McGowan Meadow restoration: 2024 annual report

February 2025

Report for Bureau of Land Management, Agreement #L23AC00272

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Institute for Applied Ecology

Institute for Applied Ecology

PREFACE

Institute for Applied Ecology (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.

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Cover photograph: McGowan Meadow, July 12, 2023. Photo taken by Rolando Beorchia.

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

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EXECUTIVE SUMMARY

The Institute for Applied Ecology (IAE) has conducted habitat restoration at McGowan Meadow in partnership with the Bureau of Land Management since 2008. In 2024, IAE performed a variety of restoration activities including herbicide treatments, hand weeding, mowing, meadow checkermallow (*Sidalcea campestris*) monitoring, and sowing native species. IAE completed herbicide spot treatments on reed canarygrass (*Phalaris arundinacea*), Himalayan blackberry (*Rubus bifrons*), and Fuller's teasel (*Dipsacus fullonum*). IAE broadcast 7.02 pounds of native seed to disturbed ground throughout the meadow. Future restoration activities will include chemical and mechanical weed management, mowing and/or burning to reduce shrub cover, 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. Its elevation (2000 ft) makes this site an important refugia for native prairie species that may expand their range 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 2024. See Appendix B for a summary of restoration activities conducted by IAE from 2008-2024. Appendix C provides a photo point comparison through time at McGowan Meadow.

To help describe where management actions occur, we split McGowan Meadow into two management units: North and South Meadow. McGowan Creek Road bisects the two units and acts as a natural delineation between them.

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 (*Phalaris arundinacea*), 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 objectives were recommended in the McGowan Meadow 2022 annual report (Beorchia & Esterson, 2023).

3. 2024 RESTORATION ACTIVITIES

In 2024, IAE broadcast native seed, hand pulled invasive weeds, applied Aquaneat (glyphosate) herbicide targeting reed canarygrass, and applied Garlon 3A (triclopyr) targeting Himalayan blackberry. (Figure 2, Table 1). See Appendix B for a complete list of completed and proposed management actions at McGowan Meadow from 2008-2027. 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.

Over the first seven months of 2024 herbicide application was not permitted because the BLM's pesticide use permit (PUP) expired. Therefore, only manual and mechanical treatments were used. The PUP was signed in August and herbicide treatments were permitted at that point.

Table 1. 2024 management actions at McGowan Meadow

Date	Management Action*
2-Apr	Manual weed removal targeting bull thistle (*Cirsium vulgare*), oxeye daisy (*Leucanthemum vulgare*), Fuller's teasel (*Dipsacus fullonum*), St. John's wort (*Hypericum perforatum*).
16-May	
1-Jul	
2-Jul	Site visit and evaluation with BLM staff: Emily Erickson, Jessica Celis, Matt Bahm.
17-Jul	Monitored meadow checkermallow (*Sidalcea campestris*).
7-Oct	Applied triclopyr (Garlon 3A) to Himalayan blackberry (*Rubus bifrons*) along the roadside and within North Meadow. Applied glyphosate (Aquaneat) to reed canary grass (*Phalaris arundinacea*) within North Meadow and along the roadside to the east of the meadow.
3-Dec	Mowed North Meadow at 6-inch height with Canycom mower. Mowed South Meadow with walk-behind brush mower to 6 inches.
4-Dec	Mowed western half of South Meadow with Canycom mower to 3 inches. Seeded 7.02 pounds seed to North and South Meadows on disturbed ground patches.

*Institute for Applied Ecology (IAE) performed all listed activities.
Bureau of Land Management (BLM).

