2013 MONITORING REPORT
for
OAK CREEK MITIGATION BANK
LEBANON, OR

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

Submitted by
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January 31, 2014

2013 MONITORING REPORT
for
OAK CREEK MITIGATION BANK
LEBANON, OR

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Performance Standard	PC Area	2007 South Marsh	2007 North Marsh	NE Forest	West Forest
Dominated by 70% or more desireable plants	72% Vegetated 88% FAC or wetter 56% Native	67% Vegetated 84% FAC or wetter 65% Native	73% Vegetated 55% FAC or wetter 45% Native	52% Vegetated under closed canopy 85% FAC or wetter 80% Native	83% Vegetated under closed canopy 89% FAC or wetter 74% Native
80% survival of planted trees and shrubs	no 2013 data	NA	NA	NA	NA
Less than 15% listed noxious invasives	0%	0%	0%	5%	1%

2013 MONITORING REPORT
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OAK CREEK MITIGATION BANK
LEBANON, OR

This is the fifteenth monitoring report for the Oak Creek Wetland Mitigation Bank Site near Lebanon, OR. Maureen Stellrecht and Richard Novitzki compiled and edited this report and designed and participated in monitoring activities. Maureen Stellrecht conducted or supervised weed management and other site maintenance and monitored pond, stream, and ground water levels. Michael Bollman sampled vegetation in May. Wildlife data was collected by Courtenay Brasier in January and June.

The Oak Creek Mitigation Bank has restored a wet meadow wetland – a class of wetland sensitive to variations in precipitation patterns. 2013 was the fourth driest year recorded at the Hyslop weather station at Corvallis. The United States drought monitor listed the entire state of Oregon as abnormally dry for 2013. Despite the extremely dry conditions, the plant community was able to maintain itself with little or no loss from levels achieved in 2012, confirming the success of the restoration. However, during extreme dry conditions, sensitive wetland plants do poorly, allowing openings for invasive species to establish. Additional spot spraying was required to minimize invasion of non-native plant species during this vulnerable period, and additional seeding was needed to maintain a healthy wetland plant community.

Site Management Activities

In 2010 after the inspection of the OCWMB, a conclusion was reached that a new remedial action plan would be developed with the help of Ray Fiori and Pat Thompson. Appendix 1 shows this remedial plan that was created on July 27, 2010. The treatments have been conducted as presented in the management activities summary. This remedial action plan is aimed at removing the seed bank of non-native invasives, and preparing the site for seeding more desirable species in the near future. In 2012, Allen Martin and Pat Thompson visited the site twice to see how well the remedial plan is progressing and establish a seeding plan. We continued intense efforts of spraying and monitoring the areas B3-A, A1, A2, and a portion of A4 and A3. These areas finally reached a place where we were comfortable that the seed bank of non- natives was exhausted, and we could seed with confidence in the fall of 2012. We prepped the soil by using a saw toothed harrow, or drag, and then used a broadcast seeder with mixes recommended in the remedial action plan.

In order to improve the western most buffer, 2000 potted trees and shrubs were planted in March 2013 along with 1000 bare root shrubs.

Oak Creek				Observation Well Numbers												
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**reference site**
1/16/13	0	15	1	6	10	5	1	7	10	30	8	3	11	22	5	10.6
2/15/13	4	15	5	7	12	4	0	6	11	31	7	0	10	23	5	0.3
3/15/13	6	19	1	8	11	8	0	6	10	26	11	4	15	24	7	+3.1
4/16/13	4	17	2	7	5	6	0	7	11	34	6	2	14	23	4	+3.1
5/15/13	26	46	7	30	47	36	24	19	29	67	32	20	44	51	24	7.2
6/1/13	41	52	31	29	40	30	27	21	30	56	40	30	51	46	31	+3.1
6/14/13	40	60	42	31	50	41	30	27	35	60	30	37	62	71	41	2.1
7/16/13	38	66	77	39	63	46	38	29	48	88	35	44	54	85	46	42
8/15/13	57	85	_	50	83	79	29	44		_	51	58	64	_	64	70.7
9/14/13	46	95	_	48	87	68	46	44	70	-	62	58	58	102	55	57.1
10/15/13	36	74	_	34	61	36	30	32	81	_	40	41	70	90	32	3.1
11/1/13	21	54	63	19	43	29	16	21	87	18	22	36	84	-	19	22.2
11/16/13	1	17	20	3	6	3	0	7	9	37	5	2	6	52	4	+2.7
12/2/13	1	11	7	0	9	2	1	8	6	62	+1	1	2	23	3	+3.1
12/15/13	0	12	9	2	13	4	0	6	9	41	3	3	6	21	4	6.2

Table 1. Depth to water (in inches) below land surface in 2013 in Observation Wells.

Oak Creek				Shallow Well Numbers									
Date	**S1**	**S5**	**S6**	**S7**	**S8**	**S9**	**S10**	**S11**	**S12**	**S13**	**S14**	**S15**	**S16**
1/16/13	8	+2	+5	12	11	8	9	4	2	17	11	14	-14
2/15/13	1	+4	+3	4	4	2	0	+2	+2	0	2	8	4
3/15/13	+1	+6	+10	4	6	1	1	+5	+3	+11	2	5	8
4/16/13	12	+3	+3	11	9	6	7	3	2	16	10	11	17
5/15/13	12	8	11	14	15	12	10	12	10	9	8	11	15
6/1/13	13	13	1	14	12	10	9	2	2	18	10	12	17
6/14/13	19	22	23	25	23	21	17	13	-	-	15	18	17
7/16/13	-	-	21	-	-	22	17	12	-	-	15	15	16
8/15/13	-	-	-	-	-	-	18	-	-	-	-	16	17
9/14/13	-	-	-	-	-	-	-	-	-	-	-	19	17
10/15/13	19	22	-	14	-	-	-	13	11	-	-	18	17
11/1/13	-	23	23	5	25	-	18	-	4	-	-	-	17
11/16/13	-	20	13	24	24	22	17	13	2	-	15	17	-
12/2/13													
12/15/13	13	+4	+6	12	8	5	8	0	0	11	7	10	17

Table 2. Depth to water (in inches) below land surface in 2013 in shallow observation wells

Hydrology Monitoring

Ground water levels were measured in 17 observation wells (Figure 1) and at the USFWS reference site. Data for wells 1 through 15, measured monthly, are presented in Table 1. Water levels are recorded daily in well 16 and the USFWS reference well. Those data are presented in Appendix 4. Precipitation (Table 3) in 2013, was 18.70 inches below the 30 year average. Those wells meeting hydrology criteria (water levels within 12 inches of the surface for more than 15 days during the growing season) are highlighted in Table 1.

Water levels in observation well 17 were recorded four times each day (Appendix 4) to record ground water levels within 45 inches below the surface and to record over-bank flooding up to 35 inches above the surface. The index mark (zero) for well 17 is above land surface; water at land surface registers as -35 inches. Over bank flooding is assumed to occur any time the well registers between zero and -35 inches. Periods of over bank flooding are highlighted in Appendix 3. Oak Creek did not overflow its banks once in 2013. There were a few areas of localized flooding in low areas but these were of short duration and of little significance.

Table 3. Monthly precipitation in inches in 2013 at the HYSLOP Weather Station at Corvallis, OR.

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	YEAR
Observed	1.71	1.99	2.58	1.99	2.27	1.28	0.0	0.33	7.06	1.17	2.73	2.04	25.07
30-Year Normal	6.46	5.65	4.61	3.09	2.27	1.45	0.60	0.74	1.44	3.07	7.04	7.35	43.77

The small ponds (vernal pools) began to fill in November 2012 and they contained water from January into April, briefly refilling in June (Table 4). Oak Creek ceased flowing around July 8, 2013, which was two months earlier than observed in 2012.

Table 4. Depth of water (in feet) in selected ponds in 2013 at Oak Creek. Ponds are identified by the well nearest to the pond (near well 8; between wells 8 and 13).

Pond # (nearest well): Date	3	4-7	4-7-1	7	8	8-13	12	13	15	7-15	17	Pond	Pond 6
1/16/13	.48	.25	.35	.52	.70	.92	.54	.82	.65	.68	.72	2.60	1.10
2/15/13	.48	.26	.38	.60	.70	.90	.50	.84	.62	.68	.78	1.85	.78
3/15/13	.34	.24	.36	.32	.76	.90	.56	.76	.52	.66	.72	1.65	1.12
4/16/13	.46	.26	.38	.56	.64	.86		.84	.52	.70	.74	1.40	.46
5/15/13	-	-	-	-	-	-	-	-	-	-	-	-	-
6/1/13	-	-	-	-	-	-	-	.72	-	-	.64	-	-
6/14/13	-	.40	.32	.48	.56	.60	.48	.72	.42	.12	.64	.85	-
__Ponds dry in summer__													
11/15/13	-	.28	.34	.62	.73	.92	.48	.82	.64	.65	.72	1.48	.42
12/2/13	-	.32	.44	.96	1.02	1.35	.75	1.12	.92	.76	.92	1.75	1.12
12/15/13	-	.38	.42	.72	.62	.94	.55	.95	.66	.70	.72	1.77	1.12

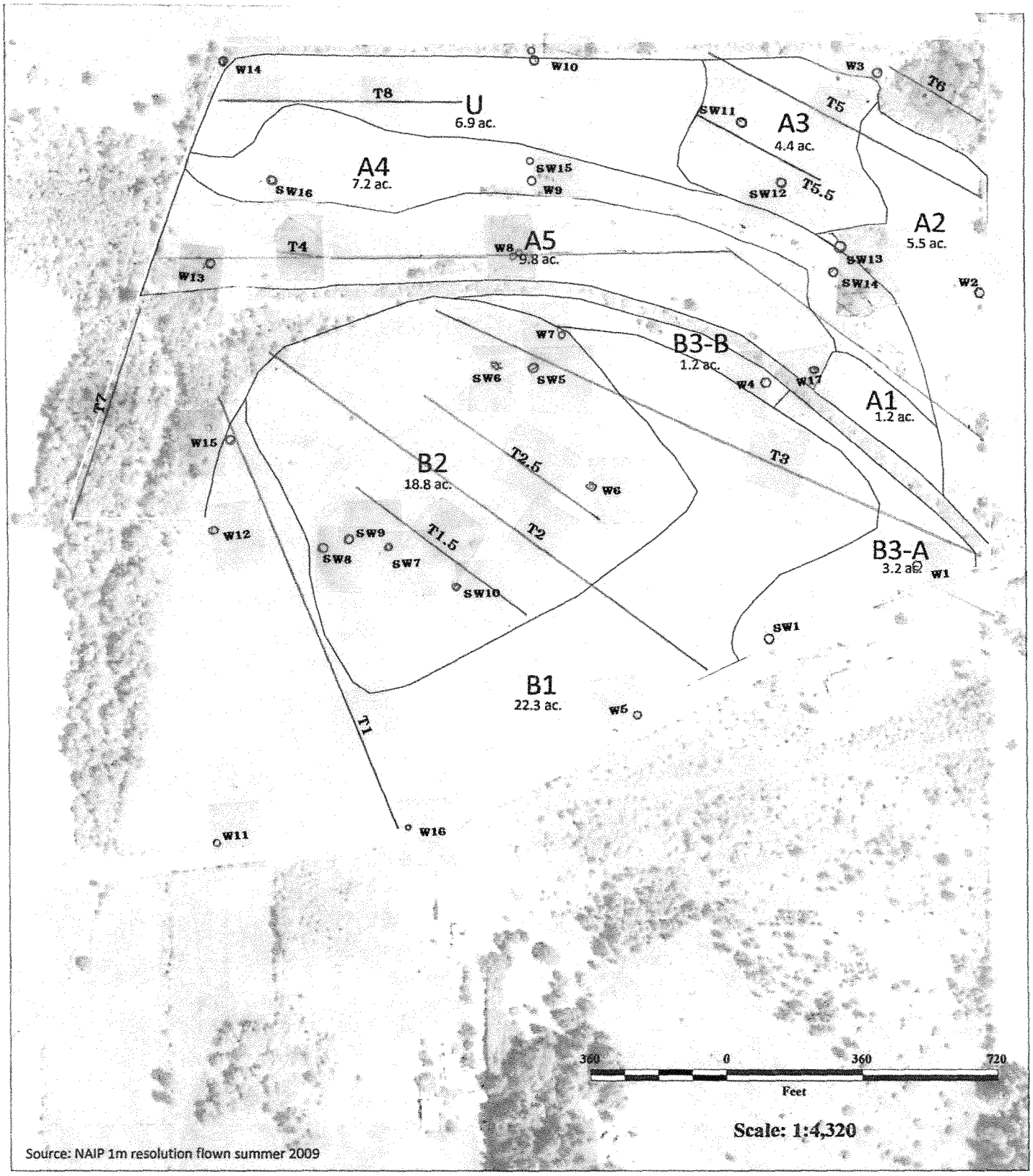

Figure 1. Map of Oak Creek Mitigation Bank site showing observation wells, vegetation sampling transects, and habitat types.

Some photographic examples of the functioning of the ecosystem at Oak Creen Mitigation Bank

Photo 1. Stellar example of Tufted hairgrass (*Deschampsia cespitosa)* along transect 2, at times reaching 6 feet tall or taller.

Photo 2. Onsite visitor – A native western pond turtle sunning himself on a log by the creek.

Photo 3. Native Camas in full bloom, completely filling the floor beneath the canopy along transect 7

Photo 4. 5000 trees and shrubs were planted in 2013 to ehhance buffers.Here is a Nootka rose (*Rosa Nutkana*) thriving in its new home along the western boundary

Sediment Monitoring

Sediment deposition or scour was measured at ten stations along Oak Creek in 2012 and 2013. The differences between measurements (the amount of deposition or scour) are presented in Table 5. Scour occurred at 5 stations, ranging from 0.4 to 1.70 inches, and deposition occurred at 5 stations, ranging from 0.1 to 1.05 inches. Because the stations were located randomly along both sides of the stream, they represent the entire riparian zone and the average sediment change is the arithmetic total (-1.10 inches) divided by the number of stations (10) for a net loss of 0.11 inches within the riparian zone. These data confirm that the function of the riparian wetland has been restored.

