2011 MONITORING REPORT
for
OAK CREEK MITIGATION BANK
LEBANON, OR

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

Submitted by
Oak Creek Mitigation Bank, LLC
4853 Bruno Place
Corvallis, OR 97330
(541) 758-0057

Prepared by
R.P. Novitzki & Associates, Inc.
4853 NW Bruno Place
Corvallis, OR 97330
(541) 758-0057

January 31, 2012

2011 MONITORING REPORT
for
OAK CREEK MITIGATION BANK
LEBANON, OR

Contents

Site Management Activities 1
Hydrology Monitoring 4
Sediment Monitoring 8
Vegetation Monitoring 9
Summary 11
Credit Sales 12
References 12

Figure 1 Map of the Oak Creek Mitigation Bank site showing locations of observation wells and vegetation samplingtransects..... 5

Table 1. Water levels in 2011 in observation wells at the Oak Creek Mitigation Bank 6
Table 2. Monthly precipitation in 2011 at the National Weather Service Station., Corvallis, OR 4
Table 3. Water levels in 2011 in shallow wells at the Oak Creek Mitigation Bank 7
Table 4. Water levels in 2011 in ponds at the Oak Creek Mitigation Bank 8
Table 5. Measurements at sediment stations in the riparian zone along Oak Creek 8

Appendix 1. Addendum Remedial Action Plan
Appendix 2. Water levels in Observation Well No. 16
Appendix 3. Water levels in Observation Well No. 17
Appendix 4. Vegetation Monitoring Report - 2011
Appendix 5 Journal of Credit Releases and Sales

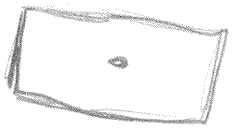
Collected 7/1-10, 2012

Oak Creek Mitigation Bank Plant Monitoring, 2012															
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**
Agrostis exarata	spike bentgrass	yes	FACW	y	2	5	2	2	15		1			7	
Alopecurus geniculatis	water foxtail		OBL	y	1				58						
Anthoxanthum odoratum	sweet vernalgrass		FACU		4		2	8							
Beckmannia syzigachne	American slough grass	yes	OBL	y	1			1	12		2				2
Bidens frondosa	leafy beggar's ticks	yes	FACW+	y	2						1				
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4										1
Carex feta	green-sheathed sedge	yes	FACW	y	2									3	
Carex unilateralis	one-sided sedge	yes	FACW	y	2						2				
Centaurium erythraea	European centaury		FAC	y	3		1	1							
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	38	12	5	2		30	4	5	18	12
Eleocharis palustris	creeping spikerush	yes	OBL	y	1					78					
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	25	23	37				5	30	17	4
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	1	27	1			1		1	1	10
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1						1				2
Holcus lanatus	common velvetgrass		FAC	y	3	1	5	12				1	1	2	
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	5	10	2				3	7	3	10
Hypochaeris radicata	hairy cat's ear		FACU		4		15	1						2	15
Juncus bufonius	toad rush	yes	FACW	y	2		30	25			3			1	
Juncus tenuis	slender rush	yes	FACW-	y	2			2					2	27	
Ludwigia palustris	waterpurslane/ marsh seedbox		OBL	y	1					1					
Lythrum portula	spatulaleaf loosestrife		OBL	y	1						60		3		2
Mentha pulegium	pennyroyal		OBL	y	1					5	2				
Parentucellia viscosa	parentucellia		FAC-		3			3							
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2								1		
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1										1
Rubus discolor	Himalayan blackberry	invasive	FACU		4							1			
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	2	1	5	1	4	5	15	8	25
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					20	1	6	5	17	2	80	35	20	20
standing water (inches)						tr			1	6			tr	tr	tr

Oak Creek Mitigation Bank Plant Monitoring, 2012															
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**
Agrostis exarata	spike bentgrass	yes	FACW	y	2						3		20	55	
Alopecurus geniculatis	water foxtail		OBL	y	1								5		
Anthoxanthum odoratum	sweet vernalgrass		FACU		4						2		2		4
Beckmannia syzigachne	American slough grass	yes	OBL	y	1					2					
Bidens frondosa	leafy beggar's ticks	yes	FACW+	y	2					1					
Carex unilateralis	one-sided sedge	yes	FACW	y	2	28								12	
Centaurium erythraea	European centaury		FAC	y	3										1
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	5	2				30	20	32	15	10
Eleocharis acicularis	needle spikerush	yes	OBL	y	1					18					
Eleocharis ovata	ovate spikerush	yes	OBL	y	1				2						
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	9	2				10	7	4	2	33
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3					2	3	3	1		
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1	1				1					
Holcus lanatus	common velvetgrass		FAC	y	3	1	1					15	2		1
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	3		5	2		25	25	30		8
Hypochaeris radicata	hairy cat's ear		FACU		4							1			
Juncus bufonius	toad rush	yes	FACW	y	2				5			5			6
Juncus tenuis	slender rush	yes	FACW-	y	2	12	2				1				5
Lythrum portula	spatulaleaf loosestrife		OBL	y	1		2	5	75	80					
Mentha pulegium	pennyroyal		OBL	y	1		1		3	5					
Montia linearis	narrow-leaved montia	yes	NOL	u	5									1	
Populus balsamifera ssp. trichocarpa	black cottonwood	yes	FAC	y	3		32								
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1	1				1					
Rosa pisocarpa	clustered rose	yes	FAC	y	3										27
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4						1				2
Rumex crispus	curly dock		FAC+	y	3	25									
Sonchus asper	prickly sowthistle		FAC-		3						1				
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2									1	3
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	10	90	15	5	1	5	1	3	5
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					15	80			2	25	20	4	12	15
standing water (inches)							tr	8	1	tr			tr		

last yr. 100%

Plot like this?



Oak Creek Mitigation Bank Plant Monitoring, 2012

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**
Agrostis exarata	spike bentgrass	yes	FACW	y	2	35	3	17	12	7	7	12	17	12	20
Alopecurus geniculatis	water foxtail		OBL	y	1										7
Anthoxanthum odoratum	sweet vernalgrass		FACU		4								16		
Beckmannia syzigachne	American slough grass	yes	OBL	y	1									2	1
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4								2		
Carex unilateralis	one-sided sedge	yes	FACW	y	2	5 ?					3	8			10
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	7	3	18	20		19	5	1		1
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	1		5	1	7	3	15	40	68	3
Fraxinus latifolia	Oregon ash	yes	FACW	y	2			1							
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3				2	2	1	1	1		1
Holcus lanatus	common velvetgrass		FAC	y	3	12	2	1	3	8		2	15	5	1
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	22	70	17	15	20	8	27	5		7
Juncus bufonius	toad rush	yes	FACW	y	2				15	12	2			2	5
Juncus tenuis	slender rush	yes	FACW-	y	2								10		
Kickxia elatine	sharp-leaved fluellin [cancerwort]		UPL		5					3					
Lotus corniculatus	birdsfoot trefoil		FAC	y	3					12					
Lythrum hyssopifolia	hyssop loosestrife		OBL	y	1							5	1	1	15
Mentha pulegium	pennyroyal		OBL	y	1		3	5	18	10	5	7			8
Montia linearis	narrow-leaved montia	yes	NOL	u	5						1				1
Myosotis laxa	small flowered forget-me-not	yes	OBL	y	1						6				
Parentucellia viscosa	parentucellia		FAC-		3								1	1	
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2						40				3
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	18	6								
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1				1			1	1	1	
Rumex crispus	curly dock		FAC+	y	3							5			
Vicia tetrasperma	slender vetch		NOL	u	5	27									
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY						5	20	8	5	2	1	1	1	1
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					2	7	15	7	10	10	15	4	15	18

Plots are 1 m²

underestimated

Oak Creek Mitigation Bank Plant Monitoring, 2012															
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**
Agrostis exarata	spike bentgrass	yes	FACW	y	2	3	30	2	2	8	6		42	20	
Alopecurus geniculatis	water foxtail		OBL	y	1	5	82	2					2		
Anthoxanthum odoratum	sweet vernalgrass		FACU		4						7				
Beckmannia syzigachne	American slough grass	yes	OBL	y	1			9	1	1		12	15	10	
Bidens frondosa	leafy beggar's ticks	yes	FACW+	y	2									3	
Brassica rapa	wild mustard		NOL	u	5										1
Carex unilateralis	one-sided sedge	yes	FACW	y	2		1	50	28	15	28	72	25	30	
Centaurium erythraea	European centaury		FAC	y	3										1
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2			6		25	18	20	3	17	
Deschampsia danthonioides	annual hairgrass	yes	FACW-	y	2	65									
Downingia elegans	common downingia	yes	OBL	y	1					2					
Eleocharis acicularis	needle spikerush	yes	OBL	y	1			2	12	2			10	3	
Eleocharis ovata	ovate spikerush	yes	OBL	y	1	1									
Eleocharis palustris	creeping spikerush	yes	OBL	y	1					2					
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2				17						
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	1			2				1		
Holcus lanatus	common velvetgrass		FAC	y	3		1		8		40				
Juncus bufonius	toad rush	yes	FACW	y	2	23									
Juncus tenuis	slender rush	yes	FACW-	y	2				2						
Lythrum hyssopifolia	hyssop loosestrife		OBL	y	1	8			3				1	3	
Lythrum portula	spatulaleaf loosestrife		OBL	y	1	40		1	15	1		2	14	52	
Mentha pulegium	pennyroyal		OBL	y	1	3	2	2	4	3	2	5	7	5	
Myosotis laxa	small flowered forget-me-not	yes	OBL	y	1				1		2				
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2		6	10					6		
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1			1						1	
Rumex crispus	curly dock		FAC+	y	3		1							1	
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2							17			
Veronica scutellata	marsh speedwell	yes	OBL	y	1			6							
Vicia tetrasperma	slender vetch		NOL	u	5						4				1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					2	3	7	1	15			2	2	3
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"						5	10	12	25	7	2	15	3	96

underestimated

Oak Creek Mitigation Bank Plant Monitoring, 2012															
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**
Agrostis exarata	spike bentgrass	yes	FACW	y	2					3					
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4										20
Carex unilateralis	one-sided sedge	yes	FACW	y	2										3
Centaurium erythraea	European centaury		FAC	y	3	3	3	2	2		1	1	1		
Daucus carota	Queen Anne's lace		NOL	u	5					1					
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2				1		1				
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	1	4	1	5	1	6	3	1		
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	1	37	10	7	1			5		
Holcus lanatus	common velvetgrass		FAC	y	3		1	1	1	15			32	13	25
Hypochaeris radicata	hairy cat's ear		FACU		4	1	3	4	9	8	1	1	1	1	3
Juncus bufonius	toad rush	yes	FACW	y	2	1	1	1	1	1				1	4
Juncus tenuis	slender rush	yes	FACW-	y	2										7
Lythrum hyssopifolia	hyssop loosestrife		OBL	y	1		1			1					
Lythrum portula	spatulaleaf loosestrife		OBL	y	1		1			40					
Mentha pulegium	pennyroyal		OBL	y	1					1			1	12	2
Panicum capillare	common witchgrass		FACU+		4				1				2	10	
Parentucellia viscosa	parentucellia		FAC-		3					7					
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4	1	2			5			1	1	
Sonchus asper	prickly sowthistle		FAC-		3		1		1				2	1	
Spergula arvensis	stickwort/ starwort/ corn spurry		NOL	u	5			1							
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2		1								5
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	10	10	10	15	12	15	2	7	1
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					87	38	70	65	5	80	80	55	55	30

Oak Creek Mitigation Bank Plant Monitoring, 2012

Prior Converted Habitat Type - South Side New 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**
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3				5						
Agrostis exarata	spike bentgrass	yes	FACW	y	2				62	70		2			5
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	1	2		1						2
Beckmannia syzigachne	American slough grass	yes	OBL	y	1						7	1			
Bidens frondosa	leafy beggar's ticks	yes	FACW+	y	2					2					
Carex unilateralis	one-sided sedge	yes	FACW	y	2									5	
Centaurium erythraea	European centaury		FAC	y	3		1	1		7					
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	55	30	25	2	6				10	28
Eleocharis acicularis	needle spikerush	yes	OBL	y	1							4			
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	6		1	1						5
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	1		1		1				2	1
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1						1	2			
Holcus lanatus	common velvetgrass		FAC	y	3	1	4	1	1	3				1	
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2		7	2	6				2	20	5
Hypericum anagalloides	bog St. John'swort	yes	OBL	y	1				1						
Hypochaeris radicata	hairy cat's ear		FACU		4		2	3		4					
Juncus bufonius	toad rush	yes	FACW	y	2									2	
Juncus ensifolius	daggerleaf rush	yes	FACW	y	2				20				2		
Juncus tenuis	slender rush	yes	FACW-	y	2		4		15				82		9
Lotus unifoliolatus var. unifoliolatus	Spanish clover	yes	UPL		5		2	1							
Lythrum portula	spatulaleaf loosestrife		OBL	y	1						88	85			
Mentha pulegium	pennyroyal		OBL	y	1					1	1	2	1	3	
Parentucellia viscosa	parentucellia		FAC-		3		1		1						
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1									1	
Rubus discolor	Himalayan blackberry	invasive	FACU		4					1					
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4									1	
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					4	2	5	2	2	10	5	2	7	2
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					22	43	60	5	4			12	58	43
standing water (inches)											3				

lon

Oak Creek Mitigation Bank Plant Monitoring, 2012

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**
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3		7		10	
Agrostis exarata	spike bentgrass	yes	FACW	y	2	2	3	2	33	20
Alopecurus geniculatis	water foxtail		OBL	y	1					1
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	18	16	5		1
Carex unilateralis	one-sided sedge	yes	FACW	y	2				1	
Centaurium erythraea	European centaury		FAC	y	3	1		1		
Cerastium glomeratum	sticky chickweed		UPL		5	2				
Daucus carota	Queen Anne's lace		NOL	u	5					1
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	20	1	15	16	12
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2					1
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3				1	1
Holcus lanatus	common velvetgrass		FAC	y	3	22	8	2	0	1
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	1	2		2	7
Hypochaeris radicata	hairy cat's ear		FACU		4	3	25	32	1	1
Juncus tenuis	slender rush	yes	FACW-	y	2	20	3	1		5
Leucanthemum vulgare	oxeye daisy		UPL		5		2			
Lotus corniculatus	birdsfoot trefoil		FAC	y	3					17
Lotus micranthus	small-flowered lotus	yes	NOL	u	5		27			
Lotus unifoliolatus var. unifoliolatus	Spanish clover	yes	UPL		5			50	1	8
Lythrum portula	spatulaleaf loosestrife		OBL	y	1				5	
Mentha pulegium	pennyroyal		OBL	y	1				2	
Parentucellia viscosa	parentucellia		FAC-		3	1	10	1		1
Plagiobothrys scouleri	Scouler's popcornflower	yes	FACW	y	2				1	
Rubus discolor	Himalayan blackberry	invasive	FACU		4		1			
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4	3	10			
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	7	2	25	20
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					5	5	6	3	7

Oak Creek Mitigation Bank Plant Monitoring, 2012															
Forested Habitat Type - Transect 6															
Cover (%)															
									Sample Station						
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**6**	**7**	**8**	**9**	**4**	**5**	**10**
Allium nigrum	black garlic		NOL	u	5		8			5	32				
Amelanchier alnifolia	serviceberry	yes	FACU		4	30									
Camassia leichtlinii	great camas	yes	FACW-	y	2	5	3		4	12	8		18	22	
Carex leptopoda	Dewey's sedge	yes	FAC	y	3		40	8							
Crataegus douglasii	black hawthorn	yes	FAC	y	3								10		
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2		1			1	1		1		
Fraxinus latifolia (canopy)	Oregon ash	yes	FACW	y	2	98	98	90	95	98	55	80	98	75	95
Galium aparine	cleavers	yes	FACU		4	3							2	25	
Geum macrophyllum	large leaved avens	yes	FAC+	y	3		8								
Hypochaeris radicata	hairy cat's ear		FACU		4										2
Lapsana communis	nipplewort		FAC	y	3	3	2				12	1		15	
Lolium perenne ssp. multiflorum	annual ryegrass		FAC	y	3										20
Mentha pulegium	pennyroyal		OBL	y	1										15
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	15	4	2	1	5	20	2	32	8	40
Prunella vulgaris	self-heal	yes	FACU+		4								38		
Prunus sp.	cherry, plum	NA	---	u	5								20		
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1										12
Rubus discolor	Himalayan blackberry	invasive	FACU		4							1	4	27	2
Rubus ursinus	trailing blackberry	yes	FACU		4							2	22		
Rumex conglomeratus	clustered dock		FACW	y	2		2								
Symphoricarpos albus	snowberry	yes	FACU		4	1									
Taraxacum officinale	dandelion		FACU		4	4							1		
Torilis arvensis	spreading hedgeparsley		NOL	u	5									3	
Vicia tetrasperma	slender vetch		NOL	u	5								2	3	
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5				3		10		2	3
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					65	38	90	85	68	25	85	12	20	28

Oak Creek Mitigation Bank Plant Monitoring, 2012

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**
Agrostis exarata	spike bentgrass	yes	FACW	y	2						15				
Agrostis stolonifera	creeping bentgrass		FACW	y	2	3					50				
Camassia leichtlinii	great camas	yes	FACW-	y	2			1			5	72	8	20	95
Carex leptopoda	Dewey's sedge	yes	FAC	y	3				5	15	2		2		
Carex sp.	sedge	yes	---	u	5				8	12					
Crataegus douglasii	black hawthorn	yes	FAC	y	3						85				
Dipsacus fullonum	common teasel		FACW-	y	2		12								
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	2				2	1	1	3		
Fraxinus latifolia (canopy)	Oregon ash	yes	FACW	y	2	75	95	90	98	55	45	97	50	65	95
Galium aparine	cleavers	yes	FACU		4		1	3			2	3		2	3
Geranium carolinianum	Carolina geranium	yes	NOL	u	5									5	
Geranium lucidum	shining geranium		NOL	u	5		40	80							
Geum macrophyllum	large leaved avens	yes	FAC+	y	3		8	20	6		3	1			
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	1									
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1	6									
Heracleum maximum	cow parsnip	yes	FAC+	y	3			10			3	2			
Hypochaeris radicata	hairy cat's ear		FACU		4			1							
Juncus bufonius	toad rush	yes	FACW	y	2	1									
Lapsana communis	nipplewort		FAC	y	3		10				2		1	6	
Leucanthemum vulgare	oxeye daisy		UPL		5						1				
Lotus corniculatus	birdsfoot trefoil		FAC	y	3						10				
Lysimachia nummularia	creeping jenny		FACW	y	2		25		60						
Melica subulata	Alaska oniongrass	yes	NOL	u	5			2							
Melissa officinalis	garden balm		UPL		5		2								
Mentha pulegium	pennyroyal		OBL	y	1	1	2				12				
Oenanthe sarmentosa	Pacific water-parsley	yes	OBL	y	1					40					
Phalaris arundinacea	reed canary grass	invasive	FACW	y	2						3				
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	2	18	5	3	5	22		30	2	
Ranunculus uncinatus	hooked [small-flowered] buttercup	yes	FAC	y	3			3					4	1	
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1	1									
Rubus discolor	Himalayan blackberry	invasive	FACU		4									1	
Rubus ursinus	trailing blackberry	yes	FACU		4			1		8					
Rumex conglomeratus	clustered dock		FACW	y	2		1		8	3	1		27		
Stellaria sp.	starwort	NA	---	u	5			3							
Symphoricarpos albus	snowberry	yes	FACU		4							8			

Oak Creek Mitigation Bank Plant Monitoring, 2012															
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**
Tellima grandiflora	fringecup	yes	FACU		4			12						27	
Torilis arvensis	spreading hedgeparsley		NOL	u	5		1								
Veronica americana	American speedwell [brooklime]	yes	OBL	y	1					4					
Veronica peregrina ssp. xalapense	hairy purslane speedwell	yes	OBL	y	1	2									
Veronica scutellata	marsh speedwell	yes	OBL	y	1					22					
Vicia hirsuta	tiny vetch		NOL	u	5								1	5	
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					80	3				1		1	1	1
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					10	5	3	20	10	3	25	24	14	4

Oak Creek Mitigation Bank Plant Monitoring, 2012												
Upland Habitat Type - Transect 8												
Cover (%)												
							Sample Station					
Species	**Common Name**	**Native**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Anagallis arvensis	scarlet pimpernel						2					
Anthoxanthum odoratum	sweet vernalgrass		3	5								
Bromus sitchensis	Alaska brome	yes								2		
Daucus carota	Queen Anne's lace		10	1								1
Elymus glaucus	blue wildrye	yes	10	15						3		3
Festuca rubra	red fescue		60	65						62	15	15
Gnaphalium palustre	western marsh cudweed	yes							1			
Holcus lanatus	common velvetgrass		7	28	1			1	1	35		67
Hypochaeris radicata	hairy cat's ear		1									
Leucanthemum vulgare	oxeye daisy						1			10	7	10
Parentucellia viscosa	parentucellia		1									
Rubus discolor	Himalayan blackberry	invasive						1	2			
Rumex acetosella	sheep sorrel/ sour dock			1	1		2	1	1			
Sonchus asper	prickly sowthistle					1						
Vicia tetrasperma	slender vetch					1	1					12
Vulpia bromoides	brome fescue		2									
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY		3	1	20	3		3	5		1	1
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"		8	5	79	95	95	95	92		78	10

Oak Creek Mitigation Bank Cover Sheet 2011

Performance Sandard	PC Area	South Marsh	North Marsh	NE Forest	West Forest
Dominated by 70% or More desirable plants	62% Cover 93% FAC or wetter 68% Native	62% Cover 94% FAC or wetter 69% Native	66% Cover 47% FAC or wetter 44% Native	43% cover under closed canopy 87% FAC or wetter 81% Native	66% cover under closed canopy 77% FAC or wetter 74% Native
80% Survival of planted Trees and shrubs	NA	NA	NA	NA	NA
Less than 15% Listed Noxious Invasives	0%	0%	0%	0%	9%

2011 MONITORING REPORT
for
OAK CREEK MITIGATION BANK
LEBANON, OR

This is the thirteenth monitoring report for the Oak Creek Wetland Mitigation Bank Site near Lebanon, OR. Richard P. Maureen Stellrecht and R.P. Novitzki and Associates, Inc. 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 and June

Site Management Activities

The MBRT inspection of the site in 2005 noted large areas of velvet grass, hairy cat's ear, and other non-natives and suggested we seek assistance to develop a management plan. We developed a plan with the help of Loverna Wilson, Steve Smith, and Pat Thompson. The plan was accepted by the MBRT and was initiated in 2005, beginning with burning the entire site in September 2005. As proposed in the plan the site was mowed in late fall 2005 and spring 2006 and has been sprayed repeatedly from 2006- present to inhibit regrowth of velvet grass, teasel, reed canary grass, black berry, and other non-natives. Some of the daisy and Queen Ann's lace were pulled by hand during the spring, summer, and early fall.

