriola	FACW	2	yes	spike bentgrass	FACW	2	y														3		0.2	
Daucus carota	FACU	4		prickly lettuce	FACU	4													2				0.2	
Bidens frondosa	NOL	5	u	wild carrot/ Queen Anne's lace	NOL	5	u																0.1	
Rumex crispus	FACW+	2	yes	leafy beggar's-tick	FACW+	2	y										1						0.1	
	FAC+	3	y	curly dock	FAC+	3	y																0.1	
bare (soil, mud, rock)				DOES NOT INCLUDE CANOPY, IF ANY											20	2	5	3	8	10	20		4.9	
algae, moss, duff, dead vegetation, etc. (incl. sprayed veg.)															68	5	12	10	5	3	60		27.9	
standing water (inches)								70	5	65	25	15	30	17									6.4	
								24	8	24	6	3	2	20										
								35	200	37	144	148	145	120	67	100	83	86	91	113	21		99	
								35	200	37	144	148	145	120	67	100	82	84	91	111	21		99	
								35	200	19	142	147	120	103	56	6	81	76	91	105	5		85	
								100	100	100	100	100	100	100	100	100	99	98	100	98	100		100	
								100	100	51	99	99	83	86	84	6	98	88	100	93	24		85	
																							Soil Moisture Index: 1.58	

Marion Mitigation Bank Plant Monitoring, 2014 Phase 1																					
Scrub-Shrub Habitat Type																					
Cover (%)																					
Date(s) sampled: 5/23/14, 5/24/14																					
Species	Common Name	Native	Indicator	MTI	Wet	E-035	E-052	E-086	E-109	E-123	F-009	S-011	S-020	S-021	S-040	S-046	S-058	S-155	Mean		
Daucus carota	wild carrot/ Queen Anne's lace		NOL	5	u							1								0.1	
Epilobium brachycarpum	tall annual willow-herb	yes	UPL	5								1								0.1	
Plantago major	broadleaf plantain		FAC	3	y				1											0.1	
	bare (soil, mud, rock)					5			2	1	3				70	10	1			12	8.0
	algae, moss, duff, dead vegetation, etc. (incl. sprayed veg.)																				
	standing water (inches)					10	18	25	10	25	35	2	40	97	1	10	35	55	27.9		
						10	10	15					3		1	12	trace	2	3.3		
						123	153	189	192	88	162	143	124	144	68	155	73	23	126		
						123	153	189	192	88	105	89	124	144	68	155	73	23	117		
						95	135	178	132	39	100	66	77	137	59	140	66	3	94		
						100	100	100	100	100	65	62	100	100	100	100	100	100	100	93	
						77	88	94	69	44	62	46	62	95	87	90	90	13	75		
																					Soil Moisture Index: 1.83

Marion Mitigation Bank Phase II Vegetation Monitoring - 2014

Introduction, Summary, and Methods

This report summarizes vegetation assessment and monitoring conducted at Phase II of the Marion Mitigation Bank (MMB) site on May 25th, 2014. The following table presents a summary of the 2014 vegetation sampling results:

MMB Phase 2 Habitats	Emergent	Scrub/Shrub	Forested
Percent FAC and better cover	100	98	83
Percent native cover	96	78	68
Percent vegetated (under canopy)	91	61	86

The approach and rationale for the sampling strategy used can be found in the 2001 report on vegetation monitoring at the MMB. Sampling was completed at the same locations as in 2013. Species found in a one-square meter rectangular quadrat placed at each of the sampling stations were recorded and the cover of each was estimated as a percent of the quadrat area. Estimates of bare ground and other non-vegetated space were made at each quadrat, and estimates of overstory cover (canopy) were also included, if present.

To calculate the relative proportion of typical wetland species, those with an indicator status of FAC or better were considered. Species were assigned the indicator status for the Northwest region from the USFWS 1996 list. The most conservative National indicator status was used when the indicator status for the Northwest region was "NI" or blank. In determining proportions of cover for FAC and better species, the cover of those species was calculated as a percentage of the total cover.

Calculations were also made which included: 1) the percentage of the total cover comprised of native taxa, and 2) a Soil Moisture Index (SMI). The SMI was calculated by weighting the cover of individual species by their fidelity to wetland habitats (i.e. OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5). All species not on the USFWS 1996 list, taxa identified only to genus, and unknown taxa were assigned a value of 5 for calculating the SMI. The sum of the weighted cover values for all taxa in the plot was then divided by the total un-weighted cover of all taxa in the plot. SMI values for a plant community can range from 1.0 (all plants present are obligate wetland species) to 5.0 (all plants present are upland species), and a value of 3.0 is considered to be the break-point between wetlands and uplands.

Vegetation in the Habitat Types in the Phase II Restoration Unit at the MMB

Vegetation sampling data for the different habitat types is in the attached tables. The following sections summarize the dominant vegetation within each of the habitat types. Unlike the reports for years prior to 2005, the three wetland types were not evaluated as a combined unit in later years. Each of the habitat types is evaluated only as a distinct unit.

Emergent Habitat Type

This habitat type was dominated by *Lemna minor* (duckweed), *Juncus effusus* (soft rush), *Polygonum hydropiperoides* (waterpepper), *Salix sitchensis* (Sitka willow), *Salix lucida* ssp. *lasiandra* (Pacific willow), and *Elodea canadensis* (Canadian waterweed). FAC and better species made up 100% of the total cover. Native species accounted for about 96% of the total cover in this area. The moisture index for this habitat type was 1.40, and 91% of the area was vegetated.

Scrub/Shrub Habitat Type

This habitat type was dominated by *Salix sitchensis* (Sitka willow), *Salix hookeriana* (Hooker willow), *Juncus effusus* (soft rush), and *Phalaris arundinacea* (reed-canary grass). The *Phalaris* had been recently sprayed but was still alive at the time of sampling so it was included. FAC and better species made up 98% of the total cover. Native species accounted for about 78% of the total cover in this area. The moisture index for this habitat type was 1.99, and 61% of the area was vegetated.

Forested Habitat Type

This habitat type was dominated by *Lemna minor* (duckweed), *Salix sitchensis* (Sitka willow), *Alnus rhombifolia* (white alder), *Phalaris arundinacea* (reed-canary grass), and *Holcus mollis* (creeping velvetgrass). The *Holcus* was in only one quadrat. FAC and better species made up 83% of the total cover. Native species accounted for about 68% of the total cover in this area. The moisture index for this habitat type was 2.05, and 86% of the area was vegetated.

