

# Habitat Restoration of McGowan Meadow: 2016 Annual Report



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Report prepared for the Bureau of Land Management, Agreement #L13AC00098

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## PREFACE

This report is the result of agreement L13AC00098-0039 between United States Department of the Interior Bureau of Land Management, Northwest Oregon District (BLM) and Institute for Applied Ecology (IAE), Corvallis, Oregon. 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:** McGowan Meadow. *Photo by Matt Blakeley-Smith, April 20, 2011.*

## SUGGESTED CITATION

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REPORT SUBMITTED TO BUREAU OF LAND MANAGEMENT

## 1. EXECUTIVE SUMMARY

The Institute for Applied Ecology (IAE) worked with United Bureau of Land Management Northwest Oregon District (BLM) staff in 2016 to continue implementing habitat restoration activities at McGowan Meadow. Restoration efforts this year focused on prevention of woody plant encroachment into the meadow by mowing the meadow and manual weed reduction with the goal of conserving and enhancing rare native meadow habitat.

## 2. INTRODUCTION

McGowan Meadow (cover photo) is a regionally-rare mid-elevation meadow located in the cascade foothills northeast of Springfield, OR (Figure 1). This site is managed by the BLM and may be important for long term prairie conservation in response to climate change in the Willamette Valley ecoregion. The meadow's position at mid-elevation allows for immigration of lower elevation populations upward in response to a changing environment. McGowan Meadow hosts an unusually diverse community of native species, including a large population of BLM Species of Concern meadow checkermallow (*Sidalcea campestris*).



Figure 1. Location of McGowan Meadow.

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 at McGowan Meadow in 2008 through a Cooperative Challenge Cost Share project funded jointly by the BLM and IAE.

This report covers 2016 McGowan Meadow restoration activities funded under BLM agreement #L13AC00098-0039. Restoration efforts continue to focus on prevention of woody plant encroachment into the meadow by removing trees and biennial mowing of the meadow, weed reduction, and native plant augmentation (See Appendices).

### 3. PURPOSE AND OBJECTIVES

The purpose of this project is to assist the BLM and continue habitat restoration to conserve and increase species diversity at McGowan Meadow. This goal is being achieved through implementation of the following objectives:

1. Controlling high priority invasive species such as teasel (*Dipsacus fullonum*), false brome (*Brachypodium sylvaticum*), bull thistle (*Cirsium vulgare*), and reed canarygrass (*Phalaris arundinacea*).
2. Remove encroaching woody species and preserve open meadow habitat.
3. Increase native plant community abundance and diversity.
4. Maintain the population of meadow checkermallow, a BLM Species of Concern.

### 4. 2016 RESTORATION ACTIVITIES

See Appendix B for a summary of restoration activities conducted by IAE from 2008 to 2016.

Restoration activities in 2016 focused on manual removal of teasel and false brome from the open areas and forest edges of McGowan Meadow (Table 1). Target weeds were pulled by hand within the meadow and piled in the conifer forest surrounding the meadow. In the summer of 2014, shade cloth was put in place to inhibit growth of reed canarygrass (Figure 2). In April of 2016, the shade cloth was repaired after wind had partially detached it from the stakes that secure it to the ground. As part of a biennial mowing regime to control weeds and woody encroachment, the meadow was mowed in November 2016 (Figure 3). Table 2 provides a budget breakdown of the restoration activities implemented in 2016.

**Table 1.** 2016 restoration activities at McGowan Meadow.

Date	Task	Labor (hrs)
04/21/2016	Repaired shade cloth and removed reed canarygrass	8
07/14/2016	Hand-pulled teasel, false brome, and Queen Anne's lace	8
08/09/2016	Hand-pulled teasel, false brome, and Queen Anne's lace	9
08/17/2016	Hand-pulled teasel, false brome, and Queen Anne's lace	9
08/29/2016	Hand-pulled teasel and Queen Anne's lace	8
11/21/2016	Site mowed by contractor (Habitat Restoration, LLC)	4



**Figure 2.** Shade cloth installation in 2014 (left) and condition in November, 2016 (right). (Photos: B. Axt and A. Neill)



**Figure 3** Before (left) and after (right) skid steer mowing of cutleaf blackberry patch at McGowan Meadow on November 21, 2016. (Photos: A. Neill)

