

Dorena Prairie restoration: 2024 annual report



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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 photographs: Oregon white oak (*Quercus garryana*) at Dorena Prairie, August 14, 2023. Photo by Rolando Beorchia.

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TABLE OF CONTENTS

EXECUTIVE SUMMARY	1
1. INTRODUCTION	1
2. GOALS AND OBJECTIVES	2
3. 2024 RESTORATION ACTIONS	3
4. MANAGEMENT RECOMMENDATIONS	5
5. REFERENCES	6
APPENDIX A. COMPLETED AND PROPOSED RESTORATION ACTIVITIES: 2010-2026.....	7
APPENDIX B. COMPREHENSIVE PLANTING AND SEEDING RECORD 2012-2024	10
APPENDIX C. THIN-LEAVED PEAVINE (<i>LATHYRUS HOLOCHLORIS</i>): MAPS AND DATA.....	14

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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 2024, IAE performed a variety of restoration activities including broadcast seeding, native planting, mowing, and herbicide and manual weed treatments. IAE completed herbicide spot treatments for Himalayan blackberry (*Rubus bifrons*) and Fuller's teasel (*Dipsacus fullonum*) and manual treatments targeted bull thistle (*Cirsium vulgare*), oxeye daisy (*Leucanthemum vulgare*), Fuller's teasel, Scotch broom (*Cytisus scoparius*), and St. John's wort (*Hypericum perforatum*). IAE mowed the entire meadow to reduce thatch accumulation and shrub encroachment. In addition to treating weeds, 310 bulbs from two species were planted including 250 crown brodiaea (*Brodiaea coronaria*) and 60 ookow (*Dichelostemma congestum*). Shrub seed was scattered to continue a living fence habitat buffer between the road and meadow; species seeded include beaked hazelnut (*Corylus cornuta*), osoberry (*Oemleria cerasiformis*), and blue elderberry (*Sambucus cerulea*). Future restoration activities will include herbicide and manual weed treatments, mowing and/or burning to reduce woody vegetation and thatch, 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.



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 regionally 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 (*Cirsium arvense*), Himalayan blackberry (*Rubus bifrons*), 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 (*Holcus lanatus*), tall oat grass (*Arrhenatherum elatius*), and tall fescue (*Schedonorus arundinaceus*).

3. 2024 RESTORATION ACTIONS

In 2024, IAE broadcast a native seed mix, planted bulbs, seeded shrubs in a living fence, and treated target invasive plants (Table 1). 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. 2024 restoration actions at Dorena Prairie.

Date	Management unit(s)	Restoration Action *
17-Apr	All	Manual weed removal targeting bull thistle, oxeye daisy, Fuller's teasel, St. John's wort.
16-May		
23-May	3, 4	Mowed South one-third of meadow.
2-Jul	All	Site visit and evaluation with BLM staff: Emily Erickson, Jessica Celis, Matt Bahm.
3-Jul	All	Manual weed removal targeting bull thistle, Scotch broom, oxeye daisy, Fuller's teasel, St. John's wort.
3-Oct	1, 3	Applied triclopyr (Garlon 3A) targeting Himalayan blackberry and Fuller's teasel.
15-Nov	All	Mowed at 6 inches height with Canycom mower.
26-Nov	All	Broadcast 13.65 pounds of a native seed mix, sowed 2.5 pounds shrub seed, and planted 310 bulbs.

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

Non-native grasses, Scotch broom, Canada thistle, and Himalayan blackberry pose a significant threat to the native plant community at Dorena Prairie. In April 2024, IAE mowed non-native grasses in units 3 and 4 with a walk behind brush mower to reduce the non-native perennial grass thatch and seed development (Table 1). In April, May, and July IAE staff manually pulled, cut, or dug invasive weeds including bull thistle, oxeye daisy, Fuller's teasel, Scotch broom and St. John's wort (*Hypericum perforatum*, Table 1). In October, IAE staff applied triclopyr herbicide targeting Himalayan blackberry and Fuller's teasel (Table 1). In November, we mowed the un-mowed portion of the meadow using a Canycom flail mower. This mowing was in line with the long-term prescribed fire and mowing schedule (Table 1).