Marion Mitigation Bank Plant Monitoring, 2014 Phase 2

Habitat	Station	Percent FAC and better										Percent native											
		2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
E	E-020	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
E	E-143	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
E	E-160	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
E	E-162	100	99	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100
E	F-083	15	38	34	64	72	85	90	86	94	99	100	100	100	100	100	100	100	100	100	100	100	
E	F-090	32	84	82	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
E	F-103	98	100	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
E	S-073	37	100	91	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
E	S-140	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
E	S-195	98	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
F	E-014	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
F	E-055	16	65	80	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
F	E-081	76	98	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
F	E-091	87	91	99	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
F	E-112	84	93	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
F	E-189	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	
F	F-006	13	79	58	67	R	4	32	76	53	27	0	0	0	0	0	0	0	0	0	0	0	
F	F-028	15	44	38	23	R	27	45	64	53	40	18	9	19	4	R	0	3	12	14	22	22	
F	F-049	20	74	49	22	R	1	4	34	47	52	0	0	0	0	R	2	6	34	48	52	52	
F	S-245	75	99	98	99	97	100	100	100	99	96	63	99	98	100	100	86	85	49	45	36	48	
S	F-070	68	52	81	57	81	95	100	99	99	96	15	28	9	24	19	75	84	73	85	90	90	
S	F-076	37	55	33	63	55	86	89	96	100	99	16	40	16	49	30	76	89	95	90	94	94	
S	F-106	66	89	93	100	100	100	100	100	98	100	32	82	72	100	100	100	100	100	100	99	99	
S	F-112	67	63	63	63	77	77	60	100	99	100	34	38	38	38	46	46	60	99	99	100	100	
S	S-022	89	82	100	100	100	100	100	100	100	100	52	81	80	83	75	53	87	80	100	100	100	
S	S-036	89	44	17	98	100	100	100	100	100	100	50	25	19	97	99	98	90	89	75	41	41	
S	S-056	38	57	66	87	92	96	99	98	100	99	1	15	30	48	71	80	73	75	77	68	68	
S	S-106	89	58	16	48	71	89	90	91	91	85	10	5	4	19	23	55	65	64	64	63	63	
S	S-153	100	99	100	100	100	100	100	100	100	100	93	99	100	97	89	52	100	100	100	100	100	
S	S-227	84	64	95	97	99	100	100	100	80	78	58	26	59	66	78	88	83	79	79	69	69	
		/location error?																					
Average:		70	81	80	86	94	89	90	94	93	93	43	61	59	65	70	65	72	82	81	81	81	

R = remediated

Marion Mitigation Bank Plant Monitoring, 2014 Phase 2

Emergent Habitat Type	Cover (%)	Date(s) sampled:	5/25/2014	Sample Station												Mean
Species	Common Name	Native	Indicator	MTI	Wet	E-020	E-143	E-160	E-162	F-083	F-090	F-103	S-073	S-140	S-195	Mean
Lemna minor	duckweed	yes	OBL	1	Y	22	28	25	45	5	80	80	57	45	38.7	
Juncus effusus	soft rush	yes	FACW	2	Y	18	5	75	18	80	5	2	17	22.0		
Polygonum hydropiperoides	waterpepper	yes	OBL	1	Y	30	27	2	7	22	25	50	48	21.1		
Salix sitchensis	Sitka willow	yes	FACW	2	Y				25	32				14.5		
Salix lucida ssp. lasiandra	Pacific [red] willow	yes	FACW+	2	Y						62	75		13.7		
Elodea canadensis	Canadian waterweed	yes	OBL	1	Y	35	80							11.5		
Ludwigia palustris	marsh seedbox	yes	OBL	1	Y	58	3	3	1	1				7.6		
Wolffia borealis	northern watermeal	yes	OBL	1	Y	15	30	18						6.6		
Phalaris arundinacea	reed-canary grass	invasive	FACW	2	Y									6.1		
Myriophyllum hippuroides	western watermilfoil	yes	OBL	1	Y	7	30	18						5.5		
Spirodela polyrrhiza	common duckmeat	yes	OBL	1	Y	8			12					5.0		
Salix hookeriana	Hooker willow	yes	FACW	2	Y					28				4.8		
Fraxinus latifolia	Oregon ash	yes	FACW	2	Y					18				3.3		
Eleocharis palustris	common [creeping] spikerush	yes	OBL	1	Y	17	1	3		1				2.5		
Sparganium emersum	European bur-reed	yes	OBL	1	Y			15						1.6		
Azolla mexicana/filliculoides	mosquito-fern [water-fern]	yes	OBL	1	Y						5	10		1.5		
Holcus lanatus	common velvetgrass	yes	FAC	3	Y					12				1.2		
Carex feta	awl-fruited sedge	yes	FACW	2	Y					7				0.7		
Juncus ensifolius	dagger-leaf rush	yes	OBL	1	Y									0.7		
Alisma gramineum	narrowleaf water plantain	yes	FACW	2	Y					5				0.5		
Deschampsia cespitosa	tufted hairgrass	yes	OBL	1	Y						1			0.2		
Epilobium ciliatum	fringed willowherb	yes	FACW	2	Y					1				0.1		
Equisetum arvense	common [field] horsetail	yes	FACW-	2	Y					1				0.1		
Solanum dulcamara	bittersweet nightshade	yes	FAC	3	Y			1						0.1		
Trifolium repens	white clover		FAC+	3	Y									0.1		
Veronica americana	American speedwell	yes	OBL	1	Y						1			0.1		
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY									25						
algae, moss, duff, dead vegetation, etc. (incl. sprayed veg.)						7	2	2	2	30	18	2	5	1	6.9	
standing water (inches)						12	20	24	12	1	6	20	24	12	6	
						142	154	182	160	89	155	186	217	209	205	170
	Total cover:					142	154	182	160	88	155	186	217	209	205	170
	FAC and better cover:					142	154	181	160	76	155	185	217	209	145	162
	Native cover:															
	Percent FAC and better of total:					100	100	100	100	99	100	100	100	100	100	100
	Percent native of total:					100	100	99	100	85	100	99	100	100	71	96
																Soil Moisture Index: 1.40