Table 5. Measurements at sediment monitoring stations in the Oak Creek riparian zone
(Measurements are inches below the top of a 5/8 inch rebar.)

Station:	**1**	**2**	**3**	**4**	**5**
Left Bank (2012)	**20.70**	**19.70**	**21.00**	**24.50**	**22.25**
Left Bank (2013)	**20.50**	**19.00**	**22.50**	**24.90**	**21.20**
Change	**+0.20**	**+0.70**	**-0.50**	**-0.40**	**+1.05**
Right Bank (2012)	**12.50**	**19.00**	**13.80**	**23.50**	**22.40**
Right Bank (2013)	**14.20**	**19.80**	**13.70**	**23.25**	**22.40**
Change	**-1.70**	**-0.80**	**+0.10**	**+0.25**	**0**

Since 1999 in the riparian zone there has been annual erosion as great as -0.42 inches and deposition as great as +1.56 inches, resulting in net aggradations of 4.02 inches. This confirms the successful function for the restored riparian area.

2000	**+0.42**	**2006**	**-0.40**	**2012**	**+0.34**
2001	**+0.06**	**2007**	**+0.23**	**2013**	**-0.11**
2002	**-0.43**	**2008**	**+1.25**		
2003	**+1.56**	**2009**	**-0.06**		
2004	**+1.03**	**2010**	**-0.03**		
2005	**+0.23**	**2011**	**-0.18**		

Vegetation Monitoring

Vegetation sampling occurred in May and June 2013. The seven permanent sampling transects (Figure 1) previously established at the site were sampled to document the plant community in the open and forested areas. A new transect (#8) was added in 2010 in the northwest upland area. Transect #8 consists of 10 sample plots, approximately 40 meters apart, and runs E-W through the center of the upland area. Sample plot flags were labeled in 2010 with permanent marker for easier identification in the field. Also, in the spring of 2012, the sampling stations were located using a handheld GPS and documented for future use. This will allow the IRT to locate each sample plot during the annual field inspection.

The dominant plant species in the open prior converted (PC) areas-transect 1-5 were Deschamsia cespitosa (tufted hairgrass), *Lythrum portula* (spatulaleaf loosestrife), *Epilobium ciliatum ssp. Watsonii* (watson's willow herb), *Agrostis exarata* (spike bentgrass), *Hordeum brachyanttherum* (meadow barley), *and Carex unilateralis (*one-sided sedge). Cover was 72%. FAC or better species accounted for 88% of the cover and 56% of the cover was native species. The SMI index is 2.17.

Three transects (Figure 2) were established to sample the wetland created from upland by the berms constructed in September 2006. For the newly-constructed shallow marsh area south of Oak Creek (transects 1.5 and 2.5) the dominant species were *Lythrum portula* (spatulaleaf loosestrife), Deschamsia cespitosa (tufted hairgrass), *Juncus tenuis* (slender rush), *and Hordeum brachyanttherum* (meadow barley). Cover was 67%, FAC or better species accounted for 84% of the cover and 65% of the cover was native. The SMI was 2.21.

For the newly-constructed shallow marsh area north of Oak Creek (transect 5.5), the dominant plant species were Deschamsia cespitosa (tufted hairgrass), *Hypochaeris radicata* (hairy cat's ear), *Agrostis exarata* (spike bentgrass), *Lotus unifoliolatus var. unifoliolatus* (Spanish clover), *Anthoxanthum odoratum* (sweet vernalgrass), *Hordeum brachyanttherum* (meadow barley), and *Lotus micranthus* (small-flowered lotus). Cover in this area is 73% with 55% of the cover being comprised of FAC or better species and 45% of the cover being native species. The SMI for this area was 3.02.

In the northeast forested area (transect 6) the dominant species were *Fraxinus latifolia* (Oregon ash), *Cammassia leichtlinii* (great camas), *Poa trivialis* (roughstalk bluegrass), and *Allium nigrum* (black garlic). Cover was 52% (under a closed canopy), species FAC or better accounted for 85% and 80% of the cover was native. The SMI was 2.46.

In the west forested area (transect 7) the dominant species were *Fraxinus latifolia* (Oregon ash), *Cammassia leichtlinii* (great camas), *Poa trivialis (*rough stalk blue grass), *Carex leptopoda (*Dewey's sedge), and *Allium nigrum (*black garlic). The cover was 83% (no including the canopy layer), 89% of species were FAC or wetter, and 74% of the species were native. The SMI for the west forested area was 2.33.

A new transect (#8) was created in 2010 in the NW upland area. The dominant species were *Festuca idahoensis ssp. Roemeri* (Roemer's fescue), *Holcus lanatus* (common velvet grass), *Elymus glaucus* (blue wildrye), *Festucca occidentalis* (western fescue), *Agrostis castellana/ capillaris* (colonial bent grass), and *Anthoxanthum odoratum* (sweet vernalgrass). Cover accounted for 77% of the area with native species covering 26%.

We evaluated survival of the 1667 shrubs and trees planted in the riparian area in February 2007 by examining 578 of the 1300 plants that had been flagged. We found 467 of the 578 alive, for a survival of 81%. Although we are meeting the performance standard, we have

decided to re-plant 250 trees in 2009 and another 250 in 2010. We reevaluated in spring 2011 and found that 94% of the trees and shrubs planted in 2009 and 2010 had survived. We have surpassed our performance standard by a larger margin with a total survival rate of 88% in the PC area.

Recognizing the importance of species' diversity to a healthy ecosystem, we have listed the number for the bank site as well as the reference site. Unfortunately, we do not have recent data for the reference site. In 2014 we will attempt to acquire diversity data for the reference site.

	USFWS	Stolts Hill	Oak Creek
1999	63	32	53
2000	64	32	96
2001	64	32	51
2002	64	32	64
2003	66	32	93
2004	66	28	83
2005	66	28	87
2006	51	26	84
2007	51	26	81
2008	51	26	96
2009			103
2010			105
2011			97
2012			96
2013	51	26	100

Wildlife Monitoring

Wildlife monitoring had been conducted from 2001 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. Four permanent wildlife observation stations at both the bank site and the USFWS reference site were sampled in Winter (January) and Summer (June) 2013 (Tables 3A, 3B, 3C, and 3D - Appendix 5).

During the winter survey, 22 species were observed at the bank site and 10 at the reference site. The abundance of birds at the bank site (130) exceeded that at the reference site (32). Also, several waterfowl specie (Green-Winged Teal, Northern Pintail) and several relatively unique species (Osprey, Bewick's Wren, Rufus Humming Bird, and Western Meadow Lark) were observed only at the bank site.

During the spring survey, 33 species were observed at the bank site and 15 at the reference site. The abundance of birds at the reference site (166) exceeded those at the bank site (90). The disparity resulted from a greater abundance of relatively common species at the reference site (Black-capped Chickadee, Song Sparrow, Spotted Towhee, Swainson's Thrush, and Turkey Vulture). All of these species were observed at the bank site, but in fewer numbers. Unique species observed at the bank site but not at the reference included Nashville Warblers, Red-breasted Sapsuckers, Western Blue Birds, Western Kingbirds, a Yellow-throated Vireo, and Yellow-rumped Warblers.

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.

Summary

Oak Creek Mitigation Bank continues to demonstrate wetland hydrology, confirming successful site restoration. Saturated conditions persisted through June. Oak Creek flooded out onto its re-connected flood plain five times in 2004. four times in 2005, forty-six times in 2006, fifty-five times in 2007, sixty times in 2008, 12 times in 2009, 35 times in 2010, nine times in 2011, 17 times in 2012, and 0 times in 2013. These suggest that the vegetation is encroaching into the channel and that the stream may cut a new channel segment and abandon a segment of its old channel- a natural phenomenon occurring in undisturbed streams and wetlands. When this occurs, it will further confirm that the re-connection of Oak Creek to its flood plain and the wetland restoration have been successful. The flooding resulted in an average sediment deposition of -0.11 inches in the riparian zone during the year.

The site was burned in 2005 and mowed and sprayed in 2006. Vegetation sampling found the plant community in the open PC area is 88% FAC or better, 56% native, and the SMI was 2.17. South of Oak Creek the wetland created from upland in 2006 is 84% FAC or better, 65% native, and the SMI was 2.21. North of Oak Creek the wetland created from upland is 55% FAC or better species 45% native, and the SMI was 3.02. The plant community in the north east forested area is 85% FAC or better, 80% native, and the SMI was 2.46. In the west forest the plant community is 89% FAC or better, 74% native, and the SMI was 2.33.

The remedial treatment plan established in July 2010 has led to more bare area in the aggressive site preparation, in order to remove seed bank of non-native invasives and will establish a greater abundance of native FAC and wetter species. This plan will make the site more self-sustaining in the future.

The wildlife survey that was conducted in previous years was reinstated in 2013. We believe that the surveys done in the past have established OCWMB as a functioning component of the local ecosystem. The 2013 data are comparable to data collected from 1999-2008 confirming the ability of wildlife using this site.

References

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CREDIT SALES — 2013

Date	Credit	Purchaser	Permit #	Impact Location
11-13-13	0.02	Les Schwab Tire	2013-00357	2925 Santiam Hwy SE Albany, OR

Credit Balance:

0.01

Appendix 1

Letter from Willamette Valley NWRCS

(Expressing interest in acquiring the site)

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Willamette Valley National Wildlife Refuge Complex
26208 Finley Refuge Road
Corvallis, Oregon 97333
Phone: (541) 757-7236 FAX: (541) 757-4450

In Reply Refer To:
W L Finley NWR

March 27, 2012

Mr. Richard P. Novitzki
R.P. Novitzki and Associates, Inc.
4853 NW Bruno Place
Corvallis, OR 97330

Dear Mr. Novitzki:

It was a pleasure meeting with you to discuss the ongoing restoration efforts at the Oak Creek Mitigation Bank, Lebanon, OR. Thank you for providing the monitoring reports for 2010 and 2011. As you described to me and Jock Beall, it seems that the site may be well suited for the expanding the current Oak Creek population of Bradshaw's desert parsley. As it lies within one mile of the U.S. Fish and Wildlife Service's Oak Creek fee title property boundary, the Service remains interested in potentially acquiring interest in this property in the future.

Thank you again for your time and your continued conservation efforts.

Sincerely,

Laila A. Lienesch
Acting Project Leader
Willamette Valley NWRC

Appendix 2

Addendum Remedial Action Plan

Oak Creek Wetland Mitigation Bank (OCWMB)

Addendum Remedial Action Plan

This document specifies what actions are recommended for continuing remediation to assure success in meeting the performance standards agreed upon for the OCWMB by the bank sponsor, the Department of State Lands (DSL) and the U.S. Army Corps of Engineers (USACOE).

A site reconnaissance was conducted on July 27, 2010, by the Bank Sponsor, Dick Novitzki, Ray Fiori of RTF consulting, Pat Thompson of Patrick S. Thompson Consulting, Allen Martin of Geo Sources Inc. and Maureen Stellrecht, biologist for OCWMB. The purpose of this reconnaissance was to map problem areas where non native species were gaining the upper hand on native desirable species and agree on a treatment strategy for each area identified, decide the critical timing for the treatment, and exactly who would be in charge of providing the treatment for each area.

Pat Thompson and Allen Martin outlined nine treatment areas and assigned each one an identification number. Allen Martin then created a GPS map of the areas on an aerial photo to show the locations of each area. At the end of the document, the general weed control guidelines are outlined, so they don't need to be repeated in each section, as well as a general wet prairie mix and emergent marsh mix recommendation. Where different planting mixes are recommend they are outlined in the prescription. A prescription for treatment was agreed upon by the entire team for each of these areas and the prescriptions are as follows.

Area A-1 (1.2 acres)

Existing Conditions:

This area is a small open canopy riparian wetland. There are scattered trees with a significant non-native understory. Problem species include: Velvet grass, Teasel, Pennyroyal and non-native bent grass species.

Target Conditions:

A forested riparian wetland dominated by native species.

Recommendations to Reach Target Conditions:

- This entire area should be sprayed out ASAP, while avoiding the existing trees.
- Area should be sprayed again following the fall of 2010 green up, prior to heavy winter rains.
- Watch this area closely in spring of 2011, spraying should occur after significant germination occurs, but prior to any non-native species beginning to flower.
- During summer of 2011 this area should be monitored often to detect any new problems. Thistles, Pennyroyal, Queen Anne's lace and St John's wort can all germinate with very little moisture and should be treated if needed.
- During fall of 2011 this area should be assessed for planting. If there is significant rains (2"-3") followed by warm temperatures to get weeds germinated, the site should be planted followed by a broad spectrum herbicide treatment. If rains come rapidly, the area should be sprayed when weather allows and planted in the spring of 2012.

Area A-2 (5.5 acres)

Existing Conditions:

This area is prairie with a few scattered trees. This area has a significant population of non native grasses and forbs. Target same species as A-1 for grasses as well as sweet vernal grass, and target the following non native forbs: Pennyroyal, St. Johns wort, Centurion, Queen Anne's lace, prickly sow thistle, Cats ear dandy lion and parentucellia.

Target Conditions:

Wet prairie dominated by native facultative or wetter species with scattered woody vegetation.