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. Ray Fiori and Pat Thompson visited the site to see how well the remedial plan is progressing and establish a seeding plan for fall 2011 and spring 2012. Site visit notes are included below.

In September 2006 berms were created both north and south of Oak Creek to retain water longer and create shallow marsh habitats. A delineation performed in March 2010 confirmed that approximately 8 new acres of wetland were created from former upland for a total of 77.22 restored wetland acres at the Oak Creek Mitigation Bank.

The following is a summary of a site visit on 9-21-11 by Pat Thompson and Ray Fiori to assess the progression of the Remedial action plan for Oak Creek Mitigation Bank:

The main purpose of this site visit was to determine if seeding may be able to take place this fall or if additional treatments are required

Area A-1:

This area has been boomless sprayed with a combination of round-up and 2,4-D in September of 2010, May 2011 and again in July 2011. The area is now completely unvegetated except for a small number of Queen Ann's Lace plants that have sprouted up since the last spraying.
It is recommended that the area be mowed immediately* to prevent rogue Queen Ann's Lace plants from going to seed, and sprayed once more in fall after 1" of rain and fall green up has occurred. Planting may be possible in spring 2012.

Area A-2:

This Area was boomless sprayed with a combination of round-up and 2,4-D in late July 2010, September 2010, May 2011, July 2011, and again in August 2011. The area is now completely unvegetated except for a small number of Queen Ann's Lace and hairy cat's ear plants that have sprouted up since the last spraying.
It is recommended that the area be mowed ASAP* to prevent any new Queen Ann's Lace from going to seed, sprayed after fall green up, and sprayed again in spring for hairy cat's ear.
This area may be ready for planting in spring 2012.

Area A-3:

This Area was boomless sprayed with a combination of round-up and 2,4-D in late July 2010, September 2010, May 2011, July 2011, and August 2011. The area is now completely unvegetated except for a small number of Queen Ann's Lace plants that have sprouted up since the last spraying.
It is recommended that the area be sprayed again after fall green up, planted for grasses in spring 2012, and sprayed again for broadleaves in spring.

Area A-4:

This area was boomless sprayed with a combination of round-up and 2,4-D in May 2010, August 2010, May 2011, and August 2011. This area shows the best potential for planting this fall. The area is now completely unvegetated except for a small number of Queen Ann's Lace and Himalayan blackberry plants that have sprouted up since the last spraying.
It is recommended that the area be spot sprayed ASAP for rogue blackberry, Queen Ann's Lace and thistle. This area can be planted this fall.**

Area A-5:

This area was spot sprayed repeatedly in spring/ summer 2011 at different times for different species including velvet grass, pennyroyal, curly dock, and any other non-native species.
It is recommended that this be continued in spring 2012, and in areas of heavy infestations of velvet grass, a grass specific herbicide be boomless sprayed this fall after significant green up has occurred.

B-1:

This area was gridded off and intensively spot sprayed throughout spring of 2011 for velvet grass and sweet vernal grass. It is being spot sprayed for blackberry in fall 2011. This will continue to be the regimen for this area until significant improvements are made and planting for natives will occur in patches.

B-2:

This area continues to be intensively spot sprayed for penny royal and velvet grass. Planting will occur in patches for emergent and grass species depending on the specific habitat of the patch.

B-3:
This area has been boomless sprayed with a combination of round-up and 2,4-D in late July 2010, September 2010, May 2011, and August 2011.
It is recommended that the area be mowed ASAP* to prevent new Queen Ann's Lace from setting seed and sprayed with round up for colonial bentgrass and velvet grass after fall green up and once more in spring. This area may be planted in spring 2012.

Conclusion:

Significant progress has been made on all areas. Additional treatments are recommended in all areas before planting. A-4 is the only area to be planted this fall. All of the other areas will continue to be treated through spring and planting will occur at that time barring any unforeseen complications.

* All recommended mowing was completed by 9-23-11. Spraying will continue as weather permits.
**Seeding of A4 was completed by December 1, 2011.

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 those data are presented in Appendix 2. Precipitation (Table 2) in 2011 was below the 30 year average. The annual average was 7.51 inches below normal. 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 3) 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 overflowed its banks nine times in 2011, with over-bank flooding lasting from several hours to three days. This confirms that wetland function has been restored at this site.

Table 2. Monthly precipitation in inches in 2011 at the HYSLOP Weather Station at Corvallis, OR.

	JAN	**FEB**	**MAR**	**APR**	**MAY**	**JUN**	**JUL**	**AUG**	**SEP**	**OCT**	**NOV**	**DEC**	**YEAR**
Observed	4.01	3.30	7.69	4.06	3.57	1.18	1.12	0.03	2.59	2.74	5.51	4.77	36.51
30-Year Normal	6.46	5.71	4.59	2.98	2.30	1.46	0.57	0.73	1.47	3.02	6.94	7.43	43.66

The small ponds (vernal pools) began to fill in November 2010 and they contained water from January into July 2011 (Table 3). Several ponds refilled for a short period in June as a result of heavy rains in May and then they were dry until October when they refilled. It was observed at the site that Oak Creek ceased flowing between 8-8-11 and 8-15-11, which is much later than usual.

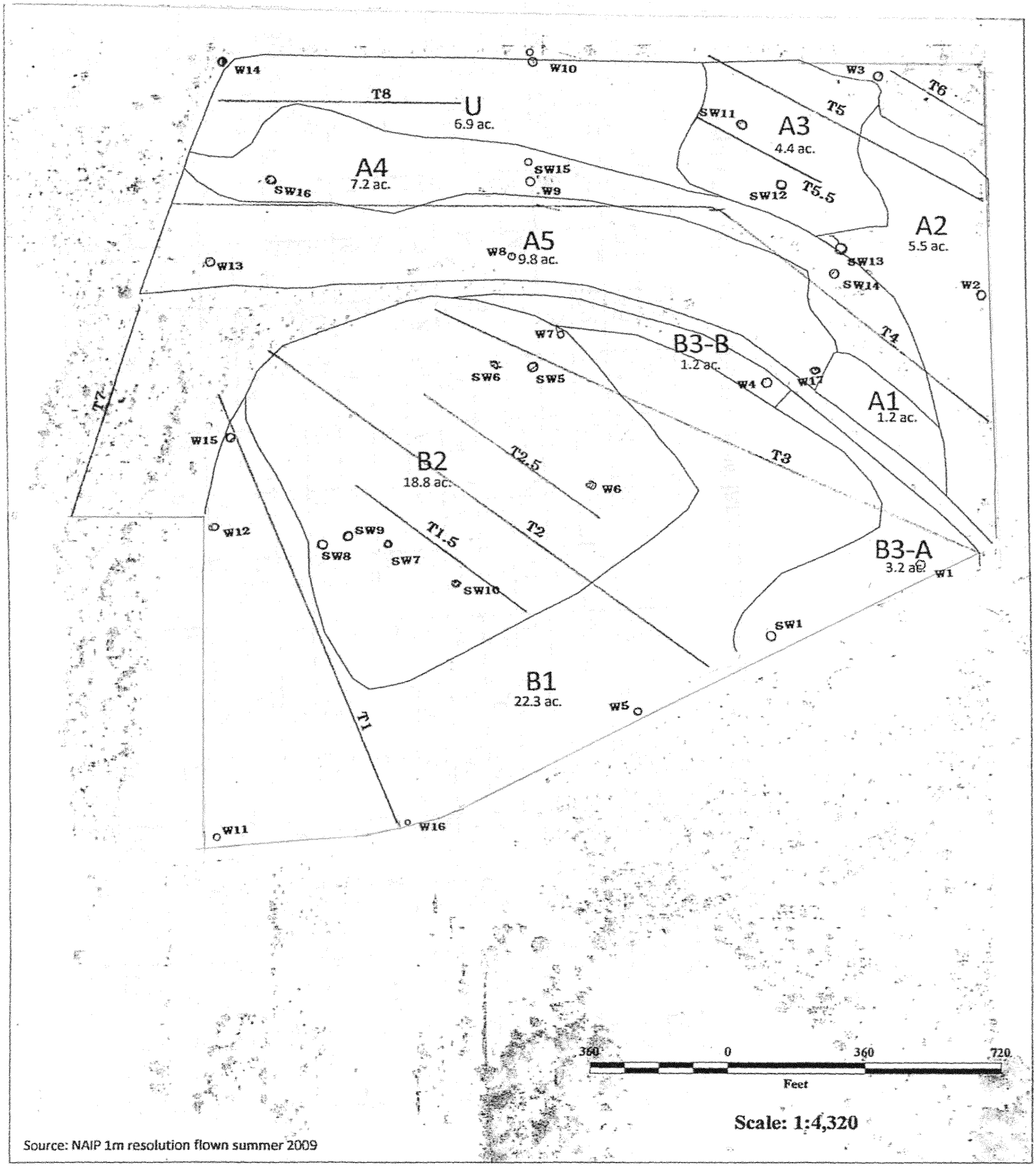


Figure 1. Map of Oak Creek Mitigation Bank site showing observation wells, vegetation sampling transects, and habitat types.

Oak Creek				Observation Well Numbers											
Date	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1/14/11	0	11	2	5	8	4	0	6	8	25	2	3	6	18	5
2/15/11	+4	2	0	+4	7	3	+3	+10	1	21	0	+1	+3	8	3
3/1/11	+5	+1	+2	+4	+3	2	+3	+8	0	6	+2	+2	+2	12	2
3/15/11	+2	6	1	2	8	5	0	+3	4	10	+1	3	2	11	4
4/1/11	0	10	0	1	5	3	1	0	5	12	0	2	3	14	3
4/16/11	2	14	0	6	4	3	0	5	7	28	2	2	5	22	4
5/1/11	5	15	2	5	7	4	2	6	9	22	6	6	10	15	9
5/16/11	7	20	3	12	8	7	3	9	11	40	8	3	18	26	5
6/15/11	13	32	32	21	28	14	16	17	25	52	31	18	26	41	12
7/15/11	31	52	50	39	51	43	34	23	32	80	35	26	48	62	18
8/15/11	41	61	48	41	62	53	42	30	45	__	46	42	54	61	35
9/14/11	56	86	__	53	85	69	51	47	69	__	58	57	67	__	62
10/14/11	44	95	__	52	87	73	53	49	75	__	64	57	57	__	60
11/15/11	23	72	51	48	61	51	42	31	52	56	59	26	45	41	20
12/16/11	11	32	41	11	25	12	8	13	15	54	12	7	15	45	11

Table 1. Depth to water (in inches) below land surface in 2011 in Observation Wells.

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

Table 2. Depth to water (in inches) below land surface in 2011 in shallow observation wells

Table 4. Depth of water (in feet) in selected ponds in 2011 at Oak Creek. Ponds are identified by the well nearest to the pond (near well 8; between wells 8 and 13).

Pond # (nearest well):	3	4-7	4-7-1	7	8	8-13	12	13	15	7-15	17	Pond	Pond 6
Date													
01-14-11	.44	.28	. 40	.68	.80	1.12	.58	.80	.62	.70	.70	2.32	1.00
02-15-11	.52	.68	.75	1.40	1.50	.83	.92	1.35	1.00	.92	.76	2.20	.95
03-01-11	.54	.60	.7	2.10	1.64	1.10	.90	1.26	.98	.92	.78	2.36	1.28
03-15-11	.40	.32	.38	.62	.80	1.08	.64	.94	.70	.80	.80	2.70	1.24
04-01-11	.45	.25	.40	.58	.74	1.05	.82	.80	.63	.72	.70	2.55	1.15
04-14-11	.45	.26	.40	.62	.72	1.00	.55	.88	.65	.72	.94	2.05	.94
05-16-11	.46	.22	.37	.22	.64	.92	.55	.75	.60	.70	.70	1.40	.32
06-15-06	-	-	.16	-	.28	.32	-	.24	-	-	-	.20	-
Ponds dry during summer													
11-15-11	-	-	.20	-	.32	.40	-	.22	-	-	-	.92	-
12-16-11	-	.02	.32	.05	.56	.76	.54	.22	.30	-	.42	1.08	-

Sediment Monitoring

Sediment deposition or scour was measured at ten stations along Oak Creek in 2010 and 2011. The differences between measurements (the amount of deposition or scour) is presented in Table 4. Scour occurred at 3 stations, ranging from .15 to 3 inches, and deposition occurred at 6 stations, ranging from .10 to 1 inch. 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 (-1.85 inches) divided by the number of stations (10) for a net loss of -0.185 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 (2010)	**21.25**	**20.50**	**21.50**	**21.00**	**22.60**
Left Bank (2011)	**21.00**	**19.50**	**21.00**	**24.00**	**21.75**
Change	**+.25**	**+1.00**	**+0.50**	**-3.00**	**+0.85**
Right Bank (2010)	**14.25**	**20.25**	**13.35**	**23.50**	**22.75**
Right Bank (2011)	**15.90**	**20.00**	**13.25**	**23.50**	**22.90**
Change	**-1.65**	**+0.25**	**+0.10**	**0**	**-0.15**

Since 1999 in the riparian zone there has been annual scour as great as -0.42 inches and deposition as great as +1.56 inches, resulting in a net aggradation of +3.71 inches. This further confirms the successful function for the restored riparian area.

2000	**+0.42**	**2006**	**-0.40**
2001	**+0.06**	**2007**	**+0.23**
2002	**-0.43**	**2008**	**+1.25**
2003	**+1.56**	**2009**	**-0.06**
2004	**+1.03**	**2010**	**-0.03**
2005	**+0.23**	**2011**	**-0.18**
			+3.71

Vegetation Monitoring

Because ponding and saturation persisted into July, vegetation sampling occurred in late May and early June. 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 will be 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 *Agrostis exarata* (spike bentgrass), *Holcus lanatus* (common velvetgrass), *Hordeum brachyanttherum* (meadow barley), *Juncus tenuis* (slender rush), and *Mentha polegeum* (pennyroyal). Cover was 62%. FAC or better species accounted for 93% of the cover and 68% of the cover was native species. The SMI index is 2.10. *Plagiobothrys* (popcorn flower), *Eliocharis aricularis* (needle spikerush), *Montia linearis* (narrow-leaved montia), and *Juncus bufonius* (toad rush) are well established since the burn. The woody species are doing very well and areas of Deschamsia cespitosa (tufted hairgrass) were noted, but so far not showing up in many of the sample plots.

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 *Juncus tenius* (slender rush), Deschamsia cespitosa (tufted hairgrass), *Anthoxanthum odoratum* (sweet vernalgrass), and *Juncus bufonius* (toad rush). Cover was 62%, FAC or better species accounted for 94% of the cover and 69% of the cover was native. The SMI was 2.00.

For the newly-constructed shallow marsh area north of Oak Creek (transect 5.5), the dominant plant species were *Agrostis exarata* (spike bentgrass), *Anthoxanthum odoratum* (sweet vernalgrass), *Hordeum brachyanttherum* (meadow barley), and *Lotus micranthus* (small-flowered lotus). Cover in this area is 66% with 47% of the cover being comprised of FAC or better species and 44% of the cover being native species. The SMI for this area was 3.35.

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 43% (under a closed canopy), species FAC or better accounted for 87% and 81% of the cover was native. The SMI was 2.43.

In the west forested area (transect 7) the dominant species were *Fraxinus latifolia* (Oregon ash), *Cammassia leichtlinii* (great camas), *Lysimachia nummularia* (creeping jenny), *Myosotis laxa* (small flowered forget-me-not), and *Veronica scutellata* (marsh speedwell). The cover was 66% (no including the canopy layer), 77% of species were FAC or wetter, and 74% of the species were native. The SMI for the west forested area was 2.63.

A new transect (#8) was created in 2010 in the NW upland area. The dominant species were *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 71% of the area with native species covering 28%.

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.

Summary

Oak Creek Mitigation Bank continues to demonstrate wetland hydrology, confirming successful site restoration. Saturated conditions persisted through July. Small shallow depressions (vernal pools) at the site held water into early August. 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, and nine times in 2011 with longer flooding periods. This suggests 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 scour of -0.185 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 96% FAC or better, 54% native, and the SMI was 2.10. South of Oak Creek the wetland created from upland in 2006 is 94% FAC or better, 69% native, and the SMI was 3.25. North of Oak Creek the wetland created from upland is 47% FAC or better species, 44% native, and the SMI was 2.43. The plant community in the north east forested area is 87% FAC or better, 81% native, and the SMI was 2.43. In the west forest the plant community is 86% FAC or better, 81% native, and the SMI was 2.63. The new transect in the NW upland area contains a plant community with native species totaling 28 of the total cover.

The remedial treatment plan established in July 2010 will undoubtedly lead to more bare area in the next year or more of aggressive site preparation, in order to remove seed bank of non-native invasives, but will establish a greater abundance of native FAC and wetter species . This plan will make the site more self-sustaining in the future. The plan includes follow-up site visits by Ray Fiori and Pat Thompson twice each year to establish how well the treatments are progressing. Ray and Pat visited the site on 9-21-11 and established a seeding plan for fall 2011 and spring 2012.

The wildlife survey that was conducted in previous years was not done in 2011 but will be restarted in 2012. We believe that the surveys done in the past have established OCWMB as a functioning component of the local ecosystem. As the population at this site has met or exceeded the numbers for the reference site in the past 3 years, we have proved stability of wildlife using this site. We would like to concentrate our efforts and resources on establishing a greater abundance of native flora.

CREDIT SALES — 2011

No credit sales in 2011

References

Wetland Mitigation Banking Instrument for the Oak Creek Mitigation Bank, Lebanon, OR, 1999. Unpublished report submitted by R. P. Novitzki and Associates, Inc., Corvallis, OR, to the Oregon Division of State Lands, Salem, OR, 93701-1279.

Novitzki, R.P., 2011. 2010 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279

Novitzki, R.P., 2010. 2009 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279

Novitzki, R.P., 2009. 2008 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279

Novitzki, R.P., 2008. 2007 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279.

Novitzki, R. P., 2007. 2006 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279.

Novitzki, R.P., 2006. 2005 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279

Novitzki, R.P., 2005. 2004 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279.

Novitzki, R. P., 2004. 2003 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279.

Novitzki, R. P., 2003. 2002 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279.

Novitzki, R. P., 2002. 2001 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279.

Novitzki, R. P., 2001. 2000 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279.

Novitzki, R. P., 2000. 1999 Monitoring Report for the Oak Creek Mitigation Bank, Lebanon, OR, unpublished report submitted to Oregon Division of State Lands, Salem OR, 93701-1279.

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.

