

Dorena Prairie restoration: 2023 annual report



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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.



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Cover photographs: Tolmie's star-tulip (*Calochortus tolmiei*) at Dorena Prairie, May 17, 2023. Photo by Rolando Beorchia.

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EXECUTIVE SUMMARY

The Institute for Applied Ecology (IAE) has conducted habitat restoration at Dorena Prairie in partnership with the Bureau of Land Management (BLM) Upper Willamette Field Office (UWFO), Northwest Oregon District, since 2010. In 2023, IAE performed a variety of restoration activities including broadcast seeding, native planting, and herbicide and manual weed treatments. This was the second full year the use of herbicides has been permitted at Dorena Prairie. IAE completed herbicide spot treatments for Canada thistle (*Cirsium arvense*), Himalayan blackberry (*Rubus bifrons*), and Fuller's teasel (*Dipsacus fullonum*). Nonnative grasses in units 3 and 4 that were not burned in the fall 2022 prescribed fire were mowed. In addition to treating weeds, 1,551 bulbs from seven species were planted including: narrow leaved onion (*Allium amplexans*), 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*). Shrubs were planted to continue a living fence habitat buffer between the road and meadow; species planted include 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*). Jonny Native Seed donated 10 pounds of Oregon white oak acorns, which were also planted within the living fence habitat buffer. Future restoration activities will include herbicide and manual weed treatments, mowing and/or burning to reduce woody vegetation, and revegetation with appropriate native plant materials.

1. INTRODUCTION

Dorena Prairie is a six-acre upland prairie located southeast of Eugene, Oregon and west of Dorena Lake (Figure 1). The prairie is managed by the Bureau of Land Management (BLM) Upper Willamette Field Office (UWFO), Northwest Oregon District. Dorena Prairie is designated a BLM Area of Critical Environmental Concern (ACEC) and hosts a diverse community of native plant species, including an introduced population of thin-leaved peavine (*Lathyrus holochlorus*), a BLM Sensitive and Oregon Endangered Species.

The Institute for Applied Ecology (IAE) began working with the BLM to restore and maintain habitat at Dorena Prairie in 2010. This prairie has undergone extensive restoration and could be a suitable location to introduce rare and/or federally listed plants. In addition, the prairie is located next to Schwarz Park, which is managed by the U.S. Army Corps of Engineers (USACE), providing an opportunity to educate the public about habitat restoration. An educational sign was installed in early 2017 to help inform the public about the ongoing work at Dorena Prairie.

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 more effectively address the threat posed by Himalayan blackberry (*Rubus bifrons*), Canada thistle (*Cirsium arvense*), velvet grass

(*Holcus lanatus*), tall oat grass (*Arrhenatherum elatius*), and tall fescue (*Schedonorus arundinaceus*). While manual techniques will still be important for site management, the use of herbicides will result in more efficient and effective control of non-native weeds.



Figure 1. Dorena Prairie management units and meadow location within the Willamette Valley Ecoregion.

2. GOALS AND OBJECTIVES

The purpose of this project is to assist the BLM with maintaining and improving rare mid-elevation (750 ft) prairie habitat in support of the native plant community at Dorena Prairie.

There are four primary objectives of this project:

1. Increase meadow plant community diversity by augmenting species occurring in low abundance.
2. Reduce low abundance priority invasive plants to below 1% total cover (or eradication): Scotch broom (*Cytisus scoparius*), Fuller's teasel (*Dipsacus fullonum*), Canada thistle, Himalayan blackberry, and bull thistle (*Cirsium vulgare*).
3. Reduce high abundance priority invasive plants to below 10% total cover: Oxeye daisy (*Leucanthemum vulgare*), and Queen Anne's lace (*Daucus carota*).
4. Reduce high abundance non-native grasses below 10% cover by implementing regular burning, mowing and herbicide applications: velvet grass, tall oat grass, and tall fescue.