Recommendations to Reach Target Conditions:

- This entire area should be sprayed out ASAP.
- Area should be sprayed again following fall of 2010' green up, prior to heavy winter rains.
- Watch this area closely in the spring of 2011, spraying should occur after significant germination occurs, but prior to any non-native species beginning to flower.
- Depending on spring rains, this area will likely need sprayed again in June. If there is still significant dead organic matter (over 50% ground cover) the area should be mowed with a 4 blade rotary mower (mulching type) or a flail mower.
- During the summer of 2011 this area should be monitored weekly to detect any new

problems. Thistle, Pennyroyal, Queen Anne's lace and St Johns wart can all germinate with very little moisture and should be treated if needed.

- During the fall of 2011 this area should be assessed for planting. If there is significant rains (2"-3") followed by warm temperatures to get weeds germinated, the site should be planted followed by a broad spectrum herbicide treatment. If rains come rapidly, the area should be sprayed when weather allows and planted in spring of 2012.

Area A-3 (4.4 acres)

Existing Conditions:

This area is a combination of emergent and wet prairie. The emergent is in fair condition, but the wet prairie is being invaded by non native species. Problem species for grasses include sweet vernal grass, Velvet grass, and non-native Bent grass spp. Problem species for non native forbs include: Pennyroyal, Curly dock, Oxeye daisy, St. Johns wort, Centurion, Queen Anne's lace, prickly sow thistle, Cats ear dandy lion and parentucellia.

Target Conditions:

A combination of emergent and wet prairie dominated by native facultative or wetter species.

Recommendations to Reach Target Conditions:

- This area should be sprayed out ASAP with the exception of the two wetter areas near each side of the existing berm. A combination of a broad spectrum and broadleaf herbicide should be utilized to control established hard to kill weeds.
- The emergent areas are sparsely vegetated. They should be spot sprayed for non natives and re-planted to a mix of Dowingia, Popcorn flower, and Ovate spike-rush.
- The constructed dike along the north side of this area should be breached to allow surface flows to enter site from the adjoining property to the north. This berm should be sprayed out ASAP and then replanted with upland species such as blue wildrye, slender wheatgrass and California oatgrass once non-natives are under control (likely late fall of 2011).
- Follow recommendation in A-2.

Upland Area (6.9 acres)

Existing Conditions:

The upland area is in fair shape with ~ 50-60% native species. Blue wildrye is the dominant native species, and velvet grass is the dominant non-native species. Weeds in this area present a contamination problem for adjacent wetland areas if not managed. The following option

appears to be the preferred option discussed in a meeting on September 7, 2010 by the bank sponsor, Pat Thompson and the regulatory agencies to limit the contamination issue.

Target Conditions:

Native upland prairie if buffer credits are sufficient to warrant the work it will take to keep it that way.

Recommendations to Reach Target Conditions:

If restoring this area is the goal, follow site preparation measures outlined in A-2, with final planting in the fall of 2012. Due to abundant bio-mass, mowing will be necessary here this fall to accomplish full restoration. Re-plant to a combination of the following seed mix, which is in order of the highest percentage of mix first: blue wild rye, slender wheatgrass, Roemer's fescue, and California oatgrass. Follow planting with 2 years of broad-leaf weed control. Once broad-leaf weeds are under control, plant to a native forbs mix of aggressive habitat generalists such as: Common yarrow, Meadow checkermallow, Streamside lupine, and Bi-color lupine.

This area will be deemed successful if at least 50 percent of the vegetation is native upland prairie, with not more than 15 percent non native invasives and the remainder either native or non intrusive non native species (eg. Parentucellia, curly dock and centurion).

Area A-4 (7.2 acres)

Existing Conditions:

This area is mostly wet prairie with a few scatter trees. The vegetation is mostly non native grasses and forbs such as bent grass, velvet grass, cats ear dandelion, oxeye daisy, and pennyroyal.

Target Conditions:

A combination of forested wetland, scrub/shrub wetland and wet prairie.

Recommendations to Reach Target Conditions:

- This entire area should be sprayed out ASAP. The existing trees and shrubs should be avoided during spraying when possible.
- Area should be sprayed again following fall of 2010' green up, prior to heavy winter

- Watch this area closely in the spring of 2011, spraying should occur after significant rains germination occurs, but prior to any non-native species beginning to flower.
- Depending on spring rains, this area will likely need sprayed again in June. If there is still significant dead organic matter (over 50% ground cover) the area should be mowed with a 4 blade rotary mower (mulching type) or a flail mower.
- During the summer of 2011 this area should be monitored weekly to detect any new problems. Thistle, Pennyroyal, Queen Anne's lace and St John's-wort can all germinate with very little moisture and should be treated if needed.
- During the fall of 2011 this area should be assessed for planting. If there is significant rains (2"-3") followed by warm temperatures to get weeds germinated, the site should be planted followed by a broad spectrum herbicide treatment. If rains come rapidly, the area should be sprayed when weather allows and planted in spring of 2012.

Area A-5 (9.8 acres)

Existing Conditions:

This area is approximately half wet prairie and half emergent wetland. The wet prairie area is nearly dominated by non native undesirable species such as bent grass, velvet grass, cats ear dandelion, oxeye daisy, and pennyroyal.

Target Conditions:

A combination of emergent wetland and wet prairie dominated by facultative or wetter native wetland species.

Recommendations to Reach Target Conditions:

- This area needs intensive spot spraying for pennyroyal and curly dock. Due to the hardiness of these species, a mix of broad spectrum and broadleaf specific herbicides should be utilized. Boom spraying will likely be more efficient in areas of heavy infestation.
- Re-plant emergent marsh areas this fall if non-natives are prevented from going to seed this year or if infestations limited enough for spot spraying to be effective next year (ie) less than 25% non-native cover).
- The entire wet prairie portion should be sprayed out ASAP and follow site prep protocols outlined in A-2.

Area B-1 (22.3 acres)

Existing Conditions:

This area is fairly good native wet prairie for the most part, however, if left unattended this area will eventually be overtaken by non native species, predominately velvet grass.

Target Conditions:

Wet prairie dominated by at least 70% native facultative or wetter species.

Recommendations to Reach Target Conditions:

- In this area target those areas where the velvet grass is approaching approximately 15% or more cover and spray these areas out with Round-up® as needed through fall of 2011. Re-plant sprayed out areas to wet prairie.
- The areas that are less than 15% velvet grass should be spot sprayed. All pennyroyal should also be spot sprayed and other non-natives that are encountered.

Area B-2 (18.8 acres)

Existing Conditions:

This area is a combination of emergent wetland behind a dike and wet prairie. This area is also in fair condition, but in danger of becoming overtaken by non native velvet grass in the wet prairie and pennyroyal in the emergent areas.

Target Conditions:

A combination of emergent wetland and wet prairie dominated by at least 70% native facultative or wetter species.

Recommendations to Reach Target Conditions:

- The area east of the berm needs to be spot sprayed targeting barnyard grass and pennyroyal. This area would greatly benefit from additional emergent planting to increase native plant cover and diversity.
- In the area west of the dike, intensive spot spraying needs to target pennyroyal, velvet grass and bent grass. If sufficient cover of these species is not reduced by early June, the area should be mowed prior to seed set, and spot spraying should continue as seed heads appear to aid in identification.

Area B-3-A (3.2 acres & Area-B-3- B 1.2 acres)

Existing Conditions:

The western portion of this area is wet prairie in fairly good condition; the eastern portion is wet prairie in very poor condition as far as native species is concerned.

Target Conditions:

Wet prairie in the short term, transitioning into riparian forested along Oak Creek.

Recommendations to Reach Target Conditions:

- The western portion of this area needs to be spot sprayed for velvet grass, cat's ear dandelion, and pennyroyal.
- The eastern portion should be sprayed out ASAP, and follow site prep/planting protocols outlined in A-2 followed by wet prairie seeding.
- Once the herbaceous layer is established, plant a mix of native trees and shrubs along Oak Creek.
- The small upland area that remains in the southern upland area delineated by Pacific Habitat Services in 1997 should be sprayed out for 2 growing season and planted with native species.

Conclusion

This plan is designed to correct vegetative deficiencies within the Oak Creek Mitigation Bank. Every attempt was made to define BMP's (best management practices) for each area and the anticipated timing of each activity. These recommendations are based on many years of experience and typical weather patterns. Timing/quantity of precipitation, Soil temperatures, and various other environmental variables will ultimately dictate the timing of management activities, and there effectiveness. This should be accomplished through field visits by an experienced professional. Contracts should be drawn up as soon as possible for the critical spraying that needs to take place this fall and the spring of 2011 to assure meeting the recommended critical time frames.

In follow-up to this plan, a minimum of three yearly inspections will be conducted by Ray Fiori and Pat Thompson, or other wetland professionals. The first site visit should take place in the early spring (March-April) the second in mid-June to assess how treatments are progressing and the third in August to determine if or what additional treatments are necessary. A memo

outlining this information will be immediately passed on to the bank sponsor, DSL and the USACOE for review and comment.

General Weed Control Guidelines

Broadcast/Spot Spraying

- For areas that are designated to be sprayed out and for spot spraying, a broad spectrum herbicide such as Glysophate should be utilized. Round-up™ power max with 5.5 Lbs of active ingredient has proven to be the most effective on established perennial species, and should be utilized whenever possible.

- When broadcast spraying, utilizing well calibrated equipment with adequate spray volume is absolutely necessary for complete control. For broad spectrum herbicides like Round-up™, a minimum of 7 gal/ac. total solution should be utilized, with higher volumes for dense foliage. For broad-leaf specific herbicides such as Garlon 3A™, a minimum of 10gal/ac total solution should be utilized, with higher volumes for dense foliage.

- When spot spraying, a high visibility dye (red works best) should be utilized. This aids in follow up treatments, and also allows for evaluation of herbicide effectiveness on target species.

- In order for this plan to be successful, it is critical in areas designated for management that no non-native species are permitted to seed throughout this intensive management period.

- It is also critical to monitor herbicide success following each treatment. Using a broad spectrum herbicide does not guarantee all plants will be killed and broadleaf herbicides are very selective. Weather conditions, spray equipment, and stage of plant growth all play important roles in success, and corrective measures may need to be taken.

Velvet Grass (*Holcus lanatus*)

- Once established a Round-up® product with 5.5Lbs of active ingredient is necessary for control

- For areas designated for spot spraying, foggy mornings in early spring or a heavy dew aid in identification as the fuzzy leaf surface collects water droplets and distinguishes it from desirable native species.

- During its first growing season following germination this species can be difficult to identify until late June when seed heads begin to appear. This is the best time for spot

treatment control, but it is imperative to cover these areas multiple times to ensure no plants produce viable seed.

Non-Native Bent grass species (*Agrostis species*)

- Once established a Round-up™ product with 5.5Lbs of active ingredient is necessary control.
- Although spring treatments are necessary to keep these species from producing seed, fall application are best for rhizome control.
- These species tend to germinate in late fall, several weeks after significant precipitation, so a late herbicide application just prior to heavy winter rains is very advantageous.

Sweet vernal grass (*Anthoxanthum odoratum*)

- Although this species is a perennial, it remains fairly small in poor soils with limited nutrients.
- The best defense is to eliminate the seed bank through site prep.
- During its first season after germination, it is difficult to distinguish from other natives. Spot spraying is best after seed heads begin to appear, but prior to producing viable seed.
- Mowing can help prevent it from going to seed and subsequent spot spraying, but has little benefit for long term control.
- Once established, spot spraying is the best control. It can be mistaken for meadow foxtail (which should be controlled) as well as Blue wildrye and Meadow barley

Oxeye daisy (*Leucanthemum vulgare*)

- Once established, it can be difficult to kill with a broad spectrum herbicide.
- When using broadleaf specific herbicides, Milestone™ is the most effective.
- Mixing the two together is best for spot spraying.

Teasel (*Dipsacus sylvestris*)

- Once established, it creates abundant seed and spreads rapidly, but since It is a biennial, it takes 2 years to go to seed
- Most herbicides are effective on it in the rosette stage, before it starts to bolt, and should be controlled at that stage.

- Mowing is ineffective for long term control, but will delay seed production.

Pennyroyal (*Menthe pulegium*)

- This species spreads rapidly from existing roots and seed, and is mostly associated with emergent drawdown zones, and similar habitats.
- Hand pulling and mowing have no effect on control.
- Depending on the year, plants can begin to appear in late June, and continue into the fall. Control should begin as soon as flowers appear to aid in detection, but areas should be covered at least once weekly to prevent seed production.
- Due to its spreading nature, areas of previous infestations should be checked frequently.
- When spot treating, a Round-up™ product with 5.5Lbs of active ingredient is necessary control.
- Garlon 3A™ is fairly effective as a broad-leaf specific treatment, but stage of growth and weather play a big role.

Curley dock (*Rumex crispus*)

- Once established, it can be difficult to kill with a broad spectrum herbicide.
- When using broadleaf specific herbicides, Milestone™ is the most effective.
- Mixing the two together is best for spot spraying.

Thistle Species (*Cirsium arvense*)

- These species can germinate most months of the year with little moisture necessary.
- They are fast to reproduce when stressed during hot weather and early detection and control is the best defense. Once vegetation is established, competition from native species is the best long-term strategy, with limited ground disturbance.