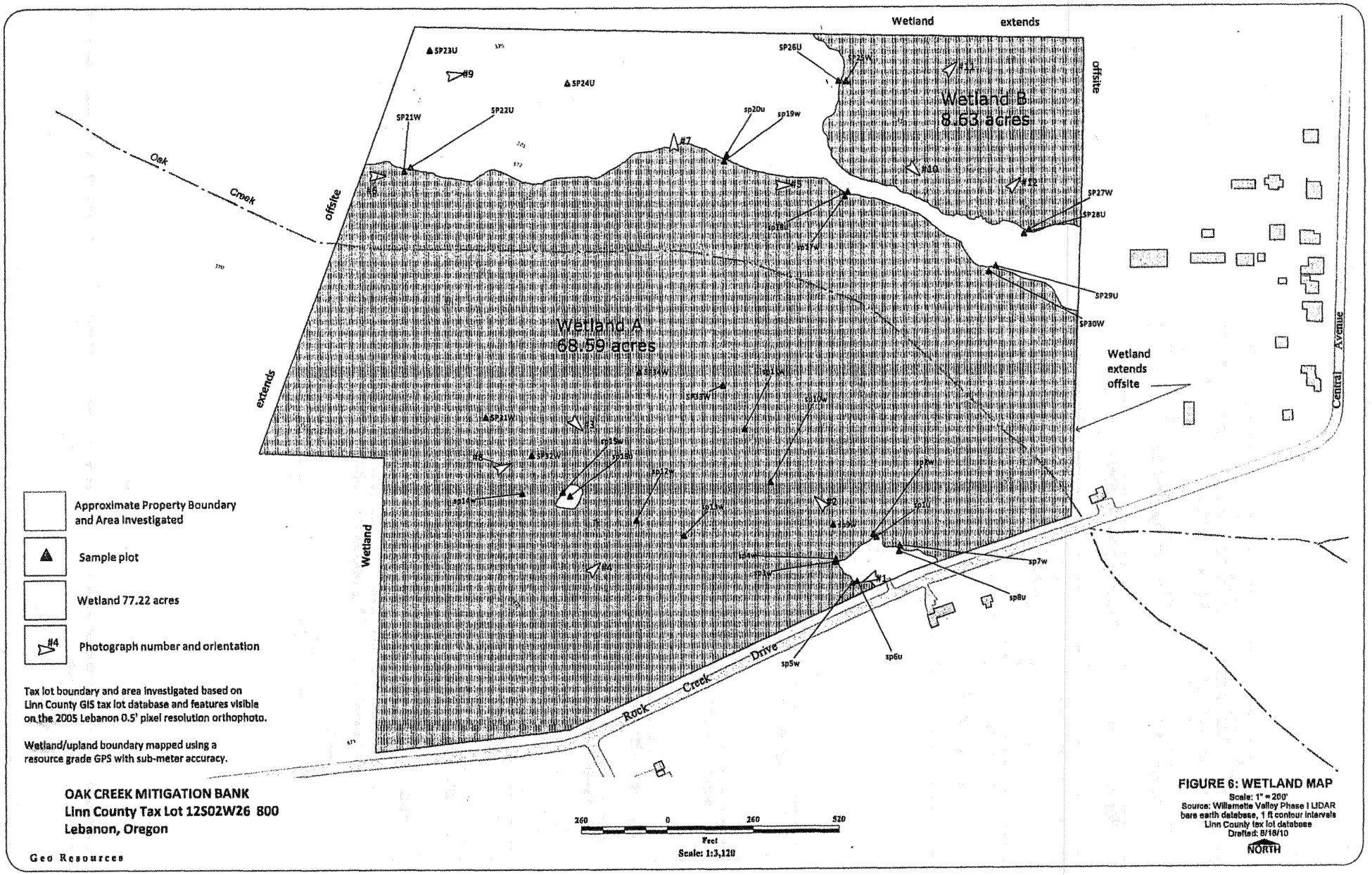
Wet Prairie Planting List

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
Linn County Tax Lot 12S02W26 800
Lebanon, Oregon

Geo Resources

FIGURE 6: WETLAND MAP

Scale: 1" = 200'
Source: Willamette Valley Phase I LIDAR bare earth database, 1 ft contour intervals
Linn County tax lot database
Drafted: 8/18/10

Oak Creek Well 16 – 2011 Data (12.0 inches have been subtracted so data listed are inches below land surface) Serial # 02B25C Data logged Jan 6, 2012

		-01.3,	20-Feb-11,	-01.0,	12-Apr-11,	+00.3,	02-Jun-11,
-03.0,	01-Jan-11,	-02.3,	21-Feb-11,	-01.7,	13-Apr-11,	-00.0,	03-Jun-11,
-05.0,	02-Jan-11,	-02.3,	22-Feb-11,	-01.0,	14-Apr-11,	-02.0,	04-Jun-11,
-03.3,	03-Jan-11,	-03.3,	23-Feb-11,	-00.0,	15-Apr-11,	-06.7,	05-Jun-11,
-06.6,	04-Jan-11,	-01.7,	24-Feb-11,	+00.3,	16-Apr-11,	-10.3,	06-Jun-11,
-05.3,	05-Jan-11,	-01.3,	25-Feb-11,	-00.0,	17-Apr-11,	-12.6,	07-Jun-11,
-05.3,	06-Jan-11,	-02.7,	26-Feb-11,	-01.0,	18-Apr-11,	-15.0,	08-Jun-11,
-05.7,	07-Jan-11,	-02.3,	27-Feb-11,	-02.3,	19-Apr-11,	-17.0,	09-Jun-11,
-02.3,	08-Jan-11,	-00.7,	28-Feb-11,	-05.3,	20-Apr-11,	-18.6,	10-Jun-11,
-01.7,	09-Jan-11,	-00.0,	01-Mar-11,	-06.7,	21-Apr-11,	-19.3,	11-Jun-11,
-02.3,	10-Jan-11,	-00.3,	02-Mar-11,	-08.0,	22-Apr-11,	-19.6,	12-Jun-11,
-03.0,	11-Jan-11,	-00.3,	03-Mar-11,	-09.0,	23-Apr-11,	-17.6,	13-Jun-11,
-01.7,	12-Jan-11,	-01.0,	04-Mar-11,	-02.7,	24-Apr-11,	-18.6,	14-Jun-11,
+00.3,	13-Jan-11,	-00.0,	05-Mar-11,	-00.0,	25-Apr-11,	-20.6,	15-Jun-11,
+00.7,	14-Jan-11,	-01.0,	06-Mar-11,	-00.3,	26-Apr-11,	-21.0,	16-Jun-11,
-00.3,	15-Jan-11,	-01.3,	07-Mar-11,	-00.3,	27-Apr-11,	-21.0,	17-Jun-11,
+01.0,	16-Jan-11,	-01.0,	08-Mar-11,	-01.0,	28-Apr-11,	-21.6,	18-Jun-11,
00.0,	17-Jan-11,	-00.7,	09-Mar-11,	-00.3,	29-Apr-11,	-22.0,	19-Jun-11,
-01.0,	18-Jan-11,	-00.3,	10-Mar-11,	-00.3,	30-Apr-11,	-21.3,	20-Jun-11,
-00.3,	19-Jan-11,	-00.3,	11-Mar-11,	-01.0,	01-May-11,	-21.6,	21-Jun-11,
-01.3,	20-Jan-11,	-01.7,	12-Mar-11,	-03.3,	02-May-11,	-22.0,	22-Jun-11,
-01.3,	21-Jan-11,	-00.3,	13-Mar-11,	-03.3,	03-May-11,	-23.3,	23-Jun-11,
-00.0,	22-Jan-11,	+00.3,	14-Mar-11,	-06.3,	04-May-11,	-24.0,	24-Jun-11,
-01.3,	23-Jan-11,	+00.3,	15-Mar-11,	-08.6,	05-May-11,	-23.6,	25-Jun-11,
-02.0,	24-Jan-11,	-00.3,	16-Mar-11,	-10.0,	06-May-11,	-24.0,	26-Jun-11,
-04.0,	25-Jan-11,	-00.3,	17-Mar-11,	-02.0,	07-May-11,	-24.3,	27-Jun-11,
-04.7,	26-Jan-11,	-00.3,	18-Mar-11,	-01.0,	08-May-11,	-24.3,	28-Jun-11,
-05.3,	27-Jan-11,	-00.7,	19-Mar-11,	-00.3,	09-May-11,	-25.6,	29-Jun-11,
-06.3,	28-Jan-11,	-00.7,	20-Mar-11,	-02.0,	10-May-11,	-26.3,	30-Jun-11,
-06.7,	29-Jan-11,	-00.7,	21-Mar-11,	-05.7,	11-May-11,	-27.0,	01-Jul-11,
-06.0,	30-Jan-11,	-01.0,	22-Mar-11,	-00.3,	12-May-11,	-26.6,	02-Jul-11,
-08.0,	31-Jan-11,	-02.0,	23-Mar-11,	-01.3,	13-May-11,	-27.3,	03-Jul-11,
-08.6,	01-Feb-11,	-01.0,	24-Mar-11,	-05.3,	14-May-11,	-27.6,	04-Jul-11,
-09.3,	02-Feb-11,	-00.7,	25-Mar-11,	-08.0,	15-May-11,	-28.0,	05-Jul-11,
-10.0,	03-Feb-11,	-00.3,	26-Mar-11,	-03.7,	16-May-11,	-28.6,	06-Jul-11,
-09.6,	04-Feb-11,	-00.3,	27-Mar-11,	-07.6,	17-May-11,	-29.0,	07-Jul-11,
-09.3,	05-Feb-11,	-00.3,	28-Mar-11,	+00.3,	18-May-11,	-29.6,	08-Jul-11,
-07.0,	06-Feb-11,	-00.0,	29-Mar-11,	-00.7,	19-May-11,	-30.0,	09-Jul-11,
-06.7,	07-Feb-11,	-00.0,	30-Mar-11,	-05.3,	20-May-11,	-30.3,	10-Jul-11,
-06.0,	08-Feb-11,	-01.0,	31-Mar-11,	-09.6,	21-May-11,	-31.6,	11-Jul-11,
-08.6,	09-Feb-11,	-01.3,	01-Apr-11,	-12.0,	22-May-11,	-31.6,	12-Jul-11,
-09.6,	10-Feb-11,	-00.3,	02-Apr-11,	-13.6,	23-May-11,	-32.0,	13-Jul-11,
-10.0,	11-Feb-11,	-00.7,	03-Apr-11,	-13.6,	24-May-11,	-33.0,	14-Jul-11,
-10.0,	12-Feb-11,	-01.7,	04-Apr-11,	-12.0,	25-May-11,	-32.6,	15-Jul-11,
-00.0,	13-Feb-11,	-00.3,	05-Apr-11,	-13.3,	26-May-11,	-33.0,	16-Jul-11,
-00.3,	14-Feb-11,	-00.3,	06-Apr-11,	+00.3,	27-May-11,	-33.3,	17-Jul-11,
-00.0,	15-Feb-11,	-00.3,	07-Apr-11,	+00.3,	28-May-11,	-33.6,	18-Jul-11,
-00.0,	16-Feb-11,	-01.3,	08-Apr-11,	-00.0,	29-May-11,	-33.3,	19-Jul-11,
-01.0,	17-Feb-11,	-02.3,	09-Apr-11,	-00.0,	30-May-11,	-33.6,	20-Jul-11,
-02.0,	18-Feb-11,	-02.3,	10-Apr-11,	+00.3,	31-May-11,	-34.0,	21-Jul-11,
-01.0,	19-Feb-11,	-00.3,	11-Apr-11,	+00.3,	01-Jun-11,	-34.0,	22-Jul-11,

-33.6, 23-Jul-11,
-33.6, 24-Jul-11,
-34.6, 25-Jul-11,
-35.0, 26-Jul-11,
-35.6, 27-Jul-11,
-36.0, 28-Jul-11,
-36.6, 29-Jul-11,
-37.0, 30-Jul-11,
-37.3, 31-Jul-11,
-38.3, 01-Aug-11,
-39.6, 02-Aug-11,
-39.6, 03-Aug-11,
-40.3, 04-Aug-11,
-42.0, 05-Aug-11,
-42.0, 06-Aug-11,
-43.0, 07-Aug-11,
-43.6, 08-Aug-11,
-42.6, 09-Aug-11,
-45.0, 10-Aug-11,
-45.6, 11-Aug-11,
-46.3, 12-Aug-11,
-47.3, 13-Aug-11,
-47.6, 14-Aug-11,
-48.3, 15-Aug-11,
-48.6, 16-Aug-11,
-48.9, 17-Aug-11,
-49.9, 18-Aug-11,
-50.3, 19-Aug-11,
-50.6, 20-Aug-11,
-51.3, 21-Aug-11,
-52.3, 22-Aug-11,
-52.9, 23-Aug-11,
-53.3, 24-Aug-11,
-54.3, 25-Aug-11,
-54.6, 26-Aug-11,
-55.3, 27-Aug-11,
-55.6, 28-Aug-11,
-56.3, 29-Aug-11,
-56.6, 30-Aug-11,
-56.9, 31-Aug-11,
-57.3, 01-Sep-11,
-57.6, 02-Sep-11,
-58.3, 03-Sep-11,
-58.6, 04-Sep-11,
-58.9, 05-Sep-11,
-59.6, 06-Sep-11,
-59.9, 07-Sep-11,
-60.6, 08-Sep-11,
-60.6, 09-Sep-11,
-60.9, 10-Sep-11,
-60.9, 11-Sep-11,
-61.9, 12-Sep-11,
-62.3, 13-Sep-11,
-62.6, 14-Sep-11,
-63.9, 15-Sep-11,
-62.6, 16-Sep-11,
-63.9, 17-Sep-11,
-64.3, 18-Sep-11,
-66.3, 19-Sep-11,
-66.6, 20-Sep-11,
-66.6, 21-Sep-11,
-66.6, 22-Sep-11,
-66.6, 23-Sep-11,
-66.3, 24-Sep-11,
-66.6, 25-Sep-11,
-66.6, 26-Sep-11,
-66.3, 27-Sep-11,
-66.6, 28-Sep-11,
-66.6, 29-Sep-11,
-66.6, 30-Sep-11,
-66.9, 01-Oct-11,
-66.6, 02-Oct-11,
-66.9, 03-Oct-11,
-66.6, 04-Oct-11,
-66.9, 05-Oct-11,
-66.6, 06-Oct-11,
-66.6, 07-Oct-11,
-64.3, 08-Oct-11,
-63.9, 09-Oct-11,
-63.3, 10-Oct-11,
-62.6, 11-Oct-11,
-61.9, 12-Oct-11,
-61.3, 13-Oct-11,
-60.9, 14-Oct-11,
-60.9, 15-Oct-11,
-60.3, 16-Oct-11,
-60.6, 17-Oct-11,
-60.3, 18-Oct-11,
-59.6, 19-Oct-11,
-59.6, 20-Oct-11,
-59.9, 21-Oct-11,
-59.6, 22-Oct-11,
-59.6, 23-Oct-11,
-59.3, 24-Oct-11,
-59.9, 25-Oct-11,
-59.9, 26-Oct-11,
-59.9, 27-Oct-11,
-59.3, 28-Oct-11,
-59.3, 29-Oct-11,
-59.3, 30-Oct-11,
-59.3, 31-Oct-11,
-58.9, 01-Nov-11,
-58.3, 02-Nov-11,
-57.3, 03-Nov-11,
-56.6, 04-Nov-11,
-55.9, 05-Nov-11,
-54.9, 06-Nov-11,
-54.9, 07-Nov-11,
-54.6, 08-Nov-11,
-53.9, 09-Nov-11,
-53.6, 10-Nov-11,
-53.3, 11-Nov-11,
-52.6, 12-Nov-11,
-51.9, 13-Nov-11,
-51.3, 14-Nov-11,
-50.6, 15-Nov-11,
-49.9, 16-Nov-11,
-47.9, 17-Nov-11,
-05.7, 18-Nov-11,
-04.0, 19-Nov-11,
-08.3, 20-Nov-11,
-10.0, 21-Nov-11,
+00.3, 22-Nov-11,
-01.3, 23-Nov-11,
-01.3, 24-Nov-11,
-02.0, 25-Nov-11,
-04.3, 26-Nov-11,
-05.3, 27-Nov-11,
-00.0, 28-Nov-11,
-02.0, 29-Nov-11,
-03.0, 30-Nov-11,
-05.3, 01-Dec-11,
-07.0, 02-Dec-11,
-08.0, 03-Dec-11,
-08.3, 04-Dec-11,
-08.6, 05-Dec-11,
-09.6, 06-Dec-11,
-10.0, 07-Dec-11,
-10.0, 08-Dec-11,
-10.3, 09-Dec-11,
-11.0, 10-Dec-11,
-10.6, 11-Dec-11,
-11.0, 12-Dec-11,
-12.6, 13-Dec-11,
-13.6, 14-Dec-11,
-09.6, 15-Dec-11,
-10.6, 16-Dec-11,
-10.6, 17-Dec-11,
-11.0, 18-Dec-11,
-09.3, 19-Dec-11,
-10.3, 20-Dec-11,
-10.6, 21-Dec-11,
-11.6, 22-Dec-11,
-13.3, 23-Dec-11,
-13.6, 24-Dec-11,
-14.0, 25-Dec-11,
-17.6, 26-Dec-11,
-05.7, 27-Dec-11,
-00.3, 28-Dec-11,
+00.3, 29-Dec-11,
+01.3, 30-Dec-11,
+01.0, 31-Dec-11,
-01.7, 01-Jan-12,
-03.0, 02-Jan-12,
-01.0, 03-Jan-12,
-03.0, 04-Jan-12,
-01.7, 05-Jan-12,
-03.3, 06-Jan-12,

