

McGowan Meadow restoration: 2023 annual report



February
2024

Report for Bureau of Land Management,
Agreement #L21AC10245, #L20AC00228,
and #L23AC00272

Report prepared by Rolando Beorchia and Andrew
Esterson
Institute for Applied Ecology



PREFACE

IAE is a non-profit organization whose mission is the 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.



Questions regarding this report or IAE should be directed to:

Thomas Kaye (Executive Director)
Institute for Applied Ecology
4950 SW Hout St.
Corvallis, OR 97333

phone: 541-753-3099
fax: 541-753-3098
email: info@appliedeco.org

ACKNOWLEDGEMENTS

Funding for this project was provided by the Bureau of Land Management (BLM) Upper Willamette Field Office, Northwest Oregon District. We thank Northwest Oregon District botanist John Klock, Upper Willamette Field Office Botanist Jessica Celis, and Upper Willamette Field Office Forestry Technician Emily Erickson for their commitment to restoration work at this and other sensitive habitats in their field office.

We thank ESRI for their support of our GIS program. Maps were created using ArcGIS® software by Esri. ArcGIS® and ArcMap™ are the intellectual property of Esri and are used herein under license. Copyright © Esri. All rights reserved. For more information about Esri® software, please visit www.esri.com.

Cover photograph: Farewell to spring (*Clarkia amoena*) at McGowan Meadow, July 12, 2023. Photo taken by Rolando Beorchia.

Photo credits: All photos taken by IAE staff unless otherwise noted.

SUGGESTED CITATION

Beorchia, Rolando and Andrew Esterson. 2024. McGowan Meadow restoration: 2023 annual report. Unpublished report for the Bureau of Land Management, Northwest Oregon District. Institute for Applied Ecology. Corvallis, Oregon. 13 pages plus appendices.

TABLE OF CONTENTS

EXECUTIVE SUMMARY	4
1. INTRODUCTION	4
2. GOALS AND OBJECTIVES	6
3. 2023 RESTORATION ACTIVITIES.....	6
4. MANAGEMENT RECOMMENDATIONS	11
5. REFERENCES	12
APPENDIX A: MEADOW CHECKERMALLOW (SIDALCEA CAMPESTRIS) POPULATION MONITORING RESULTS 1992-2021	13
APPENDIX B: COMPLETED AND PROPOSED MANAGEMENT ACTIONS: 2008-2026.....	14
APPENDIX C: MEADOW EDGE PHOTO POINT: 2021-2023	18
APPENDIX D: COMPREHENSIVE PLANTING AND SEEDING RECORD 2010-2023.....	20

LIST OF TABLES

Table 1. 2023 management actions at McGowan Meadow	7
Table 2. 2023 McGowan Meadow native seed mix.	9
Table 3. 2023 McGowan Meadow native shrub and bulb planting list.	9
Table 4. Meadow checkermallow (<i>Sidalcea campestris</i>) population monitoring results 1992-2021	13

McGowan Meadow restoration: 2023 annual report

EXECUTIVE SUMMARY

The Institute for Applied Ecology (IAE) has conducted habitat restoration at McGowan Meadow in partnership with the Bureau of Land Management (BLM) since 2008. In 2023, IAE performed a variety of restoration activities including herbicide treatments, hand weeding, planting native bulbs, seeding native species, and planting fruit and nut bearing trees and shrubs. This was the third full year in which the use of herbicides has been permitted at McGowan Meadow. IAE completed herbicide spot treatments on reed canarygrass (*Phalaris arundinacea*) and Fuller's teasel (*Dipsacus fullonum*) and hand removed false brome (*Brachypodium sylvaticum*), Himalayan blackberry (*Rubus bifrons*), Fuller's teasel, and oxeye daisy (*Leucanthemum vulgare*). IAE broadcast 14.28 pounds of native seed mix and planted 1,216 bulbs from six species: crown brodiaea (*Brodiaea coronaria*) harvest brodiaea (*Brodiaea elegans*), Tolmie's star-tulip (*Calochortus tolmiei*), ookow (*Dichelostemma congestum*), chocolate lily (*Fritillaria affinis*), and Gardner's yampah (*Perideridia gairdneri*). IAE also planted golden chinquapin (*Chrysolepis chrysophylla*), Pacific crabapple (*Malus fusca*), osoberry (*Oemleria cerasiformis*), Lewis' mock-orange (*Philadelphus lewisii*), Oregon white oak (*Quercus garryana*), salmon berry (*Rubus spectabilis*), oval-leaved viburnum (*Viburnum ellipticum*) red-flowering currant (*Ribes sanguineum*), stink currant (*Ribes bracteosum*) and red elderberry (*Sambucus racemosa*) to start a living fence habitat buffer between the road and meadow. Jonny Native Seed donated 20 pounds of Oregon white oak acorns, which were also planted along the road. Future restoration activities will include chemical and mechanical weed management, mowing and/or burning to reduce shrub cover, conifer removal to preserve open meadow habitat and release Oregon white oaks, and revegetation with appropriate native plant materials.

1. INTRODUCTION

McGowan Meadow is a 6.3-acre, regionally rare, mid-elevation wet meadow located in the Cascade foothills northeast of Springfield, Oregon (Figure 1). It is managed by the Bureau of Land Management (BLM) Upper Willamette Field Office, Northwest Oregon District. McGowan Meadow is designated as a BLM Area of Critical Environmental Concern (ACEC) and hosts a diverse community of native species, including a large population of meadow checkermallow (*Sidalcea campestris*), a BLM Species of Concern. 2021 population monitoring counted 199 total individuals (Appendix A). Its mid-elevation (2000 ft) makes this site an important refugia for native prairie species that need to shift their ranges in response to climate change in the Willamette Valley.