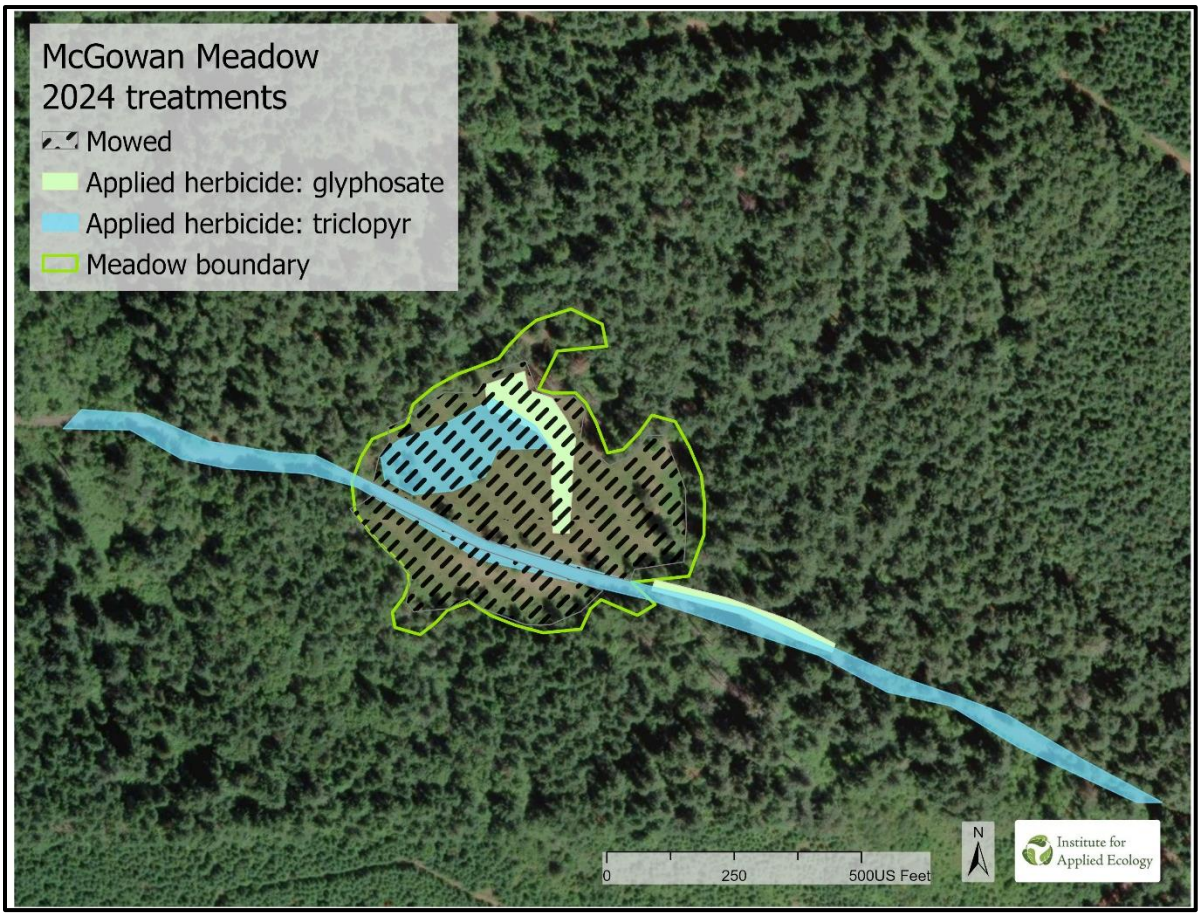

Figure 2. McGowan Meadow 2024 treatment locations.

Treatment of invasive plants occurred throughout the year. In April, May, and July IAE manually removed invasive plants targeting oxeye daisy, Fuller's teasel, bull thistle (*Cirsium vulgare*), Canada thistle (*Cirsium arvense*), and Scotch broom. In October, IAE staff applied Aquaneat (glyphosate) to reed canarygrass and Garlon 3A (triclopyr) to Himalayan blackberry (Table 1).

Invasive species continue to decline at McGowan Meadow. In 2024, Scotch broom was only observed along the roadside to the east and west of the meadow, where it was once abundant throughout the meadow. One-seeded hawthorn was not observed, and Canada thistle was in low abundance, mostly on the east side of North Meadow. IAE staff treated reed canarygrass and observed only two tiny patches within the meadow this year. Because of this reduction, IAE staff began treating reed canary grass along McGowan creek road within the ACEC boundary. 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 2024. It was last seen in 2020 and has potentially been eradicated. Velvet grass (*Holcus lanatus*) continues to be prominent throughout McGowan Meadow, though 2024 observations suggest burning and follow-up glyphosate herbicide treatments were effective at reducing its abundance in the North Meadow. Roadside weed removal and mowing the South Meadow reduced competition and appear to have helped Oregon sunshine (*Eriophyllum lanatum*) and Oregon geranium (*Geranium oreganum*) become more robust compared to previous years.

In early December, IAE hand-scattered a seven-pound seed mix to small patches of bare ground throughout the meadow. The Willamette Valley sourced mix contained a diverse blend of 56 forbs and graminoids, with an emphasis on wet prairie species (Table 2).