Oak Creek Well 17 – 2011 Data Serial No. SB22D2 Data logged Jan 6, 2012

-33.1, 06:00:00, 13-Dec-10,
-34.8, 12:00:00, 13-Dec-10,
-35.8, 18:00:00, 13-Dec-10,
-35.8, 00:00:00, 14-Dec-10,
-32.1, 06:00:00, 14-Dec-10,
-31.8, 12:00:00, 14-Dec-10,
-34.8, 18:00:00, 14-Dec-10,
-36.8, 00:00:00, 15-Dec-10,
-38.5, 06:00:00, 15-Dec-10,
-38.1, 12:00:00, 15-Dec-10,
-40.8, 18:00:00, 15-Dec-10,
-42.5, 00:00:00, 16-Dec-10,
-43.5, 06:00:00, 16-Dec-10,
-42.5, 12:00:00, 16-Dec-10,
-43.1, 18:00:00, 16-Dec-10,
-43.8, 00:00:00, 17-Dec-10,
-44.1, 06:00:00, 17-Dec-10,
-43.8, 12:00:00, 17-Dec-10,
-43.8, 18:00:00, 17-Dec-10,
-43.5, 00:00:00, 18-Dec-10,
-42.5, 06:00:00, 18-Dec-10,
-41.8, 12:00:00, 18-Dec-10,
-42.5, 18:00:00, 18-Dec-10,
-42.8, 00:00:00, 19-Dec-10,
-43.5, 06:00:00, 19-Dec-10,
-42.8, 12:00:00, 19-Dec-10,
-43.1, 18:00:00, 19-Dec-10,
-43.1, 00:00:00, 20-Dec-10,
-42.8, 06:00:00, 20-Dec-10,
-42.1, 12:00:00, 20-Dec-10,
-42.5, 18:00:00, 20-Dec-10,
-42.8, 00:00:00, 21-Dec-10,
-43.5, 06:00:00, 21-Dec-10,
-41.8, 12:00:00, 21-Dec-10,
-42.8, 18:00:00, 21-Dec-10,
-43.8, 00:00:00, 22-Dec-10,
-43.1, 06:00:00, 22-Dec-10,
-42.1, 12:00:00, 22-Dec-10,
-43.5, 18:00:00, 22-Dec-10,
-43.5, 00:00:00, 23-Dec-10,
-43.1, 06:00:00, 23-Dec-10,
-42.1, 12:00:00, 23-Dec-10,
-42.5, 18:00:00, 23-Dec-10,
-42.8, 00:00:00, 24-Dec-10,
-43.1, 06:00:00, 24-Dec-10,
-42.1, 12:00:00, 24-Dec-10,
-42.1, 18:00:00, 24-Dec-10,
-42.8, 00:00:00, 25-Dec-10,
-43.1, 06:00:00, 25-Dec-10,
-41.8, 12:00:00, 25-Dec-10,
-42.1, 18:00:00, 25-Dec-10,
-42.5, 00:00:00, 26-Dec-10,
-42.8, 06:00:00, 26-Dec-10,
-41.5, 12:00:00, 26-Dec-10,
-42.5, 18:00:00, 26-Dec-10,
-43.1, 00:00:00, 27-Dec-10,
42.8, 06:00:00, 27-Dec-10,
-41.8, 12:00:00, 27-Dec-10,
-41.8, 18:00:00, 27-Dec-10,
-41.1, 00:00:00, 28-Dec-10,
-41.5, 06:00:00, 28-Dec-10,
-40.8, 12:00:00, 28-Dec-10,
-31.4, 18:00:00, 28-Dec-10,
-32.8, 00:00:00, 29-Dec-10,
-32.1, 06:00:00, 29-Dec-10,
-34.1, 12:00:00, 29-Dec-10,
-36.8, 18:00:00, 29-Dec-10,
-39.1, 00:00:00, 30-Dec-10,
-40.8, 06:00:00, 30-Dec-10,
-41.8, 12:00:00, 30-Dec-10,
-43.1, 18:00:00, 30-Dec-10,
-43.8, 00:00:00, 31-Dec-10,
-44.1, 06:00:00, 31-Dec-10,
43.8, 12:00:00, 31-Dec-10,
-44.1, 18:00:00, 31-Dec-10,
-44.1, 00:00:00, 01-Jan-11,
-44.5, 06:00:00, 01-Jan-11,
-44.5, 12:00:00, 01-Jan-11,
-44.1, 18:00:00, 01-Jan-11,
-44.5, 00:00:00, 02-Jan-11,
-44.8, 06:00:00, 02-Jan-11,
-44.5, 12:00:00, 02-Jan-11,
-44.8, 18:00:00, 02-Jan-11,
-44.8, 00:00:00, 03-Jan-11,
-45.2, 06:00:00, 03-Jan-11,
-45.2, 12:00:00, 03-Jan-11,
-44.8, 18:00:00, 03-Jan-11,
-45.2, 00:00:00, 04-Jan-11,
-45.2, 06:00:00, 04-Jan-11,
-44.8, 12:00:00, 04-Jan-11,
-44.8, 18:00:00, 04-Jan-11,
-44.8, 00:00:00, 05-Jan-11,
-44.8, 06:00:00, 05-Jan-11,
-43.8, 12:00:00, 05-Jan-11,
-43.8, 18:00:00, 05-Jan-11,
-43.8, 00:00:00, 06-Jan-11,
-44.5, 06:00:00, 06-Jan-11,
-44.1, 12:00:00, 06-Jan-11,
-44.5, 18:00:00, 06-Jan-11,
-44.8, 00:00:00, 07-Jan-11,
-44.5, 06:00:00, 07-Jan-11,
-39.8, 12:00:00, 07-Jan-11,
-39.5, 18:00:00, 07-Jan-11,
-41.1, 00:00:00, 08-Jan-11,
-43.1, 06:00:00, 08-Jan-11,
-41.5, 12:00:00, 08-Jan-11,
-42.1, 18:00:00, 08-Jan-11,
-43.1, 00:00:00, 09-Jan-11,
-43.8, 06:00:00, 09-Jan-11,
-41.1, 12:00:00, 09-Jan-11,
-41.8, 18:00:00, 09-Jan-11,
-43.5, 00:00:00, 10-Jan-11,
-44.1, 06:00:00, 10-Jan-11,
-43.5, 12:00:00, 10-Jan-11,
-43.5, 18:00:00, 10-Jan-11,
-44.1, 00:00:00, 11-Jan-11,
-44.1, 06:00:00, 11-Jan-11,
-43.8, 12:00:00, 11-Jan-11,
-44.1, 18:00:00, 11-Jan-11,
-43.8, 00:00:00, 12-Jan-11,
-41.1, 06:00:00, 12-Jan-11,
-39.8, 12:00:00, 12-Jan-11,
-38.5, 18:00:00, 12-Jan-11,
-38.5, 00:00:00, 13-Jan-11,
-37.8, 06:00:00, 13-Jan-11,
-37.1, 12:00:00, 13-Jan-11,
-38.1, 18:00:00, 13-Jan-11,
-38.8, 00:00:00, 14-Jan-11,
-38.8, 06:00:00, 14-Jan-11,
-38.1, 12:00:00, 14-Jan-11,
-38.8, 18:00:00, 14-Jan-11,
-39.5, 00:00:00, 15-Jan-11,
-39.8, 06:00:00, 15-Jan-11,
-38.1, 12:00:00, 15-Jan-11,
-36.1, 18:00:00, 15-Jan-11,
-36.1, 00:00:00, 16-Jan-11,
-32.8, 06:00:00, 16-Jan-11,
-31.1, 12:00:00, 16-Jan-11,
-29.8, 18:00:00, 16-Jan-11,
-34.1, 00:00:00, 17-Jan-11,
-37.1, 06:00:00, 17-Jan-11,
-36.8, 12:00:00, 17-Jan-11,
-40.5, 18:00:00, 17-Jan-11,
-41.1, 00:00:00, 18-Jan-11,
-41.1, 06:00:00, 18-Jan-11,
-40.1, 12:00:00, 18-Jan-11,
-39.8, 18:00:00, 18-Jan-11,
-41.1, 00:00:00, 19-Jan-11,
-42.1, 06:00:00, 19-Jan-11,
-41.8, 12:00:00, 19-Jan-11,
-42.8, 18:00:00, 19-Jan-11,
-43.5, 00:00:00, 20-Jan-11,
-43.8, 06:00:00, 20-Jan-11,
-42.5, 12:00:00, 20-Jan-11,
-41.8, 18:00:00, 20-Jan-11,
-43.1, 00:00:00, 21-Jan-11,
-42.8, 06:00:00, 21-Jan-11,
-42.1, 12:00:00, 21-Jan-11,
-40.1, 18:00:00, 21-Jan-11,
-40.8, 00:00:00, 22-Jan-11,
-40.8, 06:00:00, 22-Jan-11,
-40.5, 12:00:00, 22-Jan-11,
-40.5, 18:00:00, 22-Jan-11,
-41.8, 00:00:00, 23-Jan-11,
-42.8, 06:00:00, 23-Jan-11,
-40.1, 12:00:00, 23-Jan-11,
-40.8, 18:00:00, 23-Jan-11,
-41.5, 00:00:00, 24-Jan-11,
-41.8, 06:00:00, 24-Jan-11,
-40.1, 12:00:00, 24-Jan-11,
-41.8, 18:00:00, 24-Jan-11,
-41.8, 00:00:00, 25-Jan-11,
-43.5, 06:00:00, 25-Jan-11,
-39.5, 12:00:00, 25-Jan-11,
-41.8, 18:00:00, 25-Jan-11,
-43.5, 00:00:00, 26-Jan-11,
-43.1, 06:00:00, 26-Jan-11,
-41.8, 12:00:00, 26-Jan-11,
-41.1, 18:00:00, 26-Jan-11,
-42.1, 00:00:00, 27-Jan-11,
-43.5, 06:00:00, 27-Jan-11,
-41.1, 12:00:00, 27-Jan-11,
-42.1, 18:00:00, 27-Jan-11,
-43.8, 00:00:00, 28-Jan-11,
-44.1, 06:00:00, 28-Jan-11,
-40.8, 12:00:00, 28-Jan-11,
-40.1, 18:00:00, 28-Jan-11,
-40.8, 00:00:00, 29-Jan-11,
-41.1, 06:00:00, 29-Jan-11,
-38.8, 12:00:00, 29-Jan-11,
-41.5, 18:00:00, 29-Jan-11,
-42.1, 00:00:00, 30-Jan-11,
-42.1, 06:00:00, 30-Jan-11,
-40.1, 12:00:00, 30-Jan-11,
-42.5, 18:00:00, 30-Jan-11,
-43.1, 00:00:00, 31-Jan-11,
-43.8, 06:00:00, 31-Jan-11,
-40.8, 12:00:00, 31-Jan-11,
-40.8, 18:00:00, 31-Jan-11,
-42.5, 00:00:00, 01-Feb-11,
-43.1, 06:00:00, 01-Feb-11,
-42.8, 12:00:00, 01-Feb-11,
-43.8, 18:00:00, 01-Feb-11,
-44.8, 00:00:00, 02-Feb-11,
-45.2, 06:00:00, 02-Feb-11,
-42.5, 12:00:00, 02-Feb-11,
-44.1, 18:00:00, 02-Feb-11,
-44.8, 00:00:00, 03-Feb-11,
-45.2, 06:00:00, 03-Feb-11,
-42.5, 12:00:00, 03-Feb-11,
-43.5, 18:00:00, 03-Feb-11,
-44.1, 00:00:00, 04-Feb-11,
-44.1, 06:00:00, 04-Feb-11,
-41.8, 12:00:00, 04-Feb-11,
-41.5, 18:00:00, 04-Feb-11,
-41.8, 00:00:00, 05-Feb-11,
-41.5, 06:00:00, 05-Feb-11,
-40.5, 12:00:00, 05-Feb-11,
-40.5, 18:00:00, 05-Feb-11,
-40.8, 00:00:00, 06-Feb-11,
-42.5, 06:00:00, 06-Feb-11,
-40.1, 12:00:00, 06-Feb-11,
-40.1, 18:00:00, 06-Feb-11,
-41.8, 00:00:00, 07-Feb-11,
-42.1, 06:00:00, 07-Feb-11,
-40.1, 12:00:00, 07-Feb-11,
-42.1, 18:00:00, 07-Feb-11,
-42.5, 00:00:00, 08-Feb-11,
-42.8, 06:00:00, 08-Feb-11,
-41.5, 12:00:00, 08-Feb-11,
-42.5, 18:00:00, 08-Feb-11,
-44.1, 00:00:00, 09-Feb-11,
-44.8, 06:00:00, 09-Feb-11,
-44.8, 12:00:00, 09-Feb-11,
-43.8, 18:00:00, 09-Feb-11,
-44.8, 00:00:00, 10-Feb-11,
-45.2, 06:00:00, 10-Feb-11,
-43.1, 12:00:00, 10-Feb-11,
-43.8, 18:00:00, 10-Feb-11,
-44.8, 00:00:00, 11-Feb-11,
-44.8, 06:00:00, 11-Feb-11,
-42.8, 12:00:00, 11-Feb-11,
-42.5, 18:00:00, 11-Feb-11,
-43.5, 00:00:00, 12-Feb-11,
-43.5, 06:00:00, 12-Feb-11,
-42.1, 12:00:00, 12-Feb-11,
-41.8, 18:00:00, 12-Feb-11,
-41.5, 00:00:00, 13-Feb-11,
-41.1, 06:00:00, 13-Feb-11,
-39.8, 12:00:00, 13-Feb-11,
-41.5, 18:00:00, 13-Feb-11,
-41.5, 00:00:00, 14-Feb-11,
-42.1, 06:00:00, 14-Feb-11,
-39.5, 12:00:00, 14-Feb-11,
-40.1, 18:00:00, 14-Feb-11,
-39.1, 00:00:00, 15-Feb-11,
-37.5, 06:00:00, 15-Feb-11,
-34.4, 12:00:00, 15-Feb-11,
-35.1, 18:00:00, 15-Feb-11,
-38.1, 00:00:00, 16-Feb-11,
-40.8, 06:00:00, 16-Feb-11,
-35.8, 12:00:00, 16-Feb-11,
-40.5, 18:00:00, 16-Feb-11,
-41.8, 00:00:00, 17-Feb-11,
-43.1, 06:00:00, 17-Feb-11,
-39.8, 12:00:00, 17-Feb-11,
-39.8, 18:00:00, 17-Feb-11,
-43.1, 00:00:00, 18-Feb-11,
-43.8, 06:00:00, 18-Feb-11,
-40.1, 12:00:00, 18-Feb-11,
-41.1, 18:00:00, 18-Feb-11,
-42.8, 00:00:00, 19-Feb-11,
-43.5, 06:00:00, 19-Feb-11,
-42.1, 12:00:00, 19-Feb-11,
-39.1, 18:00:00, 19-Feb-11,
-41.5, 00:00:00, 20-Feb-11,
-42.5, 06:00:00, 20-Feb-11,
-38.5, 12:00:00, 20-Feb-11,
-40.1, 18:00:00, 20-Feb-11,
-41.1, 00:00:00, 21-Feb-11,
-42.5, 06:00:00, 21-Feb-11,
-39.8, 12:00:00, 21-Feb-11,
-40.8, 18:00:00, 21-Feb-11,
-42.1, 00:00:00, 22-Feb-11,
-42.8, 06:00:00, 22-Feb-11,
-39.8, 12:00:00, 22-Feb-11,
-40.8, 18:00:00, 22-Feb-11,
-42.5, 00:00:00, 23-Feb-11,
-43.5, 06:00:00, 23-Feb-11,
-40.8, 12:00:00, 23-Feb-11,
-41.1, 18:00:00, 23-Feb-11,
-43.1, 00:00:00, 24-Feb-11,

-43.8, 06:00:00, 24-Feb-11,
-40.5, 12:00:00, 24-Feb-11,
-41.1, 18:00:00, 24-Feb-11,
-43.1, 00:00:00, 25-Feb-11,--
43.8, 06:00:00, 25-Feb-11,
-42.8, 12:00:00, 25-Feb-11,
-43.1, 18:00:00, 25-Feb-11,
-44.1, 00:00:00, 26-Feb-11,
-45.5, 06:00:00, 26-Feb-11,
-42.8, 12:00:00, 26-Feb-11,
-43.1, 18:00:00, 26-Feb-11,
-43.5, 00:00:00, 27-Feb-11,
-43.5, 06:00:00, 27-Feb-11,
-40.5, 12:00:00, 27-Feb-11,
-39.8, 18:00:00, 27-Feb-11,
-40.1, 00:00:00, 28-Feb-11,
-40.5, 06:00:00, 28-Feb-11,
-36.1, 12:00:00, 28-Feb-11,
-29.8, 18:00:00, 28-Feb-11,
-30.1, 00:00:00, 01-Mar-11,
-30.4, 06:00:00, 01-Mar-11,
-31.8, 12:00:00, 01-Mar-11,
-34.4, 18:00:00, 01-Mar-11,
-37.8, 00:00:00, 02-Mar-11,
-36.5, 06:00:00, 02-Mar-11,
-37.5, 12:00:00, 02-Mar-11,
-37.8, 18:00:00, 02-Mar-11,
-40.8, 00:00:00, 03-Mar-11,
-41.1, 06:00:00, 03-Mar-11,
-37.5, 12:00:00, 03-Mar-11,
-39.8, 18:00:00, 03-Mar-11,
-40.5, 00:00:00, 04-Mar-11,
-40.8, 06:00:00, 04-Mar-11,
-38.1, 12:00:00, 04-Mar-11,
-38.5, 18:00:00, 04-Mar-11,
-33.4, 00:00:00, 05-Mar-11,
-36.5, 06:00:00, 05-Mar-11,
-36.8, 12:00:00, 05-Mar-11,
-38.8, 18:00:00, 05-Mar-11,
-41.8, 00:00:00, 06-Mar-11,
-42.5, 06:00:00, 06-Mar-11,
-40.5, 12:00:00, 06-Mar-11,
-40.1, 18:00:00, 06-Mar-11,
-42.1, 00:00:00, 07-Mar-11,
-42.5, 06:00:00, 07-Mar-11,
-38.5, 12:00:00, 07-Mar-11,
-40.5, 18:00:00, 07-Mar-11,
-41.5, 00:00:00, 08-Mar-11,
-40.5, 06:00:00, 08-Mar-11,
-37.1, 12:00:00, 08-Mar-11,
-40.1, 18:00:00, 08-Mar-11,
-39.8, 00:00:00, 09-Mar-11,
-39.8, 06:00:00, 09-Mar-11,
-37.1, 12:00:00, 09-Mar-11,
-40.1, 18:00:00, 09-Mar-11,
-40.5, 00:00:00, 10-Mar-11,
-39.8, 06:00:00, 10-Mar-11,
-36.5, 12:00:00, 10-Mar-11,
-39.1, 18:00:00, 10-Mar-11,
-41.5, 00:00:00, 11-Mar-11,
-42.1, 06:00:00, 11-Mar-11,
-38.5, 12:00:00, 11-Mar-11,
-40.1, 18:00:00, 11-Mar-11,
-41.5, 00:00:00, 12-Mar-11,
-41.8, 06:00:00, 12-Mar-11,
-40.1, 12:00:00, 12-Mar-11,
-39.1, 18:00:00, 12-Mar-11,
-39.8, 00:00:00, 13-Mar-11,
-39.8, 06:00:00, 13-Mar-11,
-38.8, 12:00:00, 13-Mar-11,
-37.5, 18:00:00, 13-Mar-11,
-39.1, 00:00:00, 14-Mar-11,
-40.5, 06:00:00, 14-Mar-11,
-36.5, 12:00:00, 14-Mar-11,
-40.5, 18:00:00, 14-Mar-11,
-40.5, 00:00:00, 15-Mar-11,
-40.1, 06:00:00, 15-Mar-11,
-38.8, 12:00:00, 15-Mar-11,
-40.5, 18:00:00, 15-Mar-11,
-39.5, 00:00:00, 16-Mar-11,
-39.5, 06:00:00, 16-Mar-11,
-33.1, 12:00:00, 16-Mar-11,
-32.8, 18:00:00, 16-Mar-11,
-35.5, 00:00:00, 17-Mar-11,
-38.1, 06:00:00, 17-Mar-11,
-36.5, 12:00:00, 17-Mar-11,
-38.5, 18:00:00, 17-Mar-11,
-40.1, 00:00:00, 18-Mar-11,
-41.1, 06:00:00, 18-Mar-11,
-39.8, 12:00:00, 18-Mar-11,
-39.8, 18:00:00, 18-Mar-11,
-41.8, 00:00:00, 19-Mar-11,
-42.1, 06:00:00, 19-Mar-11,
-37.1, 12:00:00, 19-Mar-11,
-39.8, 18:00:00, 19-Mar-11,
-41.5, 00:00:00, 20-Mar-11,
-42.1, 06:00:00, 20-Mar-11,
-38.1, 12:00:00, 20-Mar-11,
-38.8, 18:00:00, 20-Mar-11,
-40.8, 00:00:00, 21-Mar-11,
-40.8, 06:00:00, 21-Mar-11,
-37.8, 12:00:00, 21-Mar-11,
-39.5, 18:00:00, 21-Mar-11,
-41.8, 00:00:00, 22-Mar-11,
-42.5, 06:00:00, 22-Mar-11,
-37.5, 12:00:00, 22-Mar-11,
-40.5, 18:00:00, 22-Mar-11,
-42.5, 00:00:00, 23-Mar-11,
-43.5, 06:00:00, 23-Mar-11,
-38.1, 12:00:00, 23-Mar-11,
-39.1, 18:00:00, 23-Mar-11,
-41.1, 00:00:00, 24-Mar-11,
-41.5, 06:00:00, 24-Mar-11,
-37.5, 12:00:00, 24-Mar-11,
-37.5, 18:00:00, 24-Mar-11,
-41.5, 00:00:00, 25-Mar-11,
-41.8, 06:00:00, 25-Mar-11,
-38.5, 12:00:00, 25-Mar-11,
-38.5, 18:00:00, 25-Mar-11,
-40.8, 00:00:00, 26-Mar-11,
-40.8, 06:00:00, 26-Mar-11,
-36.5, 12:00:00, 26-Mar-11,
-40.1, 18:00:00, 26-Mar-11,
-41.1, 00:00:00, 27-Mar-11,
-41.8, 06:00:00, 27-Mar-11,
-38.8, 12:00:00, 27-Mar-11,
-39.1, 18:00:00, 27-Mar-11,
-41.5, 00:00:00, 28-Mar-11,
-42.1, 06:00:00, 28-Mar-11,
-36.8, 12:00:00, 28-Mar-11,
-39.8, 18:00:00, 28-Mar-11,
-40.5, 00:00:00, 29-Mar-11,
-40.1, 06:00:00, 29-Mar-11,
-38.8, 12:00:00, 29-Mar-11,
-38.1, 18:00:00, 29-Mar-11,
-37.8, 00:00:00, 30-Mar-11,
-38.5, 06:00:00, 30-Mar-11,
-36.1, 12:00:00, 30-Mar-11,
-39.1, 18:00:00, 30-Mar-11,
-39.8, 00:00:00, 31-Mar-11,
-39.5, 06:00:00, 31-Mar-11,
-37.1, 12:00:00, 31-Mar-11,
-38.5, 18:00:00, 31-Mar-11,
-40.5, 00:00:00, 01-Apr-11,
-41.5, 06:00:00, 01-Apr-11,
-38.1, 12:00:00, 01-Apr-11,
-40.5, 18:00:00, 01-Apr-11,
-41.5, 00:00:00, 02-Apr-11,
-42.1, 06:00:00, 02-Apr-11,
-39.8, 12:00:00, 02-Apr-11,
-39.8, 18:00:00, 02-Apr-11,
-42.8, 00:00:00, 03-Apr-11,
-43.1, 06:00:00, 03-Apr-11,
-37.8, 12:00:00, 03-Apr-11,
-40.1, 18:00:00, 03-Apr-11,
-41.1, 00:00:00, 04-Apr-11,
-41.5, 06:00:00, 04-Apr-11,
-40.1, 12:00:00, 04-Apr-11,
-39.5, 18:00:00, 04-Apr-11,
-40.1, 00:00:00, 05-Apr-11,
-41.8, 06:00:00, 05-Apr-11,
-38.5, 12:00:00, 05-Apr-11,
-39.5, 18:00:00, 05-Apr-11,
-41.8, 00:00:00, 06-Apr-11,
-41.8, 06:00:00, 06-Apr-11,
-40.1, 12:00:00, 06-Apr-11,
-41.1, 18:00:00, 06-Apr-11,
-42.5, 00:00:00, 07-Apr-11,
-42.8, 06:00:00, 07-Apr-11,
-40.8, 12:00:00, 07-Apr-11,
-41.1, 18:00:00, 07-Apr-11,
-43.1, 00:00:00, 08-Apr-11,
-43.8, 06:00:00, 08-Apr-11,
-40.8, 12:00:00, 08-Apr-11,
-41.1, 18:00:00, 08-Apr-11,
-42.5, 00:00:00, 09-Apr-11,
-43.1, 06:00:00, 09-Apr-11,
-39.1, 12:00:00, 09-Apr-11,
-39.1, 18:00:00, 09-Apr-11,
-41.5, 00:00:00, 10-Apr-11,
-42.1, 06:00:00, 10-Apr-11,
-38.8, 12:00:00, 10-Apr-11,
-40.1, 18:00:00, 10-Apr-11,
-41.1, 00:00:00, 11-Apr-11,
-42.1, 06:00:00, 11-Apr-11,
-40.5, 12:00:00, 11-Apr-11,
-40.1, 18:00:00, 11-Apr-11,
-42.8, 00:00:00, 12-Apr-11,
-43.5, 06:00:00, 12-Apr-11,
-39.5, 12:00:00, 12-Apr-11,
-40.1, 18:00:00, 12-Apr-11,
-41.8, 00:00:00, 13-Apr-11,
-42.5, 06:00:00, 13-Apr-11,
-39.5, 12:00:00, 13-Apr-11,
-40.1, 18:00:00, 13-Apr-11,
-41.8, 00:00:00, 14-Apr-11,
-42.5, 06:00:00, 14-Apr-11,
-38.8, 12:00:00, 14-Apr-11,
-39.8, 18:00:00, 14-Apr-11,
-40.5, 00:00:00, 15-Apr-11,
-41.1, 06:00:00, 15-Apr-11,
-39.5, 12:00:00, 15-Apr-11,
-37.5, 18:00:00, 15-Apr-11,
-38.1, 00:00:00, 16-Apr-11,
-38.8, 06:00:00, 16-Apr-11,
-37.1, 12:00:00, 16-Apr-11,
-37.5, 18:00:00, 16-Apr-11,
-39.1, 00:00:00, 17-Apr-11,
-41.8, 06:00:00, 17-Apr-11,
-38.1, 12:00:00, 17-Apr-11,
-40.1, 18:00:00, 17-Apr-11,
-42.1, 00:00:00, 18-Apr-11,
-43.1, 06:00:00, 18-Apr-11,
-40.1, 12:00:00, 18-Apr-11,
-39.5, 18:00:00, 18-Apr-11,
-43.1, 00:00:00, 19-Apr-11,
-43.8, 06:00:00, 19-Apr-11,
-40.1, 12:00:00, 19-Apr-11,
-41.1, 18:00:00, 19-Apr-11,
-43.5, 00:00:00, 20-Apr-11,
-43.8, 06:00:00, 20-Apr-11,
-40.5, 12:00:00, 20-Apr-11,
-40.5, 18:00:00, 20-Apr-11,
-42.1, 00:00:00, 21-Apr-11,
-42.8, 06:00:00, 21-Apr-11,
41.1, 12:00:00, 21-Apr-11,
41.1, 18:00:00, 21-Apr-11,
43.5, 00:00:00, 22-Apr-11,
44.1, 06:00:00, 22-Apr-11,
-40.8, 12:00:00, 22-Apr-11,
-40.8, 18:00:00, 22-Apr-11,
-43.8, 00:00:00, 23-Apr-11,
-44.1, 06:00:00, 23-Apr-11,
-40.8, 12:00:00, 23-Apr-11,
-41.1, 18:00:00, 23-Apr-11,
-41.8, 00:00:00, 24-Apr-11,
-42.5, 06:00:00, 24-Apr-11,
-39.8, 12:00:00, 24-Apr-11,
-40.5, 18:00:00, 24-Apr-11,
-41.5, 00:00:00, 25-Apr-11,
-40.8, 06:00:00, 25-Apr-11,
-39.8, 12:00:00, 25-Apr-11,
-40.8, 18:00:00, 25-Apr-11,
-42.5, 00:00:00, 26-Apr-11,
-42.5, 06:00:00, 26-Apr-11,
-39.5, 12:00:00, 26-Apr-11,
-40.8, 18:00:00, 26-Apr-11,
-42.1, 00:00:00, 27-Apr-11,
-43.1, 06:00:00, 27-Apr-11,
-39.8, 12:00:00, 27-Apr-11,
-41.1, 18:00:00, 27-Apr-11,
-42.5, 00:00:00, 28-Apr-11,
-42.8, 06:00:00, 28-Apr-11,
-41.5, 12:00:00, 28-Apr-11,
-41.5, 18:00:00, 28-Apr-11,
-43.1, 00:00:00, 29-Apr-11,
-43.1, 06:00:00, 29-Apr-11,
-40.5, 12:00:00, 29-Apr-11,
-40.5, 18:00:00, 29-Apr-11,
-42.1, 00:00:00, 30-Apr-11,
-42.5, 06:00:00, 30-Apr-11,
-39.5, 12:00:00, 30-Apr-11,
-41.1, 18:00:00, 30-Apr-11,
-43.5, 00:00:00, 01-May-11,
-43.8, 06:00:00, 01-May-11,
-39.8, 12:00:00, 01-May-11,
-40.5, 18:00:00, 01-May-11,
-42.1, 00:00:00, 02-May-11,
-41.8, 06:00:00, 02-May-11,
-40.5, 12:00:00, 02-May-11,
-40.1, 18:00:00, 02-May-11,
-42.1, 00:00:00, 03-May-11,
-43.1, 06:00:00, 03-May-11,
-40.1, 12:00:00, 03-May-11,
-40.8, 18:00:00, 03-May-11,
-43.5, 00:00:00, 04-May-11,
-44.1, 06:00:00, 04-May-11,
-40.5, 12:00:00, 04-May-11,
-40.8, 18:00:00, 04-May-11,
-43.8, 00:00:00, 05-May-11,
-43.8, 06:00:00, 05-May-11,
-41.5, 12:00:00, 05-May-11,
-40.1, 18:00:00, 05-May-11,
-41.1, 00:00:00, 06-May-11,
-41.5, 06:00:00, 06-May-11,
-40.1, 12:00:00, 06-May-11,
-41.1, 18:00:00, 06-May-11,
-42.1, 00:00:00, 07-May-11,
-42.1, 06:00:00, 07-May-11,
-39.8, 12:00:00, 07-May-11,
-40.8, 18:00:00, 07-May-11,
-42.5, 00:00:00, 08-May-11,
-42.5, 06:00:00, 08-May-11,
-40.5, 12:00:00, 08-May-11,
-41.1, 18:00:00, 08-May-11,
-42.5, 00:00:00, 09-May-11,
-42.8, 06:00:00, 09-May-11,
-39.8, 12:00:00, 09-May-11,
-40.5, 18:00:00, 09-May-11,
-41.1, 00:00:00, 10-May-11,
-41.1, 06:00:00, 10-May-11,
-39.8, 12:00:00, 10-May-11,
-40.8, 18:00:00, 10-May-11,
-42.5, 00:00:00, 11-May-11,
-42.5, 06:00:00, 11-May-11,
-40.1, 12:00:00, 11-May-11,
-41.8, 18:00:00, 11-May-11,
-42.5, 00:00:00, 12-May-11,
-43.5, 06:00:00, 12-May-11,
-39.8, 12:00:00, 12-May-11,
-40.5, 18:00:00, 12-May-11,
-42.8, 00:00:00, 13-May-11,