3. 2023 RESTORATION ACTIONS

In 2023, IAE broadcast a native seed mix, planted bulbs, planted shrubs in a living fence, and mowed target invasive plants. We also treated Himalayan blackberry with Garlon 3A (triclopyr) herbicide, Canada thistle with Stinger (clopyralid) herbicide, and perennial grasses with Rodeo (glyphosate) herbicide (Table 1, Figure 2, Figure 3). To more accurately describe where management actions occur, Dorena Prairie has four designated management units (Figure 1). For a complete list of management actions at Dorena Prairie from 2010-2022, see Appendix A. For a comprehensive record of species planted and seeded at Dorena Prairie, see Appendix B.

Table 1. 2023 restoration actions at Dorena Prairie.

Date	Management unit(s)	Restoration Action *
March 9	All units	Assessed winter storms had minimal damage, planned spring mowing, observed plant phenology from fall 2022 seeding.
April 13	All units	Assessed post burn revegetation and planned weed treatments with Jessica Celis (Bureau of Land Management).
April 17	3, 4	Mowed non-native grasses in units 3 and 4.
	1	Pulled Scotch broom (<i>Cytisus scoparius</i>) throughout meadow with focus in unit 1.
	2	Mowed Himalayan blackberry (<i>Rubus bifrons</i>) with string trimmer throughout meadow with focus in unit 2.
	1, 2	Removed Oregon white oak (<i>Quercus garryana</i>) branches (removed during prescribed burn) from meadow and scattered in surrounding forest.
May 17	2, 4	Applied Stinger (clopyralid) herbicide on Canada thistle (<i>Cirsium arvense</i>).
	3, 4	Applied Rodeo (glyphosate) herbicide on non-native grasses and Fuller's teasel (<i>Dipsacus fullonum</i>).
	All units	Applied Garlon 3A (triclopyr) on Himalayan blackberry.
September 18	All units	Assessed spring weed treatments were effective and planned upcoming planting.
October 5	1, 3	Planted shrubs donated from BLM and Pacific crabapple (<i>Malus fusca</i>).
October 11	1, 2	Planted bulbs.
	1, 3	Planted shrubs in living fence row.
October 25	1, 3	Planted shrubs in living fence row.
	1, 2	Planted bulbs throughout meadow but primarily in units 1 and 2.
	All units	Broadcast 19.82 pounds native seed mix.

*Institute for Applied Ecology performed all listed activities.