Marion Mitigation Bank Plant Monitoring, 2014 Phase 2

Scrub/Shrub Habitat Type	Cover (%)	Date(s) sampled: 5/25/2014	recently sprayed	Sample Station										Mean		
Species	Common Name	Native	Indicator	MTI	Wet	F-070	F-076	F-106	F-112	S-022	S-036	S-056	S-106	S-153	S-227	Mean
Salix sitchensis	Sitka willow	yes	FACW	2	y	65	7	98	12	99						28.1
Salix hookeriana	Hooker willow	yes	FACW	2	y	62		70	95							22.7
Juncus effusus	soft rush	yes	FACW	2	y	35	72	6								11.3
Phalaris arundinacea	reed-canary grass	invasive	FACW	2	y	2		55							50	10.7
Alnus rhombifolia	white alder	yes	FACW	2	y										98	9.8
Elodea canadensis	Canadian waterweed	yes	OBL	1	y										98	9.8
Salix lucida ssp. lasiandra	Pacific [red] willow	yes	FACW+	2	y			95								9.5
Equisetum arvense	common [field] horsetail	yes	FAC	3	y	22		35							32	8.9
Callitriche sp.	water starwort	NA	OBL	1	y					85						8.5
Holcus lanatus	common velvetgrass		FAC	3	y	15	5			27	22				8	7.7
Veronica americana	American speedwell	yes	OBL	1	y	55	8	1	2						3	6.9
Agrostis castellana/capillaris	dryland/colonial bentgrass		FAC	3	y					18	12					3.0
Lemna minor	duckweed	yes	OBL	1	y	2	5		10						3	2.0
Populus balsamifera ssp. trichocarpa	black cottonwood	yes	FAC	3	y		20									2.0
Himalayan blackberry	Himalayan blackberry	invasive	FACU	4						1	15					1.6
Fraxinus latifolia	Oregon ash	yes	FACW	2	y			10								1.0
Ludwigia palustris	marsh seedbox	yes	OBL	1	y	1		1	5						1	0.8
Polygonum hydropiperoides	waterpepper	yes	OBL	1	y										6	0.6
Galium aparine	catchweed bedstraw/ cleavers	yes	FACU	4		5										0.5
Trifolium pratense	red clover		FACU	4									4			0.4
Vicia sativa	common vetch		UPL	5		1				1	2					0.4
Poa trivialis	rough [roughstalk] bluegrass		FACW	2	y										3	0.3
Carex stipata	awl-fruited sedge	yes	OBL	1	y		2									0.2
Eleocharis palustris	common [creeping] spikerush	yes	OBL	1	y									2		0.2
Juncus ensifolius	dagger-leaf rush	yes	FACW	2	y		2									0.2
Lotus corniculatus	birdsfoot trefoil		FAC	3	y					2						0.2
Myosotis laxa	small-flowered forget-me-not	yes	OBL	1	y	2										0.2
Spirodela polyrrhiza	common duckmeat	yes	OBL	1	y	1								1		0.2
Epilobium ciliatum	fringed willowherb	yes	FACW-	2	y		1									0.1
Mentha pulegium	pennyroyal		OBL	1	y		1									0.1
Trifolium repens	white clover		FAC-	3									1			0.1
Vicia hirsuta	tiny vetch		NOL	5	u		1									0.1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	1		20	3			2		2	3.3

Marion Mitigation Bank Plant Monitoring, 2014 Phase 2

Forested Habitat Type		Date(s) sampled: 5/25/2014														
Cover (%)		Sample Station														
Species	Common Name	Native	Indicator	MTI	Wet	E-014	E-055	E-081	E-091	E-112	E-189	F-006	F-028	F-049	S-245	Mean
Lemna minor	duckweed	yes	OBL	1	y	90	75		57	33	3					25.8
Salix sitchensis	Sitka willow	yes	FACW	2	y				52	90				55		19.7
Alnus rhombifolia	white alder	yes	FACW	2	y			99							45	14.4
Phalaris arundinacea	reed-canary grass	invasive	FACW	2	y		35	60	18							11.3
Holcus mollis	creeping velvetgrass		FACW	4												9.0
Spiraea douglasii	Douglas' spiraea	yes	FACW	2	y				47					42		8.9
Elodea canadensis	Canadian waterweed	yes	OBL	1	y						85					8.5
Holcus lanatus	common velvetgrass		FAC	3	y							18	25	25		6.8
Poa trivialis	rough [roughstalk] bluegrass		FACW	2	y							10	3	55		6.8
Salix lucida ssp. lasiandra	Pacific [red] willow	yes	FACW+	2	y	40	15		12							6.7
Trifolium repens	white clover		FAC-	3								20	42			6.2
Eleocharis palustris	common [creeping] spikerush	yes	OBL	1	y	37	12									4.9
Typha latifolia	cattail	yes	OBL	1	y		40									4.0
Hordeum brachyantherum	meadow barley	yes	FACW-	2	y									30		3.0
Polygonum hydropiperoides	waterpepper	yes	OBL	1	y				30							3.0
Trifolium pratense	red clover		FACU	4								20	8			2.8
Hypochaeris radicata	hairy cat's ear		FACU	4								5	22			2.7
Populus balsamifera ssp. trichocarpa	black cottonwood	yes	FAC	3	y								23			2.3
Wolffia borealis	northern watermeal	yes	OBL	1	y				13	7	1					2.1
Ludwigia palustris	marsh seedbox	yes	OBL	1	y	5	5			3						1.3
Daucus carota	wild carrot/ Queen Anne's lace		NOL	5	u							8	4			1.2
Veronica americana	American speedwell	yes	OBL	1	y		3	8								1.1
Equisetum arvense	common [field] horsetail	yes	FAC	3	y			1								1.0
Leucanthemum vulgare	oxeye daisy		UPL	5								7	3			1.0
Rumex acetosella	sheep [red] sorrel		FACU+	4								7	3			1.0
Spirodela polyrrhiza	common duckmeat	yes	OBL	1	y	10										1.0
Lolium arundinacea	tall fescue		FAC-	3								8	1			0.9
Azolla mexicana/filliculoides	mosquito-fern [water-fern]	yes	OBL	1	y	5										0.5
Hypericum perforatum	St. John'swort/ Klamathweed		NOL	5	u							4	1			0.5
Myriophyllum hippuroides	western watermilfoil	yes	OBL	1	y						5					0.5
Rubus ursinus	trailing blackberry	yes	FACU	4					5							0.5
Vicia pannonica	Hungarian vetch		NOL	5	u											0.5
Crepis capillaris	smooth hawkbeard		FACU	4												0.3
Deschampsia cespitosa	tufted hairgrass	yes	FACW	2	y											0.3
Rorripa nasturtium-aquaticum	watercress		OBL	1	y		3									0.3
Agrostis castellana/capillaris	dryland/colonial bentgrass		FAC	3	y								2			0.2

Marion Mitigation Bank Plant Monitoring, 2014 Phase 2

Forested Habitat Type		Date(s) sampled: 5/25/2014															
Cover (%)																	
Species	Common Name	Native	Indicator	MTI	Wet	E-014	E-055	E-081	E-091	E-112	E-189	F-006	F-028	F-049	S-245	Mean	
<i>Cerastium glomeratum</i>	sticky chickweed		UPL	5								1	1			0.2	
<i>Geranium carolinianum</i>	Carolina geranium	yes	NOL	5	u								2			0.2	
<i>Senecio jacobaea</i>	fansy ragwort	invasive	FACU	4									2			0.2	
<i>Vicia sativa</i>	common vetch		UPL	5								2				0.2	
<i>Alisma gramineum</i>	narrowleaf water plantain	yes	OBL	1	y	1										0.1	
<i>Centaureum erythraea</i>	European centaury		FAC	3	y								1			0.1	
<i>Galium aparine</i>	catchweed bedstraw/ cleavers	yes	FACU	4										1		0.1	
<i>Myosotis discolor</i>	yellow and blue forget-me-not		FACW	2	y							1				0.1	
<i>Parentucellia viscosa</i>	parentucellia		FAC-	3									1			0.1	
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY											6	4		1	1.1	
algae, moss, duff, dead vegetation, etc. (incl. sprayed veg.)	"																
standing water (inches)	"					2	5	35	20	27	10	7	6	10	7	12.9	
						16	8	4	16	14	18						
	Total cover:					188	188	168	204	163	94	117	158	188	155	162	
	FAC and better cover:					188	188	168	199	163	94	32	63	97	155	135	
	Native cover:					188	150	108	186	163	94	3	34	98	75	110	
	Percent FAC and better of total:					100	100	100	98	100	100	27	40	52	100	83	
	Percent native of total:					100	80	64	91	100	100	3	22	52	48	68	
																Soil Moisture Index: 2.05	