-43.1, 06:00:00, 13-May-11,
-39.8, 12:00:00, 13-May-11,
-41.1, 18:00:00, 13-May-11,
-41.8, 00:00:00, 14-May-11,
-42.8, 06:00:00, 14-May-11,
-40.5, 12:00:00, 14-May-11,
-40.8, 18:00:00, 14-May-11,
-42.1, 00:00:00, 15-May-11,
-42.1, 06:00:00, 15-May-11,
-40.1, 12:00:00, 15-May-11,
-41.5, 18:00:00, 15-May-11,
-42.8, 00:00:00, 16-May-11,
-43.5, 06:00:00, 16-May-11,
-40.1, 12:00:00, 16-May-11,
-41.1, 18:00:00, 16-May-11,
-43.1, 00:00:00, 17-May-11,
-43.8, 06:00:00, 17-May-11,
-40.5, 12:00:00, 17-May-11,
-41.5, 18:00:00, 17-May-11,
-41.8, 00:00:00, 18-May-11,
-41.8, 06:00:00, 18-May-11,
-39.8, 12:00:00, 18-May-11,
-40.8, 18:00:00, 18-May-11,
-42.8, 00:00:00, 19-May-11,
-43.1, 06:00:00, 19-May-11,
-40.5, 12:00:00, 19-May-11,
-41.5, 18:00:00, 19-May-11,
-44.1, 00:00:00, 20-May-11,
-44.5, 06:00:00, 20-May-11,
-41.5, 12:00:00, 20-May-11,
-42.1, 18:00:00, 20-May-11,
-42.5, 00:00:00, 21-May-11,
-42.5, 06:00:00, 21-May-11,
-41.1, 12:00:00, 21-May-11,
-42.8, 18:00:00, 21-May-11,
-43.8, 00:00:00, 22-May-11,
-45.8, 06:00:00, 22-May-11,
-41.5, 12:00:00, 22-May-11,
-45.2, 18:00:00, 22-May-11,
-45.8, 00:00:00, 23-May-11,
-47.8, 06:00:00, 23-May-11,
-44.1, 12:00:00, 23-May-11,
-46.8, 18:00:00, 23-May-11,
-49.8, 00:00:00, 24-May-11,
-49.5, 06:00:00, 24-May-11,
-44.8, 12:00:00, 24-May-11,
-47.8, 18:00:00, 24-May-11,
-48.5, 00:00:00, 25-May-11,
-43.5, 06:00:00, 25-May-11,
-40.1, 12:00:00, 25-May-11,
-40.5, 18:00:00, 25-May-11,
-43.8, 00:00:00, 26-May-11,
-43.5, 06:00:00, 26-May-11,
-39.8, 12:00:00, 26-May-11,
-41.1, 18:00:00, 26-May-11,
-42.1, 00:00:00, 27-May-11,
-42.1, 06:00:00, 27-May-11,
-39.8, 12:00:00, 27-May-11,
-40.1, 18:00:00, 27-May-11,
-42.1, 00:00:00, 28-May-11,
-42.5, 06:00:00, 28-May-11,
-39.5, 12:00:00, 28-May-11,
-41.1, 18:00:00, 28-May-11,
-42.5, 00:00:00, 29-May-11,
-42.8, 06:00:00, 29-May-11,
-40.5, 12:00:00, 29-May-11,
-40.1, 18:00:00, 29-May-11,
-41.8, 00:00:00, 30-May-11,
-41.8, 06:00:00, 30-May-11,
-39.1, 12:00:00, 30-May-11,
-40.5, 18:00:00, 30-May-11,
-41.8, 00:00:00, 31-May-11,
-41.8, 06:00:00, 31-May-11,
-39.1, 12:00:00, 31-May-11,
-40.5, 18:00:00, 31-May-11,
-41.5, 00:00:00, 01-Jun-11,
-41.8, 06:00:00, 01-Jun-11,
-39.5, 12:00:00, 01-Jun-11,

-40.1, 18:00:00, 01-Jun-11,
-41.8, 00:00:00, 02-Jun-11,
-41.8, 06:00:00, 02-Jun-11,
-39.1, 12:00:00, 02-Jun-11,
-40.1, 18:00:00, 02-Jun-11,
-42.1, 00:00:00, 03-Jun-11,
-42.5, 06:00:00, 03-Jun-11,
-39.5, 12:00:00, 03-Jun-11,
-39.8, 18:00:00, 03-Jun-11,
-42.1, 00:00:00, 04-Jun-11,
-41.8, 06:00:00, 04-Jun-11,
-37.8, 12:00:00, 04-Jun-11,
-39.5, 18:00:00, 04-Jun-11,
-40.5, 00:00:00, 05-Jun-11,
-40.1, 06:00:00, 05-Jun-11,
-39.5, 12:00:00, 05-Jun-11,
-39.8, 18:00:00, 05-Jun-11,
-41.1, 00:00:00, 06-Jun-11,
-41.1, 06:00:00, 06-Jun-11,
-39.5, 12:00:00, 06-Jun-11,
-39.8, 18:00:00, 06-Jun-11,
-42.1, 00:00:00, 07-Jun-11,
-43.8, 06:00:00, 07-Jun-11,
-40.8, 12:00:00, 07-Jun-11,
-41.8, 18:00:00, 07-Jun-11,
-46.2, 00:00:00, 08-Jun-11,
-46.2, 06:00:00, 08-Jun-11,
-43.1, 12:00:00, 08-Jun-11,
-45.2, 18:00:00, 08-Jun-11,
-48.5, 00:00:00, 09-Jun-11,
-48.5, 06:00:00, 09-Jun-11,
-43.1, 12:00:00, 09-Jun-11,
-46.2, 18:00:00, 09-Jun-11,
-49.5, 00:00:00, 10-Jun-11,
-48.5, 06:00:00, 10-Jun-11,
-45.8, 12:00:00, 10-Jun-11,
-47.2, 18:00:00, 10-Jun-11,
-49.8, 00:00:00, 11-Jun-11,
-48.5, 06:00:00, 11-Jun-11,
-47.2, 12:00:00, 11-Jun-11,
-48.2, 18:00:00, 11-Jun-11,
-53.8, 00:00:00, 12-Jun-11,
-53.5, 06:00:00, 12-Jun-11,
-48.8, 12:00:00, 12-Jun-11,
-46.8, 18:00:00, 12-Jun-11,
-43.8, 00:00:00, 13-Jun-11,
-42.8, 06:00:00, 13-Jun-11,
-42.5, 12:00:00, 13-Jun-11,
-46.2, 18:00:00, 13-Jun-11,
-48.2, 00:00:00, 14-Jun-11,
-47.8, 06:00:00, 14-Jun-11,
-46.5, 12:00:00, 14-Jun-11,
-50.2, 18:00:00, 14-Jun-11,
-52.2, 00:00:00, 15-Jun-11,
-52.8, 06:00:00, 15-Jun-11,
-49.8, 12:00:00, 15-Jun-11,
-52.8, 18:00:00, 15-Jun-11,
-56.5, 00:00:00, 16-Jun-11,
-55.9, 06:00:00, 16-Jun-11,
-51.2, 12:00:00, 16-Jun-11,
-55.2, 18:00:00, 16-Jun-11,
-59.2, 00:00:00, 17-Jun-11,
-58.9, 06:00:00, 17-Jun-11,
-52.5, 12:00:00, 17-Jun-11,
-57.2, 18:00:00, 17-Jun-11,
-61.5, 00:00:00, 18-Jun-11,
-60.2, 06:00:00, 18-Jun-11,
-57.2, 12:00:00, 18-Jun-11,
-49.8, 18:00:00, 18-Jun-11,
-52.2, 00:00:00, 19-Jun-11,
-51.8, 06:00:00, 19-Jun-11,
-47.8, 12:00:00, 19-Jun-11,
-53.5, 18:00:00, 19-Jun-11,
-55.9, 00:00:00, 20-Jun-11,
-54.5, 06:00:00, 20-Jun-11,
-51.2, 12:00:00, 20-Jun-11,
-56.5, 18:00:00, 20-Jun-11,
-61.2, 00:00:00, 21-Jun-11,

-60.9, 06:00:00, 21-Jun-11,
-53.5, 12:00:00, 21-Jun-11,
-57.2, 18:00:00, 21-Jun-11,
-62.5, 00:00:00, 22-Jun-11,
-62.2, 06:00:00, 22-Jun-11,
-57.2, 12:00:00, 22-Jun-11,
-60.9, 18:00:00, 22-Jun-11,
-62.5, 00:00:00, 23-Jun-11,
-62.2, 06:00:00, 23-Jun-11,
-60.2, 12:00:00, 23-Jun-11,
-61.5, 18:00:00, 23-Jun-11,
-64.9, 00:00:00, 24-Jun-11,
-64.6, 06:00:00, 24-Jun-11,
-60.2, 12:00:00, 24-Jun-11,
-63.2, 18:00:00, 24-Jun-11,
-66.2, 00:00:00, 25-Jun-11,
-65.9, 06:00:00, 25-Jun-11,
-60.5, 12:00:00, 25-Jun-11,
-64.2, 18:00:00, 25-Jun-11,
-67.2, 00:00:00, 26-Jun-11,
-66.9, 06:00:00, 26-Jun-11,
-61.5, 12:00:00, 26-Jun-11,
-64.9, 18:00:00, 26-Jun-11,
-67.2, 00:00:00, 27-Jun-11,
-66.6, 06:00:00, 27-Jun-11,
-63.5, 12:00:00, 27-Jun-11,
-66.2, 18:00:00, 27-Jun-11,
-66.2, 00:00:00, 28-Jun-11,
-65.2, 06:00:00, 28-Jun-11,
-62.2, 12:00:00, 28-Jun-11,
-62.9, 18:00:00, 28-Jun-11,
-64.6, 00:00:00, 29-Jun-11,
-64.2, 06:00:00, 29-Jun-11,
-63.2, 12:00:00, 29-Jun-11,
-64.9, 18:00:00, 29-Jun-11,
-66.2, 00:00:00, 30-Jun-11,
-65.9, 06:00:00, 30-Jun-11,
-63.9, 12:00:00, 30-Jun-11,
-65.2, 18:00:00, 30-Jun-11,
-68.6, 00:00:00, 01-Jul-11,
-67.9, 06:00:00, 01-Jul-11,
-63.2, 12:00:00, 01-Jul-11,
-66.9, 18:00:00, 01-Jul-11,
-69.2, 00:00:00, 02-Jul-11,
-68.6, 06:00:00, 02-Jul-11,
-64.9, 12:00:00, 02-Jul-11,
-68.9, 18:00:00, 02-Jul-11,
-70.6, 00:00:00, 03-Jul-11,
-70.2, 06:00:00, 03-Jul-11,
-66.6, 12:00:00, 03-Jul-11,
-67.9, 18:00:00, 03-Jul-11,
-70.6, 00:00:00, 04-Jul-11,
-69.9, 06:00:00, 04-Jul-11,
-66.6, 12:00:00, 04-Jul-11,
-69.6, 18:00:00, 04-Jul-11,
-71.2, 00:00:00, 05-Jul-11,
-70.6, 06:00:00, 05-Jul-11,
-67.6, 12:00:00, 05-Jul-11,
-70.2, 18:00:00, 05-Jul-11,
-71.6, 00:00:00, 06-Jul-11,
-70.9, 06:00:00, 06-Jul-11,
-68.6, 12:00:00, 06-Jul-11,
-70.9, 18:00:00, 06-Jul-11,
-72.2, 00:00:00, 07-Jul-11,
-71.9, 06:00:00, 07-Jul-11,
-71.9, 12:00:00, 07-Jul-11,
-71.2, 18:00:00, 07-Jul-11,
-72.6, 00:00:00, 08-Jul-11,
-71.6, 06:00:00, 08-Jul-11,
-69.2, 12:00:00, 08-Jul-11,
-71.6, 18:00:00, 08-Jul-11,
-72.6, 00:00:00, 09-Jul-11,
-71.9, 06:00:00, 09-Jul-11,
-70.2, 12:00:00, 09-Jul-11,
-72.2, 18:00:00, 09-Jul-11,
-73.2, 00:00:00, 10-Jul-11,
-72.2, 06:00:00, 10-Jul-11,
-70.6, 12:00:00, 10-Jul-11,

-73.6, 18:00:00, 10-Jul-11,
-73.9, 00:00:00, 11-Jul-11,
-73.2, 06:00:00, 11-Jul-11,
-72.6, 12:00:00, 11-Jul-11,
-72.9, 18:00:00, 11-Jul-11,
-73.2, 00:00:00, 12-Jul-11,
-72.9, 06:00:00, 12-Jul-11,
-72.2, 12:00:00, 12-Jul-11,
-72.6, 18:00:00, 12-Jul-11,
-72.6, 00:00:00, 13-Jul-11,
-71.9, 06:00:00, 13-Jul-11,
-70.9, 12:00:00, 13-Jul-11,
-71.9, 18:00:00, 13-Jul-11,
-72.2, 00:00:00, 14-Jul-11,
-71.6, 06:00:00, 14-Jul-11,
-70.9, 12:00:00, 14-Jul-11,
-72.9, 18:00:00, 14-Jul-11,
-73.2, 00:00:00, 15-Jul-11,
-71.9, 06:00:00, 15-Jul-11,
-69.2, 12:00:00, 15-Jul-11,
-73.6, 18:00:00, 15-Jul-11,
-73.2, 00:00:00, 16-Jul-11,
-72.6, 06:00:00, 16-Jul-11,
-69.9, 12:00:00, 16-Jul-11,
-71.9, 18:00:00, 16-Jul-11,
-72.6, 00:00:00, 17-Jul-11,
-71.6, 06:00:00, 17-Jul-11,
-71.2, 12:00:00, 17-Jul-11,
-70.2, 18:00:00, 17-Jul-11,
-70.6, 00:00:00, 18-Jul-11,
-69.9, 06:00:00, 18-Jul-11,
-69.2, 12:00:00, 18-Jul-11,
-68.9, 18:00:00, 18-Jul-11,
-69.2, 00:00:00, 19-Jul-11,
-69.9, 06:00:00, 19-Jul-11,
-67.2, 12:00:00, 19-Jul-11,
-68.6, 18:00:00, 19-Jul-11,
-69.6, 00:00:00, 20-Jul-11,
-68.9, 06:00:00, 20-Jul-11,
-67.6, 12:00:00, 20-Jul-11,
-70.2, 18:00:00, 20-Jul-11,
-70.6, 00:00:00, 21-Jul-11,
-69.9, 06:00:00, 21-Jul-11,
-67.6, 12:00:00, 21-Jul-11,
-68.2, 18:00:00, 21-Jul-11,
-69.9, 00:00:00, 22-Jul-11,
-69.9, 06:00:00, 22-Jul-11,
-67.9, 12:00:00, 22-Jul-11,
-71.9, 18:00:00, 22-Jul-11,
-72.2, 00:00:00, 23-Jul-11,
-71.2, 06:00:00, 23-Jul-11,
-68.2, 12:00:00, 23-Jul-11,
-72.6, 18:00:00, 23-Jul-11,
-73.2, 00:00:00, 24-Jul-11,
-71.9, 06:00:00, 24-Jul-11,
-69.6, 12:00:00, 24-Jul-11,
-74.3, 18:00:00, 24-Jul-11,
-74.3, 00:00:00, 25-Jul-11,
-73.2, 06:00:00, 25-Jul-11,
-71.9, 12:00:00, 25-Jul-11,
-72.9, 18:00:00, 25-Jul-11,
-73.6, 00:00:00, 26-Jul-11,
-72.9, 06:00:00, 26-Jul-11,
-71.2, 12:00:00, 26-Jul-11,
-74.3, 18:00:00, 26-Jul-11,
-74.6, 00:00:00, 27-Jul-11,
-73.6, 06:00:00, 27-Jul-11,
-71.6, 12:00:00, 27-Jul-11,
-76.6, 18:00:00, 27-Jul-11,
-74.9, 00:00:00, 28-Jul-11,
-73.9, 06:00:00, 28-Jul-11,
-71.6, 12:00:00, 28-Jul-11,
-76.3, 18:00:00, 28-Jul-11,
-75.3, 00:00:00, 29-Jul-11,
-74.3, 06:00:00, 29-Jul-11,
-72.2, 12:00:00, 29-Jul-11,
-76.9, 18:00:00, 29-Jul-11,
-75.6, 00:00:00, 30-Jul-11,