Wet Prairie Planting List

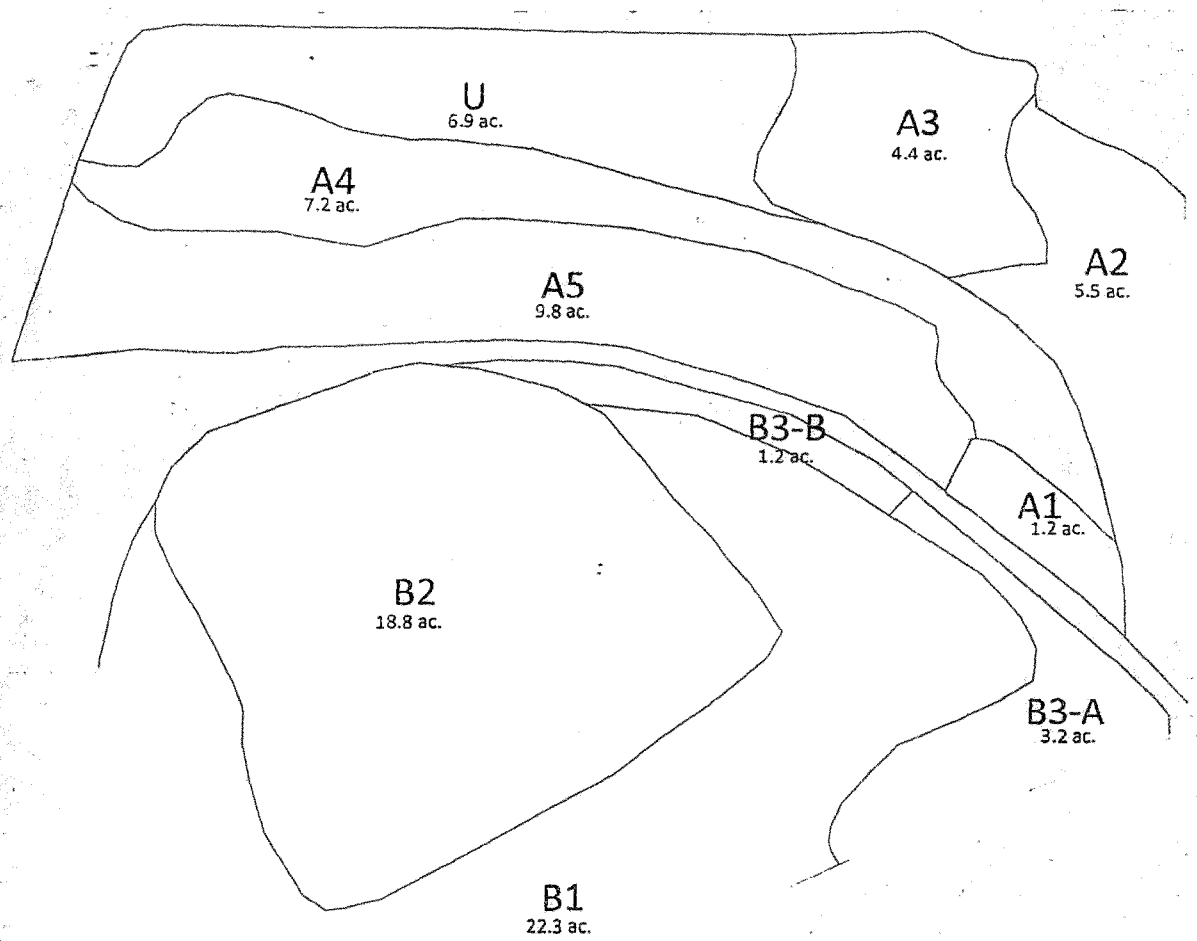
Common Name	Latin Name	LBS/ Acre
Tufted hairgrass	*Deschampsia cespitosa*	0.25
Water foxtail	*Alopecurus geniculatus*	o.5

Spike bentgrass	*Agrostis exarata*	0.25
Western mannagrass	*Glyceria occidentalis*	0.5
Meadow barley	*Hordeum Brachyantherum*	1
Slender hairgrass	*Deschampsia elongata*	1
Annual hairgrass	*Deschampsia danthonioides*	1
American sloughgrass	*Beckmania syzigachne*	1

Emergent Marsh Planting Mix

Common Name	Latin Name	LBS/ Acre
Water Plantain	*Alisma plantago aquatica*	1
American sloughgrass	*Beckmania syzigachne*	2
Water foxtail	*Alopecurus geniculatus*	1
Western mannagrass	*Glyceria occidentalis*	1
Ovate spike rush	*Eleocharis ovate*	0.5
Creeping spike rush	*Eleocharis palutris*	0.5
Showy downingia	*Downingia elegans*	0.25
Fragrant popcorn flower	*Plagiobothrys figuaratus*	1

OAK CREEK MITIGATION BANK
REMEDIATION AREAS



360 0 360 720
Feet

Scale: 1:4,320

Source: NAIP 1m resolution flown summer 2009

Appendix 3

Water Levels in Well 16

&

USFWS Reference site well

Well 16 automatically records ground water levels daily (6:00 am) so that measurements obtained at other observation wells once a month could be viewed in the context of annual ground-water fluctuation. Well 16 wasinstalled in the wetland along Rock Hill Rd. and across from the Sodaville Cutoff Rd on the south side of Oak Creek (figure 1).

Oak Creek Well 16 - 2013 Data (12 inches have been subtracted so data listed are inches below land surface.) Serial # - 02B25C5 Data logged Fri Jan 3 2014

-02.0, 01-Jan-13,	-00.3, 27-Feb-13,	-12.6, 25-Apr-13,	-28 0, 21-Jun-13,
-04.3, 02-Jan-13,	+01.7, 28-Feb-13,	-13.3, 26-Apr-13,	-27.6, 22-Jun-13,
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USFWS Reference Well - Serial # - 0214039 Data logged Fri Jan 0,3 2014

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Appendix 4

Water Levels in Well 17

Well 17 automatically records water levels four times a day (6 am; noon; 6 pm.; and midnight). The well is installed to record ground water levels within 45 inches of the surface and flooding levels up to 35 inches above the surface. Well 17 is located along the right bank of Oak Creek and approximately at the mid-point of the relatively straight channel segment from Rock Hill Rd. to the point where Oak Creek gradually bends to the west. Well 17 is located on the north side of Oak Creek (figure 1).

Oak Creek Well 17 - 2013 Data - Seruak # SB22D2 Data logged Jan 3, 2014

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Appendix 5

Vegetation Monitoring Report

2013

Oak Creek Mitigation Bank Vegetation Monitoring - 2013

Introduction and Methods

Vegetation monitoring was conducted in 2013 at the Oak Creek Mitigation Bank site on May 31st, and June 4th and 14th, 2013. The sampling protocol followed was that used in 1999 through 2012 at the site and is described in detail in the report for the 1999 vegetation monitoring. In brief, it consisted of 10 equally spaced sampling stations along each of 7 transects at the site, with 5 transects in the Prior Converted Wetland area and one transect each in the Forested areas in the northeast corner and along the west edge of the site. Sample stations were marked in 1999 with 5/8-inch steel rods, which were recovered in later years using descriptions of station locations, flags placed near the rods, and a magnetic locator if needed. In addition, in 2007 three new transects consisting of 5 sample stations each were added in areas of new construction, one each (Transects 1.5 and 2.5) placed 50 meters on either side of Transect #2 and parallel to it, and one (Transect 5.5) placed 50 meters south of Transect #5 and parallel to it. Also, in 2010 one new transect (Transect 8) consisting of 10 sample stations was added in the upland area in the NW portion of the site.

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. In addition to the cover data in quadrats, other species encountered along transects were recorded as being present in the area. As in previous years, these latter data were not used in the calculations of average cover. Estimates of bare ground and other non-vegetated space were made at each quadrat. Estimates of overstory cover (canopy) were also included, when present. Sample stations with over about16 inches of water at sampling time and with no emergent or aquatic vegetation (i.e. vernal pools) were not included in the vegetation analyses.

Data were entered into a spreadsheet and cover was averaged by species for each transect. Tables are included for the Prior Converted Wetlands area (Transects 1 through 5) as a whole which includes summary data for all transects. Data are presented separately for the added transects in the 2007 construction areas on the south side of Oak Creek (Transects 1.5 and 2.5) and the north side of Oak Creek (Transect 5.5), for the Forested areas (Transects 6 and 7), and for the NW upland area (Transect 8).

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.

Results and Discussion

The following paragraphs describe the overall cover for the Prior Converted Wetlands area, for the south side and north side 2007 construction areas, for the Forested areas, and for the NW upland area. The separate transects within the Prior Converted Wetlands area are not discussed individually.

In 2013, the dominant species found in the Prior Converted Wetlands area (Transects #1 through #5) were *Deschampsia cespitosa* (tufted hairgrass), *Holcus lanatus* (common velvetgrass), *Lythrum portula* (spatulaleaf loosestrife), *Mentha pulegium* (pennyroyal), and *Hordeum brachyantherum* (meadow barley). Species with an indicator status of FAC or better accounted for about 88% of the total cover in this area. Native species accounted for about 56% of the total cover in this area. The SMI for this area was 2.17, and 72% of the area was vegetated.

For the south side 2007 construction area (Transects 1.5 and 2.5), the dominant species were *Deschampsia cespitosa* (tufted hairgrass), *Lythrum portula* (spatulaleaf loosestrife), *Juncus tenuis* (slender rush), *Agrostis exarata* (spike bentgrass), and *Anthoxanthum odoratum* (sweet vernalgrass). Species with an indicator status of FAC or better accounted for about 84% of the total cover in this area. Native species accounted for about 65% of the total cover in this area. The SMI for this area was 2.21, and 67% of the area was vegetated.

For the north side 2007 construction area (Transect 5.5), the dominant species were *Hypochaeris radicata* (hairy cat's ear), *Deschampsia cespitosa* (tufted hairgrass), *Anthoxanthum odoratum* (sweet vernalgrass), and *Agrostis exarata* (spike bentgrass). Species with an indicator status of FAC or better accounted for about 55% of the total cover in this area. Native species accounted for about 45% of the total cover in this area. The SMI for this area was 3.02, and 73% of the area was vegetated.

For the northeast Forested area (Transect #6), the dominant species were *Fraxinus latifolia* (Oregon ash), *Poa trivialis* (roughstalk bluegrass), *Camassia leichtlinii* (great camas), *Carex leptopoda* (Dewey's sedge), *Allium nigrum* (black garlic), *Rubus ursinus* (trailing blackberry), and *Rubus discolor* (Himalayan blackberry). Species with an indicator status of FAC or better accounted for about 85% of the total cover in this area. Native species accounted for about 80% of the total cover in this area. The SMI for this area was 2.46, and 52% of the ground was vegetated (not including the canopy layer).

For the west Forested area (Transect #7), the dominant species were *Fraxinus latifolia*

(Oregon ash), *Camassia leichtlinii* (great camas), *Poa trivialis* (roughstalk bluegrass), *Lysimachia nummularia* (creeping jenny), and *Crataegus douglasii* (black hawthorn). The *Crataegus* was found at only one of the 10 sampling stations. Species with an indicator status of FAC or better accounted for about 89% of the total cover in this area. Native species accounted for about 74% of the total cover in this area. The Moisture Index for this area was 2.33, and 83% of the ground was vegetated (not including the canopy layer).

For the NW upland area (Transect #8), the dominant species were *Anthoxanthum odoratum* (sweet vernalgrass), *Festuca idahoensis* ssp. *roemeri/ F. occidentalis* (Roemer's fescue/ western fescue), *Holcus lanatus* (common velvetgrass), *Leucanthemum vulgare* (oxeye daisy), and *Hypochaeris radicata* (hairy cat's ear). Native species accounted for about 26% of the total cover in this area, and 77% of the area was vegetated.

Oak Creek Mitigation Bank Plant Monitoring, Trends

	Percent FAC and better (FAC+ and better in 2000)														
Transect	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
1		36	70	39	46	36	59	S	71	64	76	94	98	94	91
1.5/2.5	NA	NA	NA	NA	NA	NA	NA	NA	81	87	87	81	94	97	84
2		41	91	52	48	70	77	S	82	67	86	90	98	98	98
3		55	64	52	51	54	65	S	54	87	96	94	98	94	96
4		78	85	78	76	85	88	87	92	88	79	79	96	99	90
5		5	56	55	39	52	62	S	59	66	56	44	R	75	69
5.5	NA	NA	NA	NA	NA	NA	NA	NA	63	71	61	54	R	53	55
6*		26	77	78	81	64	78	89	79	82	80	83	87	84	85
7*		29	61	65	73	66	75	70	75	82	84	88	77	87	89

	Percent native														
Transect	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**
1						24	12	S	65	54	56	45	44	74	63
1.5/2.5	NA	NA	NA	NA	NA	NA	NA	NA	83	84	80	70	69	70	65
2						50	37	S	89	62	63	49	80	69	71
3						32	16	S	80	72	79	77	66	75	56
4						59	46	43	66	57	56	53	65	68	47
5						6	3	S	54	43	37	21	R	31	50
5.5	NA	NA	NA	NA	NA	NA	NA	NA	60	67	71	48	R	55	45
6*						46	74	69	76	78	78	79	81	79	80
7*						34	61	58	63	75	77	81	74	74	74

S = sprayed R = remediated *Includes canopy from 2005 on

Number of Species, Transects 1-5

Native					31	26	26	NA	25	30	26	29	24	26	30
Introduced					35	37	35	NA	27	25	32	24	20	23	28

