

Pioneer Butte restoration: 2024 annual report



April 2025

Report for U.S. Forest Service, Siuslaw National
Forest, Agreement #24-SA-11061200-595

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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: Tough-leaf iris (*Iris tenax*) abundance in unit 5. Photo by Zade Clark-Henry May 17, 2024.

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EXECUTIVE SUMMARY

In 2024, the Institute for Applied Ecology (IAE) and the U.S. Forest Service (USFS) continued restoration actions at Pioneer Butte, a meadow owned and managed by the USFS, Siuslaw National Forest. IAE performed a variety of restoration activities including herbicide and hand weeding treatments, broadcast seeding, and planting native bulbs. IAE treated non-native plants targeting bull thistle (*Cirsium vulgare*), oxeye daisy (*Leucanthemum vulgare*), foxglove (*Digitalis purpurea*), St. John's wort (*Hypericum perforatum*), Scotch broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus bifrons*), rattail fescue (*Vulpia myuros*), and hairy cat's ear (*Hypochaeris radicata*). In the fall, IAE broadcast a 23.35-pound native seed mix comprised of 52 species and planted 2,325 bulbs of five species in units 3, 5, 6, and 7. 2025 recommendations include manual and chemical treatment of invasive plants and seeding and planting a diverse suite of forb and graminoid species.

1. INTRODUCTION

Pioneer Butte is a mid-elevation meadow located at approximately 1,275 feet elevation in the Oregon Coast Range, west of Corvallis. It is part of the Siuslaw National Forest and managed by the U.S. Forest Service (USFS). The Institute for Applied Ecology (IAE) began conducting habitat restoration activities at Pioneer Butte in 2011, on the one-acre of remnant prairie present there at the time. Initial goals included managing non-native species, primarily false brome (*Brachypodium sylvaticum*), and collecting native mid-elevation seed from the site to put into production. In 2016, the USFS removed trees and expanded prairie habitat to 11.25 acres. IAE completed a draft revegetation plan for Pioneer Butte in 2018. The plan divided Pioneer Butte into seven units to allow for unit-specific treatments (Figure 1). Since the inception of the revegetation plan, the USFS and IAE have performed numerous herbicide applications targeting non-native forbs, shrubs and grasses, built slash piles to remove woody debris, sown native seed, and planted native bulbs.

This report summarizes 2024 restoration activities under Agreement #24-SA-11061200-595.