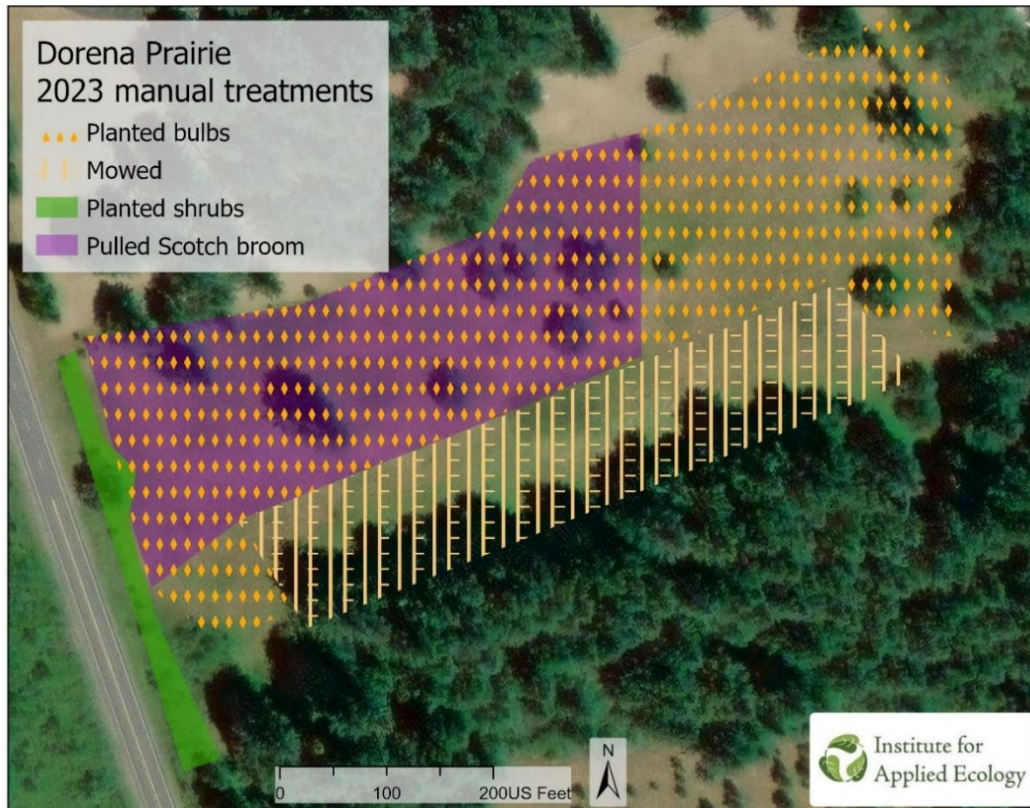


Figure 2. Mowing, hand weeding, and competitive planting treatments at Dorena Prairie in 2023.

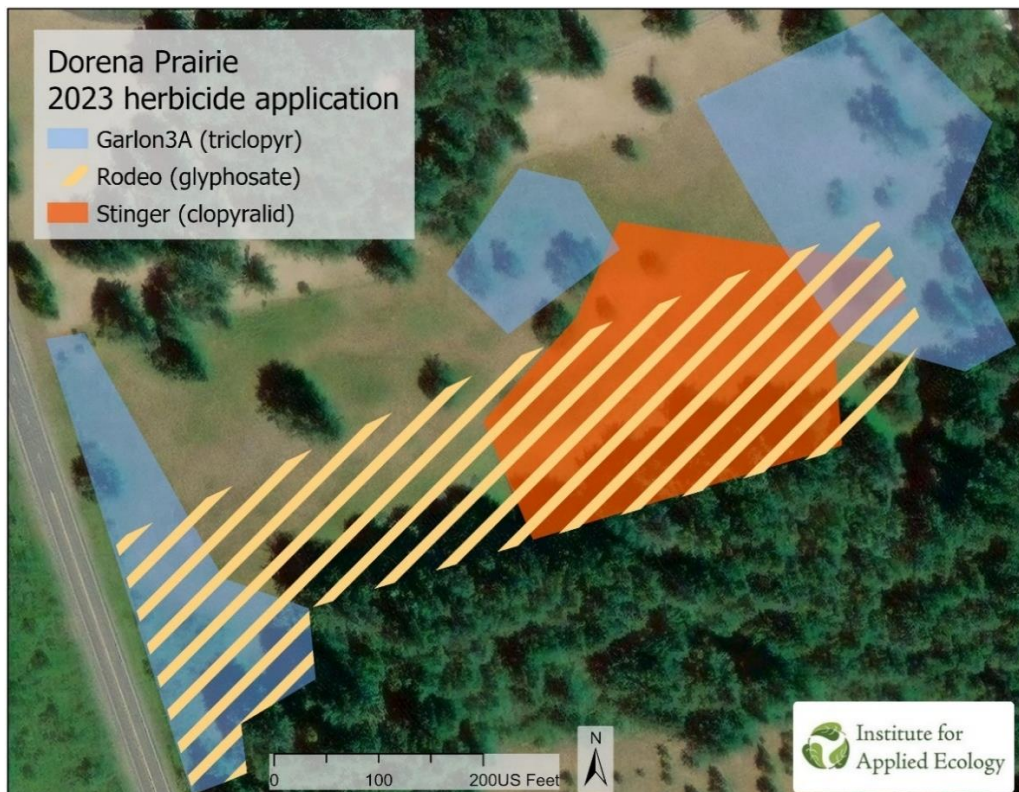


Figure 3. Herbicide applications at Dorena Prairie in 2023.