In November, IAE broadcast seed and planted native bulbs to increase diversity in the prairie (Table 1). We broadcast 13.65 pounds of native seed to disturbed areas in all units by hand scattering onto small patches of bare ground (Table 2). The seed mix was comprised of 52 species sourced from the Willamette Valley. Additionally, 310 bulbs were planted of two forb species (250 crown brodiaea (*Brodiaea coronaria*) and 60 ookow (*Dichelostemma congestum*)) in units 1 and 2 (Table 2).

Also in November, IAE sowed 2.5 pounds of native shrub seed on 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 planted with 137 shrubs and deciduous trees in 2022 and 2023 (Appendix B). The ground layer (under one foot tall) was heavily seeded with Roemer's fescue (*Festuca roemerii*) in 2022.

Table 2. 2024 Dorena Prairie native seed mix, shrubs seed, and bulbs planted.

Scientific Name	Common Name	Meadow species (lb.)	Shrub Seed (lb.)	Bulbs (quantity)
<i>Achillea millefolium</i>	common yarrow	0.07		
<i>Allium amplexans</i>	narrow leaved onion	0.05		
<i>Amsinckia menziesii</i>	Menzies' fiddleneck	0.19		
<i>Barbarea orthoceras</i>	American yellowrocket	0.02		
<i>Brodiaea coronaria</i>	crown brodiaea			250
<i>Camassia leichtlinii</i> var. <i>suksdorfii</i>	tall camas	0.24		
<i>Carex tumulicola</i>	splitawn sedge	0.09		
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring	0.06		
<i>Clarkia purpurea</i>	winecup clarkia	0.03		
<i>Clarkia rhomboidea</i>	diamond clarkia	0.05		
<i>Collinsia grandiflora</i>	large-flowered blue-eyed Mary	0.12		
<i>Collomia grandiflora</i>	large-flowered collomia	0.4		
<i>Corylus cornuta</i>	beaked hazelnut		0.5	
<i>Dichelostemma congestum</i>	ookow			60
<i>Elymus glaucus</i>	blue wildrye	0.06		
<i>Elymus trachycaulus</i>	slender wheatgrass	0.05		
<i>Eriophyllum lanatum</i>	Oregon sunshine	0.13		
<i>Erythronium oregonum</i>	giant white fawn-lily	0.06		
<i>Festuca roemerii</i>	Roemer's fescue	0.06		
<i>Geum macrophyllum</i>	Oregon or large-leaved avens	0.12		
<i>Gilia capitata</i>	globe gilia	0.02		
<i>Grindelia integrifolia</i>	Puget Sound gumweed	1.03		
<i>Heuchera chlorantha</i>	tall alumroot	.003		
<i>Juncus tenuis</i>	slender rush	.001		
<i>Koeleria macrantha</i>	prairie Junegrass	0.01		
<i>Ligusticum apiifolium</i>	celery-leaved lovage	0.17		
<i>Lomatium dissectum</i>	fern-leaved biscuitroot	0.41		
<i>Lomatium nudicaule</i>	barestem biscuitroot	0.29		
<i>Lomatium utriculatum</i>	spring gold	0.08		
<i>Lotus purshianus</i>	bird's foot trefoil	0.13		
<i>Luzula comosa</i>	Pacific woodrush	0.01		
<i>Madia elegans</i>	showy tarweed	0.19		
<i>Madia gracilis</i>	grassy tarweed	0.08		
<i>Microseris laciniata</i>	cutleaf silverpuffs	0.04		
<i>Oemleria cerasiformis</i>	osoberry		1.0	
<i>Phacelia nemoralis</i> var. <i>oregonensis</i>	Oregon woods phacelia	0.16		
<i>Plectritis congesta</i>	shortspur seablush	0.02		
<i>Poa secunda</i>	pine bluegrass	0.02		
<i>Potentilla glandulosa</i>	sticky cinquefoil	0.02		
<i>Potentilla gracilis</i>	slender cinquefoil	0.09		
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	0.35		