Table 2. 2024 McGowan Meadow native seed mix.

Scientific name	Common name	Seed (lb.)
Achillea millefolium	common yarrow	0.05
Allium amplectens	narrow-leaf onion	0.14
Amsinckia menziesii	Menzies' fiddleneck	0.14
Barbarea orthoceras	American yellowrocket	0.02
Camassia leichtlinii var. suksdorfii	tall camas	0.24
Carex tumulicola	splitawn sedge	0.09
Clarkia amoena ssp. lindleyi	farewell-to-spring	0.04
Clarkia purpurea	winecup clarkia	0.02
Collinsia grandiflora	large-flowered blue-eyed Mary	0.09
Collomia grandiflora	large-flowered collomia	0.30
Dodecatheon pulchellum ssp. monanthum	few-flowered shooting star	0.03
Downingia elegans	elegant calicoflower	0.01
Elymus glaucus	blue wildrye	0.06
Elymus trachycaulus	slender wheatgrass	0.05
Eriophyllum lanatum	Oregon sunshine	0.09
Festuca roemeri	Roemer's fescue	0.06
Geum macrophyllum	Oregon or large-leaved avens	0.08
Gilia capitata	globe gilia	0.02
Heuchera chlorantha	tall alumroot	.0028
Hosackia pinnata	Bog bird's-foot trefoil	0.18
Juncus tenuis	slender rush	0.0007
Koeleria macrantha	prairie Junegrass	0.01
Ligusticum apiifolium	celery-leaved lovage	0.17
Lomatium dissectum	fern-leaved biscuitroot	0.41
Lomatium nudicaule	barestem biscuitroot	0.29
Lomatium utriculatum	spring gold	0.08
Lotus purshianus	bird's foot trefoil	0.22
Luzula comosa	Pacific woodrush	0.01
Madia elegans	showy tarweed	0.15
Madia glomerata	cluster tarweed	0.09
Madia gracilis	grassy tarweed	0.08
Microseris laciniata	cutleaf silverpuffs	0.04
Microsteris gracilis	slender phlox	0.08
Montia linearis	narrow-leaf miner's lettuce	0.08
Phacelia nemoralis var. oregonensis	Oregon woods phacelia	0.11
Plagiobothrys figuratus	fragrant popcorn-flower	0.05
Plectritis congesta	shortspur seablush	0.02
Poa secunda	pine bluegrass	0.02
Potentilla glandulosa	sticky cinquefoil	0.02
Potentilla gracilis	slender cinquefoil	0.07
Prunella vulgaris var. lanceolata	common selfheal	0.25
Ranunculus occidentalis	western buttercup	0.09
Rorippa curvisiliqua	western yellow-cress	0.0014
Rumex salicifolius	willow dock	0.22
Sanguisorba occidentalis	western burnet	0.19
Sanicula bipinnatifida	purple sanicle	0.22
Sidalcea campestris	meadow checkermallow	1.14

Scientific name	Common name	Seed (lb.)
Sidalcea malviflora spp. virgata	rose checkermallow	0.14
Sisyrinchium idahoense	Idaho blue-eyed grass	0.06
Solidago elongata	Cascade Canada goldenrod	0.0032
Symphyotrichum hallii	Hall's aster	0.01
Viola praemorsa	prairie violet	0.05
	Total (lb.):	***7.02***

4. MONITORING MEADOW CHECKERMALLOW

In 2021, IAE Ecologists and BLM Botanist Jessica Celis evaluated previous methods used to census meadow checkermallow and it was determined that modifications to the protocol were necessary to collect accurate data. Because meadow checkermallow spreads rhizomatously it can be difficult to determine individual plants, therefore, rhizomes separated by six inches or more would be counted as individual plants. Rhizomes less than six inches apart were considered one plant with multiple stems. It was also decided that a flowering stem would originate from the basal part of the plant and all higher branching would be considered the same stem. Only reproductive plants were counted to avoid misidentification with dwarf checkermallow and Oregon geranium. To complete the census, temporary lanes were created with meter tapes to create manageable areas for counting and locations of individual plants were not recorded as in previous years.

In 2024, IAE Ecologists monitored the meadow checkermallow population and showed an increase in reproductive plants of 148%, from 199 plants (2021) to 493 plants (2024). There was a 162% increase in flowering stems from 261 stems (2021) to 685 stems (2024) (Table 3).