Non-native grasses, Scotch broom, Canada thistle, and Himalayan blackberry pose a significant threat to the native plant community at Dorena Prairie. The prescribed fire implemented in 2022 did not burn all the vegetation in units 3 and 4, so in April IAE mowed non-native grasses in these units with walk behind brush mowers (Figure 4). We also mowed Himalayan blackberry with string trimmers throughout the meadow, and hand pulled Scotch broom in unit 1. In May, IAE applied Garlon 3A (triclopyr) herbicide targeting Himalayan blackberry throughout the meadow, Stinger (clopyralid) targeting Canada thistle in units 3 and 4, and Rodeo (glyphosate) targeting velvet grass, tall oat grass, and tall fescue primarily in units 3 and 4 (Figure 3).



Figure 4. Spring mow treatment of non-native grasses in unit 3 and 4 at Dorena prairie, April 17, 2023.

In October, IAE broadcast seed and planted native bulbs to increase diversity in the prairie (Table 1, Figure 2). We broadcast 19.82 pounds of native seed to disturbed areas in all units using belly bag seeders (Figure 2, Table 2). The seed mix was comprised of sixteen species sourced from the Willamette Valley. Additionally, 1,551 bulbs were planted of seven forb species in units 1 and 2 including narrow-leaved onion (*Allium amplexans*), 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*) (Figure 2, Table 3).

Also in October, IAE added shrubs and small deciduous trees to the living fence along the road in units 1 and 3. Once fully grown the living fence will provide structural shelter and forage to birds and mammals frequenting the meadow and will reduce the introduction of non-native seed from the road. To make an effective weed barrier, multiple vegetative layers are required. The upper layer (one to eight feet tall) is composed of a two-meter-wide shrub row that was established in 2022 with seventy-three shrubs of four different species (Beorchia & Esterson 2023). In 2023, sixty-five shrubs and deciduous trees were added including golden chinquapin (*Chrysolepis chrysophylla*), beaked hazelnut (*Corylus cornuta*), Pacific crabapple (*Malus fusca*), osoberry (*Oemleria cerasiformis*), Oregon white oak (*Quercus garryana*), stink currant (*Ribes bracteosum*), red-flowering currant (*Ribes sanguineum*), and oval-leaved viburnum (*Viburnum ellipticum*) (Figure 2, Table 3). The ground layer (under one foot tall) was heavily seeded with Roemer's fescue (*Festuca roemerii*) in 2022.

Table 2. 2023 Dorena Prairie native seed mix.

Scientific Name	Common Name	Amount (lb)
<i>Achillea millefolium</i>	common yarrow	1.00
<i>Agrostis exarata</i>	spike bentgrass	0.20
<i>Bromus carinatus</i>	California brome	10.00
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring	0.50
	large-flowered blue-eyed	0.40
<i>Collinsia grandiflora</i>	Mary	
<i>Danthonia californica</i>	California oatgrass	1.00
<i>Deschampsia cespitosa</i>	tufted hairgrass	1.00
<i>Geum macrophyllum</i>	large-leaved avens	0.50
<i>Gilia capitata</i>	bluehead gilia	0.80
<i>Grindelia integrifolia</i>	Puget Sound gumweed	1.00
<i>Hordeum brachyantherum</i>	meadow barley	1.00
<i>Lupinus bicolor</i>	bi-colored lupine	1.00
<i>Madia gracilis</i>	grassy tarweed	0.17
<i>Plectritis congesta</i>	shortspur seablush	0.50
<i>Poa secunda</i>	pine bluegrass	0.25
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	0.50
Total:		19.82 lb

Table 3. Bulbs and potted shrubs planted in 2023 at Dorena Prairie.