Marion Mitigation Bank Phase III Vegetation Monitoring - 2014

Introduction, Summary, and Methods

This report summarizes the vegetation assessment conducted at the Marion Mitigation Bank (MMB) Phase 3 site on May 24th, June 1st, and September 27th, 2014. Vegetation monitoring at MMB Phase 3 followed the sampling design implemented in 2010. However, in 2013 a change was made in how data were summarized. The ten Scrub/Shrub habitat sampling stations were re-identified as either Emergent habitat (3 stations) or Upland habitat (7 stations). The original Scrub/Shrub habitat was essentially narrow bands around the perimeter of the ponds, but over time those areas developed vegetation that was indistinguishable from either the upland berms or the emergent ponds themselves, depending on the exact position of the sampling stations on the pond banks. Accordingly, all the wetland areas at the MMB Phase 3 site were considered to be emergent wetland. The following table presents a summary of the 2014 wetland vegetation sampling results:

MMB Phase 3 Habitats	Emergent
Percent FAC and better cover	99
Percent native cover	96
Percent vegetated	81

In September 2014 three additional plots were placed in a ponded area in the extreme NE corner of MMB Phase 3. These data are summarized here but should only be considered to represent the immediate area where they were located and not to be valid samples of the entire Phase 3 area, as they were not selected at random from all the possible sampling points as were the other sample locations, but rather were selected with the expressed purpose of representing the ponded area in the extreme NE corner of MMB Phase 3. As such, these data were not included with the other data when calculating MMB Phase 3 vegetation condition.

Vegetative cover for one of the Emergent sampling stations was not assessed because it was still under deep water (more than about three feet) at the time of sampling; no emergent or floating vegetation was observed at these locations.

Species found in a one-square meter rectangular quadrat placed at each of the sampling stations were recorded and the cover of each was estimated as a percent of the quadrat area. Estimates of bare ground and other non-vegetated space were also made at each quadrat.

To calculate the relative proportion of typical wetland species, those with an indicator status of FAC or better were considered. Species were assigned the indicator status for the Northwest region from the USFWS 1996 list. The most conservative National indicator status was used when the indicator status for the Northwest region was "NI" or blank. In determining proportions of cover for FAC and better species, the cover of those

species was calculated as a percentage of the total cover.

Calculations were also made which included: 1) the percentage of the total cover comprised of native taxa, and 2) a Soil Moisture Index (SMI). The SMI was calculated by weighting the cover of individual species by their fidelity to wetland habitats (i.e. OBL = 1, FACW = 2, FAC = 3, FACU = 4, and UPL = 5). All species not on the USFWS 1996 list, taxa identified only to genus, and unknown taxa were assigned a value of 5 for calculating the SMI. The sum of the weighted cover values for all taxa in the plot was then divided by the total un-weighted cover of all taxa in the plot. SMI values for a plant community can range from 1.0 (all plants present are obligate wetland species) to 5.0 (all plants present are upland species), and a value of 3.0 is considered to be the break-point between wetlands and uplands.

Vegetation in the Habitat Types in the Phase III Restoration Unit at the MMB

Vegetation sampling data for the different habitat types is in the attached tables. The following sections summarize the dominant vegetation within each of the habitat types.

Emergent Habitat Type

This habitat type was dominated by *Azolla mexicana* (Mexican mosquito-fern), *Lemna minor* (duckweed), *Eleocharis palustris* (common spikerush), *Salix lucida* ssp. *lasianдра* (Pacific willow), and *Wolffia borealis* (northern watermeal). Twenty-two of the 23 sampling stations had standing water on the soil surface at the time of sampling. FAC and better species made up 99% of the total cover. Native species accounted for about 96% of the total cover. The SMI for this habitat type was 1.29, and 81% of the area was vegetated.

Oak Savannah Habitat Type

This habitat type currently includes 5 random sampling locations on the hill, 4 locations with one each centered on each of the perimeter berms (N, S, E, W), and 7 random sampling locations (previously Scrub/Shrub) on the interior and perimeter berms. This habitat type was dominated by *Poa compressa* (Canada bluegrass), *Agrostis castellana/capillaris* (dryland/colonial bentgrass), *Holcus lanatus* (common velvetgrass), *Festuca idahoensis* ssp. *roemerii*/ *F. occidentalis* (Roemer's fescue/ western fescue), and *Bromus hordeaceus* ssp. *hordeaceus* (soft brome). Native species accounted for 22% of the total cover in this area, and 83% of the area was vegetated.

NE Ponded Area

For sampling in this area a plot (labeled N-North) was arbitrarily placed in the area. A second plot (S-South) was then placed 20 meters south of the first. A third plot (W-West) was then placed 10 meters west of the center point between the first two plots. This

area was dominated by *Eleocharis palustris* (common spikerush), *Lemna minor* (duckweed), *Ludwigia palustris* (marsh seedbox), *Juncus effusus* (soft rush), and *Eleocharis ovata* (ovate spikerush).

Marion Mitigation Bank Plant Monitoring, 2014 Phase 3

Habitat	Station	Percent FAC and better					Percent native						
		2010	2011	2012	2013	2014	2015	2010	2011	2012	2013	2014	2015
E	E-031	100	100	100	100	100		100	100	98	100	100	
E	E-047	100	100	100	100	100		7	73	100	100	100	
E	E-051	100	100	100	100	100		40	92	88	98	89	
E	E-052	100	100	100	100	100		90	89	81	100	98	
E	E-070	100	100	100	100	100		32	93	69	99	100	
E	E-078	100	100	100	100	100		19	62	100	69	100	
E	E-138	100	100	100	100	100		80	94	71	100	99	
E	E-219	100	100	NA	100	100		100	100	NA	100	87	
E	E-315	100	100	100	100	100		76	100	100	100	97	
E	E-316	99	100	100	100	100		88	88	87	100	100	
E	E-327	100	100	100	100	100		98	95	100	100	100	
E	E-224	100	100	100	100	100		80	96	100	100	100	
E	E-269	NA	100	100	100	100		NA	100	100	99	100	
E	E-282	NA	NA	100	100	100		NA	NA	100	71	100	
E	E-299	NA	100	100	100	100		NA	100	93	98	96	
E	E-304	NA	100	100	100	100		NA	100	92	99	97	
E	E-348	NA	100	100	100	100		NA	100	100	100	100	
E	E-349	NA	100	100	100	100		NA	100	100	100	100	
E	E-375	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	
E	E-389	NA	100	100	100	100		NA	100	100	100	96	
E	S-027	100	100	100	100	100		13	48	100	64	100	
E	S-028	100	100	100	100	100		12	40	96	62	96	
E	S-105	74	95	98	84	78		0	3	60	40	60	
U	S-002	8	68	[38]	NA	NA		0	65	[15]	NA	NA	
U	S-037	70	38	[51]	NA	NA		2	11	[0]	NA	NA	
U	S-055	73	88	[92]	NA	NA		13	10	[6]	NA	NA	
U	S-075	100	98	[100]	NA	NA		23	44	[2]	NA	NA	
U	S-076	46	72	[79]	NA	NA		10	13	[0]	NA	NA	
U	S-100	93	98	[99]	NA	NA		0	25	[5]	NA	NA	
U	S-103	87	85	[4]	NA	NA		2	18	[4]	NA	NA	
U = these stations were omitted from wetland evaluation starting in 2012 as they appear to be located in upland areas													
Emergent average:		98	100	100	99	99		56	84	92	91	96	