-74.6, 06:00:00, 30-Jul-11,
-73.2, 12:00:00, 30-Jul-11,
-77.3, 18:00:00, 30-Jul-11,
-76.6, 00:00:00, 31-Jul-11,
-74.9, 06:00:00, 31-Jul-11,
-74.9, 12:00:00, 31-Jul-11,
-77.9, 18:00:00, 31-Jul-11,
-77.6, 00:00:00, 01-Aug-11,
-75.3, 06:00:00, 01-Aug-11,
-76.6, 12:00:00, 01-Aug-11,
-77.9, 18:00:00, 01-Aug-11,
-78.3, 00:00:00, 02-Aug-11,
-75.6, 06:00:00, 02-Aug-11,
-76.3, 12:00:00, 02-Aug-11,
-77.9, 18:00:00, 02-Aug-11,
-78.3, 00:00:00, 03-Aug-11,
-75.6, 06:00:00, 03-Aug-11,
-77.3, 12:00:00, 03-Aug-11,
-77.9, 18:00:00, 03-Aug-11,
-78.3, 00:00:00, 04-Aug-11,
-76.6, 06:00:00, 04-Aug-11,
-77.6, 12:00:00, 04-Aug-11,
-78.3, 18:00:00, 04-Aug-11,
-78.3, 00:00:00, 05-Aug-11,
-77.9, 06:00:00, 05-Aug-11,
-77.6, 12:00:00, 05-Aug-11,
-78.3, 18:00:00, 05-Aug-11,
-78.3, 00:00:00, 06-Aug-11,
-77.3, 06:00:00, 06-Aug-11,
-77.9, 12:00:00, 06-Aug-11,
-78.3, 18:00:00, 06-Aug-11,
-78.6, 00:00:00, 07-Aug-11,
-77.9, 06:00:00, 07-Aug-11,
-77.9, 12:00:00, 07-Aug-11,
-78.3, 18:00:00, 07-Aug-11,
-78.6, 00:00:00, 08-Aug-11,
-78.3, 06:00:00, 08-Aug-11,
-77.6, 12:00:00, 08-Aug-11,
-78.3, 18:00:00, 08-Aug-11,
-77.9, 00:00:00, 09-Aug-11,
-76.3, 06:00:00, 09-Aug-11,
-77.9, 12:00:00, 09-Aug-11,
-78.3, 18:00:00, 09-Aug-11,
-78.6, 00:00:00, 10-Aug-11,
-78.3, 06:00:00, 10-Aug-11,
-77.9, 12:00:00, 10-Aug-11,
-78.3, 18:00:00, 10-Aug-11,
-78.6, 00:00:00, 11-Aug-11,
-78.3, 06:00:00, 11-Aug-11,
-78.3, 12:00:00, 11-Aug-11,
-78.3, 18:00:00, 11-Aug-11,
-78.6, 00:00:00, 12-Aug-11,
-78.6, 06:00:00, 12-Aug-11,
-78.3, 12:00:00, 12-Aug-11,
-78.6, 18:00:00, 12-Aug-11,
-78.6, 00:00:00, 13-Aug-11,
-78.6, 06:00:00, 13-Aug-11,
-78.6, 12:00:00, 13-Aug-11,
-78.6, 18:00:00, 13-Aug-11,
-78.6, 00:00:00, 14-Aug-11,
-78.6, 06:00:00, 14-Aug-11,
-78.6, 12:00:00, 14-Aug-11,
-78.6, 18:00:00, 14-Aug-11,
-78.6, 00:00:00, 15-Aug-11,
-78.6, 06:00:00, 15-Aug-11,
-78.6, 12:00:00, 15-Aug-11,
-78.6, 18:00:00, 15-Aug-11,
-78.6, 00:00:00, 16-Aug-11,
-78.6, 06:00:00, 16-Aug-11,
-78.6, 12:00:00, 16-Aug-11,
-78.6, 18:00:00, 16-Aug-11,
-78.6, 00:00:00, 17-Aug-11,
-78.6, 06:00:00, 17-Aug-11,
-77.6, 12:00:00, 17-Aug-11,
-78.3, 18:00:00, 17-Aug-11,
-78.6, 00:00:00, 18-Aug-11,
-78.3, 06:00:00, 18-Aug-11,
-78.3, 12:00:00, 18-Aug-11,
-78.3, 18:00:00, 18-Aug-11,
-78.6, 00:00:00, 19-Aug-11,
-78.6, 06:00:00, 19-Aug-11,
-78.3, 12:00:00, 19-Aug-11,
-78.3, 18:00:00, 19-Aug-11,
-78.6, 00:00:00, 20-Aug-11,
-78.6, 06:00:00, 20-Aug-11,
-78.3, 12:00:00, 20-Aug-11,
-78.3, 18:00:00, 20-Aug-11,
-78.6, 00:00:00, 21-Aug-11,
-78.6, 06:00:00, 21-Aug-11,
-78.3, 12:00:00, 21-Aug-11,
-78.3, 18:00:00, 21-Aug-11,
-78.6, 00:00:00, 22-Aug-11,
-78.6, 06:00:00, 22-Aug-11,
-78.3, 12:00:00, 22-Aug-11,
-78.3, 18:00:00, 22-Aug-11,
-78.6, 00:00:00, 23-Aug-11,
-78.6, 06:00:00, 23-Aug-11,
-78.3, 12:00:00, 23-Aug-11,
-78.3, 18:00:00, 23-Aug-11,
-78.6, 00:00:00, 24-Aug-11,
-78.6, 06:00:00, 24-Aug-11,
-78.3, 12:00:00, 24-Aug-11,
-78.3, 18:00:00, 24-Aug-11,
-78.6, 00:00:00, 25-Aug-11,
-78.6, 06:00:00, 25-Aug-11,
-78.3, 12:00:00, 25-Aug-11,
-78.3, 18:00:00, 25-Aug-11,
-78.6, 00:00:00, 26-Aug-11,
-78.6, 06:00:00, 26-Aug-11,
-78.3, 12:00:00, 26-Aug-11,
-78.3, 18:00:00, 26-Aug-11,
-78.6, 00:00:00, 27-Aug-11,
-78.6, 06:00:00, 27-Aug-11,
-78.3, 12:00:00, 27-Aug-11,
-78.3, 18:00:00, 27-Aug-11,
-78.6, 00:00:00, 28-Aug-11,
-78.6, 06:00:00, 28-Aug-11,
-78.3, 12:00:00, 28-Aug-11,
-78.3, 18:00:00, 28-Aug-11,
-78.6, 00:00:00, 29-Aug-11,
-78.6, 06:00:00, 29-Aug-11,
-78.6, 12:00:00, 29-Aug-11,
-78.6, 18:00:00, 29-Aug-11,
-78.6, 00:00:00, 30-Aug-11,
-78.6, 06:00:00, 30-Aug-11,
-78.6, 12:00:00, 30-Aug-11,
-78.6, 18:00:00, 30-Aug-11,
-78.6, 00:00:00, 31-Aug-11,
-78.6, 06:00:00, 31-Aug-11,
-78.6, 12:00:00, 31-Aug-11,
-78.6, 18:00:00, 31-Aug-11,
-78.6, 00:00:00, 01-Sep-11,
-78.6, 06:00:00, 01-Sep-11,
-78.3, 12:00:00, 01-Sep-11,
-78.6, 18:00:00, 01-Sep-11,
-78.6, 00:00:00, 02-Sep-11,
-78.6, 06:00:00, 02-Sep-11,
-78.6, 12:00:00, 02-Sep-11,
-78.6, 18:00:00, 02-Sep-11,
-78.6, 00:00:00, 03-Sep-11,
-78.3, 06:00:00, 03-Sep-11,
-78.3, 12:00:00, 03-Sep-11,
-78.3, 18:00:00, 03-Sep-11,
-78.6, 00:00:00, 04-Sep-11,
-78.6, 06:00:00, 04-Sep-11,
-78.3, 12:00:00, 04-Sep-11,
-78.3, 18:00:00, 04-Sep-11,
-78.6, 00:00:00, 05-Sep-11,
-78.6, 06:00:00, 05-Sep-11,
-78.3, 12:00:00, 05-Sep-11,
-78.6, 18:00:00, 05-Sep-11,
-78.6, 00:00:00, 06-Sep-11,
-78.3, 06:00:00, 06-Sep-11,
-78.3, 12:00:00, 06-Sep-11,
-78.3, 18:00:00, 06-Sep-11,
-78.6, 00:00:00, 07-Sep-11,
-78.6, 06:00:00, 07-Sep-11,
-78.3, 12:00:00, 07-Sep-11,
-78.3, 18:00:00, 07-Sep-11,
-78.6, 00:00:00, 08-Sep-11,
-78.6, 06:00:00, 08-Sep-11,
-78.3, 12:00:00, 08-Sep-11,
-78.6, 18:00:00, 08-Sep-11,
-78.6, 00:00:00, 09-Sep-11,
-78.6, 06:00:00, 09-Sep-11,
-78.3, 12:00:00, 09-Sep-11,
-78.6, 18:00:00, 09-Sep-11,
-78.6, 00:00:00, 10-Sep-11,
-78.6, 06:00:00, 10-Sep-11,
-78.3, 12:00:00, 10-Sep-11,
-78.3, 18:00:00, 10-Sep-11,
-78.6, 00:00:00, 11-Sep-11,
-78.6, 06:00:00, 11-Sep-11,
-78.3, 12:00:00, 11-Sep-11,
-78.6, 18:00:00, 11-Sep-11,
-78.6, 00:00:00, 12-Sep-11,
-78.6, 06:00:00, 12-Sep-11,
-78.6, 12:00:00, 12-Sep-11,
-78.6, 18:00:00, 12-Sep-11,
-78.6, 00:00:00, 13-Sep-11,
-78.6, 06:00:00, 13-Sep-11,
-78.6, 12:00:00, 13-Sep-11,
-78.6, 18:00:00, 13-Sep-11,
-78.6, 00:00:00, 14-Sep-11,
-78.6, 06:00:00, 14-Sep-11,
-78.6, 12:00:00, 14-Sep-11,
-78.6, 18:00:00, 14-Sep-11,
-78.6, 00:00:00, 15-Sep-11,
-78.6, 06:00:00, 15-Sep-11,
-78.6, 12:00:00, 15-Sep-11,
-78.6, 18:00:00, 15-Sep-11,
-78.6, 00:00:00, 16-Sep-11,
-78.6, 06:00:00, 16-Sep-11,
-78.6, 12:00:00, 16-Sep-11,
-78.3, 18:00:00, 16-Sep-11,
-78.6, 00:00:00, 17-Sep-11,
-78.6, 06:00:00, 17-Sep-11,
-78.3, 12:00:00, 17-Sep-11,
-78.3, 18:00:00, 17-Sep-11,
-78.6, 00:00:00, 18-Sep-11,
-78.6, 06:00:00, 18-Sep-11,
-78.6, 12:00:00, 18-Sep-11,
-78.6, 18:00:00, 18-Sep-11,
-78.6, 00:00:00, 19-Sep-11,
-78.6, 06:00:00, 19-Sep-11,
-78.6, 12:00:00, 19-Sep-11,
-78.3, 18:00:00, 19-Sep-11,
-78.6, 00:00:00, 20-Sep-11,
-78.6, 06:00:00, 20-Sep-11,
-78.3, 12:00:00, 20-Sep-11,
-78.3, 18:00:00, 20-Sep-11,
-78.6, 00:00:00, 21-Sep-11,
-78.6, 06:00:00, 21-Sep-11,
-78.3, 12:00:00, 21-Sep-11,
-78.3, 18:00:00, 21-Sep-11,
-78.6, 00:00:00, 22-Sep-11,
-78.6, 06:00:00, 22-Sep-11,
-78.3, 12:00:00, 22-Sep-11,
-78.3, 18:00:00, 22-Sep-11,
-78.6, 00:00:00, 23-Sep-11,
-78.6, 06:00:00, 23-Sep-11,
-78.3, 12:00:00, 23-Sep-11,
-78.3, 18:00:00, 23-Sep-11,
-78.6, 00:00:00, 24-Sep-11,
-78.6, 06:00:00, 24-Sep-11,
-78.6, 12:00:00, 24-Sep-11,
-78.6, 18:00:00, 24-Sep-11,
-78.6, 00:00:00, 25-Sep-11,
-78.6, 06:00:00, 25-Sep-11,
-78.6, 12:00:00, 25-Sep-11,
-78.6, 18:00:00, 25-Sep-11,
-78.6, 00:00:00, 26-Sep-11,
-78.6, 06:00:00, 26-Sep-11,
-78.6, 12:00:00, 26-Sep-11,
-78.6, 18:00:00, 26-Sep-11,
-78.6, 00:00:00, 27-Sep-11,
-78.6, 06:00:00, 27-Sep-11,
-78.6, 12:00:00, 27-Sep-11,
-78.6, 18:00:00, 27-Sep-11,
-78.6, 00:00:00, 28-Sep-11,
-78.6, 06:00:00, 28-Sep-11,
-78.3, 12:00:00, 28-Sep-11,
-78.6, 18:00:00, 28-Sep-11,
-78.6, 00:00:00, 29-Sep-11,
-78.3, 06:00:00, 29-Sep-11,
-78.3, 12:00:00, 29-Sep-11,
-78.3, 18:00:00, 29-Sep-11,
-78.3, 00:00:00, 30-Sep-11,
-78.3, 06:00:00, 30-Sep-11,
-77.9, 12:00:00, 30-Sep-11,
-78.3, 18:00:00, 30-Sep-11,
-78.3, 00:00:00, 01-Oct-11,
-78.3, 06:00:00, 01-Oct-11,
-78.3, 12:00:00, 01-Oct-11,
-78.6, 18:00:00, 01-Oct-11,
-78.6, 00:00:00, 02-Oct-11,
-78.3, 06:00:00, 02-Oct-11,
-78.3, 12:00:00, 02-Oct-11,
-78.3, 18:00:00, 02-Oct-11,
-78.3, 00:00:00, 03-Oct-11,
-78.6, 06:00:00, 03-Oct-11,
-78.3, 12:00:00, 03-Oct-11,
-78.3, 18:00:00, 03-Oct-11,
-78.6, 00:00:00, 04-Oct-11,
-78.3, 06:00:00, 04-Oct-11,
-77.6, 12:00:00, 04-Oct-11,
-78.6, 18:00:00, 04-Oct-11,
-78.6, 00:00:00, 05-Oct-11,
-78.3, 06:00:00, 05-Oct-11,
-77.6, 12:00:00, 05-Oct-11,
-78.3, 18:00:00, 05-Oct-11,
-78.3, 00:00:00, 06-Oct-11,
-78.3, 06:00:00, 06-Oct-11,
-76.9, 12:00:00, 06-Oct-11,
-77.6, 18:00:00, 06-Oct-11,
-77.9, 00:00:00, 07-Oct-11,
-77.9, 06:00:00, 07-Oct-11,
-76.6, 12:00:00, 07-Oct-11,
-76.9, 18:00:00, 07-Oct-11,
-77.6, 00:00:00, 08-Oct-11,
-77.9, 06:00:00, 08-Oct-11,
-75.6, 12:00:00, 08-Oct-11,
-77.6, 18:00:00, 08-Oct-11,
-77.9, 00:00:00, 09-Oct-11,
-77.6, 06:00:00, 09-Oct-11,
-75.9, 12:00:00, 09-Oct-11,
-75.9, 18:00:00, 09-Oct-11,
-76.6, 00:00:00, 10-Oct-11,
-77.3, 06:00:00, 10-Oct-11,
-74.9, 12:00:00, 10-Oct-11,
-76.6, 18:00:00, 10-Oct-11,
-76.9, 00:00:00, 11-Oct-11,
-77.3, 06:00:00, 11-Oct-11,
-74.6, 12:00:00, 11-Oct-11,
-77.6, 18:00:00, 11-Oct-11,
-77.9, 00:00:00, 12-Oct-11,
-77.9, 06:00:00, 12-Oct-11,
-75.3, 12:00:00, 12-Oct-11,
-77.6, 18:00:00, 12-Oct-11,
-78.3, 00:00:00, 13-Oct-11,
-77.9, 06:00:00, 13-Oct-11,
-75.9, 12:00:00, 13-Oct-11,
-76.9, 18:00:00, 13-Oct-11,
-77.3, 00:00:00, 14-Oct-11,
-77.3, 06:00:00, 14-Oct-11,
-75.6, 12:00:00, 14-Oct-11,
-76.3, 18:00:00, 14-Oct-11,
-76.9, 00:00:00, 15-Oct-11,
-76.9, 06:00:00, 15-Oct-11,
-76.3, 12:00:00, 15-Oct-11,
-76.9, 18:00:00, 15-Oct-11,
-76.9, 00:00:00, 16-Oct-11,

-76.9,	06:00:00,	16-Oct-11,
-75.9,	12:00:00,	16-Oct-11,
-77.6,	18:00:00,	16-Oct-11,
-77.6,	00:00:00,	17-Oct-11,
-77.6,	06:00:00,	17-Oct-11,
-75.3,	12:00:00,	17-Oct-11,
-77.6,	18:00:00,	17-Oct-11,
-78.3,	00:00:00,	18-Oct-11,
-78.3,	06:00:00,	18-Oct-11,
-75.6,	12:00:00,	18-Oct-11,
-77.6,	18:00:00,	18-Oct-11,
-77.9,	00:00:00,	19-Oct-11,
-77.3,	06:00:00,	19-Oct-11,
-75.6,	12:00:00,	19-Oct-11,
-75.9,	18:00:00,	19-Oct-11,
-77.3,	00:00:00,	20-Oct-11,
-77.3,	06:00:00,	20-Oct-11,
-75.3,	12:00:00,	20-Oct-11,
-76.9,	18:00:00,	20-Oct-11,
-76.9,	00:00:00,	21-Oct-11,
-76.6,	06:00:00,	21-Oct-11,
-75.3,	12:00:00,	21-Oct-11,
-76.9,	18:00:00,	21-Oct-11,
-77.3,	00:00:00,	22-Oct-11,
-77.3,	06:00:00,	22-Oct-11,
-74.9,	12:00:00,	22-Oct-11,
-76.9,	18:00:00,	22-Oct-11,
-76.9,	00:00:00,	23-Oct-11,
-77.3,	06:00:00,	23-Oct-11,
-75.9,	12:00:00,	23-Oct-11,
-77.3,	18:00:00,	23-Oct-11,
-77.9,	00:00:00,	24-Oct-11,
-78.3,	06:00:00,	24-Oct-11,
-76.6,	12:00:00,	24-Oct-11,
-78.3,	18:00:00,	24-Oct-11,
-78.3,	00:00:00,	25-Oct-11,
-78.3,	06:00:00,	25-Oct-11,
-76.9,	12:00:00,	25-Oct-11,
-78.3,	18:00:00,	25-Oct-11,
-78.6,	00:00:00,	26-Oct-11,
-78.6,	06:00:00,	26-Oct-11,
-76.6,	12:00:00,	26-Oct-11,
-77.3,	18:00:00,	26-Oct-11,
-77.9,	00:00:00,	27-Oct-11,
-78.3,	06:00:00,	27-Oct-11,
-76.9,	12:00:00,	27-Oct-11,
-77.9,	18:00:00,	27-Oct-11,
-78.3,	00:00:00,	28-Oct-11,
-78.3,	06:00:00,	28-Oct-11,
-75.9,	12:00:00,	28-Oct-11,
-76.9,	18:00:00,	28-Oct-11,
-76.6,	00:00:00,	29-Oct-11,
-76.6,	06:00:00,	29-Oct-11,
-75.3,	12:00:00,	29-Oct-11,
-76.3,	18:00:00,	29-Oct-11,
-76.3,	00:00:00,	30-Oct-11,
-76.3,	06:00:00,	30-Oct-11,
-75.3,	12:00:00,	30-Oct-11,
-76.3,	18:00:00,	30-Oct-11,
-76.9,	00:00:00,	31-Oct-11,
-77.6,	06:00:00,	31-Oct-11,
-76.6,	12:00:00,	31-Oct-11,
-77.6,	18:00:00,	31-Oct-11,
-77.9,	00:00:00,	01-Nov-11,
-77.9,	06:00:00,	01-Nov-11,
-76.6,	12:00:00,	01-Nov-11,
-77.9,	18:00:00,	01-Nov-11,
-77.9,	00:00:00,	02-Nov-11,
-77.9,	06:00:00,	02-Nov-11,
-76.6,	12:00:00,	02-Nov-11,
-77.6,	18:00:00,	02-Nov-11,
-77.6,	00:00:00,	03-Nov-11,
-77.9,	06:00:00,	03-Nov-11,
-76.6,	12:00:00,	03-Nov-11,
-77.6,	18:00:00,	03-Nov-11,
-77.9,	00:00:00,	04-Nov-11,
-77.9,	06:00:00,	04-Nov-11,
-76.9,	12:00:00,	04-Nov-11,

-77.3,	18:00:00,	04-Nov-11,
-77.9,	00:00:00,	05-Nov-11,
-77.6,	06:00:00,	05-Nov-11,
-76.6,	12:00:00,	05-Nov-11,
-76.9,	18:00:00,	05-Nov-11,
-77.3,	00:00:00,	06-Nov-11,
-77.3,	06:00:00,	06-Nov-11,
-76.6,	12:00:00,	06-Nov-11,
-77.3,	18:00:00,	06-Nov-11,
-77.3,	00:00:00,	07-Nov-11,
-77.3,	06:00:00,	07-Nov-11,
-75.6,	12:00:00,	07-Nov-11,
-76.9,	18:00:00,	07-Nov-11,
-77.3,	00:00:00,	08-Nov-11,
-77.6,	06:00:00,	08-Nov-11,
-76.3,	12:00:00,	08-Nov-11,
-76.9,	18:00:00,	08-Nov-11,
-76.9,	00:00:00,	09-Nov-11,
-77.6,	06:00:00,	09-Nov-11,
-75.6,	12:00:00,	09-Nov-11,
-76.9,	18:00:00,	09-Nov-11,
-77.3,	00:00:00,	10-Nov-11,
-77.3,	06:00:00,	10-Nov-11,
-76.6,	12:00:00,	10-Nov-11,
-76.6,	18:00:00,	10-Nov-11,
-77.3,	00:00:00,	11-Nov-11,
-77.3,	06:00:00,	11-Nov-11,
-75.6,	12:00:00,	11-Nov-11,
-75.6,	18:00:00,	11-Nov-11,
-77.3,	00:00:00,	12-Nov-11,
-77.3,	06:00:00,	12-Nov-11,
-75.6,	12:00:00,	12-Nov-11,
-76.6,	18:00:00,	12-Nov-11,
-76.3,	00:00:00,	13-Nov-11,
-76.9,	06:00:00,	13-Nov-11,
-75.3,	12:00:00,	13-Nov-11,
-76.3,	18:00:00,	13-Nov-11,
-76.6,	00:00:00,	14-Nov-11,
-76.9,	06:00:00,	14-Nov-11,
-75.9,	12:00:00,	14-Nov-11,
-76.6,	18:00:00,	14-Nov-11,
-76.6,	00:00:00,	15-Nov-11,
-76.9,	06:00:00,	15-Nov-11,
-76.3,	12:00:00,	15-Nov-11,
-77.3,	18:00:00,	15-Nov-11,
-77.3,	00:00:00,	16-Nov-11,
-77.3,	06:00:00,	16-Nov-11,
-75.3,	12:00:00,	16-Nov-11,
-74.6,	18:00:00,	16-Nov-11,
-74.6,	00:00:00,	17-Nov-11,
-75.9,	06:00:00,	17-Nov-11,
-71.6,	12:00:00,	17-Nov-11,
-71.2,	18:00:00,	17-Nov-11,
-66.9,	00:00:00,	18-Nov-11,
-60.5,	06:00:00,	18-Nov-11,
-57.2,	12:00:00,	18-Nov-11,
-58.5,	18:00:00,	18-Nov-11,
-57.2,	00:00:00,	19-Nov-11,
-52.5,	06:00:00,	19-Nov-11,
-51.2,	12:00:00,	19-Nov-11,
-53.8,	18:00:00,	19-Nov-11,
-54.9,	00:00:00,	20-Nov-11,
-55.2,	06:00:00,	20-Nov-11,
-54.9,	12:00:00,	20-Nov-11,
-55.5,	18:00:00,	20-Nov-11,
-56.2,	00:00:00,	21-Nov-11,
-54.5,	06:00:00,	21-Nov-11,
-53.2,	12:00:00,	21-Nov-11,
-50.5,	18:00:00,	21-Nov-11,
-43.1,	00:00:00,	22-Nov-11,
-40.1,	06:00:00,	22-Nov-11,
-39.1,	12:00:00,	22-Nov-11,
-38.8,	18:00:00,	22-Nov-11,
-38.8,	00:00:00,	23-Nov-11,
-39.8,	06:00:00,	23-Nov-11,
-38.5,	12:00:00,	23-Nov-11,
-40.8,	18:00:00,	23-Nov-11,
-43.1,	00:00:00,	24-Nov-11,