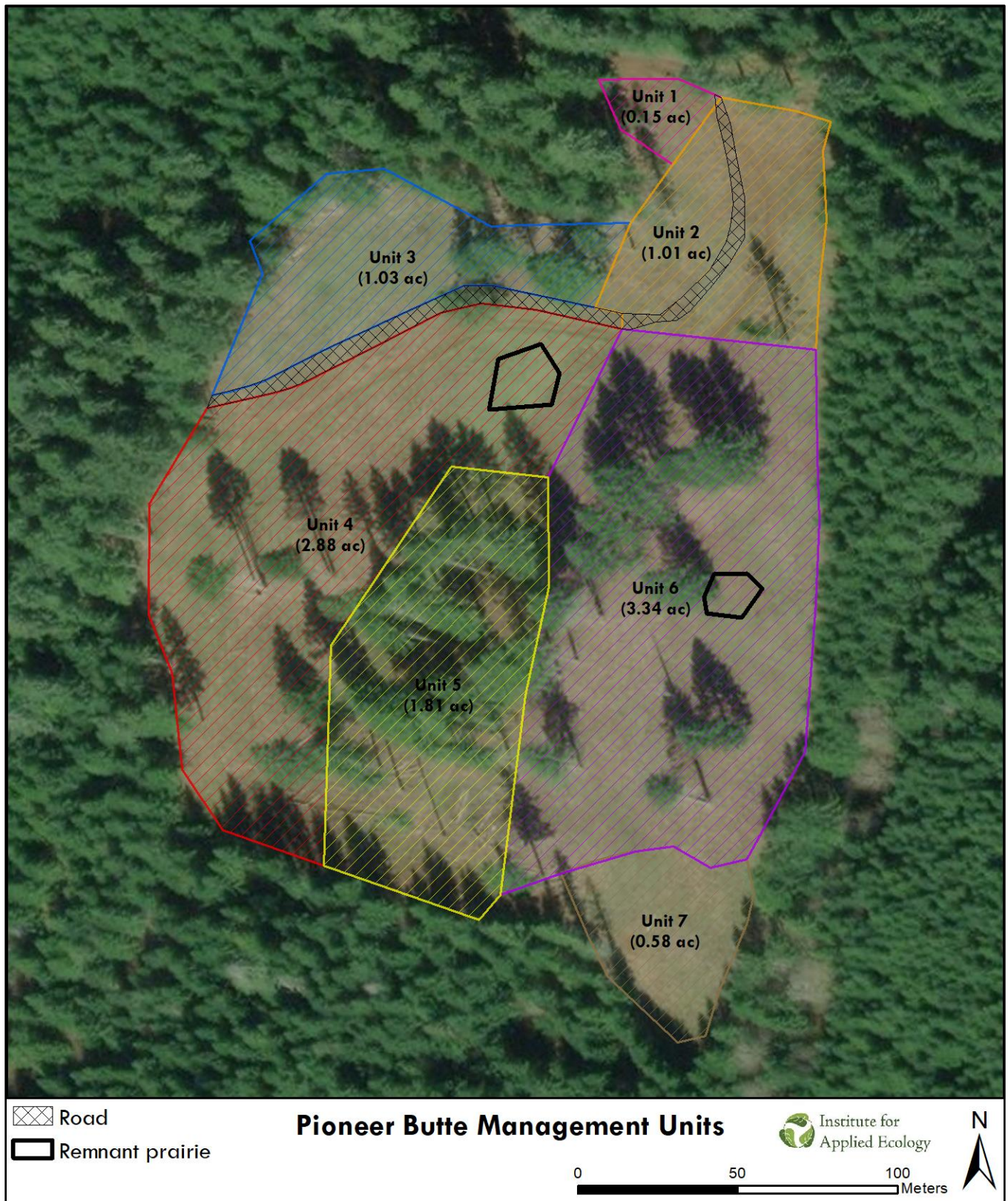


Figure 1. Pioneer Butte restoration units and remnant prairie areas.

2. GOALS AND OBJECTIVES

The goal of this project is to improve prairie habitat at Pioneer Butte. There are three primary objectives of this project:

1. Reduce the abundance of invasive shrubs, grasses, and forbs.
2. Remove conifer seedlings to reduce encroachment of the meadow.
3. Increase native plant abundance and diversity.
4. Enhance wildlife forage and shelter opportunities.

3. 2024 RESTORATION ACTIVITIES

In 2024, restoration activities at Pioneer Butte focused on treating invasive weeds, broadcasting native seed, and planting native bulbs. Restoration occurred in all units but emphasized units 6 and 7.

Invasive weed treatments

In 2024, IAE treated invasive species using chemical application and manual removal methods, targeting bull thistle (*Cirsium vulgare*), oxeye daisy (*Leucanthemum vulgare*), foxglove (*Digitalis purpurea*), St. John's wort (*Hypericum perforatum*), Scotch broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus bifrons*), rattail fescue (*Vulpia myuros*), and hairy cat's ear (*Hypochaeris radicata*, Table 1).

Table 1. 2024 management actions at Pioneer Butte.

Date	Location	Management Action
3-Apr	2, 6, 7	Manual weed removal targeting bull thistle (<i>Cirsium vulgare</i>), oxeye daisy (<i>Leucanthemum vulgare</i>), foxglove (<i>Digitalis purpurea</i>), and St. John's wort (<i>Hypericum perforatum</i>), Scotch broom (<i>Cytisus scoparius</i>), Himalayan blackberry (<i>Rubus bifrons</i>), rattail fescue (<i>Vulpia myuros</i>), and hairy cat's ear (<i>Hypochaeris radicata</i>).
12-Apr	All	Confirmed road access free of winter windfall trees. Weed assessment for spring treatments.
9-May	All	Manual weed removal targeting bull thistle, oxeye daisy, foxglove, and St. John's wort.
17-May	2, 3, 4, 6, 7	Applied triclopyr (Garlon 3A) targeting hairy cat's ear. Manual weed removal targeting bull thistle, oxeye daisy, foxglove, St. John's wort, and hairy cat's ear (<i>Hypochaeris radicata</i>).
31-May	2, 5, 6, 7	Manual weed removal targeting bull thistle, oxeye daisy, foxglove, St. John's wort, and hairy cat's ear.
1-Jul		
25-Jul		
9-Aug	All	Assessment of weed abundance for fall treatments and bare ground availability for fall seeding and planting.
10-Oct		
17-Oct	3, 6, 7	Broadcast part of a 23.35-pound native seed mix comprised of 52 species.
6-Nov	6, 7	Planted 2,325 bulbs including five species.
27-Nov	5, 6	Broadcast remainder of native seed mix.