Scientific Name	Common Name	Meadow species (lb.)	Shrub Seed (lb.)	Bulbs (quantity)
<i>Ranunculus occidentalis</i>	western buttercup	0.09		
<i>Rumex salicifolius</i>	willow dock	0.25		
<i>Sanguisorba occidentalis</i>	western burnet	0.22		
<i>Sanicula bipinnatifida</i>	purple sanicle	0.22		
<i>Sambucus cerulea</i>	blue elderberry		1.0	
<i>Scrophularia californica</i>	California bee plant	0.03		
<i>Sidalcea campestris</i>	meadow checkermallow	1.64		
<i>Sidalcea malviflora</i> spp. <i>virgata</i>	rose checkermallow	0.14		
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass	0.06		
<i>Solidago elongata</i>	Cascade Canada goldenrod	.003		
<i>Symphyotrichum hallii</i>	Hall's aster	0.01		
<i>Toxicoscordion venenosum</i>	meadow deathcamas	3.5		
<i>Viola praemorsa</i>	prairie violet	0.05		
Total:		13.65 lb.	2.5 lb.	310 bulbs

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 2025 and beyond:

- Implement a prescribed burn every three years as 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 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.
- 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. 2024. Dorena Prairie restoration: 2023 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 the 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 thin-leaved peavine introduction plots.
- Removed Scotch broom and Himalayan blackberry from within and around plots planted with thin-leaved peavine.

2019

- Monitored thin-leaved peavine introduction plots.
- IAE mowed the 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 the 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.
- Mowed diagonal strips through Dorena East plot.
- 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.

2024

- Manual weed removal targeting bull thistle, oxeye daisy, Fuller's teasel, St. John's wort (*Hypericum perforatum*).
- Mowed the entire meadow.
- Applied triclopyr (Garlon 3A) targeting Himalayan blackberry and Fuller's teasel.
- Broadcast 13.65 pounds of native seed, sowed 2.5 pounds shrub seed, and planted 310 bulbs.

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: BLM implement a 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 the fencerow.

2026 (Proposed)

- March-June: Spot spray Himalayan blackberry, teasel, and non-native thistle with herbicide. Manually remove inflorescences if not treated prior to flowering.
- Oct-Nov: Treat invasive weeds with glyphosate and triclopyr as necessary for control.
- Oct-Nov: Broadcast native seed mix to disturbed areas, plant plugs and bulbs if available. Plant fruit and nut bearing shrubs along the fencerow.

APPENDIX B. COMPREHENSIVE PLANTING AND SEEDING RECORD 2012-2024

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.					
		2012 - 2019*	2020	2021	2022	2023	2024
<i>Achillea millefolium</i>	common yarrow			0.02	0.96	1	0.07
<i>Acmispon americanus</i>	American bird's-foot trefoil				3.28		
<i>Allium amplexans</i>	narrow leaved onion				{175}	{100}	0.05
<i>Agrostis exarata</i>	spike bentgrass					0.2	
<i>Amsinckia menziesii</i>	Menzies' fiddleneck				0.845		0.19
<i>Aquilegia formosa</i>	red columbine	{384}		0.14	0.63		
<i>Asclepias speciosa</i>	showy milkweed	{198}			0.54		
<i>Balsamorhiza deltoidea</i>	deltoid balsamroot	{41}					
<i>Barbarea orthoceras</i>	American yellowrocket						0.02
<i>Brodiaea coronaria</i>	crown brodiaea					{184}	{250}
<i>Brodiaea elegans</i>	harvest brodiaea				{300}	{133}	
<i>Bromus carinatus</i>	California brome				6.53	10	
<i>Calochortus tolmiei</i>	Tolmie's star-tulip				{175}	{200}	
<i>Camassia leichtlinii</i> var. <i>suksdorfii</i>	tall camas						0.24
<i>Camassia quamash</i> var. <i>azurea</i>	common camas		{500}		{400}		
<i>Carex densa</i>	dense sedge	{144}			0.2		
<i>Carex obnupta</i>	slough sedge	{648}					
<i>Carex tumulicola</i>	splitawn sedge						0.09
<i>Chrysolepis chrysophylla</i>	golden chinquapin					{4}	
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring				1.275	0.5	0.06
<i>Clarkia purpurea</i>	winecup clarkia			0.04	0.1		0.03
<i>Clarkia rhomboidea</i>	diamond clarkia						0.05
<i>Collinsia grandiflora</i>	large-flowered blue-eyed Mary				1.41	0.4	0.12
<i>Collomia grandiflora</i>	large-flowered collomia				2.72		0.4
<i>Corylus cornuta</i>	beaked hazelnut					{12}	0.5
<i>Danthonia californica</i>	California danthonia	{1224}		0.5	2.8	1	
<i>Deschampsia caespitosa</i>	tufted hairgrass				0.52	1	