-43.5,	06:00:00,	24-Nov-11,
-42.5,	12:00:00,	24-Nov-11,
-42.1,	18:00:00,	24-Nov-11,
-42.5,	00:00:00,	25-Nov-11,
-43.8,	06:00:00,	25-Nov-11,
-40.1,	12:00:00,	25-Nov-11,
-42.8,	18:00:00,	25-Nov-11,
-43.1,	00:00:00,	26-Nov-11,
-43.8,	06:00:00,	26-Nov-11,
-39.8,	12:00:00,	26-Nov-11,
-43.1,	18:00:00,	26-Nov-11,
-44.5,	00:00:00,	27-Nov-11,
-44.8,	06:00:00,	27-Nov-11,
-40.8,	12:00:00,	27-Nov-11,
-41.1,	18:00:00,	27-Nov-11,
-42.5,	00:00:00,	28-Nov-11,
-43.5,	06:00:00,	28-Nov-11,
-42.5,	12:00:00,	28-Nov-11,
-43.1,	18:00:00,	28-Nov-11,
-43.5,	00:00:00,	29-Nov-11,
-43.8,	06:00:00,	29-Nov-11,
-42.5,	12:00:00,	29-Nov-11,
-43.1,	18:00:00,	29-Nov-11,
-43.5,	00:00:00,	30-Nov-11,
-43.8,	06:00:00,	30-Nov-11,
-41.1,	12:00:00,	30-Nov-11,
-44.1,	18:00:00,	30-Nov-11,
-44.8,	00:00:00,	01-Dec-11,
-44.5,	06:00:00,	01-Dec-11,
-43.8,	12:00:00,	01-Dec-11,
-44.8,	18:00:00,	01-Dec-11,
-45.2,	00:00:00,	02-Dec-11,
-45.2,	06:00:00,	02-Dec-11,
-43.1,	12:00:00,	02-Dec-11,
-45.2,	18:00:00,	02-Dec-11,
-45.5,	00:00:00,	03-Dec-11,
-45.8,	06:00:00,	03-Dec-11,
-45.8,	12:00:00,	03-Dec-11,
-45.5,	18:00:00,	03-Dec-11,
-45.8,	00:00:00,	04-Dec-11,
-45.5,	06:00:00,	04-Dec-11,
-45.2,	12:00:00,	04-Dec-11,
-45.5,	18:00:00,	04-Dec-11,
-45.8,	00:00:00,	05-Dec-11,
-45.8,	06:00:00,	05-Dec-11,
-45.5,	12:00:00,	05-Dec-11,
-45.8,	18:00:00,	05-Dec-11,
-46.2,	00:00:00,	06-Dec-11,
-46.5,	06:00:00,	06-Dec-11,
-46.2,	12:00:00,	06-Dec-11,
-46.5,	18:00:00,	06-Dec-11,
-46.5,	00:00:00,	07-Dec-11,
-46.8,	06:00:00,	07-Dec-11,
-46.5,	12:00:00,	07-Dec-11,
-46.5,	18:00:00,	07-Dec-11,
-46.5,	00:00:00,	08-Dec-11,
-46.5,	06:00:00,	08-Dec-11,
-46.2,	12:00:00,	08-Dec-11,
-47.2,	18:00:00,	08-Dec-11,
-47.2,	00:00:00,	09-Dec-11,
-47.2,	06:00:00,	09-Dec-11,
-47.2,	12:00:00,	09-Dec-11,
-47.2,	18:00:00,	09-Dec-11,
-47.2,	00:00:00,	10-Dec-11,
-47.5,	06:00:00,	10-Dec-11,
-47.2,	12:00:00,	10-Dec-11,
-46.5,	18:00:00,	10-Dec-11,
-46.8,	00:00:00,	11-Dec-11,
-46.8,	06:00:00,	11-Dec-11,
-46.2,	12:00:00,	11-Dec-11,
-46.8,	18:00:00,	11-Dec-11,
-47.5,	00:00:00,	12-Dec-11,
-47.5,	06:00:00,	12-Dec-11,
-45.5,	12:00:00,	12-Dec-11,
-47.8,	18:00:00,	12-Dec-11,
-48.5,	00:00:00,	13-Dec-11,
-49.5,	06:00:00,	13-Dec-11,
-47.2,	12:00:00,	13-Dec-11,

-48.2,	18:00:00,	13-Dec-11,
-49.2,	00:00:00,	14-Dec-11,
-50.2,	06:00:00,	14-Dec-11,
-48.5,	12:00:00,	14-Dec-11,
-46.5,	18:00:00,	14-Dec-11,
-45.8,	00:00:00,	15-Dec-11,
-46.2,	06:00:00,	15-Dec-11,
-43.8,	12:00:00,	15-Dec-11,
-45.2,	18:00:00,	15-Dec-11,
-47.2,	00:00:00,	16-Dec-11,
-47.8,	06:00:00,	16-Dec-11,
-45.8,	12:00:00,	16-Dec-11,
-45.8,	18:00:00,	16-Dec-11,
-46.8,	00:00:00,	17-Dec-11,
-47.5,	06:00:00,	17-Dec-11,
-46.5,	12:00:00,	17-Dec-11,
-47.2,	18:00:00,	17-Dec-11,
-47.8,	00:00:00,	18-Dec-11,
-47.8,	06:00:00,	18-Dec-11,
-45.2,	12:00:00,	18-Dec-11,
-43.8,	18:00:00,	18-Dec-11,
-45.2,	00:00:00,	19-Dec-11,
-46.5,	06:00:00,	19-Dec-11,
-44.8,	12:00:00,	19-Dec-11,
-45.5,	18:00:00,	19-Dec-11,
-46.5,	00:00:00,	20-Dec-11,
-46.8,	06:00:00,	20-Dec-11,
-45.2,	12:00:00,	20-Dec-11,
-44.8,	18:00:00,	20-Dec-11,
-45.8,	00:00:00,	21-Dec-11,
-47.2,	06:00:00,	21-Dec-11,
-46.2,	12:00:00,	21-Dec-11,
-46.8,	18:00:00,	21-Dec-11,
-47.8,	00:00:00,	22-Dec-11,
-48.2,	06:00:00,	22-Dec-11,
-47.2,	12:00:00,	22-Dec-11,
-48.8,	18:00:00,	22-Dec-11,
-49.5,	00:00:00,	23-Dec-11,
-49.5,	06:00:00,	23-Dec-11,
-47.2,	12:00:00,	23-Dec-11,
-49.2,	18:00:00,	23-Dec-11,
-49.8,	00:00:00,	24-Dec-11,
-49.8,	06:00:00,	24-Dec-11,
-47.8,	12:00:00,	24-Dec-11,
-48.5,	18:00:00,	24-Dec-11,
-49.5,	00:00:00,	25-Dec-11,
-49.5,	06:00:00,	25-Dec-11,
-43.1,	12:00:00,	25-Dec-11,
-43.1,	18:00:00,	25-Dec-11,
-45.8,	00:00:00,	26-Dec-11,
-46.2,	06:00:00,	26-Dec-11,
-45.2,	12:00:00,	26-Dec-11,
-45.2,	18:00:00,	26-Dec-11,
-44.1,	00:00:00,	27-Dec-11,
-43.8,	06:00:00,	27-Dec-11,
-40.8,	12:00:00,	27-Dec-11,
-40.1,	18:00:00,	27-Dec-11,
-38.5,	00:00:00,	28-Dec-11,
-38.1,	06:00:00,	28-Dec-11,
-36.1,	12:00:00,	28-Dec-11,
-29.8,	18:00:00,	28-Dec-11,
-30.1,	00:00:00,	29-Dec-11,
-34.4,	06:00:00,	29-Dec-11,
-35.1,	12:00:00,	29-Dec-11,
-34.1,	18:00:00,	29-Dec-11,
-28.1,	00:00:00,	30-Dec-11,
-26.8,	06:00:00,	30-Dec-11,
-29.1,	12:00:00,	30-Dec-11,
-31.8,	18:00:00,	30-Dec-11,
-36.5,	00:00:00,	31-Dec-11,
-38.8,	06:00:00,	31-Dec-11,
-38.5,	12:00:00,	31-Dec-11,
-39.8,	18:00:00,	31-Dec-11,
-40.5,	00:00:00,	01-Jan-12,
-40.8,	06:00:00,	01-Jan-12,
-40.1,	12:00:00,	01-Jan-12,
-42.1,	18:00:00,	01-Jan-12,
-43.1,	00:00:00,	02-Jan-12,

Oak Creek Mitigation Bank Vegetation Monitoring - 2011

Introduction and Methods

Vegetation monitoring was conducted in 2011 at the Oak Creek Mitigation Bank site on June 5th and July 2nd, 2011. The monitoring protocol followed was that used in 1999 through 2010 at the site and 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 and for the Forested areas (Transects #6 & #7) as a whole, which include summary data for all transects. Data for the added transects in the new construction areas are presented separately for the south side of Oak Creek (Transects 1.5 and 2.5), for the north side of Oak Creek (Transect 5.5), 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 proportion of native taxa, 2) the proportion of FAC and better species comprised of native taxa, and 3) a Soil Moisture Index. A Soil Moisture Index

(SMI) 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 new 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 2011, the dominant species found in the Prior Converted Wetlands area (Transects #1 through #5) were *Holcus lanatus* (common velvetgrass), *Juncus tenuis* (slender rush), *Agrostis exarata* (spike bentgrass), *Mentha pulegium* (pennyroyal), and *Hordeum brachyantherum* (meadow barley). Species with an indicator status of FAC or better accounted for about 96% of the total cover in this area. Native species accounted for about 54% of the total cover in this area. The SMI for this area was 2.10, and non-vegetated ground accounted for 38% of the area.

For the south side new construction area (Transects 1.5 and 2.5), the dominant species were *Juncus tenuis* (slender rush), *Deschampsia cespitosa* (tufted hairgrass), *Lythrum portula* (spatulaleaf loosestrife), *Agrostis exarata* (spike bentgrass), and *Holcus lanatus* (common velvetgrass). Species with an indicator status of FAC or better accounted for about 94% of the total cover in this area. Native species accounted for about 69% of the total cover in this area. The SMI for this area was 2.00, and non-vegetated ground accounted for 38% of the area.

For the north side new construction area (Transect 5.5), the dominant species were *Anthoxanthum odoratum* (sweet vernalgrass), *Agrostis exarata* (spike bentgrass), *Hypochaeris radicata* (hairy cat's ear), *Holcus lanatus* (common velvetgrass), and *Deschampsia cespitosa* (tufted hairgrass). Species with an indicator status of FAC or better accounted for about 47% of the total cover in this area. Native species accounted for about 44% of the total cover in this area. The SMI for this area was 3.35 and non-vegetated ground accounted for 34% of the area.

For the northeast Forested area (Transect #6), the dominant species were *Fraxinus latifolia* (Oregon ash), *Poa trivialis* (roughstalk bluegrass), *Camassia leichtlinii* (great camas), *Lapsana communis* (nipplewort), and *Carex leptopoda* (Dewey's sedge). Species with an indicator status of FAC or better accounted for about 87% of the total cover in this area. Native species accounted for about 81% of the total cover in this area. The SMI for this area was 2.43 and non-vegetated ground accounted for 57% of the area (not including the canopy layer).

For the west Forested area (Transect #7), the dominant species were *Fraxinus latifolia* (Oregon ash), *Camassia leichtlinii* (great camas), *Geranium lucidum* (shining geranium), *Rubus discolor* (Himalayan blackberry), and *Carex* sp. (sedges). Species with an indicator status of FAC or better accounted for about 77% 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 2.63 and non-vegetated ground accounted for 34% of the area (not including the canopy layer).

For the NW upland area (Transect #8), the dominant species were *Holcus lanatus* (common velvetgrass), *Festuca occidentalis* (western fescue), *Anthoxanthum odoratum* (sweet vernalgrass), *Elymus glaucus* (blue wildrye), and *Agrostis castellana/capillaris* (highland/colonial bentgrass). Native species accounted for about 28% of the total cover in this area, and non-vegetated ground accounted for about 39% of the area.

Oak Creek Mitigation Bank Plant Monitoring, 2011

Prior Converted Habitat Type - Transect 1

sp = sprayed

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Holcus lanatus	common velvetgrass		FAC	y	3	32	sp	75				sp	sp	10	sp	19.5
Alopecurus geniculatis	water foxtail		OBL	y	1		sp		85	6		sp	sp		sp	15.2
Agrostis exarata	spike bentgrass	yes	FACW	y	2	35	sp	5	8		6	sp	sp	10	sp	10.7
Juncus tenuis	slender rush	yes	FACW-	y	2		sp	1				sp	sp	40	sp	6.8
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	10	sp	2			28	sp	sp		sp	6.7
Eleocharis palustris	creeping spikerush	yes	OBL	y	1		sp			17		sp	sp		sp	2.8
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	1	sp	4				sp	sp	5	sp	1.7
Ludwigia palustris	waterpurslane/ marsh seedbox		OBL	y	1		sp			10		sp	sp		sp	1.7
Parentucellia viscosa	parentucellia		FAC-		3		sp	1				sp	sp	5	sp	1.0
Mentha pulegium	pennyroyal		OBL	y	1		sp			4	1	sp	sp		sp	0.8
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	2	sp		2			sp	sp		sp	0.7
Lythrum portula	spatulaleaf loosestrife		OBL	y	1		sp			4		sp	sp		sp	0.7
Beckmannia syzigachne	American slough grass	yes	OBL	y	1		sp		1	1	1	sp	sp		sp	0.5
Hypochaeris radicata	hairy cat's ear		FACU		4		sp	1				sp	sp	1	sp	0.3
Alisma subcordatum	American water plantain	yes	OBL	y	1		sp				1	sp	sp		sp	0.2
Carex leptopoda	Dewey's sedge	yes	FAC	y	3		sp					sp	sp	1	sp	0.2
Juncus bufonius	toad rush	yes	FACW	y	2		sp					sp	sp	1	sp	0.2
Montia linearis	narrow-leaved montia	yes	NOL	u	5		sp					sp	sp	1	sp	0.2
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	NA	1	0	4	20	NA	NA	2	NA	5.3
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					17	NA	18	6	55	45	NA	NA	22	NA	27.2
standing water (inches)						0	NA	0	0	7	trace	NA	NA	0	NA	

Oak Creek Mitigation Bank Plant Monitoring, 2011

Prior Converted Habitat Type - Transect 2

Cover (%)

sp = sprayed w = deep water

Species	Common Name	Native	Indicator	Wet	MTI	Sample Station 1	2	3	4	5	6	7	8	9	10	Mean
Juncus tenuis	slender rush	yes	FACW-	y	2	45	sp	w		sp	sp	sp	25		20	18.0
Agrostis exarata	spike bentgrass	yes	FACW	y	2	2	sp	w		sp	sp	sp	7	50	5	12.8
Holcus lanatus	common velvetgrass		FAC	y	3	4	sp	w		sp	sp	sp	2	1	20	5.4
Lythrum portula	spatulaleaf loosestrife		OBL	y	1		sp	w	25	sp	sp	sp				5.0
Carex feta	green-sheathed sedge	yes	FACW	y	2	25	sp	w		sp	sp	sp				5.0
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2		sp	w		sp	sp	sp	15		2	3.4
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	12	sp	w		sp	sp	sp		1	3	3.2
Rosa pisocarpa	clustered rose	yes	FAC	y	3		sp	w		sp	sp	sp			16	3.2
Carex unilateralis	one-sided sedge	yes	FACW	y	2		sp	w		sp	sp	sp		8		1.6
Montia linearis	narrow-leaved montia	yes	NOL	u	5	2	sp	w		sp	sp	sp			1	0.6
Centaurium erythraea	European centaury		FAC	y	3	2	sp	w		sp	sp	sp			1	0.6
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2		sp	w		sp	sp	sp		1	1	0.4
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	2	sp	w		sp	sp	sp				0.4
Eleocharis palustris	creeping spikerush	yes	OBL	y	1		sp	w	1	sp	sp	sp				0.2
Parentucellia viscosa	parentucellia		FAC-		3	1	sp	w		sp	sp	sp				0.2
Mentha pulegium	pennyroyal		OBL	y	1		sp	w	1	sp	sp	sp				0.2
Juncus bufonius	toad rush	yes	FACW	y	2		sp	w		sp	sp	sp			1	0.2
Myosotis discolor	yellow and blue forget-me-not		FACW	y	2	1	sp	w		sp	sp	sp				0.2
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4		sp	w		sp	sp	sp			1	0.2
Rumex crispus	curly dock		FAC+	y	3	1	sp	w		sp	sp	sp				0.2
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					1	NA	NA	50	NA	NA	NA	3	2	2	11.6
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					15	NA	NA	25	NA	NA	NA	50	40	45	35.0
standing water (inches)						0	NA	NA	6	NA	NA	NA	0	0	0	

Oak Creek Mitigation Bank Plant Monitoring, 2011

Prior Converted Habitat Type - Transect 3

Cover (%)

sp = sprayed

Species	Common Name	Native	Indicator	Wet	MTI	Sample Station 1	2	3	4	5	6	7	8	9	10	Mean
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	40	50	sp	25	sp	50	60			2	28.4
Holcus lanatus	common velvetgrass		FAC	y	3	27	11	sp	1	sp		4	2	38		10.4
Agrostis exarata	spike bentgrass	yes	FACW	y	2	7	6	sp	1	sp	2	1		35	30	10.3
Mentha pulegium	pennyroyal		OBL	y	1		4	sp	13	sp	5	9			45	9.5
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	9		sp	14	sp	20					5.4
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2		1	sp	1	sp		7	4	13	12	4.8
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	20	17	sp		sp						4.6
Juncus tenuis	slender rush	yes	FACW-	y	2			sp		sp	1		15			2.0
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3			sp	10	sp						1.3
Montia linearis	narrow-leaved montia	yes	NOL	u	5		1	sp	1	sp		1	1	1	2	0.9
Rumex crispus	curly dock		FAC+	y	3		1	sp		sp	1	5				0.9
Carex unilateralis	one-sided sedge	yes	FACW	y	2		1	sp		sp					5	0.8
Vicia tetrasperma	slender vetch		NOL	u	5	5		sp		sp			1			0.8
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3		1	sp		sp	1					0.3
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2			sp		sp	2					0.3
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1			sp		sp		1			1	0.3
Juncus bufonius	toad rush	yes	FACW	y	2		1	sp		sp						0.1
Myosotis discolor	yellow and blue forget-me-not		FACW	y	2			sp		sp		1				0.1
Anagallis arvensis	scarlet pimpernel		FAC	y	3			sp		sp				1		0.1
Epilobium brachycarpum	autumn [tall annual] willowherb	yes	UPL		5			sp		sp					1	0.1
Geranium carolinianum	Carolina geranium	yes	NOL	u	5		1	sp		sp						0.1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					1	25	NA	3	NA	10	6	2	15	2	8.0
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					7	2	NA	38	NA	12	8	80	5	8	20.0
standing water (inches)						0	0	NA	0	NA	0	0	0	0	trace	

Oak Creek Mitigation Bank Plant Monitoring, 2011																
Prior Converted Habitat Type - Transect 4							sp = sprayed									
Cover (%)																
									Sample Station							
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Carex unilateralis	one-sided sedge	yes	FACW	y	2		sp	22	8	8	sp	37	6	7	sp	12.6
Eleocharis acicularis	needle spikerush	yes	OBL	y	1		sp		1		sp	45	5		sp	7.3
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	40	sp				sp				sp	5.7
Mentha pulegium	pennyroyal		OBL	y	1	2	sp	5	17	7	sp	4	3	1	sp	5.6
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2		sp	4		12	sp	15		6	sp	5.3
Holcus lanatus	common velvetgrass		FAC	y	3	25	sp		4		sp				sp	4.1
Beckmannia syzigachne	American slough grass	yes	OBL	y	1		sp	10			sp	2	6	4	sp	3.1
Juncus tenuis	slender rush	yes	FACW-	y	2	8	sp		8		sp				sp	2.3
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4	10	sp				sp				sp	1.4
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2		sp				sp		8	1	sp	1.3
Alopecurus geniculatis	water foxtail		OBL	y	1	2	sp				sp		3	4	sp	1.3
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2		sp				sp	7			sp	1.0
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2		sp		5	1	sp				sp	0.9
Veronica scutellata	marsh speedwell	yes	OBL	y	1		sp	4	2		sp				sp	0.9
Montia linearis	narrow-leaved montia	yes	NOL	u	5		sp		2		sp				sp	0.3
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1		sp			1	sp		1		sp	0.3
Hordeum murinum ssp. glaucum	smooth barley		NOL	u	5	2	sp				sp				sp	0.3
Myosotis discolor	yellow and blue forget-me-not		FACW	y	2		sp		1		sp				sp	0.1
Eleocharis palustris	creeping spikerush	yes	OBL	y	1		sp				sp			1	sp	0.1
Lotus corniculatus	birdsfoot trefoil		FAC	y	3	1	sp				sp				sp	0.1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY						NA	12	2	70	NA	1	65	40	NA	27.1
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					10	NA	50	45	5	NA	4	8	40	NA	23.1
standing water (inches)						0	NA	6	0.5	4	NA	0	0.5	2	NA	

Oak Creek Mitigation Bank Plant Monitoring, 2011

Prior Converted Habitat Type - Transect 5

sp = sprayed

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Holcus lanatus	common velvetgrass		FAC	y	3	sp	sp	sp	sp	12	sp	sp	65	33	11	30.3
Mentha pulegium	pennyroyal		OBL	y	1	sp	sp	sp	sp	5	sp	sp		40	35	20.0
Juncus tenuis	slender rush	yes	FACW-	y	2	sp	sp	sp	sp		sp	sp		4	25	7.3
Hypochaeris radicata	hairy cat's ear		FACU		4	sp	sp	sp	sp	12	sp	sp	1			3.3
Agrostis exarata	spike bentgrass	yes	FACW	y	2	sp	sp	sp	sp	8	sp	sp		1	1	2.5
Carex unilateralis	one-sided sedge	yes	FACW	y	2	sp	sp	sp	sp		sp	sp			8	2.0
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	sp	sp	sp	sp		sp	sp	4	3		1.8
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3	sp	sp	sp	sp		sp	sp	5			1.3
Montia linearis	narrow-leaved montia	yes	NOL	u	5	sp	sp	sp	sp	3	sp	sp			1	1.0
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1	sp	sp	sp	sp	4	sp	sp				1.0
Parentucellia viscosa	parentucellia		FAC-		3	sp	sp	sp	sp	1	sp	sp	3			1.0
Centaurium erythraea	European centaury		FAC	y	3	sp	sp	sp	sp		sp	sp	3			0.8
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2	sp	sp	sp	sp		sp	sp			2	0.5
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4	sp	sp	sp	sp		sp	sp	2			0.5
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4	sp	sp	sp	sp		sp	sp			1	0.3
Carex feta	green-sheathed sedge	yes	FACW	y	2	sp	sp	sp	sp	1	sp	sp				0.3
Daucus carota	Queen Anne's lace		NOL	u	5	sp	sp	sp	sp	1	sp	sp				0.3
Eleocharis ovata	ovate spikerush	yes	OBL	y	1	sp	sp	sp	sp	1	sp	sp				0.3
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					NA	NA	NA	NA	55	NA	NA	3	1	1	15.0
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					NA	NA	NA	NA	5	NA	NA	20	20	30	18.8