Marion Mitigation Bank Plant Monitoring, 2014 Phase 3																															
Emergent Habitat Type	Cover (%)	Date(s) sampled:	5/24/2014, 6/1/14																												
			Wet	E-031	E-047	E-051	E-052	E-078	E-078	E-138	E-219	E-224	E-269	E-282	E-289	E-304	E-315	E-316	E-327	E-348	E-349	E-375	E-387	S-027	S-028	S-105	Mean				
Species	Common Name	Native	Indicator	MTI	Wet	E-031	E-047	E-051	E-052	E-078	E-078	E-138	E-219	E-224	E-269	E-282	E-289	E-304	E-315	E-316	E-327	E-348	E-349	E-375	E-387	S-027	S-028	S-105	Mean		
<i>Azolla mexicana</i>	mexican mosquito-fern (water-fern)	yes	OBL	1	Y	8	85	72	80	65		5	1	1	1	1	1	1	1	15	18	1	4	W	1	70	57		20.2		
<i>Lemna minor</i>	duckweed	yes	OBL	1	Y	70	1	18	18	35		30	90	28	40	1	2	8	1	1	15	18	1	4	W	22	8	5	18.9		
<i>Eleocharis palustris</i>	common [creeping] spikerush	yes	OBL	1	Y	18			27			27			37	32	28	67				45	72	W	24			17.1			
<i>Salix lucida</i> ssp. lasioandra	Pacific [red] willow	yes	FACW+	2	Y		23	25	62			30	4	7	65						42			W			28		13.0		
<i>Wolffia borealis</i>	northern watermeal	yes	OBL	1	Y				5	30	3	3	3	40	12	30	1	1	5	12	40	1	7	W		22	37		11.3		
<i>Ludwigia palustris</i>	marsh seedbox	yes	OBL	1	Y			15				2	7	65	8	2	3	7			13			W	27				6.8		
<i>Sparganium emersum</i>	European bur-reed	yes	OBL	1	Y	55	68					2				5	4		8		2			W					6.5		
<i>Juncus effusus</i>	soft rush	yes	FACW	2	Y							12							80	7				W					4.5		
<i>Phalaris arundinacea</i>	reed-canary grass	invasive	FACW	2	Y			20	3			2	17	5					3	5				W					2.7		
<i>Typha latifolia</i>	cattail	yes	OBL	1	Y	2	2	50																W					2.5		
<i>Polygonum hydropiperoides</i>	waterpepper	yes	OBL	1	Y			8				5							7	12	4	3	8	W					2.1		
<i>Epilobium ciliatum</i>	fringed willowherb	yes	FACW-	2	Y																			W					2.0		
<i>Paspalum distichum</i>	knolgrass	yes	FACW	2	Y																			W	42				1.9		
<i>Populus balsamifera</i> ssp. trichocarpa	black cottonwood narrowleaf water	yes	FAC	3	Y			5				35												W					1.8		
<i>Alisma gramineum</i>	plantain	yes	OBL	1	Y	1	10	1																W	18				1.4		
<i>Myriophyllum hippuroides</i>	western watermilfoil	yes	OBL	1	Y							25												W					1.4		
<i>Spiridola polyrrhiza</i>	common duckmeat	yes	OBL	1	Y							15										28		W					1.4		
<i>Salix hookeriana</i>	hooker willow	yes	FACW	2	Y																			W					1.3		
<i>Poa compressa</i>	Canada bluegrass		FACU+	4	Y																			W					17	0.8	
<i>Agrostis castellana/capillaris</i>	dryland/colonial bentgrass		FAC	3	Y																			W					12	0.5	
<i>Deschampsia danthonioides</i>	annual hairgrass	yes	FACW-	2	Y																			W					10	0.5	
<i>Holcus lanatus</i>	common velvetgrass		FAC	3	Y																			W					5	0.2	
<i>Lythrum portula</i>	spatulateleaf loosestrife		OBL	1	Y																			W	3				0.1		
<i>Callitriche</i> sp.	water starwort	NA	OBL	1	Y																			W	2				0.1		
<i>Cerastium glomeratum</i>	sticky chickweed		UPL	5	Y																			W					2	0.1	
<i>Lotus corniculatus</i>	birdsfoot trefoil		FAC	3	Y															1				W					0.05		
<i>Vicia hirsuta</i>	tiny vetch		NOL	5	u																			W					1	0.05	
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY																							NA					2	0.1	
algae, moss, turf, dead vegetation, etc. (incl. sprayed veg.)																															
standing water (inches)						4	26	12	16	16	16	5	3	5	25	75	30	45	20	82	10	12	53	15	NA	5	20	16.7			
						24	26	12	16	16	16	18	16	16	20	30	30	32	30	34	6	25	36	26	>36	8	24	21.0			
						154	166	184	181	167	131	172	132	150	90	73	55	61	18	111	158	47	91	NA	139	100	132	92	119		
						154	166	184	181	167	131	172	132	150	90	73	55	61	18	111	158	47	91	NA	139	100	132	72	118		
						154	166	164	178	187	131	170	115	145	90	73	55	61	18	107	153	47	91	NA	134	100	127	55	115		
						100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	78	
						100	100	89	98	100	100	99	87	97	100	100	100	100	100	100	96	97	100	100	100	96	100	96	60	96	
																														Soil Moisture Index: 1.29	