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.					
		2012 - 2019*	2020	2021	2022	2023	2024
<i>Dichelostemma congestum</i>	ookow				{300}	{200}	{60}
<i>Dodecatheon hendersonii</i>	Henderson's shooting star				{300}	{300}	
<i>Elymus glaucus</i>	blue wildrye			0.58	4.87		0.06
<i>Elymus trachycaulus</i>	slender wheatgrass						0.05
<i>Eriophyllum lanatum</i>	Oregon sunshine			0.06	1.56		0.13
<i>Erythronium oregonum</i>	giant white fawn-lily						0.06
<i>Festuca roemerii</i>	Roemer's fescue				7.745		0.06
<i>Fritillaria affinis</i>	chocolate lily				{200}	{100}	
<i>Geranium oreganum</i>	Oregon geranium	{1015}			0.0055		
<i>Geum macrophyllum</i>	Oregon or large-leaved avens				0.75	0.5	0.12
<i>Gilia capitata</i>	globe gilia				7.7	0.8	0.02
<i>Grindelia integrifolia</i>	Puget Sound gumweed	{216}				1	1.03
<i>Heuchera chlorantha</i>	tall alumroot						0.003
<i>Hordeum brachyantherum</i>	meadow barley					1	
<i>Iris tenax</i>	toughleaf iris	{67}			1.32		
<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>Juncus tenuis</i>	slender rush						0.001
<i>Koeleria macrantha</i>	prairie Junegrass			0.03			0.01
<i>Lathyrus holochlorus</i>	thin-leaved peavine	240 seeds {200}					
<i>Lilium columbianum</i>	tiger lily				{200}		
<i>Ligusticum apiifolium</i>	celery-leaved lovage						0.17
<i>Lomatium dissectum</i>	fern-leaved biscuitroot						0.41
<i>Lomatium nudicaule</i>	barestem biscuitroot				1.6		0.29
<i>Lomatium utriculatum</i>	spring gold						0.08
<i>Lotus purshianus</i>	bird's foot trefoil						0.13
<i>Lupinus bicolor</i>	bi-colored lupine				3.6	0.17	
<i>Lupinus rivularis</i>	river lupine	{672}			10.185		
<i>Luzula comosa</i>	Pacific woodrush						0.01
<i>Madia elegans</i>	showy tarweed			0.33	1.55		0.19