In 2005, the Native Plant Conservation Program of the Oregon Department of Agriculture (ODA) developed a prairie habitat assessment with management recommendations for McGowan Meadow (Mitchell et al. 2005). The Institute for Applied Ecology (IAE) began working in partnership with the BLM to implement restoration at McGowan Meadow in 2008. This report describes McGowan Meadow restoration activities implemented by IAE in 2023. See Appendix B for a summary of restoration activities conducted by IAE from 2008-2023. Appendix C provides a photo point comparison through time at McGowan Meadow.

Prior to September 2020, manual and mechanical weed removal techniques were the only tools available to maintain the meadow and slow the spread of non-native species. Herbicides have since been

approved for use in the BLM Northwest Oregon District, making it possible to remove the weed cloth installed in 2014 and still maintain control of the underlying reed canarygrass (*Phalaris arundinacea*). While manual techniques will still be important for site management, the use of herbicides has resulted in more efficient and effective control of non-native weeds.



Figure 1. McGowan Meadow site location and project boundary.

2. GOALS AND OBJECTIVES

The purpose of this project is to assist the BLM with maintaining and improving rare mid-elevation prairie habitat in support of the native plant community and meadow checkermallow population at McGowan Meadow. There are five primary objectives of this project:

1. Eradicate low abundance priority invasive plants: reed canarygrass, Scotch broom (*Cytisus scoparius*), meadow knapweed (*Centaurea x moncktonii*), one-seeded hawthorn (*Crataegus monogyna*);
2. Reduce high abundance priority invasive plants to below 5% cover: Fuller's teasel (*Dipsacus fullonum*), false brome (*Brachypodium sylvaticum*), Himalayan blackberry (*Rubus bifrons*), cutleaf blackberry (*Rubus laciniatus*), and oxeye daisy (*Leucanthemum vulgare*);
3. Reduce high abundance non-native grasses to 10% cover;
4. Increase meadow checkermallow abundance by 50% (300 total plants);
5. Increase meadow plant community diversity by augmenting species occurring in low abundance.

These revised objectives were recommended in the McGowan Meadow 2022 annual report (Beorchia & Esterson, 2023).

3. 2023 RESTORATION ACTIVITIES

In 2023, IAE broadcast native seed, planted native shrubs, hand pulled invasive weeds, and applied Rodeo (glyphosate) herbicide targeting reed canarygrass, false brome, Fuller's teasel, and Himalayan blackberry. (Figure 2, Table 1). See Appendix B for a complete list of management actions at McGowan Meadow from 2008-2023. Appendix C is a single photo point comparison from 2021-2023. Appendix D contains a comprehensive record of species planted and seeded at McGowan Meadow.

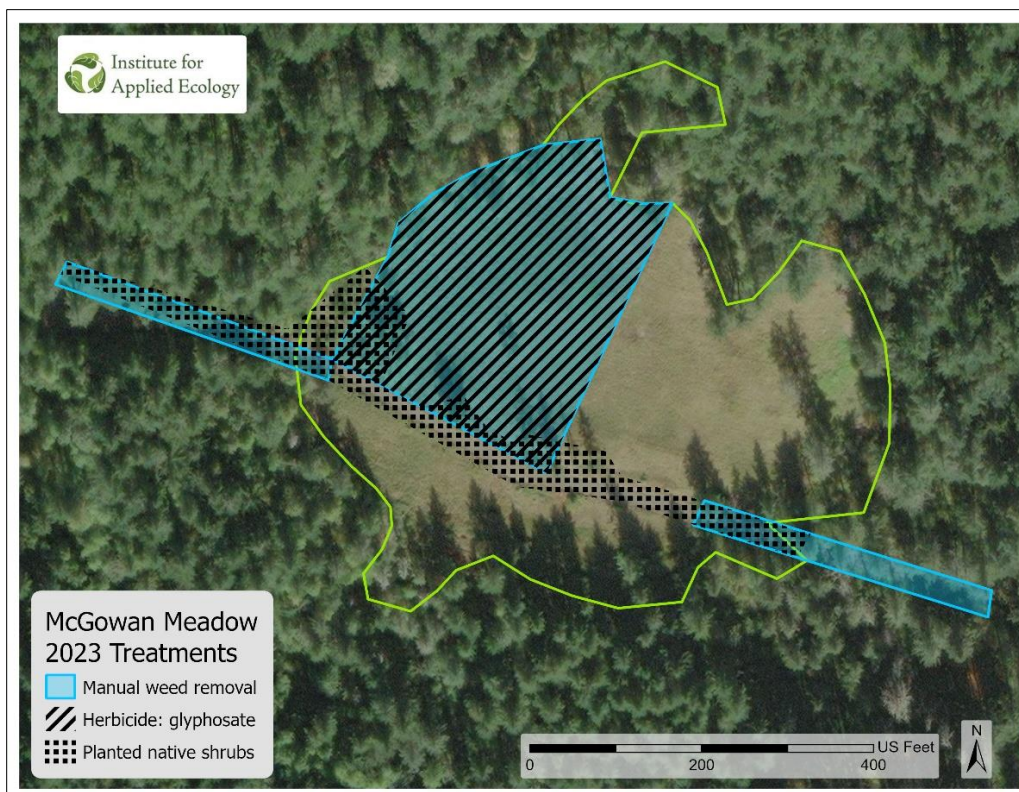


Figure 2. McGowan Meadow 2023 treatment locations.