Marion Mitigation Bank Plant Monitoring, 2014 Phase 3																			
Oak Savannah Habitat Type																			
Species	Common Name	Native	O-007	O-027	O-028	O-059	O-060	O-BN	O-BW	O-BS	O-BE	S-002	S-037	S-055	S-075	S-076	S-100	S-103	O-Uavg
	four-seeded vetch										2								0.1
	Cirsium vulgare						1												0.1
	Dipsacus fullonum																		0.1
	Juncus tenuis	yes	1													1			0.1
	Verbascum blattaria																		0.1
	Veronica arvensis																	1	0.1
	bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY	1	3	1	3	7						1	1	3	1	2	2	1.4
	algae, moss, duff, dead vegetation, etc. (incl. sprayed veg.)		15	3	3	12	3	2	12				5	15	7	5	15	15	7.0
	Total cover:		110	135	142	143	128	138	156	154	135	183	131	127	98	104	98	110	130.6
	Native cover:		13	82	72	104	45	7	5	10	8	42	2	13	4	5	16	28	28.5
	Percent native of total:		12	61	51	73	35	5	3	6	6	23	2	10	4	5	17	25	22

NE Poned Area		Date sampled:	9/27/2014										
Cover (%)													
Species	Common Name	Native	Indicator	MTI	Wet	N	S	W	avg				
Eleocharis palustris	common [creeping] spikerush	yes	OBL	1	y	7	95	15	39.0				
Lemna minor	duckweed	yes	OBL	1	y	60	40	10	36.7				
Ludwigia palustris	marsh seedbox	yes	OBL	1	y	28	45	12	28.3				
Juncus effusus	soft rush	yes	FACW	2	y			66	22.0				
Eleocharis ovata	ovate spikerush	yes	OBL	1	y	47			15.7				
Bidens cernua	nodding beggar's-ticks	yes	FACW+	2	y		23	3	8.7				
Wolffia borealis	northern watermeal	yes	OBL	1	y	10	5	8	7.7				
Phalaris arundinacea	reed-canary grass	invasive	FACW	2	y			22	7.3				
Leersia oryzoides	rice cut-grass	yes	OBL	1	y	20			6.7				
Cyperus eragrostis	tall flatsedge	yes	FACW	2	y	8			2.7				
Lythrum portula	spatulateleaf loosestrife		OBL	1	y			8	2.7				
Echinochloa crus-galli	large barnyard-grass		FACW	2	y	4			1.3				
Veronica americana	American speedwell	yes	OBL	1	y	2			0.7				
bare (soil, mud, rock)									0.0				
algae, dead vegetation, etc.						2	1	5	2.7				
standing water (inches)						6	6	3	5.0				

Wildlife Monitoring
 Marion Mitigation Bank and USFWS North Santiam Reference Site
 Winter and Spring 2014
 Surveyed by Marion Courtenay Brasier

Wildlife monitoring had been conducted from the year 1999 through 2008, when it was suspended. Recognizing the value of the data that had been collected during that time period the Wildlife Monitoring was reinstated in 2012. Five permanent stationary observation points were designated at the Marion Mitigation Bank (Marion Site) and the USFWS North Santiam Reference site (Reference Site) for their diversity and location. Starting at a specific time of day, at/or immediately after sunrise for that day, from a previously designated location the observer starts recording any Avian, Reptilian, or Mammalian activity by sight, sound, scat, and tracks. Walking a previously routed path to each observation point, a traveling observation of any wildlife is recorded. At the arrival of an observation point (see reference maps) 15 minutes are spent taking a stationary record of any activity that is observed. The surveys are conducted in the month of January for the Winter Survey, and in month of June for the Spring Survey.

The data has consistently reflected a trend for a higher number of species diversity, and concentration of individuals at the Marion Site verses lower numbers and species diversity at the Reference Site.

There was an extreme increase in numbers of birds that were observed in the 2014 survey verses the 2013 survey at the Marion Site. In the 2013 wildlife survey, the winter survey had a total of 266 individual birds, and a total of 250 individual birds in the spring survey. In the 2014 wildlife survey, a total of 921 individual birds were observed in the winter survey, and 439 total individual birds in the Spring survey. That is a difference of 655 birds for the winter surveys, and 189 birds in the spring surveys. A large number of water fowl, specifically Canada Geese, were migrating during the winter survey, which contributed greatly to the increased number of individuals. In addition to the waterfowl, at the Marion Site a very large population of Great Blue Herons have established a Heron Rookery. The heron population has been increasing dramatically in the past few years due to the Great Blue Heron Rookery. This increase of fauna is hypothesized to be due to proper flooding, and establishment of flora at the Marion site.

In contrast, due to increased flooding and poor management of the Reference site, less water fowl were observed. During the winter survey of 2014, roughly the entire month of January, almost half of the Reference site was under fast flowing river water. The Santiam River had diverted to flow over one-half of the Reference site. This caused the winter survey to be conducted over a smaller area of land, and at temporary observation points. Also, the invasive blackberry population has increased dramatically from previous years, which is decreasing visibility, maneuverability, and available food for many of the areas residents.

Overall the results of the 2014 years Wildlife Monitoring report show to follow the previous trend of increased wildlife populations, and increased wildlife diversity at the Marion Site.

All Species	<u>Marion Mitigation Bank</u>		<u>USFS Reference Site</u>	
	<u>Species</u>	<u>Individuals</u>	<u>Species</u>	<u>Individuals</u>
Winter	17	921	11	285
Spring	455	39	29	191

Table 5: Totals for Winter and Spring of 2014 for the Marion Mitigation Bank and the Marion N. Santiam USFS Reference Site.

Marion Wildlife Survey Winter 2014

Species	Marion Mitigation Bank	USFWS Reference Site
American Crow	4	
American Gold Finch		2
American Robin	20	33
Belted Kingfisher	15	
Black-Capped Chickadee	30	65
Canada Goose	600	60
Dark-Eyed Junco		15
European Starling	34	
Fox Sparrow	10	20
Gadwall		10
Great Blue Heron	35	
Green-Winged Teal	25	
Mallard Duck	15	
Red-Tailed Hawk	2	
Ring-Necked Pheasant	2	
Song Sparrow	35	45
Spotted Towhee	10	
Surf Scoter	60	
Violet-Green Swallow	20	10
Western Blue Bird		10
Western Scrub-Jay	4	15
Totals	921	285

Table: 1 Comparison of Wildlife Survey Results Including Flyovers, Calls, and all Sightings.