Oak Creek Mitigation Bank Plant Monitoring, 2013																
Prior Converted Habitat Type - Transect 1																
Cover (%)																
									Sample Station							
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Agrostis exarata	spike bentgrass	yes	FACW	y	2	5			8		8		1			2.2
Alopecurus geniculatis	water foxtail		OBL	y	1	3			90				2			9.5
Anthoxanthum odoratum	sweet vernalgrass		FACU		4			4					2			0.6
Beckmannia syzigachne	American slough grass	yes	OBL	y	1				1							0.1
Bidens frondosa	leafy beggar's ticks	yes	FACW+	y	2						2					0.2
Carex feta	green-sheathed sedge	yes	FACW	y	2								1	1		0.2
Carex unilateralis	one-sided sedge	yes	FACW	y	2						5					0.5
Centaurium erythraea	European centaury		FAC	y	3	1	1	1				1	4			0.8
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	70	40	8			75	3	10	12	10	22.8
Eleocharis palustris	creeping spikerush	yes	OBL	y	1					80						8
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2							1			1	0.2
Holcus lanatus	common velvetgrass		FAC	y	3	18	8	15					10			5.1
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2				3				6			0.9
Hypochaeris radicata	hairy cat's ear		FACU		4		17						6	1	6	3
Juncus tenuis	slender rush	yes	FACW-	y	2									5		0.5
Lolium arundinacea	tall fescue		FAC-		3							6				0.6
Lythrum portula	spatulaleaf loosestrife		OBL	y	1					1	8		1			1
Mentha pulegium	pennyroyal		OBL	y	1					1	4					0.5
Montia linearis	narrow-leaved montia	yes	NOL	u	5	1							3			0.4
Parentucellia viscosa	parentucellia		FAC-		3			1					2			0.3
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1						1		1			0.2
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4							3				0.3
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					2	3	1		5	3	3	5	5	4	3.1
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					3	30	70	3	15	2	87	50	75	50	38.5
standing water (inches)									trace	7						

Oak Creek Mitigation Bank Plant Monitoring, 2013

Prior Converted Habitat Type - Transect 2

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Agrostis exarata	spike bentgrass	yes	FACW	y	2					1			15	30		4.6
Alopecurus geniculatis	water foxtail		OBL	y	1			7	2							0.9
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	1							1		2	0.4
Beckmannia syzigachne	American slough grass	yes	OBL	y	1					7						0.7
Carex feta	green-sheathed sedge	yes	FACW	y	2	52							4	27		8.3
Carex unilateralis	one-sided sedge	yes	FACW	y	2								2			0.2
Centaurium erythraea	European centaury		FAC	y	3	2	1						1			0.4
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	2					5		70	2	2	8.1
Eleocharis ovata	ovate spikerush	yes	OBL	y	1					5						0.5
Eleocharis palustris	creeping spikerush	yes	OBL	y	1				2							0.2
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	1							1			0.2
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3			5	25	22						5.2
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1					4						0.4
Holcus lanatus	common velvetgrass		FAC	y	3	2					1		3			0.6
Hypochaeris radicata	hairy cat's ear		FACU		4		3							1		0.4
Juncus bufonius	toad rush	yes	FACW	y	2		2			50						5.2
Juncus tenuis	slender rush	yes	FACW-	y	2	2							2		2	0.6
Lythrum portula	spatulaleaf loosestrife		OBL	y	1			38	50	70						15.8
Mentha pulegium	pennyroyal		OBL	y	1		4									0.4
Montia linearis	narrow-leaved montia	yes	NOL	u	5									1		0.1
Parentucellia viscosa	parentucellia		FAC-		3		1						1			0.2
Populus balsamifera ssp. trichocarpa	black cottonwood	yes	FAC	y	3		90							5		9.5
Rosa pisocarpa	clustered rose	yes	FAC	y	3										30	3
Rumex crispus	curly dock		FAC+	y	3	1										0.1
Veronica scutellata	marsh speedwell	yes	OBL	y	1		2									0.2
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	10	50	25	1	2	25	2	5	2	12.7
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					35	75	1	1	3	93	75	8	40	63	39.4
standing water (inches)										trace			1	trace		

Oak Creek Mitigation Bank Plant Monitoring, 2013

Prior Converted Habitat Type - Transect 3

Cover (%)

									Sample Station							
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3			25	5	10		2				4.2
Agrostis exarata	spike bentgrass	yes	FACW	y	2			5			5	7		3	10	3
Alopecurus geniculatis	water foxtail		OBL	y	1		1			2					1	0.4
Anthoxanthum odoratum	sweet vernalgrass		FACU		4								7			0.7
Beckmannia syzigachne	American slough grass	yes	OBL	y	1									1	1	0.2
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4	2										0.2
Carex unilateralis	one-sided sedge	yes	FACW	y	2	5	7				18	8			14	5.2
Centaurium erythraea	European centaury		FAC	y	3								1			0.1
Cerastium glomeratum	sticky chickweed		UPL		5									2		0.2
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	10	1	28	25	4	6	9	5		4	9.2
Dipsacus fullonum	common teasel		FACW-	y	2					1						0.1
Epilobium brachycarpum	autumn [tall annual] willowherb	yes	UPL		5								1			0.1
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2				1	4	1	2	2	15	1	2.6
Epilobium densiflora	dense spike-primrose	yes	FACW-	y	2									15	1	1.6
Holcus lanatus	common velvetgrass		FAC	y	3	30	5	8	1	10		3	55	22		13.4
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	27	65	17	18	45	28	38	3	5	17	26.3
Hypochaeris radicata	hairy cat's ear		FACU		4										2	0.2
Juncus tenuis	slender rush	yes	FACW-	y	2								20			2
Lotus corniculatus	birdsfoot trefoil		FAC	y	3					32					5	3.7
Lythrum hyssopifolia	hyssop loosestrife		OBL	y	1		1									0.1
Lythrum portula	spatulaleaf loosestrife		OBL	y	1		1									0.1
Mentha pulegium	pennyroyal		OBL	y	1				2	25	27	25		5	52	13.6
Montia linearis	narrow-leaved montia	yes	NOL	u	5				3					3	2	0.8
Parentucellia viscosa	parentucellia		FAC-		3								6	3		0.9
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2						12		1		2	1.5
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	20	8									2.8
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1								3	5	2	1
Rumex crispus	curly dock		FAC+	y	3					1		1			1	0.3
Vicia tetrasperma	slender vetch		NOL	u	5	1							4			0.5
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY						15	5	90	2	6	3	3	3		12.7
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					5	2	10	5	3	4	10	4	10	2	5.5

Oak Creek Mitigation Bank Plant Monitoring, 2013

Prior Converted Habitat Type - Transect 4

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Agrostis exarata	spike bentgrass	yes	FACW	y	2	2	6		3		8		40			5.9
Alisma gramineum	narrowleaf water plantain	yes	OBL	1	y									4		0.4
Alopecurus geniculatis	water foxtail		OBL	y	1	72	37			2			2	1		11.4
Beckmannia syzigachne	American slough grass	yes	OBL	y	1			10				4	3	13		3
Bidens frondosa	leafy beggar's ticks	yes	FACW+	y	2			1						1		0.2
Briza minor	little quaking grass		FAC	y	3										2	0.2
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4										8	0.8
Bromus vulgaris	Columbia brome	yes	UPL		5										2	0.2
Carex unilateralis	one-sided sedge	yes	FACW	y	2		10	45	4	5	30	75	10	5		18.4
Daucus carota	Queen Anne's lace		NOL	u	5										2	0.2
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2			4		48	15	7	2	20		9.6
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	1			20							2.1
Epilobium densiflora	dense spike-primrose	yes	FACW-	y	2				1							0.1
Geranium sp.	geranium	NA	---	u	5									12		1.2
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3									1		0.1
Holcus lanatus	common velvetgrass		FAC	y	3	7			25		30		1		5	6.8
Hypochaeris radicata	hairy cat's ear		FACU		4										2	0.2
Juncus tenuis	slender rush	yes	FACW-	y	2				2							0.2
Leucanthemum vulgare	oxeye daisy		UPL		5										60	6
Lythrum hyssopifolia	hyssop loosestrife		OBL	y	1		2	1	1	3	3			4		1.4
Lythrum portula	spatulaleaf loosestrife		OBL	y	1			10	1	10				48		6.9
Mentha pulegium	pennyroyal		OBL	y	1	20	27	8	33	4	1	7	38	12	2	15.2
Myosotis laxa	small flowered forget-me-not	yes	OBL	y	1				2	1					3	0.6
Parentucellia viscosa	parentucellia		FAC-		3										3	0.3
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2		1	2								0.3
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	4					2					0.6
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1				1							0.1
Rumex crispus	curly dock		FAC+	y	3									1		0.1
Sonchus asper	prickly sowthistle		FAC-		3				1						1	0.2
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2							27				2.7
Valerianella locusta	Lewiston cornsalad		NOL	u	5										1	0.1
Verbascum blattaria	moth mullein		UPL		5										1	0.1
Veronica americana	American speedwell [brooklime]	yes	OBL	y	1		12									1.2
Veronica scutellata	marsh speedwell	yes	OBL	y	1			4	1							0.5
Vicia tetrasperma	slender vetch		NOL	u	5				2							0.2
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					1	2	4	4	30	1		1	5	1	4.9
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					5	5	15	3	5	15	3	10	3	5	6.9
standing water (inches)								5		2						

Oak Creek Mitigation Bank Plant Monitoring, 2013

Prior Converted Habitat Type - Transect 5

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3	1										0.1
Agrostis exarata	spike bentgrass	yes	FACW	y	2		25	15	28		2	1				7.1
Alopecurus geniculatis	water foxtail		OBL	y	1				1							0.1
Anthoxanthum odoratum	sweet vernalgrass		FACU		4		2	2				1	72	9		8.6
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4										15	1.5
Carex unilateralis	one-sided sedge	yes	FACW	y	2										1	0.1
Centaurium erythraea	European centaury		FAC	y	3	3		1	1		1	1	1	1		0.9
Daucus carota	Queen Anne's lace		NOL	u	5					2						0.2
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2		25	1	7	1	2	1				3.7
Epilobium brachycarpum	autumn [tall annual] willowherb	yes	UPL		5							1				0.1
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	6	1	1	2	1	10	8	1			3
Geranium sp.	geranium	NA	---	u	5										1	0.1
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	27	6	40	4		37	17	1			13.2
Holcus lanatus	common velvetgrass		FAC	y	3	3	1	1	1	4		6	6	65	50	13.7
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2		2		2		1					0.5
Hypochaeris radicata	hairy cat's ear		FACU		4	1	1	2	2	2	5	7	10	3	6	3.9
Juncus bufonius	toad rush	yes	FACW	y	2	20	13	15	25	1	17	7				9.8
Juncus tenuis	slender rush	yes	FACW-	y	2										7	0.7
Lapsana communis	nipplewort		FAC	y	3				1			1				0.2
Lotus unifoliolatus var. unifoliolatus	Spanish clover	yes	UPL		5			1								0.1
Lythrum hyssopifolia	hyssop loosestrife		OBL	y	1		1			3	3					0.7
Lythrum portula	spatulaleaf loosestrife		OBL	y	1			1		72	18					9.1
Mentha pulegium	pennyroyal		OBL	y	1					1				25	1	2.7
Panicum capillare	common witchgrass	yes	FACU+		4	1		1	2	4	15	65	2			9
Parentucellia viscosa	parentucellia		FAC-		3	1	18	4	4	6	1	4	12		1	5.1
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4		3	1	2	1				1		0.8
Salix hookeriana	dune [Hooker's] willow	yes	FACW	y	2					4						0.4
Senecio vulgaris	common groundsel/ old-man-in-the-spring		FACU		4							2				0.2
Sonchus asper	prickly sowthistle		FAC-		3				1	1		1	5			0.8
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2										20	2
Vicia tetrasperma	slender vetch		NOL	u	5					2						0.2
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	3	5	5	10	4	3	1		1	3.7
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					45	12	20	15	3	2	4	5	5	8	11.9

Oak Creek Mitigation Bank Plant Monitoring, 2013

Prior Converted Habitat Type - Transect Means

Cover (%)