To help describe where management actions occur, we split McGowan Meadow into two management units: North Meadow and South Meadow. McGowan Creek Road bisects the two units and acts as a natural delineation between the two. Due to culvert bridge construction on McGowan Creek Road, access was not available from late May to mid-September. Access on gravel roads from Shotgun Creek Road was used occasionally, though it added significant travel time for each visit limiting on the ground labor capacity.

Table 1. 2023 management actions at McGowan Meadow

Date	Personnel*	Management Action
9-Mar	IAE	Observed no winter storm damage and clear road access, assessed weed abundance and spring treatments, observed native plant phenology and revegetation after fall 2022 controlled burn.
13-Apr	IAE, BLM	Post-burn spring site assessment with Jessica Celis. Evaluated native revegetation, weed abundance, and species specific treatments.
16-May	IAE	Applied glyphosate on reed canarygrass (<i>Phalaris arundinacea</i>) and Fuller's teasel (<i>Dipsacus fullonum</i>).
13-Jun	IAE	Verified new route access due to road repair detour. Hand pulled oxeye daisy (<i>Leucanthemum vulgare</i>), Fuller's teasel, Queen Anne's lace (<i>Daucus carota</i>), and false brome (<i>Brachypodium sylvaticum</i>).
26-Jun	IAE, BLM	Picked up native shrubs from Jessica Celis to be planted at BLM ACEC's.
12-Jul	IAE	Hand pulled bull thistle (<i>Cirsium vulgare</i>), Canada thistle (<i>Cirsium arvense</i>), Scotch broom (<i>Cytisus scoparius</i>), false brome, and Fuller's teasel. Collected seed for scattering at other ME sites: Dorena Prairie, Garoutte Prairie, and Twin Buttes Prairie. Observed grazing damage to meadow checkermallow (<i>Sidalcea campestris</i>).
18-Sep	IAE	Assessed need for weed treatments: roadside Scotch broom treatment east and west of the meadow, manual or chemical Fuller's teasel treatment of rosettes.
6-Oct	IAE	Planted shrubs donated from BLM along the road. Hand pulled roadside Scotch broom west of the meadow.
24-Oct	IAE	Planted shrubs along the road, scattered oak seed along the road, planted bulbs and broadcast seed to bare patches in North and South Meadows.

*Institute for Applied Ecology (IAE), Bureau of Land Management (BLM).

Treatment of invasive plants occurred throughout the year. In May, IAE applied Rodeo (glyphosate) to reed canarygrass and Fuller's teasel to reduce invasive weed presence. In June, July, and October, hand treatment of oxeye daisy (*Leucanthemum vulgare*), Fuller's teasel, Queen Anne's lace (*Daucus carota*), bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), Scotch broom, and false brome occurred in the North Meadow (Table 1).

Invasive species continue to decline at McGowan Meadow. In 2023, Scotch broom was only observed along the roadside to the east and west of the meadow, where it was once abundant throughout the unit. One-seeded hawthorn was not present, and Canada thistle was in low abundance, mostly on the east side of North Meadow. Staff treated reed canarygrass before flowering and observed fewer patches this year. Fuller's teasel, oxeye daisy and Himalayan blackberry are at moderate infestation levels on the western half of North Meadow. Additionally, a meadow knapweed patch previously being manually and chemically treated in South Meadow was not present in 2023. It was last seen in 2020 and has potentially been eradicated. Velvet grass (*Holcus lanatus*) continues to be prominent throughout McGowan Meadow, though 2023 observations suggest burning and follow-up glyphosate herbicide treatments were effective at reducing its abundance in the North Meadow (Figure 3). Roadside weed

removal and string trimmer mowing of the South Meadow reduced competition and appear to have helped Oregon sunshine (*Eriophyllum lanatum*) and Oregon geranium (*Geranium oregonum*) become more robust compared to previous years (Figure 4).



Figure 3. McGowan Meadow in June before (left) and after (right) prescribed fire, follow-up glyphosate treatment, and broadcast seeding.



Figure 4. Roadside Oregon sunshine (*Eriophyllum lanatum*) thriving after weed removal (left). Oregon geranium (*Geranium oregonum*) abundance in South Meadow one year after mowing (right).

In October, IAE broadcast a seed mix on bare ground throughout the meadow and planted bulbs and shrubs. The 14.28 pounds of Willamette Valley sourced seed mix contained a diverse blend of grasses and annual forbs, with an emphasis on wet prairie species (Table 2). IAE staff planted 1,216 crown brodiaea (*Brodiaea coronaria*) harvest brodiaea (*Brodiaea elegans*), ookow (*Dichelostemma congesta*), Tolmie's star-tulip (*Calochortus tolmiei*), chocolate lily (*Fritillaria affinis*), and Gardner's yampah (*Perideridia gairdneri*) bulbs in small patches across the North and South meadows (Table 3). Staff also planted 106 shrubs and trees along the north side of the road in the North Meadow (Figure 2, Table 3). The trees and shrubs will increase species diversity of McGowan Meadow, add fruit and nut forage for wildlife, create a roadside weed barrier, and reduce vehicular accessibility. Additionally, staff scattered 20 pounds of Oregon white oak (*Quercus garryana*) seed under the rocks on both sides of the road. A

local wild seed wholesaler, Jonny Native Seed, donated the seed to the project. It is expected many of these will not survive winter squirrel predation, but we anticipate some will survive to sprout.

Table 2. 2023 McGowan Meadow native seed mix.