Marlon Wildlife Survey Spring 2014

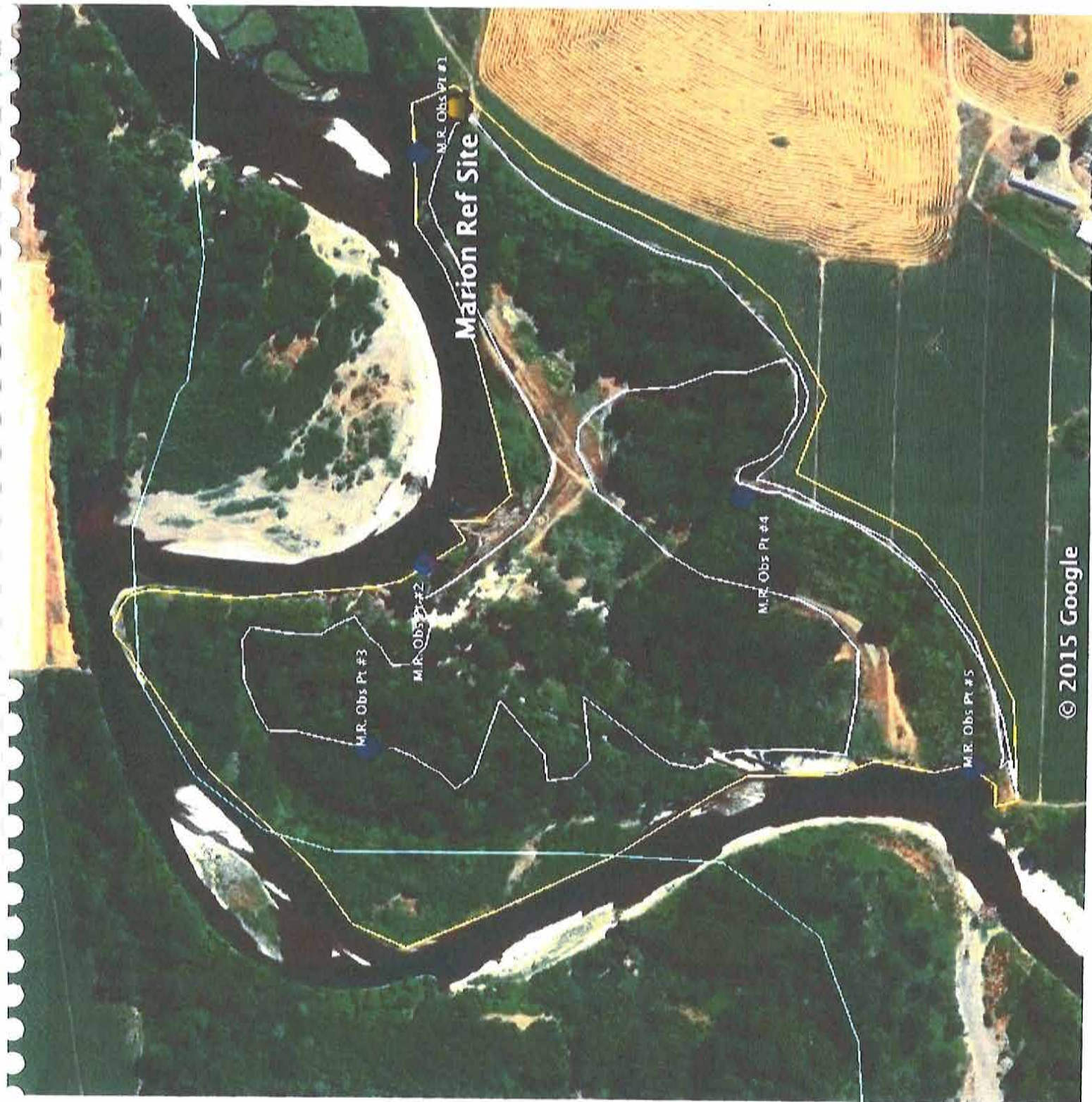
Species	Marlon Mitigation Bank	USFWS Reference Site
American Coot	5	
American Crow	5	
American Goldfinch	7	7
American Oyster Catcher		1
American Robin	32	27
Anna's Hummingbird		2
American Wigeon	2	
Barn Swallow	4	
Belted Kingfisher		1
Black-Capped Chickadee	10	10
Brewer's Blackbird	30	1
Brown Headed Cowbird	5	
Bullocks Oriole		1
Cackling Goose	1	
California Quail		1
Cedar Waxwing	3	
Cliff Swallow	8	
Common Yellow-Throat		5
European Starling	87	4
Golden-Crowned Kinglet		1
Great Blue Heron	20	
Green Heron	1	
Harlequin Ducks	2	
Kill Deer	16	
Least Sandpiper		6
Lesser Yellowlegs		19
Lezuli Bunting		5
Lincoln Sparrow		1
Mallard Duck	11	
Marsh Wren	3	
Mourning Dove	8	7
Northern Flicker	1	

Marlon Wildlife Survey Spring 2014-1

Species	Marlon Mitigation Bank	USFWS Reference Site
Pacific Wren		1
Pied-Billed Grebe	8	
Purple Finch		1
Red-Tailed Hawk		1
Red-Winged Black Bird	88	
Song Sparrow	13	33
Spotted Towhee	2	5
Swainsons Thrush	6	14
Tree Sparrow	2	
Tree Swallow	45	7
Turkey Vulture	1	1
Vaux's Swift	1	21
Virginia Rail	4	
Violet-Green Swallow	3	
Western Tanager	4	
Willow Flycatcher		4
Yellow Warbler	1	
^A Unknown Ducks	7	
Unknown Finch	4	
Unknown Hummingbird	2	
Unknown Woodpecker		2
Totals	452	191
Beaver	2	
White Tailed Deer		2
Garter Snake	1	
Deer Tracks	4	8
Northern Leopard Frog	Unknown	
Bull Frog	Unknown	
Unknown Fly-Bys	14	
Unknown Brown Bird Fly-By	1	
Unknown Black Bullet Birds	9	3
Unknown Blackbirds	4	

Table: 3 Comparison of Wildlife Survey Results Including Flyovers, Calls, and all Sightings.