Seeding and planting

In October and November, IAE staff and AmeriCorps NCCC broadcast 23.35 pounds of native seed mix to units 3, 5, 6, and 7 and planted 2,325 bulbs in units 6 and 7. Species were selected to increase diversity in bulb types, flower shape, and flowering time adding multiple species not previously used at Pioneer Butte. Twenty-two pounds of seed were purchased from Heritage Seedlings and Liners Inc. specialty mixes: Annual Color Mix (2 lb.), Diverse Prairie Mix (5 lb.), High Diversity Upland Flowers Mix (10 lb.), Tough and Tenacious Mix (5 lb.). The remaining 1.35 pounds of native seed were collected from coast range habitat and all bulbs were purchased from Scholls Valley Native Nursery.

Table 2. 2024 Pioneer Butte native seed mix.

Scientific Name	Common Name	Amount (lb.)	Bulbs (quantity)
<i>Achillea millefolium</i>	common yarrow	0.14	
<i>Allium amplexans</i>	narrow-leaf onion	0.27	600
<i>Amsinckia intermedia</i>	common fiddleneck	0.62	
<i>Barbarea orthoceras</i>	American yellowrocket	0.09	
<i>Camassia leichtlinii</i> var. <i>suksdorfii</i>	tall camas	1.18	900
<i>Carex tumulicola</i>	splitawn sedge	0.44	
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring	0.24	
<i>Clarkia purpurea</i> ssp. <i>quadrivulnera</i>	winecup clarkia	0.11	
<i>Clarkia rhomboidea</i>	diamond clarkia	0.22	
<i>Collinsia grandiflora</i>	large-flowered blue-eyed Mary	0.49	
<i>Collomia grandiflora</i>	large-flowered collomia	1.40	
<i>Dichelostemma congesta</i>	ookow		125
<i>Elymus glaucus</i>	blue wildrye	0.30	
<i>Elymus trachycaulus</i>	slender wheatgrass	0.24	
<i>Epilobium densiflorum</i>	denseflower willowherb	1.04	
<i>Eriophyllum lanatum</i>	woolly sunflower	0.29	
<i>Erythronium oregonum</i>	giant white fawn-lily	0.06	
<i>Festuca roemerii</i>	Roemer's fescue	0.30	
<i>Geum macrophyllum</i>	large-leaved avens	0.20	
<i>Gilia capitata</i>	bluehead gilia	0.17	
<i>Grindelia integrifolia</i>	Puget Sound gumweed	2.09	
<i>Heuchera chlorantha</i>	tall alumroot	0.01	
<i>Juncus tenuis</i>	slender rush	0.0033	
<i>Koeleria macrantha</i>	prairie Junegrass	0.05	
<i>Ligusticum apiifolium</i>	celery-leaved lovage	0.84	
<i>Lomatium dissectum</i>	fern-leaved biscuitroot	2.04	
<i>Lomatium nudicaule</i>	barestem biscuitroot	1.47	
<i>Lomatium utriculatum</i>	spring gold	0.42	
<i>Lotus purshianus</i>	bird's foot trefoil	0.22	

Scientific Name	Common Name	Amount (lb.)	Bulbs (quantity)
<i>Lupinus polycarpus</i>	small-flowered lupine	0.52	
<i>Luzula comosa</i>	Pacific woodrush	0.06	
<i>Madia elegans</i>	showy tarweed	0.71	
<i>Madia gracilis</i>	grassy tarweed	0.25	
<i>Microseris laciniata</i>	cutleaf silverpuffs	0.21	
<i>Phacelia nemoralis</i> var. <i>oregonensis</i>	shade phacelia	0.38	
<i>Perideridia oregana</i>	Oregon yampah		400
<i>Plagiobothrys figuratus</i>	fragrant popcornflower	0.09	
<i>Plectritis congesta</i>	shortspur seablush	0.13	
<i>Poa secunda</i>	pine bluegrass	0.10	
<i>Potentilla glandulosa</i>	sticky cinquefoil	0.11	
<i>Potentilla gracilis</i>	slender cinquefoil	0.22	
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	0.78	
<i>Ranunculus occidentalis</i>	western buttercup	0.47	
<i>Rumex salicifolius</i>	willow dock	0.59	
<i>Sanguisorba occidentalis</i>	western burnet	0.33	
<i>Sanicula bipinnatifida</i>	purple sanicle	1.11	
<i>Scrophularia californica</i>	California bee plant	0.03	
<i>Sidalcea campestris</i>	meadow checkermallow	0.72	
<i>Sidalcea malviflora</i> ssp. <i>virgata</i>	dwarf checkermallow	0.71	
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass	0.28	
<i>Solidago elongata</i>	Cascade Canada goldenrod	0.02	
<i>Symphyotrichum hallii</i>	Hall's aster	0.05	
<i>Triteleia hyacinthina</i>	hyacinth brodiaea		300
<i>Viola praemorsa</i>	prairie violet	0.26	
<i>Wyethia angustifolia</i>	narrowleaf mule ears	0.25	
Total:		23.35 lb.	2,325 bulbs