Scientific name	Common name	Seed (lb)
<i>Agrostis exarata</i>	spike bentgrass	0.5
<i>Beckmannia syzigachne</i>	American sloughgrass	5
<i>Bromus carinatus</i>	California brome	2
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring	0.25
<i>Deschampsia cespitosa</i>	tufted hairgrass	0.5
<i>Downingia elegans</i>	elegant calicoflower	0.5
<i>Eleocharis ovata</i>	ovoid spikerush	0.5
<i>Eleocharis palustris</i>	creeping spikerush	0.5
<i>Hordeum brachyantherum</i>	meadow barley	0.5
<i>Lupinus bicolor</i>	bi-colored lupine	0.5
<i>Madia gracilis</i>	grassy tarweed	0.25
<i>Mimulus guttatus</i>	common monkeyflower	0.1
<i>Plagiobothrys figuratus</i>	fragrant popcornflower	0.3
<i>Plectritis congesta</i>	shortspur seablush	0.25
<i>Poa secunda</i>	pine bluegrass	0.25
<i>Rorippa curvisiliqua</i>	western yellow-cress	0.25
<i>Sidalcea campestris</i>	meadow checkermallow	2
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass	0.13
Total (lb):		14.28

Table 3. 2023 McGowan Meadow native shrub and bulb planting list.

Scientific name	Common name	Shrubs/trees	Bulbs
<i>Chrysolepis chrysophylla</i>	golden chinquapin	4	
<i>Malus fusca</i>	Pacific crabapple	7	
<i>Oemleria cerasiformis</i>	osoberry	15	
<i>Philadelphus lewisii</i>	Lewis' mock-orange	2	
<i>Quercus garryana</i>	Oregon white oak	3	
<i>Ribes bracteosum</i>	stink currant	5	
<i>Ribes sanguineum</i>	red-flowering currant	11	
<i>Rubus spectabilis</i>	salmon berry	17	
<i>Sambucus racemosa</i>	red elderberry	40	
<i>Viburnum ellipticum</i>	oval-leaved viburnum	2	
<i>Brodiaea coronaria</i>	crown brodiaea		333
<i>Brodiaea elegans</i>	harvest brodiaea		100
<i>Dichelostemma congestum</i>	ookow		100
<i>Calochortus tolmiei</i>	Tolmie's star-tulip		100
<i>Fritillaria affinis</i>	chocolate lily		50
<i>Perideridia gairdneri</i>	Gardner's yampah		533
Total		106 shrubs/trees	1,216 bulbs

IAE staff collected native seed for dispersal at other mid-elevation BLM ACEC's: Dorena and Garoutte Prairies. Targeted species were those in high abundance at McGowan Meadow and in low abundance at Dorena and Garoutte. Both Oregon geranium and narrowleaf mule's-ear (*Wyethia angustifolia*) bloomed in high abundance this year (Figure 5). Staff collected Oregon geranium, but most of the narrowleaf mule's-ear seed heads had been eaten by cows before collection could occur.

Native fewleaf thistle (*Cirsium remotifolium*) was in abundance at multiple locations within the North and South Meadows. It is possible that the pre-burn collection and post-burn scattering of this species was successful in protecting the seed and boosting population numbers, filling the ecological niche previously occupied by non-native thistles.



Figure 5. Narrowleaf mule's ear (*Wyethia angustifolia*) abundance at McGowan Meadow (left). Butterfly nectar on native fewleaf thistle (*Cirsium remotifolium*) (center). Annual forbs seeded after prescribed fire flourishing in spring (right). June 13, 2023.

Cattle heavily grazed McGowan Meadow in 2023, gaining unwanted access and eating most of the conspicuous tall seed heads from multiple species including meadow checkermallow, narrowleaf mule's ear, showy tarweed (*Madia elegans*), and western coneflower (*Rudbeckia occidentalis*) (Figure 6). Staff observed the grazing on the morning of the intended meadow checkermallow census, so the decision was made to postpone counting until 2024. We concluded that without flowering heads the likelihood of undercounting was high due to the difficulty of distinguishing vegetative meadow checkermallow from dwarf checkermallow (*Sidalcea malviflora* spp. *virgata*) and Oregon geranium. Anecdotally, it does appear that the South Meadow has more plants than the previous census. Uncontrolled cattle grazing and recreational visitors at McGowan Meadow pose a continual threat to restoration progress at the site. Identifying ways to deter unwanted cattle grazing is necessary to allow native plants to disperse seed. Four wheel drive damage in previous years suggest it may be necessary to install more boulders if future treatments create meadow entryways.



Figure 6. Unwanted cattle grazing damage on showy tarweed (*Madia elegans*) (left) and meadow checkermallow (*Sidalcea campestris*) (right).

4. MANAGEMENT RECOMMENDATIONS

Invasive weeds at McGowan Meadow are declining in abundance every year. However, the meadow is not currently in a self-sustaining state, but could be within a few years with annual weed treatments and further native plant revegetation. The following restoration actions are recommended for 2024 and beyond:

- Implement a prescribed burn every three years if resources allow. The next prescribed burn should be scheduled for 2025.
 - Following prescribed burns, apply glyphosate herbicide three to four weeks after burning to kill disturbance-loving invasive plants. Following herbicide application, sow a native seed mix at 10-15 pounds per acre to increase native plant species diversity and abundance.
- Mow North and South Meadow every two years to reduce shrub abundance and cover. The next mowing is recommended for 2024. Since implementing prescribed burns can be unpredictable, and the combination of three-year burning and two-year mowing can get complicated, we suggest assessing in late fall (October/November). If prescribed burning or mowing did not happen that current year or the previous year, mowing should happen that November.
- Census the naturally-occurring population of meadow checkermallow in 2024 and every two to three years after that, as resources allow.
- Herbicide treatments:
 - Continue to control and eradicate reed canarygrass by spot spraying with glyphosate in the spring and fall.
 - Spot spray false brome within the meadow and along the forest edge in summer and fall with glyphosate.
 - Spot spray Himalayan blackberry in fall with glyphosate or triclopyr.