The divergence in the data between North Meadow and South Meadow, first observed in 2021, prompted IAE to implement mowing in South Meadow. 2024 monitoring suggests the meadow checkermallow population responded to treatments and rebounded in numbers. The South Meadow reproductive plant count increased 567% from 12 (2021) to 80 (2024) and flowering stems increased 742% from 12 (2021) to 101 (2024). The North Meadow plant count increased 121% from 187 (2021) to 413 (2024) and flowering stems increased 135% from 249 (2021) to 584 (2024) (Table 3, Figure 3).

Table 3. Meadow checkermallow (*Sidalcea campestris*) population monitoring results 1992-2024

Monitoring Year	**1992**	**2005**	**2008**	**2009**	**2011**	**2021**	**2024**
McGowan north meadow: reproductive plants (flowering stems)		87 (118)	43 (62)	63 (86)	88 (108)	187 (249)	413 (584)
McGowan south meadow: reproductive plants (flowering stems)		105 (119)	84 (110)	77 (96)	91 (117)	12 (12)	80 (101)
Total:	**25**	**192 (237)**	**127 (172)**	**140 (182)**	**179 (225)**	**199 (261)**	**493 (685)**

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

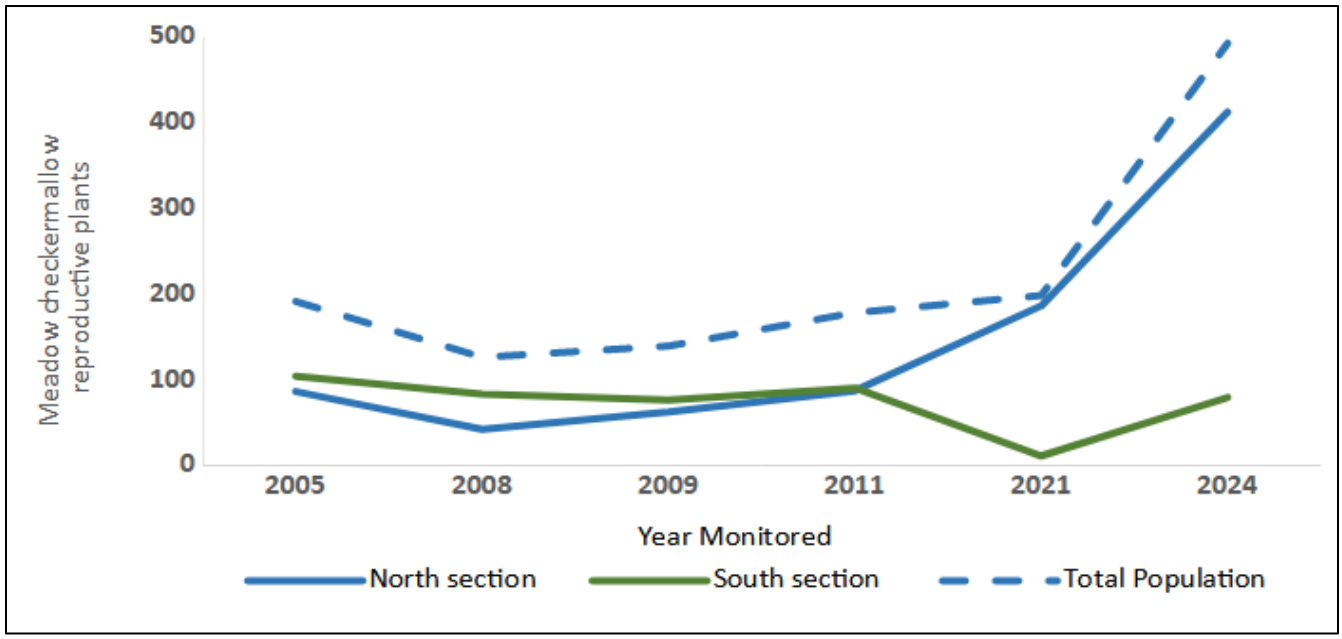

Figure 3. Meadow checkermallow (*Sidalcea campestris*) monitoring results McGowan north and south meadow sections, 2005-2024.

5. 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 2025 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 2027. 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 2026 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/or fall.
    - Spot spray false brome within the meadow and along the forest edge in summer and/or 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/or fall with glyphosate, clopyralid, or triclopyr.

