

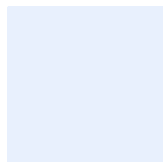
# Nelson's Checkermallow Recovery Project: Phase II (2018 Post-implementation Status Report)



7/6/2018

Report for Oregon Watershed Enhancement Board  
(Grant Agreement # 210-3054-7895)

Report prepared by Peter Moore  
*Institute for Applied Ecology*



## PREFACE

IAE is a non-profit organization whose mission is conservation of native ecosystems through restoration, research and education. IAE provides services to public and private agencies and individuals through development and communication of information on ecosystems, species, and effective management strategies. Restoration of habitats, with a concentration on rare and invasive species, is a primary focus. IAE conducts its work through partnerships with a diverse group of agencies, organizations and the private sector. IAE aims to link its community with native habitats through education and outreach.



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## ACKNOWLEDGMENTS

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**Cover photograph:** Nelson's checkermallow at Marys River Natural Area, June 2018, Peter Moore, IAE.

## SUGGESTED CITATION

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# Nelson's Checkermallow Recovery Project: Phase II (2018 Post-implementation Status Report)

## EXECUTIVE SUMMARY

Phase II of the Nelson's Checkermallow (*Sidalcea nelsoniana*) Recovery Project was funded by Oregon Watershed Enhancement Board (OWEB; Grant # 210-3054-7895) and was completed in 2014. This report summarizes post-implementation activities during 2017-18. Seed from project production fields is held in storage and continues to be used for restoration projects. Most of the 16 reintroduction sites have received some form of maintenance during 2017-18, although effort was variable between sites. Invasive and non-native species re-invading project sites remains a challenge. Nelson's checkermallow populations continued to be present at all 16 project sites and plants were observed flowering during June 2018. The larger populations that were established from seed continued to have large areas of occupied habitat, whereas the sites where small numbers of plugs or rhizomes were planted had correspondingly small or sparse populations. This project provides a model for recovery implementation for Nelson's checkermallow in other parts of its range and may guide recovery efforts with other threatened prairie species.

## 1. INTRODUCTION

Between 2010 and 2014, the Institute for Applied Ecology (IAE) received grants from the Oregon Watershed Enhancement Board (OWEB; Grant #s 210-3054-7895 and 8079) and the U.S. Fish and Wildlife Service (USFWS; Grant # F10AC00096) to work toward the recovery of Nelson's checkermallow (*Sidalcea nelsoniana*) in two of the largest recovery zones, Corvallis West and Salem West. This project implemented goals laid out in the *Recovery Plan for the Prairie Species of Western Oregon and Southwestern Washington* (USFWS 2010). The work built upon Phase I of the Nelson's Checkermallow Recovery Project (IAE 2012), which was also funded by OWEB (Grant # 208-3082). The objectives of Phase II of the project were to: 1) provide quality plant materials of Nelson's checkermallow through large scale seed collection and agricultural production, 2) increase and enhance habitat for Nelson's checkermallow at key introduction sites through weed control, site preparation, and seeding with diverse native species, 3) meet recovery objectives by introducing at least 40,000 checkermallow plants to protected sites, and 4) provide a model for recovery of other listed species. The project was completed in 2014 (Moore and Gray 2015).

This report summarizes post-implementation activities for Phase II of the Nelson's Checkermallow Recovery Project (OWEB Grant # 210-3054-7895) in 2017-18.

## 2. PROJECT POST-IMPLEMENTATION STATUS

### Plant material development

Nelson's checkermallow plant material development was a very successful aspect of the project. Two quarter-acre production blocks at the Natural Resources Conservation Service's (NRCS) Corvallis Plant Materials Center were extremely productive, yielding 744 pounds of seed over the course of five years (2009-2013), which was much more than required for the project. Seed was utilized for restoration, with 311 pounds used for direct sowing and further seed used for grow-out of 23,236 plugs. Fields also yielded 16,860 rhizomes for planting.

In fall of 2017, 20 pounds of Nelson's checkermallow seed was provided to the City of Corvallis for addition to a native prairie seed mix used to rehabilitate an area impacted by construction of a boardwalk at Marys River Natural Area. Four hundred plugs of Nelson's checkermallow are currently being grown by IAE for planting at Herbert Farm in fall 2018.