Species	Common Name	Native	Indicator	Wet	MTI	Transect 1	2	3	4	5	Mean
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3	0.0	0.0	4.2	0.0	0.1	0.86
Agrostis exarata	spike bentgrass	yes	FACW	y	2	2.2	4.6	3.0	5.9	7.1	4.56
Alisma gramineum	narrowleaf water plantain	yes	OBL	y	1	0.0	0.0	0.0	0.4	0.0	0.08
Alopecurus geniculatis	water foxtail		OBL	y	1	9.5	0.9	0.4	11.4	0.1	4.46
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	0.6	0.4	0.7	0.0	8.6	2.06
Beckmannia syzigachne	American slough grass	yes	OBL	y	1	0.1	0.7	0.2	3.0	0.0	0.80
Bidens frondosa	leafy beggar's ticks	yes	FACW+	y	2	0.2	0.0	0.0	0.2	0.0	0.08
Briza minor	little quaking grass		FAC	y	3	0.0	0.0	0.0	0.2	0.0	0.04
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4	0.0	0.0	0.2	0.8	1.5	0.50
Bromus vulgaris	Columbia brome	yes	UPL		5	0.0	0.0	0.0	0.2	0.0	0.04
Carex feta	green-sheathed sedge	yes	FACW	y	2	0.2	8.3	0.0	0.0	0.0	1.70
Carex unilateralis	one-sided sedge	yes	FACW	y	2	0.5	0.2	5.2	18.4	0.1	4.88
Centaurium erythraea	European centaury		FAC	y	3	0.8	0.4	0.1	0.0	0.9	0.44
Cerastium glomeratum	sticky chickweed		UPL		5	0.0	0.0	0.2	0.0	0.0	0.04
Daucus carota	Queen Anne's lace		NOL	u	5	0.0	0.0	0.0	0.2	0.2	0.08
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	22.8	8.1	9.2	9.6	3.7	10.68
Dipsacus fullonum	common teasel		FACW-	y	2	0.0	0.0	0.1	0.0	0.0	0.02
Eleocharis ovata	ovate spikerush	yes	OBL	y	1	0.0	0.5	0.0	0.0	0.0	0.1
Eleocharis palustris	creeping spikerush	yes	OBL	y	1	8.0	0.2	0.0	0.0	0.0	1.64
Epilobium brachycarpum	autumn [tall annual] willowherb	yes	UPL		5	0.0	0.0	0.1	0.0	0.1	0.04
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	0.2	0.2	2.6	2.1	3.0	1.62
Epilobium densiflora	dense spike-primrose	yes	FACW-	y	2	0.0	0.0	1.6	0.1	0.0	0.34
Geranium sp.	geranium	NA	---	u	5	0.0	0.0	0.0	1.2	0.1	0.26
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	0.0	5.2	0.0	0.1	13.2	3.70
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1	0.0	0.4	0.0	0.0	0.0	0.08
Holcus lanatus	common velvetgrass		FAC	y	3	5.1	0.6	13.4	6.8	13.7	7.92
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	0.9	0.0	26.3	0.0	0.5	5.54
Hypochaeris radicata	hairy cat's ear		FACU		4	3.0	0.4	0.2	0.2	3.9	1.54
Juncus bufonius	toad rush	yes	FACW	y	2	0.0	5.2	0.0	0.0	9.8	3.00
Juncus tenuis	slender rush	yes	FACW-	y	2	0.5	0.6	2.0	0.2	0.7	0.80
Lapsana communis	nipplewort		FAC	y	3	0.0	0.0	0.0	0.0	0.2	0.04
Leucanthemum vulgare	oxeye daisy		UPL		5	0.0	0.0	0.0	6.0	0.0	1.2
Lolium arundinacea	tall fescue		FAC-		3	0.6	0.0	0.0	0.0	0.0	0.12
Lotus corniculatus	birdsfoot trefoil		FAC	y	3	0.0	0.0	3.7	0.0	0.0	0.74
Lotus unifoliolatus var. unifoliolatus	Spanish clover	yes	UPL		5	0.0	0.0	0.0	0.0	0.1	0.02
Lythrum hyssopifolia	hyssop loosestrife		OBL	y	1	0.0	0.0	0.1	1.4	0.7	0.4
Lythrum portula	spatulaleaf loosestrife		OBL	y	1	1.0	15.8	0.1	6.9	9.1	6.58
Mentha pulegium	pennyroyal		OBL	y	1	0.5	0.4	13.6	15.2	2.7	6.48
Montia linearis	narrow-leaved montia	yes	NOL	u	5	0.4	0.1	0.8	0.0	0.0	0.26
Myosotis laxa	small flowered forget-me-not	yes	OBL	y	1	0.0	0.0	0.0	0.6	0.0	0.12
Panicum capillare	common witchgrass	yes	FACU+		4	0.0	0.0	0.0	0.0	9.0	1.80
Parentucellia viscosa	parentucellia		FAC-		3	0.3	0.2	0.9	0.3	5.1	1.36
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2	0.0	0.0	1.5	0.3	0.0	0.36
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	0.0	0.0	2.8	0.6	0.0	0.68
Populus balsamifera ssp. trichocarpa	black cottonwood	yes	FAC	y	3	0.0	9.5	0.0	0.0	0.0	1.90
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1	0.2	0.0	1.0	0.1	0.0	0.26
Rosa pisocarpa	clustered rose	yes	FAC	y	3	0.0	3.0	0.0	0.0	0.0	0.60
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4	0.3	0.0	0.0	0.0	0.8	0.22
Rumex crispus	curly dock		FAC+	y	3	0.0	0.1	0.3	0.1	0.0	0.10
Salix hookeriana	dune [Hooker's] willow	yes	FACW	y	2	0.0	0.0	0.0	0.0	0.4	0.1
Senecio vulgaris	common groundsel/ old-man-in the-spring		FACU		4	0.0	0.0	0.0	0.0	0.2	0.04
Sonchus asper	prickly sowthistle		FAC-		3	0.0	0.0	0.0	0.2	0.8	0.20
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2	0.0	0.0	0.0	2.7	2.0	0.94

Oak Creek Mitigation Bank Plant Monitoring, 2013											
Prior Converted Habitat Type - Transect Means											
Cover (%)											
							Transect				
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**Mean**
Valerianella locusta	Lewiston cornsalad		NOL	u	5	0.0	0.0	0.0	0.1	0.0	0.02
Verbascum blattaria	moth mullein		UPL		5	0.0	0.0	0.0	0.1	0.0	0.02
Veronica americana	American speedwell [brooklime]	yes	OBL	y	1	0.0	0.0	0.0	1.2	0.0	0.24
Veronica scutellata	marsh speedwell	yes	OBL	y	1	0.0	0.2	0.0	0.5	0.0	0.14
Vicia tetrasperma	slender vetch		NOL	u	5	0.0	0.0	0.5	0.2	0.2	0.18
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					3.1	12.7	12.7	4.9	3.7	7.4
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					38.5	39.4	5.5	6.9	11.9	20.4
			Total cover:			58	66	95	98	99	83
			FAC and better cover:			53	65	91	88	68	73
			Native cover:			36	47	54	46	50	46
			Percent FAC and better of total:			91	98	96	90	69	88
			Percent native of total:			63	71	56	47	50	56
			Moisture Index:			1.94	2.03	2.15	1.93	2.73	2.13
										Number of native species:	30
										Number of introduced species:	28

Oak Creek Mitigation Bank Plant Monitoring, 2013

Prior Converted Habitat Type - South Side 2007 Construction - Transects 1.5 and 2.5

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1.5-1**	**1.5-2**	**1.5-3**	**1.5-4**	**1.5-5**	**2.5-1**	**2.5-2**	**2.5-3**	**2.5-4**	**2.5-5**	**Mean**
Agrostis exarata	spike bentgrass	yes	FACW	y	2				12	58			3			7.3
Alopecurus geniculatis	water foxtail		OBL	y	1						3	1				0.4
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	15	28	5						4		5.2
Beckmannia syzigachne	American slough grass	yes	OBL	y	1							2				0.2
Carex leptopoda	Dewey's sedge	yes	FAC	y	3									1		0.1
Centaurium erythraea	European centaury		FAC	y	3	1	2			1				1		0.5
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	65	15	25	5	20	0	0	2	4	4	14
Eleocharis ovata	ovate spikerush	yes	OBL	y	1							1				0.1
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2									1		0.1
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3						17	14				3.1
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1							8				0.8
Holcus lanatus	common velvetgrass		FAC	y	3	5	2	1	4	8				2	2	2.4
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2				15	1			1	6		2.3
Hypericum anagalloides	bog St. John'swort	yes	OBL	y	1				2							0.2
Hypochaeris radicata	hairy cat's ear		FACU		4	2	10	12		2						2.6
Juncus bufonius	toad rush	yes	FACW	y	2						2	27				2.9
Juncus ensifolius	daggerleaf rush	yes	FACW	y	2				15							1.5
Juncus tenuis	slender rush	yes	FACW-	y	2				22				87		3	11.2
Leucanthemum vulgare	oxeye daisy		UPL		5		1									0.1
Lotus unifoliolatus var. unifoliolatus	Spanish clover	yes	UPL		5		22									2.2
Lythrum portula	spatulaleaf loosestrife		OBL	y	1						60	65				12.5
Mentha pulegium	pennyroyal		OBL	y	1					4				2		0.6
Parentucellia viscosa	parentucellia		FAC-		3	1	9									1
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2	1										0.1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					3	2	25	3	1	25	8	7	7	1	8.2
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					10	8	33	27	5		1	1	75	90	25
												Total cover:				71
												FAC and better cover:				60
												Native cover:				46
											Percent FAC and better of total:					84
												Percent native of total:				65
												Moisture Index:				2.21

Oak Creek Mitigation Bank Plant Monitoring, 2013											
Prior Converted Habitat Type - North Side New Construction - Transect 5.5											
Cover (%)											
								Station			
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**Mean**
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3		5	4	3		2.4
Agrostis exarata	spike bentgrass	yes	FACW	y	2	2		1	18	10	6.2
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	1	38	1		2	8.4
Centaurium erythraea	European centaury		FAC	y	3		1		4	3	1.6
Cerastium glomeratum	sticky chickweed		UPL		5	1					0.2
Daucus carota	Queen Anne's lace		NOL	u	5					1	0.2
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	25	2	12	22	24	17.0
Epilobium brachycarpum	autumn [tall annual] willowherb	yes	UPL		5	1					0.2
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	1					0.2
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	4					0.8
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1	1					0.2
Holcus lanatus	common velvetgrass		FAC	y	3	1	4	15	1	2	4.6
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	10	1			12	4.6
Hypochaeris radicata	hairy cat's ear		FACU		4	8	35	38		5	17.2
Juncus bufonius	toad rush	yes	FACW	y	2	5			1		1.2
Juncus tenuis	slender rush	yes	FACW-	y	2		3	1		5	1.8
Leucanthemum vulgare	oxeye daisy		UPL		5		2				0.4
Lotus micranthus	small-flowered lotus	yes	NOL	u	5	3	1	1		1	1.2
Lotus unifoliolatus var. unifoliolatus	Spanish clover	yes	UPL		5	1	1	1	1	1	1.0
Lythrum portula	spatulaleaf loosestrife		OBL	y	1	2			7		1.8
Mentha pulegium	pennyroyal		OBL	y	1				1		0.2
Panicum capillare	common witchgrass	yes	FACU+		4	4					0.8
Parentucellia viscosa	parentucellia		FAC-		3	3	1	2	1	2	1.8
Rosa pisocarpa	clustered rose	yes	FAC	y	3			1			0.2
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4	3	8	1		1	2.6
Trifolium repens	white clover		FAC-		3					2	0.4
Veronica peregrina ssp. xalapense	hairy purslane speedwell	yes	OBL	y	1	1					0.2
Vicia pannonica	Hungarian vetch		NOL	u	5					5	1.0
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					4	4	15	35	8	13.2
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					25	8	12	7	17	13.8
						Total cover:					78
						FAC and better cover:					43
						Native cover:					36
						Percent FAC and better of total:					55
						Percent native of total:					45
						Moisture Index:					3.02

Oak Creek Mitigation Bank Plant Monitoring, 2013

Forested Habitat Type - Transect 6

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Allium nigrum	black garlic		NOL	u	5		10	2	1	10	35					5.8
Amelanchier alnifolia	serviceberry	yes	FACU		4	5										0.5
Bromus vulgaris	Columbia brome	yes	UPL		5										5	0.5
Camassia leichtlinii	great camas	yes	FACW-	y	2	30	4		5	10	12	1	12	7		8.1
Carex leptopoda	Dewey's sedge	yes	FAC	y	3		52	12			4					6.8
Fraxinus latifolia	Oregon ash	yes	FACW	y	2	98	98	99	99	98	95	90	95	80	95	94.7
Galium aparine	cleavers	yes	FACU		4	8							12	2		2.2
Geum macrophyllum	large leaved avens	yes	FAC+	y	3	2	11				1					1.4
Lapsana communis	nipplewort		FAC	y	3	4					1			22		2.7
Lolium perenne ssp. multiflorum	annual ryegrass		FAC	y	3										15	1.5
Mentha pulegium	pennyroyal		OBL	y	1										8	0.8
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	20	5	1		3	38	3	15	10	20	11.5
Prunella vulgaris	self-heal	yes	FACU+		4						1		3			0.4
Prunus sp.	cherry, plum	NA	---	u	5								25			2.5
Ranunculus uncinatus	hooked [small-flowered] buttercup	yes	FAC	y	3									18		1.8
Rubus discolor	Himalayan blackberry	invasive	FACU		4							4	10	30	7	5.1
Rubus ursinus	trailing blackberry	yes	FACU		4							6	47			5.3
Rumex conglomeratus	clustered dock		FACW	y	2					2						0.2
Saxifraga oregana	Oregon [bog] saxifrage	yes	FACW+	y	2		2									0.2
Symphoricarpos albus	snowberry	yes	FACU		4	2										0.2
Taraxacum officinale	dandelion		FACU		4								2			0.2
Torilis arvensis	spreading hedgeparsley		NOL	u	5									5		0.5
Vicia tetrasperma	slender vetch		NOL	u	5								3			0.3
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					2	1	5	5	25	5	15	1	1	30	9
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					33	25	80	90	50	10	75	4	8	20	39.5
											Total cover:					153
											FAC and better cover:					130
											Native cover:					122
											Percent FAC and better of total:					85
											Percent native of total:					80
											Moisture Index:					2.46

Oak Creek Mitigation Bank Plant Monitoring, 2013

Forested Habitat Type - Transect 7

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Camassia leichtlinii	great camas	yes	FACW-	y	2						12	80	10	45	82	22.9
Carex leptopoda	Dewey's sedge	yes	FAC	y	3				15	17			2		2	3.6
Carex sp.	sedge	yes	---	u	5					2						0.2
Crataegus douglasii	black hawthorn	yes	FAC	y	3						78					7.8
Crataegus monogyna	oneseed hawthorn		FAC-		3					1						0.1
Dipsacus fullonum	common teasel		FACW-	y	2	5										0.5
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2			1	3		2		20			2.6
Fraxinus latifolia	Oregon ash	yes	FACW	y	2	70	98	90	99	60	65	100	75	75	100	83.2
Galium aparine	cleavers	yes	FACU		4		4					8		2	23	3.7
Geranium lucidum	shining geranium		NOL	u	5		45							1		4.6
Geranium sp.	geranium	NA	---	u	5									3		0.3
Geum macrophyllum	large leaved avens	yes	FAC+	y	3		17	1					6	5		2.9
Holcus lanatus	common velvetgrass		FAC	y	3									1		0.1
Hypochaeris radicata	hairy cat's ear		FACU		4								2			0.2
Juncus bufonius	toad rush	yes	FACW	y	2						1					0.1
Lapsana communis	nipplewort		FAC	y	3		5	2		1	4			6		1.8
Leucanthemum vulgare	oxeye daisy		UPL		5	1					4					0.5
Lotus corniculatus	birdsfoot trefoil		FAC	y	3						2					0.2
Lysimachia nummularia	creeping jenny		FACW	y	2			52	68							12
Melica subulata	Alaska oniongrass	yes	NOL	u	5						5					0.5
Mentha pulegium	pennyroyal		OBL	y	1	35					1					3.6
Myosotis laxa	small flowered forget-me-not	yes	OBL	y	1	15									1	1.6
Oenanthe sarmentosa	Pacific water-parsley	yes	OBL	y	1				2				2			0.4
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	60	30		20	18	15	2	37	1		18.3
Prunella vulgaris	self-heal	yes	FACU+		4									18		1.8
Ranunculus uncinatus	hooked [small-flowered] buttercup	yes	FAC	y	3		4						8			1.2
Rubus discolor	Himalayan blackberry	invasive	FACU		4									1	6	0.7
Rubus ursinus	trailing blackberry	yes	FACU		4			1		4			1			0.6
Rumex conglomeratus	clustered dock		FACW	y	2		1	2	12		2	1	4			2.2
Symphoricarpos albus	snowberry	yes	FACU		4							18		1		1.9
Tellima grandiflora	fringecup	yes	FACU		4									22		2.2
Torilis arvensis	spreading hedgeparsley		NOL	u	5		18							6		2.4