    - Spot spray thistles and meadow knapweed in the bolting to bud stage in spring with clopyralid, or triclopyr. Take care to avoid misidentification of the growing native fewleaf thistle (*Cirsium remotifolium*) population, which is quickly becoming ubiquitous.
    - Spot spray velvet grass in spring with glyphosate.
    - Treat roadside invasive plants within the ACEC boundary in spring with glyphosate and/or triclopyr. Avoid spraying native disturbance loving species, such as Oregon sunshine, common yarrow (*Achillea millefolium*), and common selfheal (*Prunella vulgaris*). These are establishing roadside and will continue to compete with new invaders.
- 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 potential vehicle access into the meadows and add boulders if needed.

A simplified timeline of these proposed activities for 2025-2027 can be found at the bottom of Appendix A.

6. REFERENCES

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APPENDIX A: MEADOW CHECKERMALLOW (SIDALCEA CAMPESTRIS) POPULATION MONITORING METHODS AND RESULTS 1992-2024

In 2005, IAE established monitoring plots in McGowan Prairie and conducted a complete census of meadow checkermallow in 2005, 2008, 2009 and 2011(Blakeley-Smith and Kaye 2005, 2006, 2008, 2010a, 2011). The census in 2005, 2008, 2009, and 2011 used seven plots, each containing between 20 and 120 subplots, which recorded the location of individual plants (Blakeley-Smith 2011). In 2021 and 2024, a population census was performed but the plot and subplot methods were not used as with previous monitoring years. Beginning in 2009, vegetative plants were no longer recorded, and only reproductive plants were counted since vegetative meadow checkermallow very closely resembles vegetative dwarf checkermallow (*Sidalcea malviflora* ssp. *virgata*) and Oregon geranium (*Geranium oreganum*) and the confidence in the vegetative data was low.

Table 4. Meadow checkermallow (*Sidalcea campestris*) population monitoring results 1992-2024

Location	**Reproductive plants (flowering stems)**						
	1992	**2005**	**2008**	**2009**	**2011**	**2021**	**2024**
McGowan north section	25*	87 (118)	43 (62)	63 (86)	88 (108)	187 (249)	413 (584)
McGowan south section		105 (119)	84 (110)	77 (96)	91 (117)	12 (12)	80 (101)
Total:	**25**	**192 (237)**	**127 (172)**	**140 (182)**	**179 (225)**	**199 (261)**	**493 (685)**

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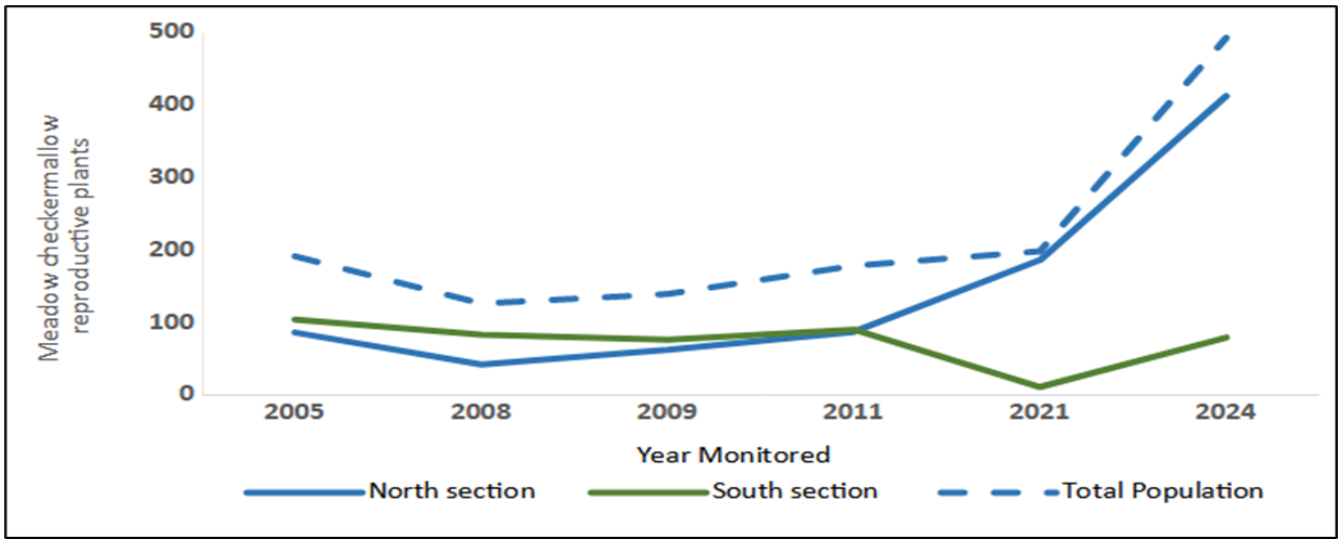

Figure 4. Meadow checkermallow (Sidalcea campestris) monitoring results McGowan North and South Meadow sections, 2005-2024.