Scientific name	Common Name	Bulbs	Shrubs/trees
<i>Allium amplexans</i>	narrow leaved onion	100	
<i>Brodiaea coronaria</i>	crown brodiaea	184	
<i>Brodiaea elegans</i>	harvest brodiaea	133	
<i>Calochortus tolmiei</i>	Tolmie's star-tulip	200	
<i>Dichelostemma congestum</i>	ookow	300	
<i>Fritillaria affinis</i>	chocolate lily	100	
<i>Perideridia gairdneri</i>	Gardner's yampah	534	
<i>Chrysolepis chrysophylla</i>	golden chinquapin		4
<i>Corylus cornuta</i>	beaked hazelnut		12
<i>Malus fusca</i>	Pacific crabapple		20
<i>Oemleria cerasiformis</i>	osoberry		7
<i>Quercus garryana</i>	Oregon white oak		5
<i>Ribes bracteosum</i>	stink currant		5
<i>Ribes sanguineum</i>	red-flowering currant		11
<i>Viburnum ellipticum</i>	oval-leaved viburnum		1
Totals:		1,551	65

The addition of native species appears to be increasing diversity throughout the meadow. Although non-native species abundance is relatively high at Dorena prairie, many native forb species were observed in 2023 showing the influence of restoration efforts on the plant community. Dwarf checkermallow (*Sidalcea malviflora* spp. *virgata*) and prairie violet (*Viola praemorsa*) were noticeably abundant in units 1 and 2. Rows of narrowleaf mule's ear and toughleaf iris (*Iris tenax*) planted in 2012 were obvious in unit 1 after the thatch burned, and many species seeded and planted in 2022 were observed in 2023 (Figure 5).



Figure 5. Native plants rebound after prescribed fire. (A) narrowleaf mule's ear (*Wyethia angustifolia*) planted 2012, (B) Canada goldenrod (*Solidago lepida*), (C) dwarf checkermallow (*Sidalcea malviflora* spp. *virgata*), (D) toughleaf iris (*Iris tenax*) planted 2012, (E) Chocolate lily (*Fritillaria affinis*) planted 2022, (F) Tolmie's star-tulip (*Calochortus tolmiei*) planted 2022.

4. MANAGEMENT RECOMMENDATIONS

The overarching goal of this project is to restore regionally rare meadow habitat at Dorena Prairie by controlling priority invasive species and increasing diversity. Many of the invasive species are currently low in abundance and could be controlled in the next few years with consistent treatment, while other species will need regular annual treatments for many years to keep their abundance at a tolerable level.

The following restoration actions are recommended for 2024 and beyond:

- Implement a prescribed burn every three years if resources allow. The next prescribed burn year is 2025. Mow any unburned portion of units 3 and 4.
 - 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 lb. per acre to increase native plant species diversity and abundance.
- Mow the meadow every two years to reduce non-native thatch buildup. 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.

- Herbicide treatments:
 - Spot spray Himalayan blackberry in spring and/or fall with glyphosate or triclopyr.
 - Spot spray teasel in the rosette to bolting stage in spring and fall with glyphosate or clopyralid.
 - Spot spray thistles in the bolting to bud stage in spring with clopyralid.
- Manual weed removal:
 - Hand-pull priority weeds (teasel and Scotch broom) if they are not treated with herbicide prior to flowering.
 - Cut and bag inflorescences of Queen Anne's lace, oxeye daisy, Canada thistle, and bull thistle 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. Improve native prairie species abundance and diversity by augmenting with appropriate plugs, bulbs, and bare root plants.
- Plant more fruit and nut-bearing shrubs and trees within the live fence.

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

5. REFERENCES

Beorchia, Rolando and Andrew Esterson. 2023. Dorena Prairie restoration: 2022 annual report. Unpublished report for the Bureau of Land Management, Northwest Oregon District. Institute for Applied Ecology. Corvallis, Oregon.

APPENDIX A. COMPLETED AND PROPOSED RESTORATION ACTIVITIES: 2010-2026

2010

- Planned and coordinated with partners mapped priority invasive plant species and surveyed native vegetation.
- Removed approximately 300 Scotch broom (*Cytisus scoparius*) and 25 Himalayan blackberry (*Rubus bifrons*) plants.
- U.S. Army Corps of Engineers (USACE) mowed the entire prairie in mid-summer to enhance habitat for herbaceous species by reducing dominance of tall oatgrass (*Arrhenatherum elatius*) and woody species.

2011

- Removed Scotch broom and Himalayan blackberry.
- Surveyed Bald Mountain milkvetch (*Astragalus umbraticus*).
- USACE mowed the entire prairie in mid-summer.