IAE currently stores the remainder of the seed produced through this project in our climate-controlled seed storage facility until it is used in future restoration and recovery projects.

### Habitat enhancement of introduction sites

Most of the 11 priority sites and five back-up sites chosen as reintroduction locations for Nelson's checkermallow (Table 1, Moore and Gray 2015) have continued to be restored or maintained by landowners and partner organizations, although maintenance efforts were variable between sites (Section 3).

Several sites continue to have invasive species challenges [e.g., teasel (*Dipsacus fullonum*) and velvet grass (*Holcus lanatus*) at Deer Creek, reed canarygrass (*Phalaris arundinacea*) at Sheldon-Holt, velvet grass at Spring Valley, and reed canarygrass at Tyee]. Sites that have had little or no maintenance in recent years, such as Dhooghe, Marys River Natural Area and Tyee Nature Reserve, have an increased prevalence of invasive weed species and encroachment of trees and shrubs. Sites that have had more active management by land managers since project completion (Table 2) show more positive gains against encroaching weeds. For example, control of false dandelion (*Hypochaeris radicata*) at E4 and tansy ragwort (*Jacobaea vulgaris*) at Spring Valley has successfully reduced the prevalence of those species.

Despite the weed challenges mentioned above, the native vegetation appears to be diverse and relatively resilient at many of the sites observed in June 2018.

**Table 1.** Summary of Nelson's checkermallow (*Sidalcea nelsoniana*) population estimates (2012-2016) and the amount of seed, plugs and rhizomes that were introduced to 16 sites in 2010-14.

Site Name	Landowner/ Easement	Recovery Zone	Baseline Natural Populati on (# plants) <sup>a</sup>	Augmented Plant Materials			Most Recent Population estimate <sup>b</sup>
				Seed (lbs)	Plugs (#)	Rhizomes (#)	
<b>Deer Creek Park*</b>	Yamhill County Parks	Salem West	0	23	1397	0	NS
<b>Dhooghe*</b>	WRP	Salem West	30	20	294	500	25,062
<b>E4 Ranch*</b>	WRP	Corvallis West	1	20	1000	1500	36,220
<b>EE Wilson Wildlife Area*</b>	ODFW	Corvallis West	377	66	1031	625	NS
<b>Herbert Farm &amp; Natural Area</b>	City of Corvallis/ODFW	Corvallis West	9	0	0	1500	222
<b>Jackson-Frazier Wetland</b>	Benton County	Corvallis West	6	10	200	882	748 <sup>c</sup>
<b>Lupine Meadows</b>	Greenbelt Land Trust	Corvallis West	107	0	2731	750	1979
<b>Marys River Natural Area*</b>	City of Corvallis/ WRP	Corvallis West	0	30	1000	2000	16,947
<b>Mud Slough*</b>	WRP	Salem West	2000	50	1794	1500	22,116
<b>Mud Slough Mitigation Bank</b>	Private/The Wetlands Conservancy	Salem West	0	0	3881	0	NS
<b>Owens Farm</b>	Greenbelt Land Trust	Corvallis West	50	0	3038	0	716 <sup>d</sup>
<b>Sheldon-Holt*</b>	WRP	Salem West	0	30	1000	1500	66,054
<b>Spring Valley Creek*</b>	WRP	Salem West	0	12	2019	0	5649
<b>Tye Nature Reserve*</b>	CTGR	Salem West	55	0	590	505	594
<b>Tye WRP*</b>	WRP	Corvallis West	15	30	1000	2625	4985 <sup>e</sup>
<b>Winter Creek*</b>	WRP	Corvallis West	1200	20	1000	1500	24,073
<b>Total</b>			3,850	311	23,236	16,860	>205,365

\* Priority site for restoration and Nelson's checkermallow introductions during the Phase II project. Other sites were back-up sites that received less intensive recovery efforts. WRP=Wetland Reserve Program Conservation Easement (Natural Resources Conservation Service). ODFW=Oregon Department of Fish and Wildlife. CTGR=Confederated Tribes of Grand Ronde.

<sup>a</sup> Counts in 2000s before re-introductions occurred (compiled from IAE survey in 2008, and earlier reports).

<sup>b</sup> Except where noted below, population estimates occurred after the Nelson's checkermallow was planted. 2012 surveys reported in Silvernail (2012); 2013-14 surveys (Silvernail et al., 2016); Herbert Farm (Moore & Ramthun 2016).