Oak Creek Mitigation Bank Plant Monitoring, 2011											
Prior Converted Habitat Type - Transect Means											
Cover (%)											
							Transect				
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**4**	**5**	**Mean**
Holcus lanatus	common velvetgrass		FAC	y	3	19.5	5.4	10.4	4.1	30.3	13.93
Juncus tenuis	slender rush	yes	FACW-	y	2	6.8	18.0	2.0	2.3	7.3	7.27
Agrostis exarata	spike bentgrass	yes	FACW	y	2	10.7	12.8	10.3	0.0	2.5	7.24
Mentha pulegium	pennyroyal		OBL	y	1	0.8	0.2	9.5	5.6	20.0	7.22
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	0.7	0.4	28.4	0.0	0.0	5.89
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	6.7	3.4	5.4	5.3	0.0	4.15
Carex unilateralis	one-sided sedge	yes	FACW	y	2	0.0	1.6	0.8	12.6	2.0	3.38
Alopecurus geniculatis	water foxtail		OBL	y	1	15.2	0.0	0.0	1.3	0.0	3.29
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	1.7	3.2	4.8	0.9	0.0	2.09
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	0.0	0.0	4.6	5.7	0.0	2.07
Eleocharis acicularis	needle spikerush	yes	OBL	y	1	0.0	0.0	0.0	7.3	0.0	1.46
Lythrum portula	spatulaleaf loosestrife		OBL	y	1	0.7	5.0	0.0	0.0	0.0	1.13
Carex feta	green-sheathed sedge	yes	FACW	y	2	0.0	5.0	0.0	0.0	0.3	1.05
Beckmannia syzigachne	American slough grass	yes	OBL	y	1	0.5	0.0	0.0	3.1	0.0	0.73
Hypochaeris radicata	hairy cat's ear		FACU		4	0.3	0.0	0.0	0.0	3.3	0.72
Rosa pisocarpa	clustered rose	yes	FAC	y	3	0.0	3.2	0.0	0.0	0.0	0.64
Eleocharis palustris	creeping spikerush	yes	OBL	y	1	2.8	0.2	0.0	0.1	0.0	0.64
Montia linearis	narrow-leaved montia	yes	NOL	u	5	0.2	0.6	0.9	0.3	1.0	0.59
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3	0.0	0.0	1.3	0.0	1.3	0.50
Parentucellia viscosa	parentucellia		FAC-		3	1.0	0.2	0.0	0.0	1.0	0.44
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	0.0	0.4	0.0	0.0	1.8	0.43
Bromus hordeaceus ssp. hordeaceus	soft brome		FACU		4	0.0	0.0	0.0	1.4	0.3	0.34
Ludwigia palustris	waterpurslane/ marsh seedbox		OBL	y	1	1.7	0.0	0.0	0.0	0.0	0.33
Plagiobothrys figuratus	fragrant popcornflower	yes	FACW	y	2	0.0	0.0	0.3	1.3	0.0	0.31
Spiraea douglasii	Douglas' spiraea/ hardhack	yes	FACW	y	2	0.0	0.0	0.0	1.0	0.5	0.30
Centaurium erythraea	European centaury		FAC	y	3	0.0	0.6	0.0	0.0	0.8	0.27
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1	0.0	0.0	0.3	0.0	1.0	0.25
Rumex crispus	curly dock		FAC+	y	3	0.0	0.2	0.9	0.0	0.0	0.22
Veronica scutellata	marsh speedwell	yes	OBL	y	1	0.0	0.0	0.0	0.9	0.0	0.17
Vicia tetrasperma	slender vetch		NOL	u	5	0.0	0.0	0.8	0.0	0.0	0.15
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4	0.0	0.2	0.0	0.0	0.5	0.14
Juncus bufonius	toad rush	yes	FACW	y	2	0.2	0.2	0.1	0.0	0.0	0.10

Oak Creek Mitigation Bank Plant Monitoring, 2011

Prior Converted Habitat Type - Transect Means

Cover (%)

Species	Common Name	Native	Indicator	Wet	MTI	Transect 1	2	3	4	5	Mean
Myosotis discolor	yellow and blue forget-me-not		FACW	y	2	0.0	0.2	0.1	0.1	0.0	0.09
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1	0.0	0.0	0.0	0.3	0.0	0.06
Hordeum murinum ssp. glaucum	smooth barley		NOL	u	5	0.0	0.0	0.0	0.3	0.0	0.06
Daucus carota	Queen Anne's lace		NOL	u	5	0.0	0.0	0.0	0.0	0.3	0.05
Eleocharis ovata	ovate spikerush	yes	OBL	y	1	0.0	0.0	0.0	0.0	0.3	0.05
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3	0.0	0.0	0.3	0.0	0.0	0.05
Alisma subcordatum	American water plantain	yes	OBL	y	1	0.2	0.0	0.0	0.0	0.0	0.03
Carex leptopoda	Dewey's sedge	yes	FAC	y	3	0.2	0.0	0.0	0.0	0.0	0.03
Lotus corniculatus	birdsfoot trefoil		FAC	y	3	0.0	0.0	0.0	0.1	0.0	0.03
Anagallis arvensis	scarlet pimpernel		FAC	y	3	0.0	0.0	0.1	0.0	0.0	0.03
Epilobium brachycarpum	autumn [tall annual] willowherb	yes	UPL		5	0.0	0.0	0.1	0.0	0.0	0.03
Geranium carolinianum	Carolina geranium	yes	NOL	u	5	0.0	0.0	0.1	0.0	0.0	0.03
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5.3	11.6	8.0	27.1	15.0	13.4
moss, duff, dead vegetation, etc. (includes sprayed vegetation)	"					27.2	35.0	20.0	23.1	18.8	24.8
			Total cover:			70	61	81	54	74	68
			FAC and better cover:			68	60	79	52	66	65
			Native cover:			31	49	54	35	15	37
			Percent FAC and better of total:			98	98	98	96	89	96
			Percent native of total:			44	80	66	65	20	54
			Moisture Index:			2.00	2.12	2.11	1.82	2.37	2.10

Oak Creek Mitigation Bank Plant Monitoring, 2011

Prior Converted Habitat Type - South Side New Construction - Transects 1.5 and 2.5 sp = sprayed

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**
Juncus tenuis	slender rush	yes	FACW-	y	2		5	sp	10	17			85	sp	35	19.0
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	70	18	sp						sp	25	14.1
Lythrum portula	spatulaleaf loosestrife		OBL	y	1			sp			15	75		sp		11.3
Agrostis exarata	spike bentgrass	yes	FACW	y	2			sp	33	2			8	sp		5.4
Holcus lanatus	common velvetgrass		FAC	y	3	2	2	sp	1	10				sp	25	5.0
Mentha pulegium	pennyroyal		OBL	y	1			sp				20		sp		2.5
Lotus unifoliolatus var. unifoliolatus	Spanish clover	yes	UPL		5		15	sp						sp		1.9
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2			sp	10				1	sp		1.4
Juncus bufonius	toad rush	yes	FACW	y	2			sp	2			8		sp	1	1.4
Juncus ensifolius	daggerleaf rush	yes	FACW	y	2			sp	7	3				sp		1.3
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	2	5	sp						sp	1	1.0
Alopecurus geniculatis	water foxtail		OBL	y	1			sp	2					sp		0.3
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2	1		sp						sp	1	0.3
Hypochaeris radicata	hairy cat's ear		FACU		4			sp		2				sp		0.3
Montia linearis	narrow-leaved montia	yes	NOL	u	5			sp	1				1	sp		0.3
Parentucellia viscosa	parentucellia		FAC-		3		1	sp						sp	1	0.3
Rorippa curvisiliqua	western yellowcress	yes	OBL	y	1			sp	2					sp		0.3
Bidens frondosa	leafy beggar's ticks	yes	FACW+	y	2			sp			1			sp		0.1
Eleocharis ovata	ovate spikerush	yes	OBL	y	1			sp				1		sp		0.1
Lotus micranthus	small-flowered lotus	yes	NOL	u	5		1	sp						sp		0.1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					0	1	NA	5	1	85	4	0	NA	1	12.1
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					25	60	NA	32	65	0	0	8	NA	15	25.6
standing water (inches)						0	0	NA	0	0	6	0.5	0	NA	0	

Total cover:	66
FAC and better cover:	62
Native cover:	46
Percent FAC and better of total:	94
Percent native of total:	69
Moisture Index:	2.00

Oak Creek Mitigation Bank Plant Monitoring, 2011

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**
Anthoxanthum odoratum	sweet vernalgrass		FACU		4	18	35	20		1	14.8
Agrostis exarata	spike bentgrass	yes	FACW	y	2	1	8		25	20	10.8
Hypochaeris radicata	hairy cat's ear		FACU		4	15	15	12		3	9.0
Holcus lanatus	common velvetgrass		FAC	y	3	12	12	6			6.0
Deschampsia cespitosa	tufted hairgrass	yes	FACW	y	2	2	2	12	7	5	5.6
Lotus unifoliolatus var. unifoliolatus	Spanish clover	yes	UPL		5		2	20		6	5.6
Lotus micranthus	small-flowered lotus	yes	NOL	u	5		22	1			4.6
Hordeum brachyantherum	meadow barley	yes	FACW-	y	2	1	1		7	6	3.0
Agrostis castellana/capillaris	highland/colonial bentgrass		FAC	y	3			4	10		2.8
Lotus corniculatus	birdsfoot trefoil		FAC	y	3					13	2.6
Rumex acetosella	sheep sorrel/ sour dock		FACU+		4	3	8				2.2
Parentucellia viscosa	parentucellia		FAC-		3	8	1	1			2.0
Juncus tenuis	slender rush	yes	FACW-	y	2	6				2	1.6
Centaurium erythraea	European centaury		FAC	y	3	2				1	0.6
Cerastium glomeratum	sticky chickweed		UPL		5	1		1			0.4
Montia linearis	narrow-leaved montia	yes	NOL	u	5	1			1		0.4
Veronica peregrina ssp. xalapense	hairy purslane speedwell	yes	OBL	y	1				1	1	0.4
Alopecurus geniculatis	water foxtail		OBL	y	1					1	0.2
Daucus carota	Queen Anne's lace		NOL	u	5		1				0.2
Fraxinus latifolia	Oregon ash	yes	FACW	y	2	1					0.2
Gnaphalium palustre	western marsh cudweed	yes	FAC+	y	3				1		0.2
Lythrum portula	spatulaleaf loosestrife		OBL	y	1				1		0.2
Mentha pulegium	pennyroyal		OBL	y	1				1		0.2
Vicia pannonica	Hungarian vetch		NOL	u	5					1	0.2
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	1	2	45	10	12.6
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					25	15	25	5	35	21.0
					Total cover:						74
					FAC and better cover:						34
					Native cover:						32
					Percent FAC and better of total:						47
					Percent native of total:						44
					Moisture Index:						3.35

Oak Creek Mitigation Bank Plant Monitoring, 2011

Forested Habitat Type - Transect 6

Cover (%)

						Sample Station										
Species	**Common Name**	**Native**	**Indicator**	**Wet**	**MTI**	**1**	**2**	**3**	**6**	**7**	**8**	**9**	**4**	**5**	**10**	**Mean**
Fraxinus latifolia (canopy)	Oregon ash	yes	FACW	y	2	99	99	95	99	95	80	95	99	99	90	95.0
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	30	7	3	1	10	10	1	22	15	10	10.9
Camassia leichtlinii	great camas	yes	FACW-	y	2	20	4	1	5	10	3		17	20		8.0
Lapsana communis	nipplewort		FAC	y	3	1					4	1	5	50		6.1
Carex leptopoda	Dewey's sedge	yes	FAC	y	3		38	10								4.8
Allium nigrum	black garlic		NOL	u	5		4				42					4.6
Prunella vulgaris	self-heal	yes	FACU+		4								45			4.5
Crataegus douglasii	black hawthorn	yes	FAC	y	3								25			2.5
Prunus sp.	cherry, plum	NA	---	u	5								25			2.5
Geum macrophyllum	large leaved avens	yes	FAC+	y	3	2	20							1		2.3
Galium aparine	cleavers	yes	FACU		4	1					1		1	18		2.1
forb	NA	NA	---	u	5										18	1.8
Rubus ursinus	trailing blackberry	yes	FACU		4								18			1.8
Amelanchier alnifolia	serviceberry	yes	FACU		4	15										1.5
Rumex conglomeratus	clustered dock		FACW	y	2						1				12	1.3
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2		3			1	1				2	0.7
Lolium perenne ssp. multiflorum	annual ryegrass		FAC	y	3										3	0.3
Ranunculus uncinatus	hooked [small-flowered] buttercup	yes	FAC	y	3						1		2			0.3
Symphoricarpos albus	snowberry	yes	FACU		4	3										0.3
Saxifraga oregana	Oregon [bog] saxifrage	yes	FACW+	y	2		2									0.2
Taraxacum officinale	dandelion		FACU		4	2										0.2
Torilis arvensis	spreading hedgeparsley		NOL	u	5									2		0.2
Vicia hirsuta	tiny vetch		NOL	u	5								2			0.2
Cardamine oligosperma	little western bittercress	yes	FAC	y	3										1	0.1
Hypochaeris radicata	hairy cat's ear		FACU		4										1	0.1
Mentha pulegium	pennyroyal		OBL	y	1										1	0.1
Solanum dulcamara	bittersweet nightshade		FAC+	y	3							1				0.1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					5	0	0	0	0	0	77	2	7	20	11.1
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					45	30	86	94	82	40	20	18	8	35	45.8

Total cover:	153
FAC and better cover:	133
Native cover:	124
Percent FAC and better of total:	87
Percent native of total:	81
Moisture Index:	2.43

Oak Creek Mitigation Bank Plant Monitoring, 2011

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**
Fraxinus latifolia (canopy)	Oregon ash	yes	FACW	y	2	99	95	95	99	50	15	99	40	80	100	77.2
Camassia leichtlinii	great camas	yes	FACW-	y	2			1				70	2	5	85	16.3
Geranium lucidum	shining geranium		NOL	u	5		60	85								14.5
Rubus discolor	Himalayan blackberry	invasive	FACU		4			1				45	1	5	37	8.9
Carex sp.	sedge	yes	---	u	5					55	1					5.6
Lysimachia nummularia	creeping jenny		FACW	y	2		7		45							5.2
Crataegus douglasii	black hawthorn	yes	FAC	y	3						50					5.0
Poa trivialis	rough [roughstalk] bluegrass		FACW	y	2	1	12	3	2	10			5	1		3.4
Geum macrophyllum	large leaved avens	yes	FAC+	y	3		15	12	4				1	1		3.3
Lapsana communis	nipplewort		FAC	y	3		20	3		1			1	8		3.3
Oenanthe sarmentosa	Pacific water-parsley	yes	OBL	y	1				1	22			5			2.8
Veronica scutellata	marsh speedwell	yes	OBL	y	1					25		1				2.6
Rubus ursinus	trailing blackberry	yes	FACU		4			3		4		3	8		6	2.4
Festuca rubra	red fescue		FAC+	y	3										18	1.8
Rumex conglomeratus	clustered dock		FACW	y	2		1		8	7			1			1.7
Myosotis laxa	small flowered forget-me-not	yes	OBL	y	1	13									2	1.5
Dipsacus fullonum	common teasel		FACW-	y	2									12	1	1.3
Rosa nutkana	Nootka rose	yes	FAC-		3							10	3			1.3
Galium aparine	cleavers	yes	FACU		4		2	1				2	5	1	1	1.2
Torilis arvensis	spreading hedgeparsley		NOL	u	5		10									1.0
Tolmiea menziesii	youth on age	yes	FAC	y	3			7					2			0.9
Geranium molle	dovefoot geranium		NOL	u	5							2		5	1	0.8
Carex leptopoda	Dewey's sedge	yes	FAC	y	3				7							0.7
Epilobium ciliatum ssp. watsonii	Watson's willowherb	yes	FACW-	y	2				1	1	1		1	2		0.6
Ranunculus uncinatus	hooked [small-flowered] buttercup	yes	FAC	y	3					1			5			0.6
Agrostis exarata	spike bentgrass	yes	FACW	y	2						5					0.5
Gratiola ebracteata	bractless hedgehyssop	yes	OBL	y	1						5					0.5
Heracleum maximum	cow parsnip	yes	FAC+	y	3			5								0.5
Juncus bufonius	toad rush	yes	FACW	y	2						5					0.5
Mentha pulegium	pennyroyal		OBL	y	1	2	1				2					0.5
Phacelia nemoralis	shade phacelia	yes	NOL	u	5							1	1		3	0.5
Symphoricarpos albus	snowberry	yes	FACU		4									5		0.5
Veronica americana	American speedwell [brooklime]	yes	OBL	y	1					5						0.5
Hypericum perforatum	St. John'swort		NOL	u	5			2							2	0.4

Oak Creek Mitigation Bank Plant Monitoring, 2011

Upland Habitat Type - Transect 8

Cover (%)

			Sample Station										
Species	**Common Name**	**Native**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**Mean**
Holcus lanatus	common velvetgrass		3	25	5	3	60	72	55	7	2	65	29.7
Festuca occidentalis	western fescue	yes	40	50	3	2	1		2	28	15	12	15.3
Anthoxanthum odoratum	sweet vernalgrass							57	50				10.7
Elymus glaucus	blue wildrye	yes	20	15			1			5	10	1	5.2
Agrostis castellana/capillaris	highland/colonial bentgrass			35			5	2	1				4.3
Daucus carota	Queen Anne's lace		40	2							1		4.3
Leucanthemum vulgare	oxeye daisy						8			2	10	3	2.3
Rubus discolor	Himalayan blackberry	invasive						1	7				0.8
Rumex acetosella	sheep sorrel/ sour dock			1	2	1		1	2				0.7
Danthonia californica	California oatgrass	yes	1	2									0.3
Vicia hirsuta	tiny vetch		1									1	0.2
Bromus hordeaceus ssp. hordeaceus	soft brome										1		0.1
Geranium carolinianum	Carolina geranium	yes								1			0.1
Myosotis discolor	yellow and blue forget-me-not											1	0.1
Vulpia bromoides	brome fescue		1										0.1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY		3	0	5	5	1	1	7	0	0	0	2.2
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"		7	2	85	90	30	8	3	60	62	20	37
								Total cover:					74
								Native cover:					21
							Percent native of total:						28

Oak Creek Mitigation Bank Plant Monitoring, 2011

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**
Cirsium vulgare	bull thistle		FACU		4									3		0.3
Prunella vulgaris	self-heal	yes	FACU+		4			1		2						0.3
Vicia hirsuta	tiny vetch		NOL	u	5			1					1	1		0.3
Hypochaeris radicata	hairy cat's ear		FACU		4			1					1			0.2
Lotus corniculatus	birdsfoot trefoil		FAC	y	3						2					0.2
Rubus laciniatus	evergreen blackberry	invasive	FACU+		4					2						0.2
Anagallis arvensis	scarlet pimpernel		FAC	y	3	1										0.1
Geranium carolinianum	Carolina geranium	yes	NOL	u	5									1		0.1
Juncus ensifolius	daggerleaf rush	yes	FACW	y	2						1					0.1
Ludwigia palustris	waterpurslane/ marsh seedbox		OBL	y	1						1					0.1
Melissa officinalis	garden balm		UPL		5		1									0.1
bare (soil, mud, rock)	DOES NOT INCLUDE CANOPY, IF ANY					80	2	0	30	1	75	1	1	3	1	19.4
moss, duff, dead vegetation, etc. (includes sprayed veg.)	"					5	1	1	5	2	5	3	65	57	2	14.6
											Total cover:					170
											FAC and better cover:					132
											Native cover:					126
											Percent FAC and better of total:					77
											Percent native of total:					74
											Moisture Index:					2.63

Oak Creek Mitigation Bank Plant Monitoring, 2011

	Percent FAC and better							Percent native						
Transect	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1	59	S	71	64	76	94	98	12	S	65	54	56	45	44
1.5/2.5	NA	NA	81	87	87	81	94	NA	NA	83	84	80	70	69
2	77	S	82	67	86	90	98	37	S	89	62	63	49	80
3	65	S	54	87	96	94	98	16	S	80	72	79	77	66
4	88	87	92	88	79	79	96	46	43	66	57	56	53	65
5	62	S	59	66	56	44	89	3	S	54	43	37	21	20
5.5	NA	NA	63	71	61	54	47	NA	NA	60	67	71	48	44
6	78	89	79	82	80	83	87	74	69	76	78	78	79	81
7	75	70	75	82	84	88	77	61	58	63	75	77	81	74
8	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	31	28
Means:	72	82	73	77	78	79	87	35	56	71	66	66	55	57

S = sprayed

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**
1		36	70	39	46	36	59	S	71	64	76	94	98
1.5/2.5	NA	NA	NA	NA	NA	NA	NA	NA	81	87	87	81	94
2		41	91	52	48	70	77	S	82	67	86	90	98
3		55	64	52	51	54	65	S	54	87	96	94	98
4		78	85	78	76	85	88	87	92	88	79	79	96
5		5	56	55	39	52	62	S	59	66	56	44	R
5.5	NA	NA	NA	NA	NA	NA	NA	NA	63	71	61	54	R
6*		26	77	78	81	64	78	89	79	82	80	83	87
7*		29	61	65	73	66	75	70	75	82	84	88	77
Means:		39	72	60	59	61	72	82	73	77	78	79	93

	Percent native												
Transect	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**
1						24	12	S	65	54	56	45	44
1.5/2.5	NA	NA	NA	NA	NA	NA	NA	NA	83	84	80	70	69
2						50	37	S	89	62	63	49	80
3						32	16	S	80	72	79	77	66
4						59	46	43	66	57	56	53	65
5						6	3	S	54	43	37	21	R
5.5	NA	NA	NA	NA	NA	NA	NA	NA	60	67	71	48	R
6*						46	74	69	76	78	78	79	81
7*						34	61	58	63	75	77	81	74
Means:						36	35	56	71	66	66	58	68

Number of Species, Transects 1-5 S = sprayed R = remediated *Includes canopy from 2005 on

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

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