2012

- Removed Scotch broom and seeded with upland prairie native grass and forb mix.
- Mapped site and updated plant species list.
- Grew and planted plugs (containerized seedlings) from seed collected for Seeds of Success (SOS) native seed collections.
- Weed-wacked thistle (*Cirsium spp.*) and Fuller's teasel (*Dipsacus fullonum*).
- USACE mowed the entire prairie in mid-summer.

2013

- Planted 1,224 California oatgrass (*Danthonia californica*), 216 slender cinquefoil (*Potentilla gracilis*), 648 common rush (*Juncus effusus*), 144 dense sedge (*Carex densa*), and 648 slough sedge (*Carex obnupta*).
- Removed Scotch broom, Himalayan blackberry, Fuller's teasel, and bull thistle (*Cirsium vulgare*) by hand. Focused removal of Scotch broom and teasel in SE corner of prairie, and Himalayan blackberry surrounding blue elderberry (*Sambucus cerulea*) in SE corner.
- Removed Fuller's teasel seed heads.
- Weed-whacked thistle and Fuller's teasel.
- USACE mowed the entire prairie in mid-summer.

2014

- Planted bare-root Oregon geranium (*Geranium oreganum*) and plugs of river lupine (*Lupinus rivularis*), western columbine (*Aquilegia formosa*), and prairie violet (*Viola praemorsa*).
- Removed Scotch broom and Fuller's teasel by hand and weed-whacked Himalayan blackberry and non-native woody species.
- USACE mowed the entire prairie in mid-summer.

2015

- Removed Scotch broom and Himalayan blackberry.

2016

- Planted 198 showy milkweed (*Asclepias speciosa*) and 200 thin-leaved peavine (*Lathyrus holochlorus*) plugs in two introduction plots.
- Manually removed Scotch broom and Himalayan blackberry.
- Hired subcontractor to mow entire prairie in mid-summer.

2017

- Installed interpretive sign.
- Monitored thin-leaved peavine introduction plots.
- Manually removed Himalayan blackberry.
- Limbed Douglas-fir (*Pseudotsuga menziesii*).

2018

- Monitored planted thin-leaved peavine introduction plots.
- Removed Scotch broom and Himalayan blackberry from within and around plots planted with thin-leaved peavine.

2019

- Monitored planted thin-leaved peavine introduction plots.
- IAE mowed entire prairie in mid-summer.
- Manually removed Scotch broom, Himalayan blackberry, and lower limbs of large Douglas-fir trees. Felled smaller trees along the southern and eastern edges of the prairie.
- Piled limbs in open meadow with the AmeriCorps Blue 5.

2020

- Monitored thin-leaved peavine introduction plots.
- Hand-pulled Scotch broom.
- Bucked and removed wind-fallen Oregon white oak (*Quercus garryana*) from thin-leaved peavine plots with AmeriCorps Blue 4.
- Planted 500 small camas (*Camassia quamash*) bulbs with AmeriCorps Blue 4.

2021

- Spot-sprayed Canada thistle (*Cirsium arvense*).
- Monitored thin-leaved peavine introduction plots.
- Manually and mechanically removed Canada thistle, Scotch broom, and Himalayan blackberry.
- Cut and trimmed woody species and spot sprayed invasive species in thin-leaved peavine plots. Spot sprayed perennial grasses and oxeye daisy (*Leucanthemum vulgare*) in and around plots after mowing diagonal strips through plots with a weed trimmer.
- Contracted skid-steer operator, Cutaway, Inc., to mow entire meadow to prepare for fall 2022 prescribed burn. Removed downed Oregon white oak limbs from meadow. Cleared small Oregon ash (*Fraxinus latifolia*) and shrub layer around meadow edges.
- Seeded bare soil created by skid steer with native grass species and thin-leaved peavine plots with a diverse native forb mix.

2021 (cont.)

- Limbed trees up to 20 feet above the ground and topped one large Douglas-fir to create a wildlife tree to prep site for a prescribed burn in fall 2022.
- Burned brush piles and seeded exposed bare ground.