<sup>c</sup> Population estimate in 2012 occurred after rhizomes, but before seeds and plugs, were planted.

<sup>d</sup> Population estimate in 2012 occurred prior to plant augmentation at project sites.

<sup>e</sup> 625 rhizomes were planted after the census in 2013.

NS: The population has not been surveyed since the project started.

**Table 2.** Nelson's checkermallow Recovery Project Site Maintenance and Enhancements in 2017-18 and plans for the remainder of 2018.

Site Name	Mowing/Disking	Hand weeding	Herbicide	Prescribed burn	Planting
Deer Creek Park	Yamhill County Parks mowed the field in early Nov. 2017 and plans to mow in fall 2018.	Hand pulling and digging of teasel by work crews and volunteers in May 2017. Less teasel growth noted in 2018			
Dhooghe	No maintenance occurred, although NRCS is planning for the landowner to mow the prairies and disk patches of reed canarygrass in 2018.				
E4 Ranch	Annual mowing in fall by USFWS.		Grass-specific herbicide (Fusilade) and clopyralid in spring 2017 was applied by USFWS to targeting invasive grasses and false dandelion to reduce competition for Nelson's checkermallow. Spot spray invasive species.	USFWS is planning a prescribed burn in fall 2018.	Native seeding completed in September 2017.
EE Wilson Wildlife Area	Pipit field was mowed in November 2017.	Volunteers hand weeded patches of Scotch broom on the edge of the prairie and mustard in the prairie in May 2018.	Small amount of spot spraying of poison oak and blackberry ( <i>Rubus armeniacus</i> ) in May 2018.		Supplemental planting of 200 camas ( <i>Camassia sp.</i> ) bulbs in January 2018.
Herbert Farm and Natural Area	Annual mow by City of Corvallis, fall 2017.		Spot spray thistles, reed canarygrass, velvetgrass in 2017 and 2018.		
Jackson-Frazier Wetland	No maintenance				
Lupine Meadows	No maintenance				
Marys River Natural Area	No mowing of the main prairie for several years. Fire lines were mowed in June 2018. A new replacement boardwalk was constructed in 2017.	Hand pulling of Scotch broom ( <i>Cytisus scoparius</i> ) with volunteer crew in 2017.	Spot spraying for Scotch broom and blackberry by City of Corvallis in 2017.		The City of Corvallis seeded the boardwalk construction area with Nelson's checkermallow and native forbs and grasses in September 2017.



Site Name	Mowing/Disking	Hand weeding	Herbicide	Prescribed burn	Planting
Mud Slough	No mowing in recent years.		Annual spot spraying by the landowner in May and June each year, targeted reed canarygrass, velvetgrass, blackberry, thistles ( <i>Cirsium sp.</i> ) and tansy ragwort.		
Mud Slough Mitigation Bank			Annual spot spraying by the landowner in May and June each year, targeted reed canarygrass, velvetgrass, blackberry, thistles and tansy ragwort.		
Owens Farm	Greenbelt Land Trust mowed the wet prairie in 2017.		Plan to mow/cut/spray ash seedlings and saplings that have encroached on prairie in 2018.		
Sheldon-Holt	USFWS mowed in fall 2018.		USFWS conducted spot spraying of reed canarygrass and broadleaf weeds in summer 2017 and spring 2018.	USFWS is planning a burn in Fall 2018.	USFWS is planning on seeding and planting bulbs and plugs after the burn in 2018.
Spring Valley Creek	USFWS mowed the periphery in late June 2017 and the whole prairie August 2017. Disking of marshes in fall 2017.		USFWS spot sprayed spring 2017.		Forb plugs were planted in February 2017. Seeding of marshes October 2017.
Tyee	The landowner did some mowing in 2017.		The landowner did some spot spraying in 2017.		
Tyee Nature Reserve	CTGR is planning to mow in fall 2018.	Scotch broom removed by hand by Tribal staff and volunteers in May 2018. Survey of invasive plants recorded.			
Winter Creek	Little maintenance since 2016 as NRCS currently has no funding for the site.		Landowner conducted a broadcast spray with glyphosate through half of the Nelson's checkermallow introduction area in spring 2018.		