- Spot spray Fuller's teasel in the rosette to bolting stage in spring and fall with glyphosate or clopyralid.
- Spot spray thistles and meadow knapweed in the bolting to bud stage in spring with clopyralid.
- Spot spray velvet grass in spring with glyphosate.
- Treat roadside invasive plants within ACEC boundary in spring with glyphosate.
- Manual weed removal:
 - Hand-pull priority weeds if they are not treated with herbicide prior to flowering: Fuller's teasel, meadow knapweed, false brome, and Scotch broom. Site visits each year to pull weeds should continue for years to come.
 - Cut and bag inflorescences of Queen Anne's lace, oxeye daisy, and thistles, and remove them from the site if they are not treated with herbicide prior to the flowering stage.
- Revegetate areas disturbed by restoration activities in the fall using a mix of native forb and grass seed. Augment native prairie species with appropriate plugs, bulbs, and bare root plants.
- Evaluate vehicle access and add boulders if needed.

A simplified timeline of these proposed activities for 2024-2026 can be found at the bottom of Appendix A.

5. REFERENCES

- Beorchia, Rolando and Andrew Esterson. 2023. McGowan Meadow restoration: 2022 annual report. Unpublished report for the Bureau of Land Management, Northwest Oregon District. Institute for Applied Ecology. Corvallis, Oregon. 12 pages plus appendices.
- Esri. "World Terrain Base" [basemap]. Scale Not Given. "World Topographic Map". July 1, 2009. https://server.arcgisonline.com/ArcGIS/rest/services/World_Terrain_Base/MapServer. Accessed December 21, 2020.
- Mitchell, K., K. Amsberry and R.J. Meinke. 2005. McGowan Prairie Habitat Assessment and Management Recommendations. Prepared by the Native Plant Conservation Program, Oregon Department of Agriculture for the Bureau of Land Management, Eugene District, CCS – HEP040032.

APPENDIX A: MEADOW CHECKERMALLOW (*SIDALCEA CAMPESTRIS*) POPULATION MONITORING RESULTS 1992-2021

Table 4. Meadow checkermallow (*Sidalcea campestris*) population monitoring results 1992-2021

Location	Reproductive plants (flowering stems)					
	1992	2005	2008	2009	2011	2021
McGowan north section	25*	87 (118)	43 (62)	63 (86)	88 (108)	187 (249)
McGowan south section		105 (119)	84 (110)	77 (96)	91 (117)	12 (12)
Total:	25	192 (237)	127 (172)	140 (182)	179 (225)	199 (261)

*1992 data was not monitoring data, but the number of plants reported by J. Koenig on a Eugene District BLM Sensitive Plant Siting Form.

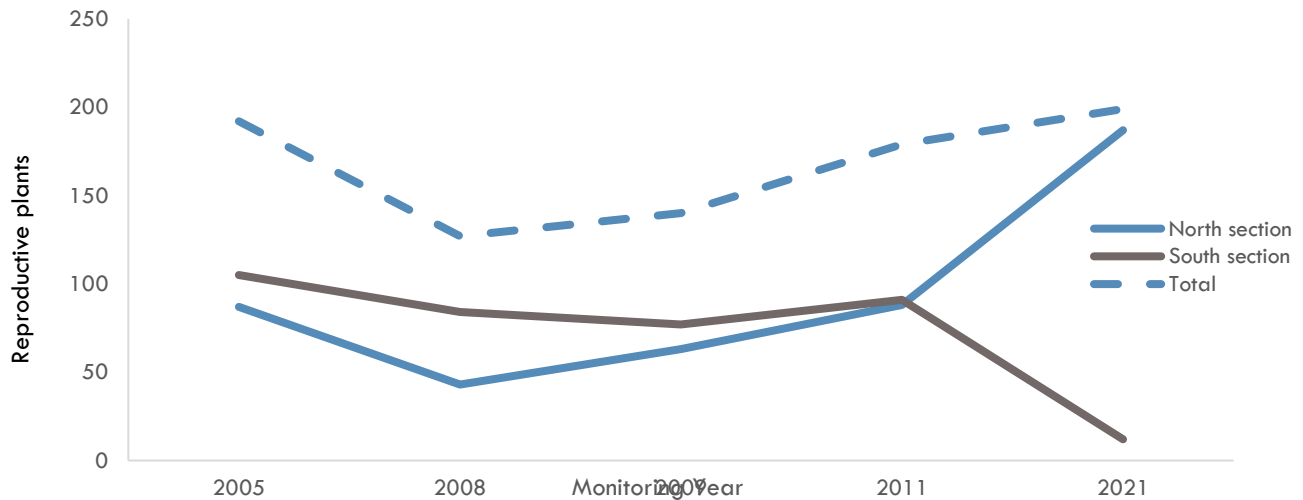


Figure 7. Meadow checkermallow (*Sidalcea campestris*) monitoring results McGowan North and South Meadow sections, 2005-2021.