2022

- Wood chipped tree limbs to prepare for prescribed burning.
- Applied Stinger (clopyralid) herbicide to Canada thistle.
- Applied Rodeo (glyphosate) and Garlon 3A (triclopyr) to Himalayan blackberry throughout the prairie and at forest edge.
- BLM implemented a prescribed burn of the entire prairie in October 2022, followed by IAE herbicide application of glyphosate and seeding.
- Planted a living fence shrub row on western fence line.

2023

- Mowed non-native grasses in units 3 and 4. Mowed Himalayan blackberry with string trimmer primarily in unit 2, but throughout meadow.
- Pulled Scotch broom primarily in unit 1, but throughout meadow.
- Collected Oak limbs (removed during prescribed burn) and scattered in surrounding forest.
- Applied Stinger (clopyralid) herbicide on Canada thistle. Applied Rodeo (glyphosate) herbicide on non-native grasses and Fuller's teasel. Applied Garlon 3A (triclopyr) on Himalayan blackberry.
- Planted 65 shrubs in living fence row. Planted 1,850 bulbs. Broadcast 19.82 pounds native seed mix.

2024 (Proposed)

- March-June: Spot spray Himalayan blackberry, Fuller's teasel, and non-native thistle with herbicide. Manually remove inflorescences if not treated prior to flowering.
- Oct-Nov: Mow entire meadow with deck mower or skid steer.
- Oct-Nov: Broadcast native seed mix to disturbed areas. Plant more bulbs throughout the meadow and fruit and nut bearing shrubs along fencerow if available.

2025 (Proposed)

- March-June: Spot spray Himalayan blackberry, teasel, 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. Plant fruit and nut bearing shrubs along fencerow.

APPENDIX B. COMPREHENSIVE PLANTING AND SEEDING RECORD 2012-2023

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.								
		2023	2022	2021	2020	2019	2016	2014	2013	2012
<i>Achillea millefolium</i>	common yarrow	1	0.96	0.02						
<i>Acmispon americanus</i>	American bird's-foot trefoil		3.28							
<i>Allium amplexans</i>	narrow leaved onion	{100}	{175}							
<i>Agrostis exarata</i>	spike bentgrass	0.2								
<i>Amsinckia menziesii</i>	Menzies' fiddleneck		0.845							
<i>Aquilegia formosa</i>	red columbine		0.63	0.14				{357}		{27}
<i>Asclepias speciosa</i>	showy milkweed		0.54				{198}			
<i>Balsamorhiza deltoidea</i>	deltoid balsamroot									{41}
<i>Brodiaea coronaria</i>	crown brodiaea	{184}								
<i>Brodiaea elegans</i>	harvest brodiaea	{133}	{300}							
<i>Bromus carinatus</i>	California brome	10	6.53							
<i>Calochortus tolmiei</i>	Tolmie's star-tulip	{200}	{175}							
<i>Camassia quamash</i> var. <i>azurea</i>	common camas		{400}		{500}					
<i>Carex densa</i>	dense sedge		0.2						{144}	
<i>Carex obnupta</i>	slough sedge								{648}	
<i>Chrysolepis chrysophylla</i>	golden chinquapin	{4}								
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring	0.5	1.275							
<i>Clarkia purpurea</i>	winecup clarkia		0.1	0.04						
<i>Collinsia grandiflora</i>	large-flowered blue-eyed Mary	0.4	1.41							
<i>Collomia grandiflora</i>	large-flowered collomia		2.72							
<i>Corylus cornuta</i>	beaked hazelnut	{12}								
<i>Danthonia californica</i>	California danthonia	1	2.8	0.5					{1 224}	
<i>Deschampsia caespitosa</i>	tufted hairgrass	1	0.52							
<i>Dichelostemma congestum</i>	ookow	{200}	{300}							
<i>Dodecatheon hendersonii</i>	Henderson's shooting star	{300}	{300}							
<i>Elymus glaucus</i>	blue wildrye		4.87	0.58						
<i>Eriophyllum lanatum</i>	Oregon sunshine		1.56	0.06						
<i>Festuca roemerii</i>	Roemer's fescue		7.745							
<i>Fritillaria affinis</i>	chocolate lily	{100}	{200}							
<i>Geranium oreganum</i>	Oregon geranium		0.0055					{880}		{135}
<i>Geum macrophyllum</i>	Oregon or large-leaved avens	0.5	0.75							