Acronyms: USFWS: US Fish & Wildlife Service; CTGR: Confederated Tribes of Grand Ronde; NRCS: Natural Resources Conservation Service.

## Nelson's checkermallow introductions

A primary objective of the project was to introduce at least 20,000 Nelson's checkermallow plants at protected sites in each of the Salem West and Corvallis West Recovery Zones. Population estimates made during, or subsequent to, the plantings exceeded these targets (Table 1; Silvernail 2012, Silvernail et al. 2016).

A secondary aim was to establish at least four populations in each recovery zone. This goal was exceeded during the recovery project, with Nelson's checkermallow established at seven sites in Salem West and nine sites in Corvallis West. The populations continued to be present at all 16 project sites in 2018 and plants were observed flowering during June 2018 when the areas were visited. The large populations of Nelson's checkermallow that were established during the project (Table 1, e.g., Dhooghe, E4 Ranch, Marys River, Mud Slough, Sheldon-Holt and Winter Creek) continued to have large areas of habitat occupied by Nelson's checkermallow, judging by the widespread distribution of flowering plants observed at the sites in 2018. Deer Creek, which wasn't seeded until 2014, now has an extensive cover of Nelson's checkermallow. The secondary sites where small numbers of plugs or rhizomes were planted tend to have correspondingly small or more sparse populations (e.g., Lupine Meadows, Owens Farm), but at some sites (e.g., Mud Slough Mitigation Bank) the plants are large and flowering well.

Since completion of the project, Nelson's checkermallow seed has been sown at Herbert Farm (7.5 pounds in fall 2015), as part of ongoing restoration, and Marys River (20 pounds in fall 2017), as part of habitat rehabilitation after construction of a boardwalk.



**Figure 1.** Widespread flowering Nelson's checkermallow at Marys River Natural Area in June 2018 (left), a sight that is typical of the large populations that established after seeding during Phase II of the recovery project. A large flowering Nelson's checkermallow at Mud Slough Mitigation Bank (right), a secondary project site where plugs were planted, is indicative of areas where plants have established well.

## Recovery model

The Nelson's checkermallow Phase I recovery project provides a model for recovery implementation for the species in other parts of its range, and may be useful to guide recovery of other prairie species. The success of Phases I and II supported development of Phase III of the project in the Portland and Coast Range recovery zones (OWEB Grant # 217-3010).

Nelson's checkermallow introduction data was contributed to USFWS's Threatened and Endangered Plant Geodatabase, which includes both natural and introduced populations of Willamette Valley species.

## 3. MAINTENANCE OR MODIFICATIONS SINCE LAST REPORT

Maintenance plans were sent to partners for all sites at the completion of the Phase II project at the end of 2014 to help with planning of treatments in 2015 and in future years.

Most landowners and partner organizations have been actively restoring and maintaining the 16 reintroduction sites in 2017 and 2018 (Table 2).

No maintenance occurred at Jackson-Frazier Wetland and Lupine Meadows over the last two years, and at Dhooghe, no maintenance has occurred since 2011. Initially this was a result of the Natural Resources Conservation Service (NRCS) not having a compatible use authorization in place, but then health issues prevented the landowner from conducting maintenance. Mowing and disking will resume in 2018.

Yamhill County Parks have conducted invasive species control at Deer Creek Park in the Habitat Conservation Area in the north-west corner of the property, and mowed and hand-weeded the main restoration field. A viewing platform has been constructed as part of a project which will create an elevated boardwalk around the perimeter of the restoration field. Building on phase one will begin in summer 2018 and completion of the second phase is anticipated in 2019. Interpretive signs at the start of the boardwalk and at the observation deck will describe the wet prairie ecosystem and restoration efforts at the site.

City of Corvallis did limited vegetation maintenance at Marys River Natural Area, including the annual mowing of fire lines prior to July 4<sup>th</sup> celebrations. In June 2018, these mowed strips were inadvertently placed through areas occupied by Nelson's checkermallow. The City constructed a boardwalk during 2017 to replace one that was destroyed in floods several years ago. As Nelson's checkermallow occupied the construction area, replanting was required to mitigate for any damage to the species. IAE supplied 20 pounds of Nelson's checkermallow seed for the native plant mix used to rehabilitate the boardwalk corridor.