APPENDIX B: COMPLETED AND PROPOSED MANAGEMENT ACTIONS: 2008-2027

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 (*Symphyotrichum 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 (*Philadelphis 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

- Spot sprayed reed canarygrass with glyphosate and Himalayan blackberry with triclopyr.
- Manually removed bull thistle, oxeye daisy, Fuller's teasel, and St. John's wort (*Hypericum perforatum*).
- Monitored population of meadow checkermallow.
- Mowed North and South Meadow with deck mower at 6-inch height. Mowed western half of South Meadow to 3-inch height.
- Broadcast 7.02 pounds native seed mix to disturbed ground.

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.

2027 (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-Nov: Mow North and South Meadow with deck mower or skidsteer in North and string trimmer in the South (if machine access not available).
- Oct-Nov: Broadcast native seed mix to disturbed areas.

APPENDIX C: MEADOW EDGE PHOTO POINT: 2021-2023


June 13, 2023

APPENDIX D: COMPREHENSIVE PLANTING AND SEEDING RECORD 2010-2024

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.					
		2010	2013	2021	2022	2023	2024
Achillea millefolium	common yarrow	{620}		0.04	0.56		0.05
Acmispon americanus	American bird's-foot trefoil				3.28		
Agrostis exarata ssp. exarata var. monolepsis	spike bentgrass					0.5	
Allium amplectens	narrow-leaf onion						0.14
Amsinckia menziesii	Menzies' fiddleneck				0.845		0.14
Barbarea orthoceras	American yellowrocket						0.02
Beckmannia syzigachne	American sloughgrass					5	
Brodiaea coronaria	crown brodiaea					{333}	
Brodiaea elegans	harvest brodiaea					{100}	
Bromus carinatus	California brome				3.75	2	
Calochortus tolmiei	Tolmie's star-tulip					{100}	
Camassia leichtlinii var. suksdorfii	tall camas						0.24
Camassia quamash var. azurea	common camas			0.12			
Carex densa	dense sedge				0.13		
Carex obnupta	slough sedge	{230}					
Carex tumulicola	splitawn sedge	{385}			0.48		0.09
Chrysolepis chrysophylla	golden chinquapin					{4}	
Clarkia amoena ssp. lindleyi	farewell-to-spring			0.28	0.785	0.25	0.04
Clarkia purpurea	winecup clarkia				0.1		0.02
Collinsia grandiflora	large-flowered blue-eyed Mary				0.41		0.09
Collomia grandiflora	large-flowered collomia				2.22		0.30
Danthonia californica	California danthonia			13.79	2.99		
Deschampsia caespitosa	tufted hairgrass	{550}			0.35	0.5	
Dichelostemma congestum	ookow					{100}	
Dodecatheon pulchellum ssp. monanthum	few-flowered shooting star						0.03
Downingia elegans	elegant calicoflower				0.5	0.5	0.01
Eleocharis ovata	ovoid spikerush					0.5	
Eleocharis palustris	creeping spikerush					0.5	
Elymus glaucus	blue wildrye			6.35	1.74		0.06
Elymus trachycaulus	slender wheatgrass						0.05
Eriophyllum lanatum	Oregon sunshine			0.22	1.81		0.09
Erythranthe guttata	seep monkeyflower			0.01		0.1	