APPENDIX B: COMPLETED AND PROPOSED MANAGEMENT ACTIONS: 2008-2026

2008

- Inspected site and coordinated with partner.
- Monitored meadow checkermallow (*Sidalcea campestris*).
- Collected meadow checkermallow and mule's ear (*Wyethia angustifolia*) seed.
- Brush cut Nootka rose (*Rosa nutkana*) and shrubs.
- Mowed 4 acres with front-loaded skid-steer with tracks.
- Felled and removed over 50 trees of various size including Douglas-fir (*Pseudotsuga menziesii*), Oregon ash (*Fraxinus latifolia*), incense cedar (*Calocedrus decurrens*), and English hawthorn (*Crataegus monogyna*).
- Hand pulled Fuller's teasel (*Dipsacus fullonum*), false brome (*Brachypodium sylvaticum*), Scotch broom (*Cytisus scoparius*), and Himalayan blackberry (*Rubus bifrons*).
- Mowed reed canarygrass (*Phalaris arundinacea*).
- Production began at Trillium Gardens in Eugene, OR of ~500 plugs each of meadow checkermallow, western yarrow (*Achillea millefolium*), Hall's aster (*Symphotrichum hallii*), tufted hairgrass (*Deschampsia cespitosa*), splitawn sedge (*Carex tumulicola*), aspen fleabane (*Erigeron speciosus*), barestem biscuitroot (*Lomatium nudicaule*), and goldenrod (*Solidago canadensis*) to be planted in 2010.

2009

- Inspected site, coordinated with partner and conducted public outreach with members of the Native Plant Society of Oregon; meeting with NW Ecology Group and Central Cascades Adaptive Management Partnership.
- Monitored meadow checkermallow.
- Continued production of ~500 plugs for each of 8 species that began in 2008.
- Hand pulled Fuller's teasel, false brome, Scotch broom, Himalayan blackberry.
- Mowed reed canarygrass.
- Cut and removed Douglas-fir, incense cedar, and English hawthorn saplings and limbs of larger trees.
- Cut stems of English hawthorn re-sprouting from stumps cut in 2008 and 2009.

2010

- Planted 348 meadow checkermallow in March and monitored survival (100) in July.
- Cut and removed of Douglas-fir and incense cedar saplings and limbs of larger trees.
- Hand pulled Fuller's teasel, Scotch broom, and meadow knapweed (*Centaurea x moncktonii*).
- IAE hired a labor crew to pull false brome.
- Mowed reed canarygrass prior to seed-set.
- Cut stems of English hawthorn re-sprouting from stumps cut in 2008, 2009, and 2010.
- Planted 3,388 native species plugs with dibbles. Species included meadow checkermallow, western yarrow, Hall's aster, tufted hairgrass, splitawn sedge, aspen fleabane, mule's ear, slender cinquefoil (*Potentilla gracilis*), slough sedge (*Carex obnupta*), common rush (*Juncus effusus*), lance selfheal (*Prunella vulgaris* v. *lanceolata*), dwarf checkermallow (*Sidalcea malviflora* ssp. *virgata*), and goldenrod.

2011

- Installation of “No Shooting” signs by BLM.
- Monitored meadow checkermallow population and survival of 2010 plantings (64).
- Hand pulled false brome.
- IAE hired a labor crew to remove all Fuller’s teasel seed heads.
- Mowed entire meadow with front-loaded skid-steer with tracks.
- To release Oregon white oak (*Quercus garryana*), BLM felled ~50 Douglas-fir trees over 10 inches in diameter. Wood was cut into firewood to be removed from the site in 2012.

2012

- Bucked downed trees and removed wood and piled slash in the forest matrix.
- Seeded disturbed area with native species including western yarrow, Alaska brome (*Bromus sitchensis*), Columbia brome (*Bromus vulgaris*), California oatgrass (*Danthonia californica*), tufted hairgrass, blue wildrye (*Elymus glaucus*), Oregon sunshine (*Eriophyllum lanatum*), California fescue (*Festuca californica*), toughleaf iris (*Iris tenax*), slender cinquefoil, lance selfheal, western buttercup (*Ranunculus occidentalis*), and mule’s ear.
- Hand pulled Scotch broom, Fuller’s teasel, and meadow knapweed.
- Mowed large forested patch of false brome during flowering.

2013

- Planted slender cinquefoil, western coneflower (*Rudbeckia occidentalis*), and dwarf checkermallow.
- Planted 485 meadow checkermallow.
- Hand pulled false brome, Fuller’s teasel, and Scotch broom.
- Mowed false brome with a brush cutter.

2014

- Hand pulled false brome, Fuller’s teasel, and bull thistle.
- Mowed entire meadow with IAE brush mower.
- Placed weed cloth over majority of reed canarygrass patch.

2015

- Repaired weed cloth covering reed canarygrass patch.
- Hand pulled false brome, Fuller’s teasel, and bull thistle.

2016

- Repaired weed cloth covering reed canarygrass patch.
- Pulled and removed seed heads from reed canarygrass extending beyond the weed cloth.
- Hand removed false brome, Fuller’s teasel, Queen Anne’s lace, and bull thistle.
- Contracted mowing of meadow using a skid-steer in November 2016.

2017

- Removed Fuller’s teasel.
- Repaired and weeded around and within weed cloth.

2018

- Hand removed false brome, Fuller's teasel, Scotch broom, reed canarygrass, and conifer saplings.
- Monitored and mapped plant community at McGowan Meadow for the Fire Dependent Ecosystem Project (Fire Resiliency Project).

2019

- Hand removed Fuller's teasel, false brome, and conifer seedlings and saplings within the meadow and along the meadow-forest edge.
- Mowed North Meadow to reduce native rose (*Rosa* sp.) competition.
- Mowed around and within weed cloth edge where reed canarygrass was resprouting and repaired weed cloth.
- Removed approximately 24 trees ~20 inch diameter and girdled another twelve.