USFWS continued to have, or renewed, agreements with NRCS to work on several WRPs, including Spring Valley, Sheldon-Holt, E4 Ranch and Tyee. USFWS is actively attempting to lessen the impact of false dandelion (*Hypochaeris radicata*) at E4 Ranch and reed canarygrass (*Phalaris arundinacea*) at Sheldon-Holt.

IAE is collaborating with partners for ongoing restoration at Herbert Farm and Natural Area through funding from Oregon Department of Fish and Wildlife, and in previous years from the Plants for People OWEB Grant # 214-3054.

Winter Creek was visited in June 2018, less than a week after a broadcast herbicide treatment was conducted to target cattails and reed canarygrass. Due to lack of understanding about the distribution of the Nelson's checkermallow, the spraying inadvertently extended into about half the species' occupied habitat. Although some Nelson's checkermallow plants were killed, other plants appeared to be less affected and were still flowering. Subsequent visits would be required to assess the overall impact as the herbicide can take a few weeks to take full effect.

#### 4. PHOTO POINTS

Photographs were repeated at photo points at all sites in 2018. Locations of photo points are provided in Appendix 1 and example photographs are shown in Appendix 2 for comparison with pre-treatment and project completion photographs.

#### 5. COST ACCOUNTING ASSOCIATED WITH MAINTENANCE OR REPORTING

Maintenance was conducted by partners and landowners, with estimated costs supplied in Table 3. Funds (\$2,700) for post-implementation visits and reporting were released by OWEB to IAE upon completion of the project.

#### 6. PUBLIC AWARENESS OR EDUCATION

The City of Corvallis conducted an opening ceremony for the new boardwalk at Marys River Natural Area in September 2017.

#### 7. LESSONS LEARNED

- This project provides a model for recovery implementation for Nelson's checkermallow in other parts of its range and may guide recovery efforts with other threatened prairie species.
- Invasive and non-native species re-invading project sites remains a challenge. This reinforces the need for sufficient ongoing maintenance at all sites, so that they continue to contribute to recovery of Nelson's checkermallow in the long term. Lasting recovery depends on the control of invasive and non-native species before and after, at-risk species are introduced. Fortunately, most partners and landowners have continued maintenance activities since completion of the recovery project in 2014.

**Table 3.** Approximate costs incurred by partners at Nelson's checkermallow project sites in 2017-18.

Site Name	Recovery Zone	Agency <sup>a</sup>	Approximate maintenance costs
<b>Deer Creek Park</b>	Salem W	Yamhill County Parks	\$250
<b>Dhooghe</b>	Salem W	NRCS	\$0
<b>E4 Ranch</b>	Corvallis W	NRCS	\$49,348
<b>EE Wilson Wildlife Area</b>	Corvallis W	ODFW	\$2000
<b>Herbert Farm &amp; Natural Area</b>	Corvallis W	City of Corvallis/ODFW	\$2000
<b>Jackson-Frazier Wetland</b>	Corvallis W	Benton County	\$0
<b>Lupine Meadows</b>	Corvallis W	Greenbelt Land Trust	\$0
<b>Marys River Natural Area</b>	Corvallis W	City of Corvallis	\$7500*
<b>Mud Slough</b>	Salem W	NRCS	\$2000
<b>Mud Slough Mitigation Bank</b>	Salem W	Landowner	\$2000
<b>Owens Farm</b>	Corvallis W	Greenbelt Land Trust	\$1000
<b>Sheldon-Holt</b>	Salem W	NRCS	\$35,408
<b>Spring Valley Creek</b>	Salem W	NRCS	\$23,523
<b>Tyee Nature Reserve</b>	Salem W		\$1725
<b>Tyee</b>	Corvallis W	NRCS	\$1000
<b>Winter Creek</b>	Corvallis W	Landowner	\$1000

<sup>a</sup> NRCS=Natural Resources Conservation Service, ODFW=Oregon Department of Fish and Wildlife.

\*Approximately \$5000 for seed and \$2500 for restoration activities as part of the total \$500,000 cost of the new boardwalk project.