**Table 2.** Budget breakdown of restoration activities at McGowan Meadow during 2016.

Budget Item	Cost
Contracted Services	\$730.00
Supplies	\$0.00
Travel	\$134.46
Labor	\$905.00
Admin	\$119.00
Total	\$1,888.46

## 5. DISCUSSION

Eight years of manual removal of teasel at McGowan Meadow has started to show positive results. Although new plants continue to appear, the abundance of this species has decreased over time at the site. It is likely that continued annual removal will be required until the teasel seed bank has been depleted. However, we expect that the resources required to complete these activities should diminish over time.

Shade cloth treatments appear to be successful at suppressing growth of the majority of the reed canarygrass patch within the meadow. However, reed canarygrass is growing along the edges of the shade cloth and in areas where segments of shade cloth did not sufficiently overlap and the grass was able to grow through the cracks. The reed canarygrass is slowly expanding outward from the edges and could re-invade the site when the shade cloth is removed. Maintaining complete coverage of the reed canarygrass has proven to be difficult, and without the use of herbicides, manual efforts that include mowing, brush cutting, pulling, and digging up of root systems should be used to repress this species.

In addition to controlling reed canarygrass, mowing is also important in impeding the encroachment of woody species. The reduction of these species allows for greater proliferation of native prairie species.

Efforts to control false brome at McGowan Meadow continue to be effective. Hand pulling of false brome prevented false brome from encroaching into the meadow from forest edges. However, the long-term prevention of false brome invasion of McGowan Meadow will depend on continued monitoring and removal of this species in the meadow and the expansion of removal efforts into the surrounding forest matrix.

Biennial mowing is effective at controlling the expansion of woody species such as blackberry and rose. However, eradication of these shrub species will be difficult without the use of herbicides or soil disturbing mechanical methods.

## 6. RECOMMENDATIONS

The overarching goal of this project is to actively restore regionally rare upland meadow habitat at McGowan Meadow by controlling priority invasive species and managing woody species encroachment. To achieve this goal, we recommend the following restoration activities:

- Hand pull target priority weeds. Without the use of herbicides, this remains as the most effective tool to remove and prevent weed invasion and expansion within and surrounding the meadow. Multiple site visits each year to pull weeds should continue in 2017 and for years to come.
- As resources allow, manually remove additional weed species such as tall oatgrass (*Arrhenatherum elatius*), Queen Anne's lace (*Daucus carota*), oxeye daisy (*Leucanthemum vulgare*), and thistles (*Cirsium arvense* and *C. vulgare*).
- Continue biennial mowing treatments to prevent woody species encroachment in the meadow.
- Consider periodic prescribed burns at the site to control invasive species and thatch buildup.
- Consider removal of trees within and surrounding the meadow to expand the open meadow habitat.
- Follow up all weed treatments with immediate seeding of native forb and grass species.

- Continue efforts to control eradicate reed canarygrass. Shade cloth has been effective at reducing the size of the reed canarygrass patches but does not eliminate this problem species. Annual brush cutting to remove flowering heads will slow the spread of reed canarygrass by seed, but a significant effort to remove the plants would be difficult without the use of herbicides or significant ground disturbance. Increased efforts to remove remaining reed canarygrass should become a priority to prevent further expansion and re-colonization following the potential shade cloth removal in 2017. Aggressive seeding and planting should occur on the bare soil exposed after the shade cloth is removed. Until reed canarygrass has been eradicated, efforts to prevent the seed set should be a priority.
- Survey for and manually remove false brome plants within the meadow. As the abundance of false brome in the meadow continue to decline, efforts should begin to focus on false brome removal at the forest edge and into the forest matrix.
- Pending approval of herbicide use at McGowan Meadow, control and eradicate non-native invasive and resprouting encroaching woody species with appropriate herbicide. Ultimately, control of reed canarygrass, tall oatgrass, Queen Anne's lace, thistles, and oxeye daisy will be extremely difficult without the use of herbicides. In particular, the deep, rhizomatous roots of Canada thistle make manual removal nearly impossible and the use of herbicides is likely the most effective method of reducing the abundance of this plant at McGowan Meadow.
- Increase native prairie species abundance and diversity by augmentation with plugs, bulbs, and rhizomes of appropriate native species. See Appendix A for location of previous native species introductions.
- Once aggressive weed species are controlled at McGowan Meadow, consider introduction of rare species, including augmentation of BLM Species of Concern meadow checkermallow.
- Annually monitor survival of introduced meadow checkermallow plants for at least three years to determine establishment.
- Census natural meadow checkermallow at least once every three years (annually if resources allow).