Marion Ref Site

M.R. Obs Pt #1

M.R. Obs Pt #2

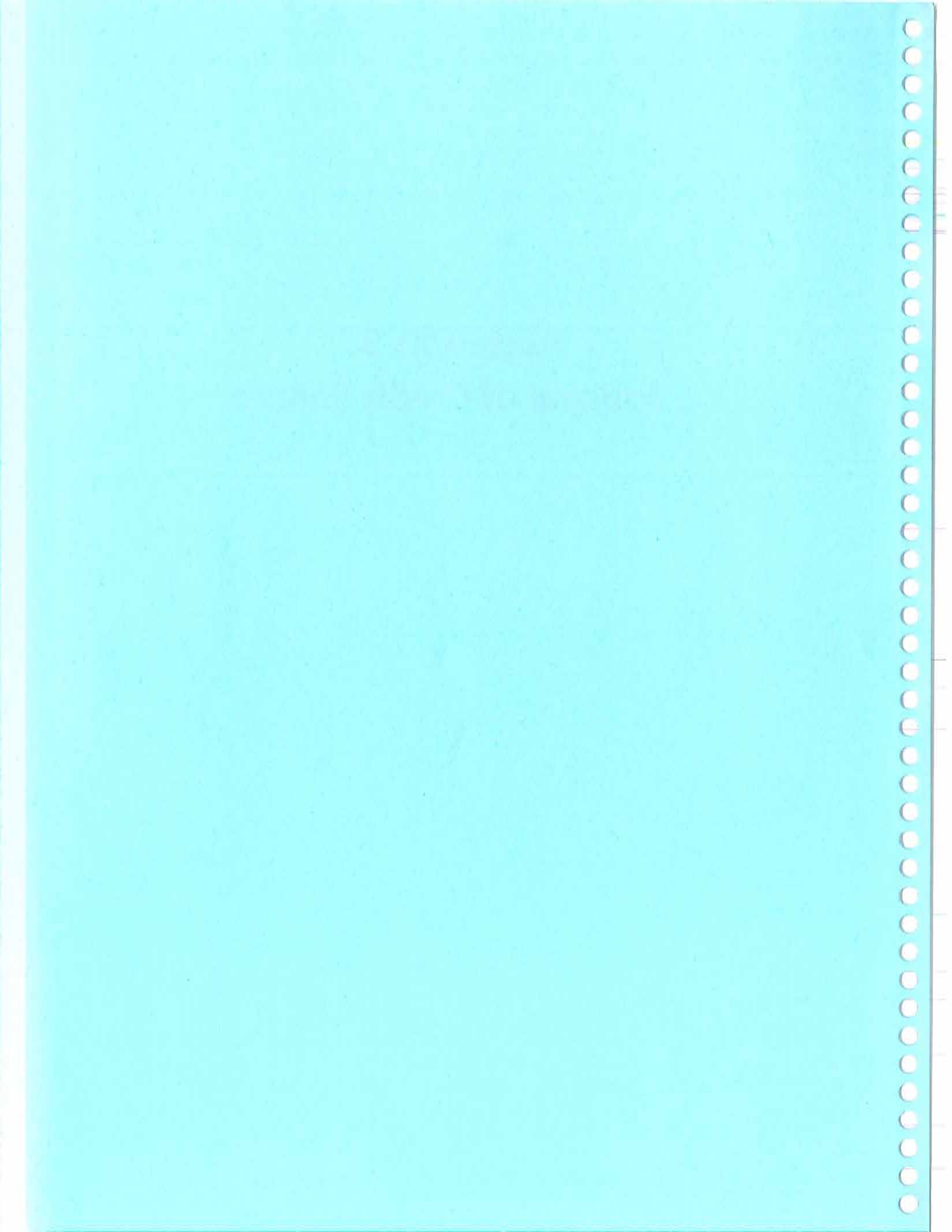
M.R. Obs Pt #3

M.R. Obs Pt #4

M.R. Obs Pt #5



Appendix 3
Journal of Credit Sales



MARION MITIGATION BANK

12/31/2014

DATE	NAME	LOCATION	PERMIT	ADD	SOLD	BALANCE
10/19/2001	DSL/COE CREDIT RELEASE	INITIAL RELEASE		10.9		10.90
4/20/2003	DSL	RECORDED			10.9	0.00
3/20/2003	DSL/COE CREDIT RELEASE	PHASE I		2.84		2.84
4/24/2003	WILLAMETTE ESTATES, LLC	3900 NE SANTIAM PASS WAY, SALEM,OR	25263RF/1998-00145		0.500	2.34
11/13/2003	OREGON DEPT OF TRANSPORTATION	I-5 N. JEFFERSON TO N.ALBANY	31156RF/2003-00622		2.330	0.010
3/18/2004	DSL/COE CREDIT RELEASE	PHASE II		3.21		3.220
5/26/2004	OREGON DEPT OF STATE LANDS	WETLAND MITIGATION BANK REVOLVING FUND			0.167	3.053
6/14/2004	CITY OF SALEM PUBLIC WORKS	GREEN IS. WATER TREATMENT FACILITY	RP12152/1996-01446		1.540	1.513
10/5/2004	WILLAMETTE DEVELOPMENT LLC	9795 MILL CREEK RD.SE, AUMSVILLE, OR	APP32629/2004-00446		1.510	0.003
4/28/2005	DSL/COE CREDIT RELEASE	PHASE II		2.19		2.193
5/4/2005	TIMOTHY YOUNGKIN	NW 1/4 SEC.33,T13S,R01W,WM SWEETHOME, OR	FP13667/1997-00203		1.000	1.193
6/30/2005	RICH BRANDVOLD	T10S,R1W,SEC18,TAX LOT 100 SCIO,OR	RF33917/2005-00074		0.090	1.103
9/30/2005	RICH BRANDVOLD	T12S,R2W,SEC22,TAX LOT 504,LEBANON,OR	RF34107/2005-00164		1.103	0.000
4/4/2008	DSL CREDIT RELEASE	PHASE II		2.5		2.500
10/3/2008	KSD INVESTMENT,LLC	11770 SUBLIMITY RD.,SUBLIMITY, OR	41232RF/2008-00504		1.845	0.655
11/6/2008	KNIFE RIVER	9710 WHEATLAND RD N.SALEM, OR	39879RP/2008-0067		0.007	0.648
12/5/2008	DSL/COE CREDIT RELEASE	PHASE III		4.5		5.148
12/9/2008	WOOD WASTE, LLC DBA COMPOST OR	TAX LOT 1700,8712 AUMSVILLE HWY, AUMSVILLE,,OR	39365RF/2007-00896		1.83	3.318
6/18/2010	DSL/COE CREDIT RELEASE	PHASE I		4.5		7.818
6/23/2010	ALBANY/LEBANON INVESTMENTS	560 HANSARD AVE./LEBANON OREGON TX LTS 1900/2000	39843RF/2007-00571		3.83	3.988
11/11/2011	MOUNTAIN WEST SENIOR HOUSING	T8N,R3W,SEC12,TAX LOT 2501	ENF2501		0.21	3.78
5/22/2013	MARION CTY PUBLIC WORKS	HAYSVILLE RD MITIGATION SITE	24306GA/2001-00624		0.16	3.62
6/25/2013	OR DEPT VETERANS AFFAIRS	600 PATRIOTS PLACE. LEBANON, OR	53043RF/2012-00404		0.57	3.05
8/19/2013	HANS THYGESON	T11S,R03W,SECS,TAX LOT 1000,1100,1208	7379-ENF		2.00	1.05
8/22/2013	JB&B INVESTMENT GROUP	T8S,R2W,SEC5WM,TAX LOT 100	5361-RF/2013-160		0.43	0.62
11/5/2013		PHASE III		2.17		2.79
5/7/2014	CITY OF SALEM PUBLIC WORKS	T7S,R3W,Sec27,28, & 23	55892RF/2012-493		0.11	2.68
9/4/2014	Linn Benton Comm College	2000 W Oak St,Lebanon, OR	55680RF/2014 76		0.07	2.61
9/4/2014	MARION CO PUBLIC WORKS	T7S,RW2,sec 17	56088RF/2014-123		0.04	2.57
9/9/2014	R4 Sons,LLC	T8S,R3W,Sec7C Tax Lots 1800,2100	56146RF		1.19	1.38
11/24/2014	Carmx Auto Superstores West Coast Inc	T7S,R2W,Sec31 Tax Lots 4900,5400	54939FP/2013-405		1.27	0.11