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## APPENDIX 1: LOCATIONS OF PHOTO POINTS AT NELSON'S CHECKERMALLOW PROJECT SITES

Area	Photpoint ID	Latitude	Longitude	Directions of photo (bold are priorities)
Deer Creek Park	DC1	45.163574	-123.388233	<b>290, 325, 0</b>
Deer Creek Park	DC2	45.165392	-123.389118	102, 320
Dhooghe	D1	44.8488	-123.364252	<b>153, 200, 240</b>
E4 Ranch	E4-1	44.476581	-123.319935	140, <b>180</b> , 270
E4 Ranch	E4-2	44.474077	-123.321829	190, 230, <b>270</b>
EE Wilson Wildlife Area	EE1	44.706573	-123.220351	<b>210, 325</b>
EE Wilson Wildlife Area	EE2	44.704963	-123.217336	235
EE Wilson Wildlife Area	EE3	44.705221	-123.218331	223
Herbert Farm and Natural Area	HF2	44.520786	-123.295572	26, 158, <b>210</b>
Herbert Farm and Natural Area	HF3	44.519756	-123.296353	<b>28</b> , 217, 300
Lupine Meadows	LM3	44.547765	-123.354236	<b>0</b>
Lupine Meadows	LM5	44.548018	-123.353946	<b>90</b>
Lupine Meadows	LM4	44.547862	-123.354682	<b>0</b>
Jackson-Frazier Wetland	JF1	44.60457	-123.240893	<b>315</b>
Marys River Natural Area	MR1	44.537779	-123.286764	<b>228</b>
Marys River Natural Area	MR2	44.537438	-123.286842	<b>0</b>

Area	Photpoint ID	Latitude	Longitude	Directions of photo (bold are priorities)
Mud Slough	MS1	44.968851	-123.20523	200, <b>255</b>
Mud Slough	MSA1	44.954433	-123.198971	<b>250</b>
Mud Slough	MSA2	44.953656	-123.198218	113, <b>270</b>
Mud Slough Mitigation Bank	MM1	44.958066	-123.209454	0, 45, 150, <b>275</b>
Mud Slough Mitigation Bank	MM14	44.960496	-123.208812	12, 76, 170, 285
Mud Slough Mitigation Bank	MM4	44.95959	-123.208775	0, 90, 180, 270
Mud Slough Mitigation Bank	MM22	44.958908	-123.209434	<b>0, 90, 180, 270</b>
Sheldon-Holt	SH1	45.139069	-123.250265	<b>155, 180</b>
Spring Valley	SV1	45.031059	-123.117523	<b>325, 8</b>
Tyee Nature Reserve	TN1	45.075705	-123.610919	<b>175, 200</b>
Tyee Nature Reserve	TN2	45.075052	-123.611282	180
Tyee Nature Reserve	TN3	45.075538	-123.611462	90, 145
Tyee Nature Reserve	TN4	45.075111	-123.611152	15
Tyee WRP	T1	44.464771	-123.319874	<b>30, 91, 160</b>
Winter Creek	WC1	44.724672	-123.240557	<b>120, 132, 280</b>