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.					
		2012 - 2019*	2020	2021	2022	2023	2024
<i>Madia gracilis</i>	grassy tarweed				0.46		0.08
<i>Malus fusca</i>	Pacific crabapple					{20}	
<i>Microseris laciniata</i>	cutleaf silverpuffs						0.04
<i>Mimulus guttatus</i>	common monkeyflower				0.0275		
<i>Oemleria cerasiformis</i>	osoberry				{23}	{7}	1
<i>Perideridia gairdneri</i>	Gardner's yampah					{534}	
<i>Phacelia nemoralis</i> var. <i>oregonensis</i>	Oregon woods phacelia				1.02		0.16
<i>Philadelphus lewisii</i>	Lewis' mock-orange					{2}	
<i>Plectritis congesta</i>	shortspur seablush			0.05	0.54	0.5	0.02
<i>Poa secunda</i>	pine bluegrass					0.25	0.02
<i>Potentilla glandulosa</i>	sticky cinquefoil						0.02
<i>Potentilla gracilis</i>	slender cinquefoil	{435}		0.02	0.0875		0.09
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal			0.09	2.165	0.5	0.35
<i>Prunus virginiana</i>	chokecherry				{14}		
<i>Quercus garryana</i>	Oregon white oak					10 {5}	
<i>Ranunculus occidentalis</i>	western buttercup				3.035		0.09
<i>Ribes bracteosum</i>	stink currant					{5}	
<i>Ribes sanguineum</i>	red-flowering currant				{30}	{11}	
<i>Rumex salicifolius</i>	willow dock						0.25
<i>Sanguisorba occidentalis</i>	western burnet						0.22
<i>Sanicula bipinnatifida</i>	purple sanicle						0.22
<i>Sambucus cerulea</i>	blue elderberry				{6}		1
<i>Scrophularia californica</i>	California bee plant						0.03
<i>Sidalcea campestris</i>	meadow checkermallow	{14}			6.52		1.64
<i>Sidalcea malviflora</i> spp. <i>virgata</i>	rose checkermallow	{19}		0.52	3.9 {400}		0.14
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass						0.06
<i>Solidago elongata</i>	Cascade Canada goldenrod						0.003
<i>Solidago lepida</i>	Canada goldenrod				0.085		
<i>Symphotrichum hallii</i>	Hall's aster						0.01
<i>Toxicoscordion venenosum</i>	meadow deathcamas						3.5

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.					
		2012 - 2019*	2020	2021	2022	2023	2024
<i>Viburnum ellipticum</i>	oval-leaved viburnum					{1}	
<i>Viola praemorsa</i>	prairie violet	{334}					0.05
<i>Wyethia angustifolia</i>	narrowleaf mule's ear	{167}			5		
	Totals:	5,781 plugs, 240 seeds	500 bulbs	2.4 lb.	2450 bulbs, 73 shrubs, 86.7 lb.	1,551 bulbs, 65 shrubs, 19.82 lb. (10lb. oak)	310 bulbs, 13.65 lb.
	Number of species:	16	1	12	51	32	54
	Seed source notes: Willamette Valley (WV) or mid-elevation (ME) genetic origin.			All ME except M. elegans (WV) and A. formosa (WV).	All Willamette Valley.	All Willamette Valley.	All Willamette Valley.
*2012-2019 seeding and planting amounts for each year can be found in the 2023 annual report (Beorchia, 2024).							

Appendix C. THIN-LEAVED PEAVINE (*LATHYRUS HOLOCHLORIS*): MAPS AND DATA

Figure 1. The white outlines show the perimeter of the introduction plots planted in 2016 at Dorena Prairie. The small orange box near the Dorena East introduction plot is the seed plot that was added in 2019.

Table 3. Number and percent survival of thin-leaved peavine transplants from 2016-2021.

Introduction site	Year planted	Number Planted	Survival 2016 No. (%)	Survival 2017 No. (%)	Survival 2018 No. (%)	Survival 2019 No. (%)	Survival 2020 No. (%)	Survival 2021 No. (%)
Dorena E	2016	100	61 (61)	22 (22)	24 (24)	24 (24)	6 (6)	22 (22)
Dorena W	2016	100	36 (36)	8 (8)	5 (5)	5 (5)	0	0

Table 4. Vigor of thin-leaved peavine transplants from 2016-2021. Vigor ranges from 0 (not present) to 4 (healthy and vigorous).

Introduction site	Mean vigor of surviving plants 2016	Mean vigor of surviving plants 2017	Mean vigor of surviving plants 2018	Mean vigor of surviving plants 2019	Mean vigor of surviving plants 2020	Mean vigor of surviving plants 2021
Dorena E	2.2	2.7	2.9	2.9	3.5	3.1
Dorena W	1.9	2	3.1	3.1	No survivors	No survivors