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.					
		2010	2013	2021	2022	2023	2024
Erythranthe moschata	musk monkeyflower			0.0002			
Festuca californica	California fescue				0.04 (ME)		
Festuca roemeri	Roemer's fescue				10.905 (ME)		0.06
Fritillaria affinis	chocolate lily					{50}	
Geranium oreganum	Oregon geranium			0.68			
Geum macrophyllum	Oregon or large-leaved avens				1.03		0.08
Gilia capitata	globe gilia				7.2		0.02
Hordeum brachyantherum	meadow barley					0.5	
Heuchera chlorantha	tall alumroot						.0028
Hosackia pinnata	Bog bird's-foot trefoil						0.18
Iris tenax	toughleaf iris				1.32		
Juncus effusus	soft rush	{500}		0.01 (WV)	0.05		
Juncus patens	spreading rush			0.41			
Juncus tenuis	slender rush						0.0007
Koeleria macrantha	prairie Junegrass						0.01
Ligusticum apiifolium	celery-leaved lovage						0.17
Lomatium dissectum	fern-leaved biscuitroot						0.41
Lomatium nudicaule	barestem biscuitroot				1.6		0.29
Lomatium utriculatum	spring gold						0.08
Lotus purshianus	bird's foot trefoil						0.22
Lupinus bicolor	bi-colored lupine					0.5	
Lupinus rivularis	river lupine				9.85		
Luzula comosa	Pacific woodrush						0.01
Madia elegans	showy tarweed			0.03	1.55		0.15
Madia glomerata	cluster tarweed						0.09
Madia gracilis	grassy tarweed				0.46	0.25	0.08
Malus fusca	Pacific crabapple					{7}	
Microseris laciniata	cutleaf silverpuffs						0.04
Microsteris gracilis	slender phlox						0.08
Montia linearis	narrow-leaf miner's lettuce						0.08
Oemleria cerasiformis	osoberry					{15}	
Perideridia gairdneri	Gardner's yampah					{533}	
Phacelia nemoralis var. oregonensis	Oregon woods phacelia				1.02		0.11

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.					
		2010	2013	2021	2022	2023	2024
Philadelphus lewisii	Lewis' mock-orange					{2}	
Plagiobothrys figuratus	fragrant popcorn-flower				0.5	0.3	0.05
Plagiobothrys nothofulvus	rusty-haired popcornflower				0.5		
Plectritis congesta	shortspur seablush			0.03	0.4	0.25	0.02
Poa secunda	pine bluegrass					0.25	0.02
Potentilla glandulosa	sticky cinquefoil						0.02
Potentilla gracilis	slender cinquefoil	{235}	{720}	0.15	0.07		0.07
Prunella vulgaris var. lanceolata	common selfheal	{580}		0.01	1.445		0.25
Quercus garryana	Oregon white oak					20 {3}	
Ranunculus occidentalis	western buttercup			0.38	3.085		0.09
Ranunculus orthorhynchus	straightbeak buttercup			0.01	0.37		
Ribes bracteosum	stink currant					{5}	
Ribes sanguineum	red-flowering currant					{11}	
Rorippa curvisiliqua	western yellow-cress					0.25	0.0014
Rubus spectabilis	salmon berry					{17}	
Rudbeckia occidentalis	western coneflower		{720}		0.2		
Rumex salicifolius	willow dock						0.22
Sanguisorba occidentalis	western burnet						0.19
Sanicula bipinnatifida	purple sanicle						0.22
Sambucus racemosa	red elderberry					{40}	
Sidalcea campestris	meadow checkermallow	{348}	{485}	0.02	6.52	2	1.14
Sidalcea malviflora spp. virgata	rose checkermallow	{100}	{108}	0.05	4.29		0.14
Sisyrinchium idahoense	Idaho blue-eyed grass					0.13	0.06
Solidago elongata	Cascade Canada goldenrod						0.0032
Solidago lepida	Canada goldenrod	{20}	{762}		0.145		
Symphyotrichum chilense	Pacific aster		{64}				
Symphyotrichum hallii	Hall's aster	{50}					0.01
Veratrum californicum var caudatum	corn lily			0.04			
Veronica americana	American brooklime			0.2			
Viburnum ellipticum	oval-leaved viburnum					{2}	
Viola praemorsa	prairie violet						0.05
Wyethia angustifolia	narrowleaf mule's ear	{110}		0.01			
Totals:		**1,943 plugs**	**2,859 plugs**	**22.84 lb.**	**71.46 lb.**	**1,216 bulbs, 106 shrubs, 14.28lb. (20lb. oak)**	**7.02 lb.**

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.					
		2010	2013	2021	2022	2023	2024
Number of species		12	6	22	37	34	56
Seed source notes: Willamette Valley (WV) or mid-elevation (ME) genetic origin.		All sourced from McGowan 2008.	Unclear seed source from 2013 report.	All Mid-elevation sourced except J. effusus. (WV)	All WV sourced except F. californica (ME) and F. roemeri (ME)	All Willamette Valley sourced.	All Willamette Valley sourced.