Oak Creek Mitigation Bank Plant Monitoring, 2013

Forested Habitat Type - Transect 7

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Toxicodendron diversilobum	poison oak	yes	NOL	u	5							2				0.2
Veronica peregrina ssp. xalapense	hairy purslane speedwell	yes	OBL	y	1	3					3					0.6
Veronica scutellata	marsh speedwell	yes	OBL	y	1					20						2
Vicia americana	American vetch	yes	FAC	y	3									2		0.2
Vicia sativa	garden vetch/ tare		UPL		5					1			5	10		1.6
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					2		5	3	5	5		1			2.1
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					2	2	40	3	27	45	3	12	4	10	14.8
											Total cover:					189
											FAC and better cover:					168
											Native cover:					140
										Percent FAC and better of total:						89
										Percent native of total:						74
											Moisture Index:					2.33

Oak Creek Mitigation Bank Plant Monitoring, 2013														
Upland Habitat Type - Transect 8														
Cover (%)														
							Sample Station							
Species	**Common Name**	**Native**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**	
Anagallis arvensis	scarlet pimpernel						10						1.0	
Anthoxanthum odoratum	sweet vernalgrass				1	42		87	75				20.5	
Cerastium glomeratum	sticky chickweed										1		0.1	
Daucus carota	Queen Anne's lace		11	1	1					1	6	1	2.1	
Elymus glaucus	blue wildrye	yes	13	10						8		2	3.3	
Festuca idahoensis ssp. roemeri/ F. occidentalis	Roemer's fescue/ western fescue	yes	55	55	3	10				42	20	2	18.7	
Holcus lanatus	common velvetgrass		15	25	18	20	5	15	17	35	20	2	17.2	
Hypochaeris radicata	hairy cat's ear		2		12	30	2	4	5		1	1	5.7	
Leucanthemum vulgare	oxeye daisy					6	15			32	20	17	9.0	
Myosotis discolor	yellow and blue forget-me-not											2	0.2	
Navarretia squarrosa	skunkweed	yes									2		0.2	
Parentucellia viscosa	parentucellia								1				0.1	
Raphanus sativus	wild radish				7	2	18						2.7	
Rumex acetosella	sheep sorrel/ sour dock				20	2		1	5				2.8	
Sonchus asper	prickly sowthistle					1	5				1	2	0.9	
Vicia hirsuta	tiny vetch		1								2		0.3	
Vicia sativa	garden vetch/ tare			1		1						3	0.5	
Vicia tetrasperma	slender vetch			1			12			2			1.5	
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY		2		30	5	10	1	3		1	1	5.3	Vegetated
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"		8	12	10	5	25	4	12	3	28	68	17.5	77
								Total cover:					87	
								Native cover:					22	
							Percent native of total:						26	

Appendix 6

Wildlife Monitoring Report

2013

WILDLIFE SURVEY
OAK CREEK MITIGATION BANK
2013

Marion Courtenay Brasiers

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. Four permanent wildlife observation stations at both the bank site and the USFWS reference site were sampled in Winter (January) and Summer (June) 2013 (Tables 3A, 3B, 3C, and 3D - Appendix G).

During the Winter survey 22 species were observed at the bank site and 10 at the reference site. The abundance of birds at the bank site (130) exceeded that at the reference site (32). Also, several waterfowl specie (Green-Winged Teal, Northern Pintail) and several relatively unique species (Osprey, Bewick's Wren, Rufus Humming Bird, and Western Meadow Lark) were observed only at the bank site.

During the Spring survey 33 species were observed at the bank site and 15 at the reference site. The abundance of birds at the reference site (166) exceeded those at the bank site (90). The disparity resulted from a greater abundance of relatively common species at the reference site (Black-capped Chickadee, Song Sparrow, Spotted Towhee, Swainson's Thrush, and Turkey Vulture). All of these species were observed at the bank site, but in fewer numbers. Unique species observed at the bank site but not at the reference included Nashville Warblers, Red-breasted Sapsuckers, Western Blue Birds, Western Kingbirds, a Yellow-throated Vireo, and Yellow-rumped Warblers.

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.

During the Winter survey, evidence of beaver tree-cuttings, 2 northern leopard frogs, and 21 Pacific tree frogs were observed at the bank site.. During the Spring survey, tracks of deer and racoon were observed at the bank site, and a beaver dam, 2 cotton tail rabbits, 16 Pacific tree frogs, and 2 white-tailed deer were observed at the reference site.

Oak Creek Site

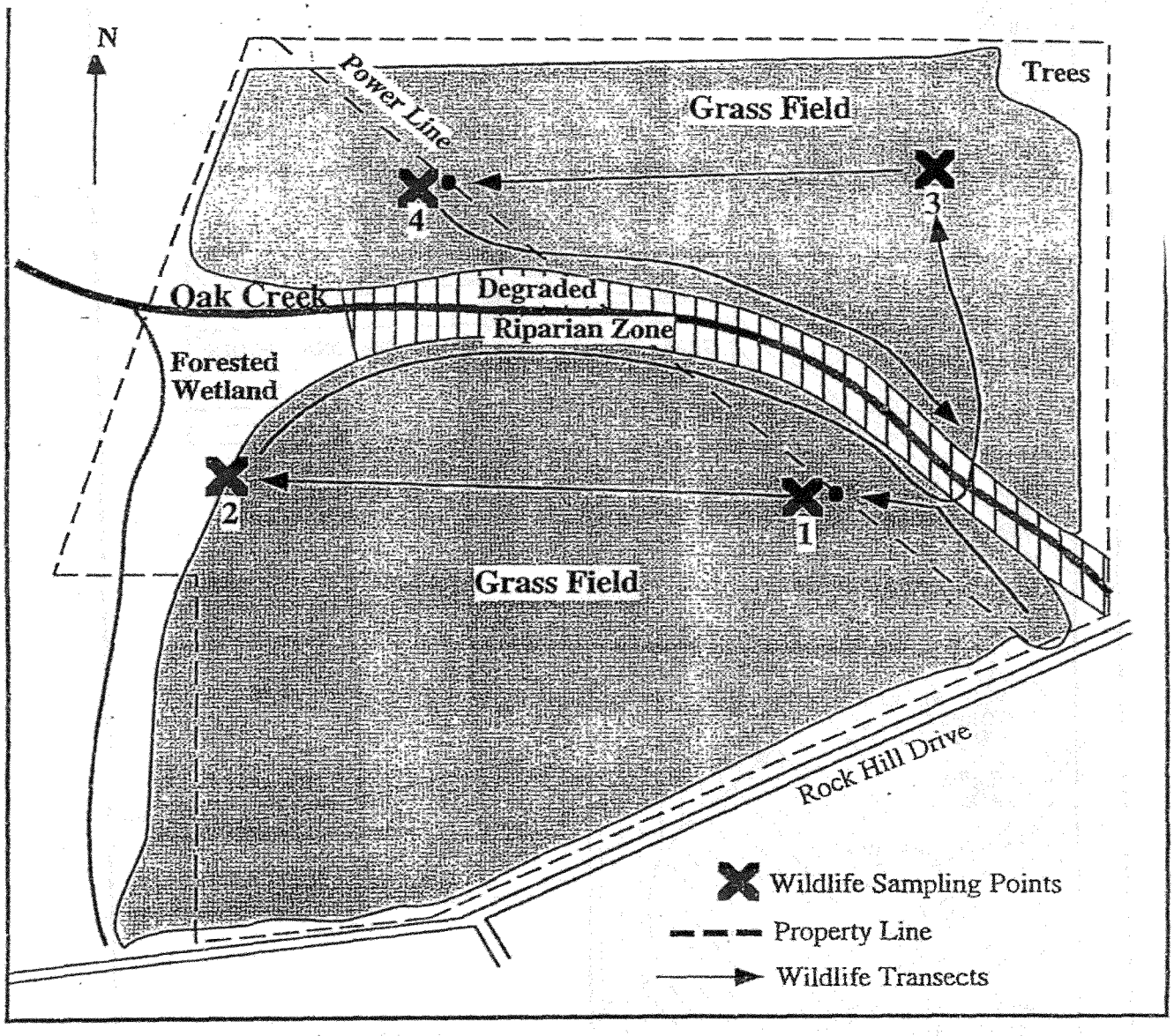

Figure 1A Site map with survey station locations for the Lebanon , Oregon, mitigation bank site.

Oak Creek Ref. Site

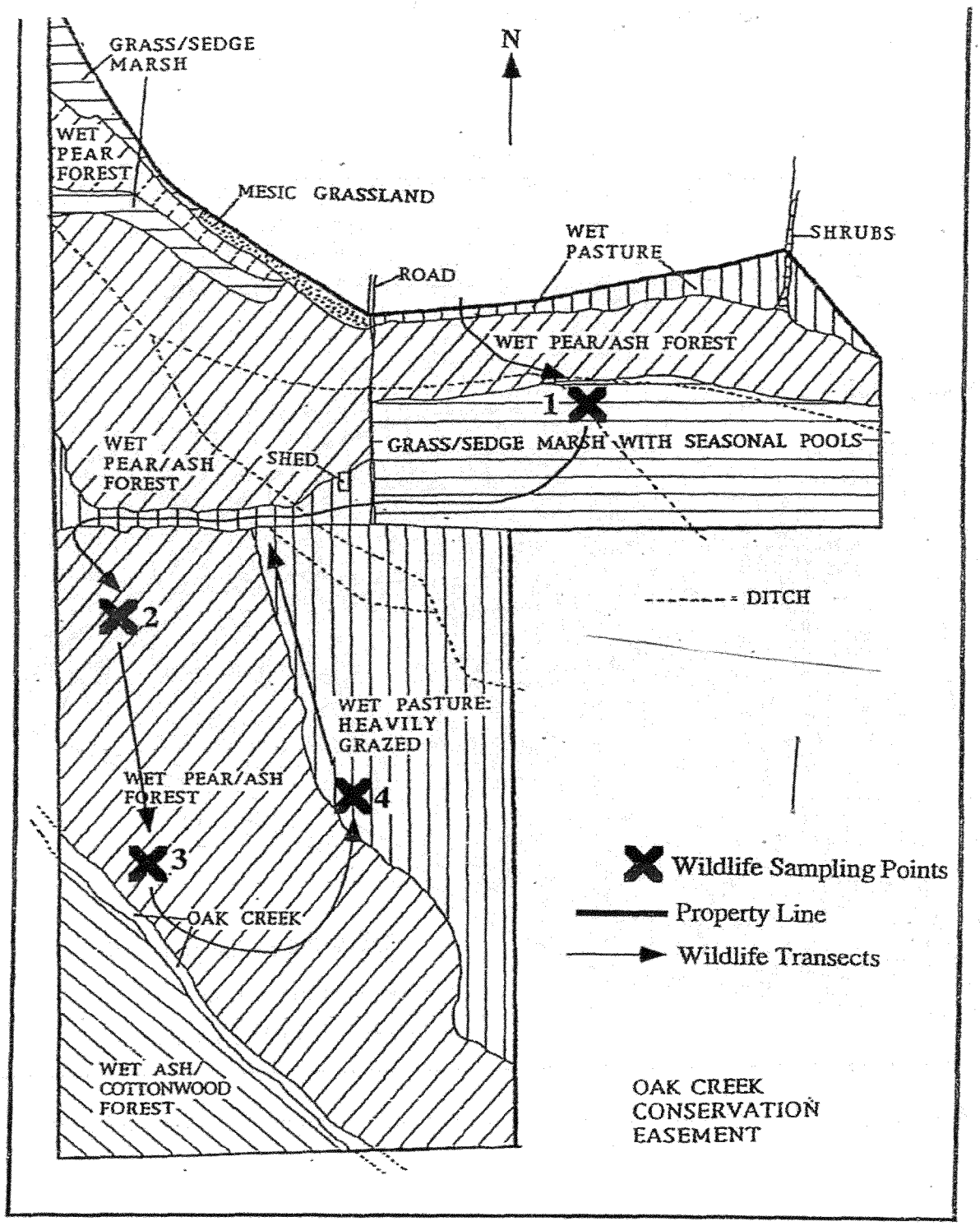

Figure 2A Site map with survey station locations for the U.S. Fish and Wildlife Reference Wetland Site.