## 7. REFERENCES

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.

## 8. APPENDICES

### Appendix A: Aerial photo of McGowan Meadow and plantings in 2013



## Appendix B: Restoration Activities at McGowan Meadow (2008-2017)

### 2008

- Site inspection and partner coordination.
- Monitored of meadow checkermallow (*Sidalcea campestris*).
- Seed collection of meadow checkermallow and mule's ear (*Wyethia angustifolia*).
- 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 teasel (*Dipsacus fullonum*), false brome (*Brachypodium sylvaticum*), Scotch broom (*Cytisus scoparius*), and Himalayan blackberry (*Rubus bifrons*).
- Mowed reed canarygrass.
- Trillium Gardens in Eugene, OR began production of ~500 plugs each of meadow checkermallow, western yarrow (*Achillea millefolium*), Hall's aster (*Symphyotrichum hallii*), tufted hairgrass (*Deschampsia caespitosa*), splitawn sedge (*Carex tumulicola*), aspen fleabane (*Erigeron speciosus*), barestem biscuitroot (*Lomatium nudicaule*), and goldenrod (*Solidago canadensis*).

### 2009

- Site inspection, partner coordination and public outreach with members of the Native Plant Society of Oregon and meeting attendees of meeting with NW Ecology Group and Central Cascades Adaptive Management Partnership.
- Continued production of ~500 plugs for each of 8 species that began in 2008.
- Hand pulled teasel, false brome, Scotch broom, Himalayan blackberry.
- Mowed reed canarygrass.
- Cut and removed of 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

- Site inspection and partner coordination.
- Cut and removed of Douglas-fir (*Pseudotsuga menziesii*) and incense cedar (*Calocedrus decurrens*) saplings and limbs of larger trees.
- Hand pulled teasel, Scotch broom (*Cytisus scoparius*), and meadow knapweed (*Centaurea pratensis*).
- 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 (*Achillea millefolium*), Hall's aster (*Aster hallii*), tufted hairgrass (*Deschampsia cespitosa*), splitawn sedge (*Carex tumulicola*), aspen fleabane (*Erigeron speciosus*), mule's ear (*Wyethia angustifolia*), 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 (*Solidago canadensis*).

#### 2011

- Site inspection, partner coordination and installation of “No Shooting” signs by BLM.
- Hand pulled false brome.
- IAE hired a labor crew to remove all 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

- Site inspection and partner coordination.
- 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, teasel, and meadow knapweed.
- Mowed large forested patch of false brome during flowering.

#### 2013

- Site inspection and partner coordination.
- Planted slender cinquefoil, western coneflower (*Rudbeckia occidentalis*), and dwarf checkermallow.
- Hand pulled false brome, teasel, and Scotch broom.
- Mowed false brome with a brush cutter.

#### 2014

- Site inspection and partner coordination.
- Hand pulling of false brome, teasel, and bull thistle.
- Mowed entire meadow with IAE brush mower.
- Placed shade cloth over majority of reed canarygrass patch.

#### 2015

- Site inspection and partner coordination.
- Repaired shade cloth covering reed canarygrass patch.
- Hand pulled false brome, teasel, and bull thistle.

#### 2016

- Site inspection and partner coordination.
- Repaired shade cloth covering reed canarygrass patch.
- Pulled and removed seed heads from canary grass extending beyond the shade cloth, as much as possible.

- Hand removed of false brome, teasel, Queen Anne's lace, and bull thistle.
- Contracted mowing of meadow using a skid-steer in November, 2016.

2017 (planned)

- Site inspection and partner coordination.
- Shade cloth removal and seeding of the resulting bare area.
- Hand removal of false brome, teasel, Queen Anne's lace, and bull thistle.
- Brushcutting of reed canarygrass to prevent seeding.