2020

- Hand removed Fuller's teasel and meadow knapweed.
- Weed whacked reed canarygrass around weed cloth and spot sprayed with glyphosate.
- Spot sprayed false brome, Fuller's teasel, and non-native thistle with glyphosate.
- Removed one tree, ~20 inch diameter and re-girdled several that were not significantly impacted by initial girdling.

2021

- Removed all weed cloth from the meadow.
- Spot sprayed reed canarygrass, false brome, Himalayan blackberry, and Fuller's teasel.
- Burn preparation:
 - Used a chainsaw to limb 41 trees and removed shrubs from meadow edge.
 - Cutaway Inc. used an auger mounted to a skid steer to grind 32 stumps and masticator to mulch wood chips and branches from interior of the meadow.
- Mowed Himalayan blackberry and manually removed Scotch broom
- Completed a census of the population of meadow checkermallow.
- Cutaway Inc. mowed North Meadow with a skid-steer in November.
- Broadcast seed mix to exposed ground from weed cloth removal and disturbed ground from mowing.

2022

- Removed wind fallen trees, cut three trees of 20" diameter on southern edge and mowed South Meadow with Lane-Metro Youth Corps.
- Herbicide treated Himalayan blackberry, and Fuller's teasel with Rodeo (glyphosate).
- Herbicide treated Himalayan blackberry with Garlon 3A (triclopyr).
- Felled seven Douglas-fir trees of 20" diameter in the South Meadow and removed material by scattering limbs in the forest and piling logs for local residents to take.
- Implemented a prescribed burn of North Meadow. Herbicide treated North Meadow with Rodeo (glyphosate). Broadcasted seed on North Meadow and roadsides.

2023

- Spot sprayed reed canarygrass and Fuller's teasel with glyphosate.
- Manually removed oxeye daisy, Fuller's teasel, Queen Anne's lace, Canada thistle, bull thistle, Scotch broom, and false brome.
- Broadcast 14.28 pounds native seed mix to disturbed areas in North and South Meadows.
- Planted 106 shrubs along roadside: golden chinquapin (*Chrysolepis chrysophylla*), Pacific crabapple (*Malus fusca*), osoberry (*Oemleria cerasiformis*), Lewis' mock-orange (*Philadelphus lewisii*), Oregon white oak, salmon berry (*Rubus spectabilis*), oval-leaved viburnum (*Viburnum ellipticum*) red-flowering currant (*Ribes sanguineum*), stink currant (*Ribes bracteosum*) and red elderberry (*Sambucus racemosa*).
- Planted 1,216 bulbs in North and South meadows: 333 crown brodiaea (*Brodiaea coronaria*), 100 harvest brodiaea (*Brodiaea elegans*), 100 ookow (*Dichelostemma congesta*), 100 Tolmie's star-tulip (*Calochortus tolmiei*), 50 chocolate lily (*Fritillaria affinis*), and 533 Gardner's yampah (*Perideridia gairdneri*).
- Seeded 20 pounds Oregon white oak acorns along both sides of road.

2024 (Proposed)

- March-June: Spot spray reed canarygrass, Himalayan blackberry, false brome, meadow knapweed, Fuller's teasel, velvet grass, and non-native thistle with herbicide. Manually remove inflorescences if not treated prior to flowering.
- June-July: Monitor population of meadow checkermallow.
- Oct-Nov: Mow North and South Meadow with deck mower or skidsteer in North and string trimmer in the South.
- Oct-Nov: Broadcast native seed mix to disturbed areas.

2025 (Proposed)

- March-June: Spot spray reed canarygrass, Himalayan blackberry, false brome, meadow knapweed, Fuller's teasel, velvet grass, and non-native thistle with herbicide. Manually remove inflorescences if not treated prior to flowering.
- Oct: Prescribed burn.
- Oct-Nov: Treat invasive weeds with glyphosate 3-5 weeks after prescribed burning.
- Oct-Nov: Broadcast native seed mix to disturbed areas, plant plugs and bulbs if available.

2026 (Proposed)

- March-June: Spot spray reed canarygrass, Himalayan blackberry, false brome, meadow knapweed, Fuller's teasel, velvet grass, and non-native thistle with herbicide. Manually remove inflorescences if not treated prior to flowering.
- June-July: Monitor population of meadow checkermallow.
- Oct-Nov: Broadcast native seed mix to disturbed areas, plant plugs and bulbs if available.