## APPENDIX 2: SUMMARY OF PHOTO POINTS AT NELSON'S CHECKERMALLOW PROJECT SITES

# Appendix 2: Summary of photo points at Nelson's checkermallow project sites. Deer Creek Park, Polk Co., Salem West

DC1 (0°)  
Pre-treatment 2008



DC1 (0°)  
Project completion 2014



DC1 (0°)  
Post-project status 2018



DC2 (320°)  
Pre-treatment 2010



DC2 (320°)  
Project completion 2014



DC2 (320°)  
Post-project status 2018



# Dhooghe WRP, Polk Co., Salem West

Photopoint D1 (153°) I;re-  
treatment during earlier restoration,  
2007



Photopoint 1C After disking  
2008



Photopoint 1C Pre-treatment  
current restoration, 2010



Photopoint 1C After mowing  
2010



Photopoint 1C Project completion  
2014



Photopoint 1C (153°)  
Post-project status 2018



# E4 Ranch WRP, Benton Co., Corvallis West

Near photopoint E4-1  
Pre-treatment 2008



E4-1 (180°)  
Project completion 2014



Photopoint E4-1 (180°)  
Post-project status 2018



Near photopoint E4-2  
Pre-treatment 2008



Photopoint E4-2 (270°)  
Project completion 2014



Photopoint E4-2 (270°)  
Post-project status 2018



# EE Wilson Wildlife Area, Benton Co., Corvallis West

EE1  
After herbicide 2010



EE1 (210°)  
Project completion 2014



EE1 (210°)  
Post-project status 2018



EE1 (325°)  
After herbicide 2010



EE1 (325°)  
Project completion 2014



EE1 (325°)  
Post-project status 2018



# Herbert Farm & Natural Area, Benton Co., Corvallis West

Near Photopoint HF2  
Pre-treatment 2009



HF2 (210°)  
Project completion 2014



HF2 (210°)  
Post-project status 2018



Near Photopoint HF3  
Pre-treatment 2009



HF3 (28°)  
Project completion 2014



HF3 (28°)  
Post-project status 2018



# Jackson-Frazier Wetland, Benton Co., Corvallis West

Near Photopoint JF1  
After burn 2012



JF1 (315°)  
Project completion 2013



JF1 (315°)  
Post-project status 2018



# Lupine Meadows, Benton Co., Corvallis West

LM 3 (0°)  
Pre-treatment 2011 (photo  
Greenbelt Land Trust (GLT))



LM3 (0°)  
After mowing, 2011 (photo GLT)



LM3 (0°)  
Post-project status 2018



LM4 (90°)  
Pre-treatment 2011 (photo GLT)



LM4 (90°)  
After mowing 2011 (photo GLT)



LM4 (90°)  
Post-project status 2018





# Marys River Natural Area WRP, Benton Co., Corvallis West

MR1 (228°) During treatments  
previous project 2008



MR1 (228°)  
Project completion 2014



MR1 (228°)  
Post-project status 2018



MR2 (0°) During treatments  
previous project 2008



MR2 (0°)  
Project completion 2015



MR2 (0°)  
Post-project status 2018



# Mud Slough WRP, Polk Co., Salem West

MSA1 (250°)  
Pre-treatment 2009



MSA1 (250°)  
Project completion 2014



MSA1 (250°)  
Post-project status 2018



MS1 (255°)  
During restoration 2011



MS1 (255°)  
Project completion 2014



MS1 (255°)  
Post-project status 2018



# Mud Slough Mitigation Bank, Polk Co., Salem West

MM1 (275°)  
Project completion 2015



MM1 (275°)  
Post-project status 2018



MM22 (0°)  
Project completion 2015



MM22 (0°)  
Post-project status 2018



# Owens Farm, Benton Co., Corvallis West

OF6 (180°)  
Pre-project, after mowing 2007



OF6 (180°)  
After plug planting, 2012



OF6 (180°)  
Post-project status 2018



OF5 (180°)  
Project completion, 2013



OF5 (180°)  
Post-project status 2018



# Sheldon-Holt WRP, Polk Co., Salem West

SH1 (155°)  
Pre-treatment 2008



SH1 (155°)  
During treatment 2010



SH1 (155°)  
After mowing 2011



SH1 (155°)  
During treatment 2012



SH1 (155°)  
Project completion 2014



SH1 (155°)  
Post-project status 2018



# Spring Valley WRP, Polk Co., Salem West

SV1 (325°)

Native grass establishment 2010



SV1 (325°)

Project completion 2014



SV1 (325°)

Post-project status 2017



SV2 (8°)

Native grass establishment 2010



SV2 (8°)

Project completion 2014



SV2 (8°)

Post-project status 2018



# Tyee Nature Reserve, Polk Co., Salem West

TN1 (175°)  
Pretreatment 2010



TN1 (175°)  
Project completion 2014



TN1 (175°)  
Post-project status 2018



TN2 (180°)  
Pretreatment 2010



TN2 (180°)  
Project completion 2014



TN2 (180°)  
Post-project status 2018



# Tyee WRP, Benton Co., Corvallis West

T1 (91°)  
Native grass establishment 2009



T1 (91°)  
Project completion 2014



T1 (91°)  
Post-project status 2018



T1 (160°)  
Native grass establishment 2009



T1 (160°)  
Project completion 2014



T1 (160°)  
Post-project status 2018





# Winter Creek WRP, Polk Co., Corvallis West

WC1 (120°)  
Pre-treatment 2009



WC1 (120°)  
Project completion 2014



WC1 (120°)  
Post-project status 2018



WC1 (280°)  
During treatments 2010



WC1 (280°)  
Project completion 2014



WC1 (280°)  
Post-project status 2018