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.								
		2023	2022	2021	2020	2019	2016	2014	2013	2012
<i>Gilia capitata</i>	globe gilia	0.8	7.7							
<i>Grindelia integrifolia</i>	Puget Sound gumweed	1								{216}
<i>Hordeum brachyantherum</i>	meadow barley	1								
<i>Iris tenax</i>	toughleaf iris		1.32							{67}
<i>Juncus bolanderi</i>	Bolander's rush		0.0325							
<i>Juncus bufonius</i>	toad rush		0.0335							
<i>Juncus effusus</i>	soft rush		0.0565							
<i>Juncus occidentalis</i>	poverty rush		0.006							
<i>Koeleria macrantha</i>	prairie Junegrass			0.03						
<i>Lathyrus holochlorus</i>	thin-leaved peavine					240 seeds	{200}			
<i>Lilium columbianum</i>	tiger lily		{200}							
<i>Lomatium nudicaule</i>	barestem biscuitroot		1.6							
<i>Lupinus bicolor</i>	bi-colored lupine	0.17	3.6							
<i>Lupinus rivularis</i>	river lupine		10.185					{672}		
<i>Madia elegans</i>	showy tarweed		1.55	0.33						
<i>Madia gracillis</i>	grassy tarweed		0.46							
<i>Malus fusca</i>	Pacific crabapple	{20}								
<i>Mimulus guttatus</i>	common monkeyflower		0.0275							
<i>Oemleria cerasiformis</i>	osoberry	{7}	{23}							
<i>Perideridia gairdneri</i>	Gardner's yampah	{534}								
<i>Phacelia nemoralis</i> var. <i>oregonensis</i>	Oregon woods phacelia		1.02							
<i>Philadelphus lewisii</i>	Lewis' mock-orange	{2}								
<i>Plectritis congesta</i>	shortspur seablush	0.5	0.54	0.05						
<i>Poa secunda</i>	pine bluegrass	0.25								
<i>Potentilla gracilis</i>	slender cinquefoil		0.0875	0.02					{216}	{219}
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	0.5	2.165	0.09						
<i>Prunus virginiana</i>	chokecherry		{14}							
<i>Quercus garryana</i>	Oregon white oak	10 {5}								
<i>Ranunculus occidentalis</i>	western buttercup		3.035							
<i>Ribes bracteosum</i>	stink currant	{5}								
<i>Ribes sanguineum</i>	red-flowering currant	{11}	{30}							
<i>Sambucus cerulea</i>	blue elderberry		{6}							

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.								
		2023	2022	2021	2020	2019	2016	2014	2013	2012
<i>Sidalcea campestris</i>	meadow checkermallow		6.52							{14}
<i>Sidalcea malviflora</i> spp. <i>virgata</i>	rose checkermallow		3.9 {400}	0.52						{19}
<i>Solidago lepida</i>	Canada goldenrod		0.085							
<i>Viburnum ellipticum</i>	oval-leaved viburnum	{1}								
<i>Viola praemorsa</i>	prairie violet							{334}		
<i>Wyethia angustifolia</i>	narrowleaf mule's ear		5							{167}
	Totals:	1,551 bulbs 65 shrubs 19.82 lb. (10lb. oak)	2450 bulbs 73 shrubs 86.7 lb.	2.4 lb.	500 bulbs	240 seeds	398 plugs	2,243 plugs	2,232 plugs	908 plugs
	Seed source notes: Willamette Valley (WV) or mid-elevation (ME) genetic origin.	All Willamette Valley.	All Willamette Valley.	All ME except <i>M. elegans</i> (WV) and <i>A. formosa</i> (WV).						All mid-elevation.