Oak Creek #3
Oak Creek #4
Oak Creek #1
Oak Creek #2
Oak Creek Site
Imagery Date: 7/7/2012

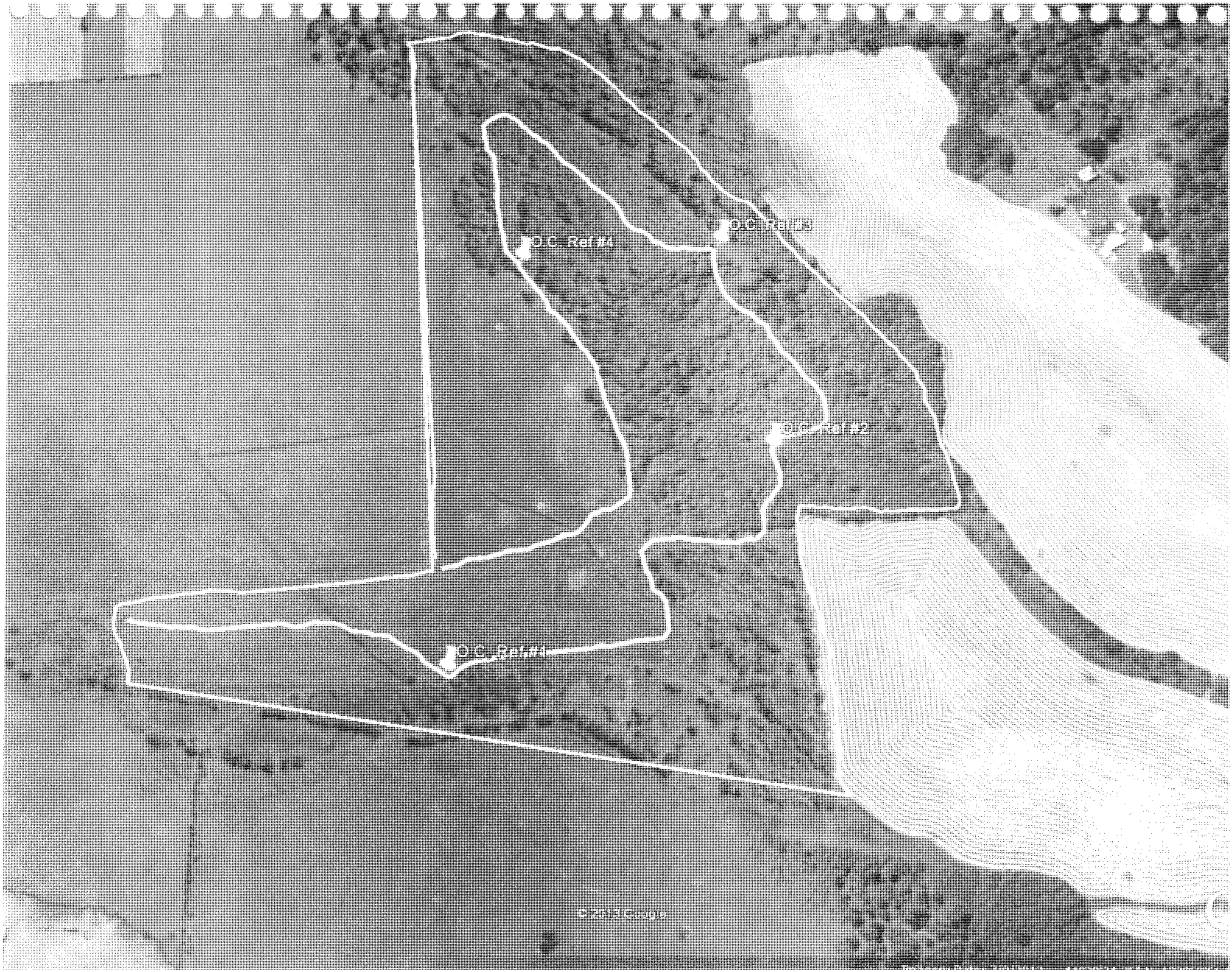
O.C. Ref #4
O.C. Ref #3
O.C. Ref #2
O.C. Ref #1
© 2013 Google

Table 3A. Birds observed in winter 2013.

SPECIES	OAK CREEK SITE	USFWS OAK CREEK REF
AMERICAN ROBIN	1	1,1=2
BEWICKS WREN	1	
BLACK-CAPPED CHICKADEE	5,2,1,1,1,2,1,1=14	1,1,3,1=6
BUSHTIT	2	
CANADA GOOSE	2,2,16=20	4
COMMON RAVEN	1,1,1=3	
FOX SPARROW	1	
GREEN-WINGED TEAL	4,50,1=55	
LESSER GOLDFINCH	1	
MOURNING DOVE	2	4
NORTHERN FLICKER	1,1,2,1=5	1,1,1,1,2,1=7
NORTHERN HARRIER		1
NORTHERN PINTAIL	1	
OSPREY	1	
PACIFIC WREN	1,1=2	
RED-TAILED HAWK		1
RED-WINGED BLACK BIRD	1,1,1,1=4	
RING-NECKED PHEASANT		5
RUFUS HUMMING BIRD	3	
SPOTTED TOWHEE	1,1=2	1
TURKEY VULTURE	2	
VARRIED THRUSH		1
WESTERN MEADOW LARK	1,1=2	
WESTERN SCRUB-JAY	2,1=3	
WILSONS SNIPE	1,1,2=4	
WRENTIT	1	
TOTAL	**130**	**32**
GRAND TOTAL BIRDS	**162**	

Table 3B. Non-avian species observed in winter 2013.

SPECIES	OAK CREEK SITE	USFWS OAK CREEK REF
BEAVER	CUT TREE	1 DAM
COTTON TAILED RABBIT		1,1(DEAD)
NORTHERN LEOPARD FROG	2	
PACIFIC TREE FROG	21	16
WHITE-TAILED DEER		2

Table 3C. Birds observed in spring 2013.

SPECIES	OAK CREEK SITE	USFWS OAK CREEK REF
AMERICAN CROW	1	1,1,1=3
AMERICAN GOLD FINCH		1,1=2
AMERICAN KESTREL	1	
AMERICAN ROBIN	1,1,1=3	1,1=2
BEWICKS WREN	1	
BLACK-CAPPED CHICKADEE	2,1,1,1,1,1,1=8	5,1,6,2,7,5,1,1=27
BROWN HEADED COWBIRD	3	1
BUSHTIT	1,1=2	
CEDAR WAXWING	2	
CLIFF SWALLOW	1	
DARK-EYED JUNCO	1	
GOLDEN-CROWNED KINGLET	1,1=2	
KILLDEER	1	
LESSER GOLDFINCH	5	
LEZULI BUNTING	3	4
LINCOLN SPARROW	4	
MARSH WREN	5	
MOURNING DOVE	1	
NASHVILLE WARBLER	2	
NORTHERN FLICKER	1,1,1=3	
PINE SISKEN		2
PIPET		5
PURPLE FINCH	2,1=3	1
RED-BREASTED SAPSUCKER	1	
RED-TAILED HAWK	1	
SONG SPARROW	1,2,24,1,1=11	50,2,1,2,1,1,2=59
SPOTTED TOWHEE	1,5,1=7	2,1,8,2,1,1=15
SWAINSONS THRUSH	2	1,10,1=12
TURKEY VULTURE	1	6
VIOLET-GREEN SWALLOW	1	2
WESTERN BLUE BIRD	2	
WESTERN KINGBIRD	2	

WESTERN SCRUB-JAY	1,1,2 =4	
WHITE -CROWNED SPARROW	2	15
WHITE-THROATED SPARROW		10
YELLOW-RUMPED WARBLER	3	
YELLOW-THROATED VIREO	1	
TOTAL	**90**	**166**

Table 3D. Non-avian species observed in spring 2013.

SPECIES	OAK CREEK SITE	USFWS OAK CREEK REF
DEER	1(TRACKS)	
RACOON	1 (TRACKS)	

Appendix 7

Journal of Credit Sales

OAK CREEK MITIGATION BANK

DATE	NAME	LOCATION	PERMIT	ADD	SOLD	BALANCE
8/4/1999	DSL/COE UNCERTIFIED 30%			9.350		9.350
10/13/1999	RANCO	MILLERSBURG, OREGON	FP14608		0.420	8.930
10/15/1999	CENTRAL TRAINING TRUST	TANGENT, OREGON	FP17275/1999-00935		0.420	8.510
1/13/2000	GORDON VOGT	CENTER ST.,ALBANY, OR	FP18135/		0.360	8.150
3/15/2000	GARY HARTALOO	COVEY RUN, NORTH ALBANY, OR	RF17655		0.360	7.790
5/19/2000	CLEAR CHANNEL BROADCASTING	2840 MARION RD.ALBANY, OR	RF18955		0.260	7.530
8/16/2000	WESTERN WEBB PRESS	263 29TH AVE., ALBANY, OR	FP22718/2000-00581		0.110	7.420
8/16/2000	PAHLISCH NEILSON HOMES	GRAND OAKS SUBDIVISION, CORVALLIS, OR	RF22756		0.130	7.290
9/8/2000	CLOUDBURST DEVELOPMENT	5TH AND MAIN STS., LEBANON, OR	RF22824/2008-00659		0.470	6.820
9/20/2000	L&H BUILDERS	FIR CT SWEET HOME, OR	RF22478/2000-00365		0.130	6.690
10/5/2000	CAMAS COMMONS	53RD AND COUNTRYCLUB, CORVALLIS, OR	2255-1RF/2000-00467		0.450	6.240
10/20/2000	CONIFER PL APARTMENTS,LLC	3403 NW 60TH ST.,CORVALLIS, OR	22351/20000492		1.520	4.720
10/20/2000	TIMBERHILL HOMES, LLC	29TH ST., CORVALLIS, OR	DSL22349		0.351	4.369
11/1/2000	DSL/COE CREDITS CERTIFIED			6.24		10.609
12/11/2000	ALL STATE PROPERTIES	SKYVIEW ESTATES, LEBANON, OR	FP18844		0.740	9.869
1/8/2001	WEYERHAEUSER COMPANY	AMERICAN CEMWOOD SITE, ALBANY, OR			0.270	9.599
1/27/2001	CITY OF MILLERSBURG	KUMPULA PROPERTY MT VIEW PL	RF22934		0.105	9.494
2/18/2001	MONACO COACH	COBURG, OREGON	FP17425/99-00778		3.680	5.814
3/15/2001	CITY OF LEBANON	VIOLATION	VIOLATION		0.339	5.475
6/8/2001	PAHLISCH NEILSON HOMES	THE PARK AT TIMBERHILL	2001-00207		0.017	5.458
7/27/2001	HARRISON INDUSTRIES	KNOX BUTTE RD AND TIMBER ST., ALBANY, OR	24201RF/2001-00724		0.120	5.338
9/22/2001	LINN COUNTY AFFORDABLE HOUSING	LINN COUNTY AFFORDABLE HOUSING	24434FP/2001-00724		0.020	5.318
5/25/2002	THE SANDERS DO/TC2 INVESTMENT	45TH STREET NEAR COUNTRY CLUB DR	25203FP/2002-00179		0.190	5.128
2/7/2003	CITY OF ALBANY	OAK CREEK DRAINAGE AT 53RD AVENUE	26256/2002-00901		0.480	4.648
2/17/2003	BENTON COUNTY PUBLIC HEALTH	CHAPEL DRIVE NEWTON CR. BRIDGE	26401GA/2002-00993		0.060	4.588
3/8/2003	CITIES OF ALBANY AND MILLERSBURG	WATER INTAKE, SCAVEL HILL ROAD	25849RF/2000-00720		0.105	4.483
11/3/2003	OREGON DEPT OF TRANSPORTATION	I-5 N. JEFFERSON TO N. ALBANY, OR	31156RF/2003-00622		0.300	4.183
1/14/2004	BBF DEVELOPMENT, LLC	NE 1/4 SEC. 20,T11S,R3W W. ALBANY, OR	3106FP/2003-00570		0.080	4.103
3/11/2004	STILLWATER ASSOC, A WASH LP,WA	T12S,R2W TAX LOT 1400 LEBANON, OR	30822FP/2003-00473		0.466	3.637
3/27/2004	LINN COUNTY ROAD DEPARTMENT	CALAPOOIA RIVER (DRIVER ROAD) BRIDGE TANGENT, OR	31618GA/NA		0.047	3.590
5/26/2004	OREGON DEPT OF STATE LANDS	WETLAND MITIGATION BANK REVOLVING FUND			0.167	3.423
6/7/2004	TIMBERHILL CORPORATION	KINGS BLVD. EXT. N OF WALNUT BLVD.,CORVALLIS, OR	30514FP/2000-00320		2.464	0.959
7/20/2004	ROTH BUILT AND BASIC HOMES INC	NW/NE 1/4 SEC.3&4 T11S R3W IN ALBANY, OR	32195FP/2004-00280		0.980	-0.021
5/2/2007	OREGON DEPT OF TRANSPORTATION	I-5 CROSSING OF SODOM DITCH MP221.13 NEAR HALSEY,OR	38105GA/2004-0035		0.052	-0.073
4/4/2008	DSL/COE CREDITS RELEASED			3.000		2.927
9/17/2008	CONSUMERS POWER	AIRPORT SUBSTATION SITE NEAR 36394 AIRPORT DR.,LEBANON,OR	40366RF/2008-00241		0.191	2.736
9/15/2008	DSL/COE CREDITS RELEASED			4.000		6.736
12/3/2008	JUSTIFICATION HOLDINGS, LLC	T13S,R1E,SEC29,TAX LOT 6500,SWEETHOME,OR	40059RF/2008-00153		0.059	6.677
10/8/2009	CITY OF JEFFERSON	700 N 2ND ST,JEFFERSON. OR	39627/RP/1994-989-1		0.250	6.427
10/14/2010	CITY OF PHILOMATH	SEC 18,19,20TS23SR5/6W TAX LOT 801	43699RF/2009-00626		6.230	0.197
6/26/2012	CITY OF CORVALLIS	T11S R5W SSO T23SEC.26TAX LOT 500	50275GP/2012-00173		0.170	0.03
11/13/2013	LES SCHWAB TIRE CENTERS	2925 SANTIAM HWY SE, ALBANY, OR	NWP2013-00357		0.020	0.010