APPENDIX C: MEADOW EDGE PHOTO POINT: 2021-2023





APPENDIX D: COMPREHENSIVE PLANTING AND SEEDING RECORD 2010-2023

Scientific name	Common name	Planted (number) 2023	Seeded (lb.) 2023	Seeded (lb.) 2022	Seeded (lb.) 2021	Plugs 2013	Plugs 2010
<i>Achillea millefolium</i>	common yarrow			0.56	0.04		620
<i>Acemispum americanum</i>	American bird's-foot trefoil			3.28			
<i>Agrostis exarata</i> ssp. <i>exarata</i> var. <i>monolepis</i>	spike bentgrass		0.5				
<i>Amsinckia menziesii</i>	Menzies' fiddleneck			0.845			
<i>Beckmannia syzigachne</i>	American sloughgrass		5				
<i>Brodiaea coronaria</i>	crown brodiaea	333					
<i>Brodiaea elegans</i>	harvest brodiaea	100					
<i>Bromus carinatus</i>	California brome		2	3.75			
<i>Calochortus tolmiei</i>	Tolmie's star-tulip	100					
<i>Camassia quamash</i> var. <i>azurea</i>	common camas				0.12		
<i>Carex densa</i>	dense sedge			0.13			
<i>Carex obnupta</i>	slough sedge						230
<i>Carex tumulicola</i>	splitawn sedge			0.48			385
<i>Chrysolepis chrysophylla</i>	golden chinquapin	4					
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring		0.25	0.785	0.28		
<i>Clarkia purpurea</i>	winecup clarkia			0.1			
<i>Collinsia grandiflora</i>	large-flowered blue-eyed Mary			0.41			
<i>Collomia grandiflora</i>	large-flowered collomia			2.22			
<i>Danthonia californica</i>	California danthonia			2.99	13.79		
<i>Deschampsia caespitosa</i>	tufted hairgrass		0.5	0.35			550
<i>Dichelostemma congestum</i>	ookow	100					
<i>Downingia elegans</i>	elegant calicoflower		0.5	0.5			
<i>Eleocharis ovata</i>	ovoid spikerush		0.5				
<i>Eleocharis palustris</i>	creeping spikerush		0.5				
<i>Elymus glaucus</i>	blue wildrye			1.74	6.35		
<i>Eriophyllum lanatum</i>	Oregon sunshine			1.81	0.22		
<i>Erythranthe guttata</i>	seep monkeyflower				0.01		
<i>Erythranthe moschata</i>	musk monkeyflower				0.0002		
<i>Festuca californica</i>	California fescue			0.04 (ME)			
<i>Festuca roemerii</i>	Roemer's fescue			10.905 (ME)			
<i>Fritillaria affinis</i>	chocolate lily	50					
<i>Geranium oreganum</i>	Oregon geranium				0.68		

Scientific name	Common name	Planted (number) 2023	Seeded (lb.) 2023	Seeded (lb.) 2022	Seeded (lb.) 2021	Plugs 2013	Plugs 2010
<i>Geum macrophyllum</i>	Oregon or large-leaved avens			1.03			
<i>Gilia capitata</i>	globe gilia			7.2			
<i>Hordeum brachyantherum</i>	meadow barley		0.5				
<i>Iris tenax</i>	toughleaf iris			1.32			
<i>Juncus effusus</i>	soft rush			0.05	0.01 (WV)		500
<i>Juncus patens</i>	spreading rush				0.41		
<i>Lomatium nudicaule</i>	barestem biscuitroot			1.6			
<i>Lupinus bicolor</i>	bi-colored lupine		0.5				
<i>Lupinus rivularis</i>	river lupine			9.85			
<i>Madia elegans</i>	showy tarweed			1.55	0.03		
<i>Madia gracillis</i>	grassy tarweed		0.25	0.46			
<i>Malus fusca</i>	Pacific crabapple	7					
<i>Mimulus guttatus</i>	common monkeyflower		0.1				
<i>Oemleria cerasiformis</i>	osoberry	15					
<i>Perideridia gairdneri</i>	Gardner's yampah	533					
<i>Phacelia nemoralis</i> var. <i>oregonensis</i>	Oregon woods phacelia			1.02			
<i>Philadelphus lewisii</i>	Lewis' mock-orange	2					
<i>Plagiobothrys figuratus</i>	fragrant popcorn-flower		0.3	0.5			
<i>Plagiobothrys nothofulvus</i>	rusty-haired popcornflower			0.5			
<i>Plectritis congesta</i>	shortspur seablush		0.25	0.4	0.03		
<i>Poa secunda</i>	pine bluegrass		0.25				
<i>Potentilla gracilis</i>	slender cinquefoil			0.07	0.15	720	235
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal			1.445	0.01		580
<i>Quercus garryana</i>	Oregon white oak	3	20				
<i>Ranunculus occidentalis</i>	western buttercup			3.085	0.38		
<i>Ranunculus orthorhynchus</i>	straightbeak buttercup			0.37	0.01		
<i>Ribes bracteosum</i>	stink currant	5					
<i>Ribes sanguineum</i>	red-flowering currant	11					
<i>Rorippa curvisiliqua</i>	western yellow-cress		0.25				
<i>Rubus spectabilis</i>	salmon berry	17					
<i>Rudbeckia occidentalis</i>	western coneflower			0.2		720	
<i>Sambucus racemosa</i>	red elderberry	40					
<i>Sidalcea campestris</i>	meadow checkermallow		2	6.52	0.02	485	348

Scientific name	Common name	Planted (number) 2023	Seeded (lb.) 2023	Seeded (lb.) 2022	Seeded (lb.) 2021	Plugs 2013	Plugs 2010
<i>Sidalcea malviflora</i> spp. <i>virgata</i>	rose checkermallow			4.29	0.05	108	100
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass		0.13				
<i>Solidago lepida</i>	Canada goldenrod			0.145		762	20
<i>Symphyotrichum chilense</i>	Pacific aster					64	
<i>Symphyotrichum hallii</i>	Hall's aster						50
<i>Veratrum californicum</i> var <i>caudatum</i>	corn lily				0.04		
<i>Veronica americana</i>	American brooklime				0.2		
<i>Viburnum ellipticum</i>	oval-leaved viburnum	2					
<i>Wyethia angustifolia</i>	narrowleaf mule's ear				0.01		110
Totals:		1,216 bulbs 106 shrubs	14.28lb. (20lb. oak)	71.46 lb.	22.84 lb.	2,859 plugs	1,943 plugs
Seed source notes: Willamette Valley (WV) or mid-elevation (ME) genetic origin.		All Willamette Valley sourced.	All Willamette Valley sourced.	All WV sourced except <i>F. californica</i> (ME) and <i>F. roemerii</i> (ME)	All Mid-elevation sourced except <i>J.</i> <i>effusus</i> . (WV)	Unclear seed source from 2013 report.	All sourced from McGowan 2008.