4. MANAGEMENT RECOMMENDATIONS

The overarching goal of this project is to restore regionally rare mid-elevation habitat at Pioneer Butte by controlling priority invasive species, managing conifer encroachment, and increasing native plant diversity.

The following recommended restoration actions are for 2025 and beyond.

- Invasive plant treatments:
 - Due to the abundance of native vegetation, manual and mowing treatment methods are preferable to chemical.
 - Oxeye daisy: Hand pull in spring before flowering. Once in full flower mow seed heads or pull and bag to remove seed if petals have fallen off the inflorescence. If pulling labor is not available, treat with glyphosate or triclopyr before flowering.
 - Foxglove and bull thistle: treat manually with shovels and hand pulling in spring and early summer. If pulling labor is not available and plants are still in rosettes, spot spray with glyphosate. If bull thistle flowers or foxglove seed pods have developed, cut and bag the inflorescence to reduce the seed bank.
 - Himalayan blackberry and Scotch broom: treat manually by pulling up roots and/or cutting them at ground level in the spring, or spot treat with triclopyr in the fall.
 - Rattail fescue: this annual grass is becoming more abundant throughout the meadow and without approval to apply clethodim (Select Max) herbicide, minimal treatment will be possible using glyphosate or mowing before seed development occurs.
- Revegetation and increasing diversity:
 - Plant bareroot shrubs with emphasis on fruit and nut bearing species, uncommon species, filling niche of flowering shape or flowering time, and providing climate adaptive range shift.
 - Unit 3 (eastern forested half), Unit 6 (under large conifers).
 - Suggested species are serviceberry (*Amelanchier alnifolia*), coyote brush (*Baccharis pilularis*), beaked hazelnut (*Corylus cornuta*), silk-tassel (*Garrya elliptica*), pacific crab apple (*Malus fusca*), osoberry (*Oemleria cerasiformis*), mock orange (*Philadelphus lewisii*), Oregon white oak (*Quercus garryana*), goose berry (*Ribes divaricatum*), red-flowering currant (*Ribes sanguineum*), bald hip rose (*Rosa gymnocarpa*), red elderberry (*Sambucus racemosa*), Pacific yew (*Taxus brevifolia*), and oval-leaf viburnum (*Viburnum ellipticum*).
 - Unit 7 (edges), Unit 4 (southern edge).
 - Additional suggested species are red-osier dogwood (*Cornus sericea*) and stink currant (*Ribes bracteosum*).
 - Protect native thistles when found and aid seed dispersal by hand scattering to new disturbed areas.
 - Plant bulbs, bareroot forbs, and broadcast seed to increase diversity.
 - In addition to increasing the abundance of the 64 species already used at Pioneer Butte (Appendix C), suggested additional species include: deltoid balsamroot (*Balsamorhiza deltoidei*), crown brodiaea (*Brodiaea coronaria*), harvest brodiaea (*Brodiaea elegans*), tufted hairgrass (*Deschampsia cespitosa*), Henderson's shooting star (*Dodecatheon hendersonii*), chocolate lily (*Fritillaria affinis*), Oregon geranium

(*Geranium oreganum*), meadow barley (*Hordeum brachyantherum*), tiger lily (*Lilium columbianum*), Canada goldenrod (*Solidago lepida*), meadow death-camas (*Toxicoscordion venenosum*), and beargrass (*Xerophyllum tenax*).

- Wildlife habitat:
 - Develop a strategy to encourage cavity nesting birds and bats: i.e., girdle trees at the meadow edge or install bird boxes.
 - Leave woody debris piles for insect, salamander, and rodent use. Treat weeds as necessary, but maintain trailing blackberry cover for wildlife forage.

APPENDIX A. PIONEER BUTTE MANAGEMENT ACTIONS (2011-2024)

Year	Season	Personnel*	Restoration Action
2011	Summer	IAE	Removed false brome (<i>Brachypodium sylvaticum</i>) inflorescences.
2012	Summer	IAE	Removed false brome inflorescences. Pulled conifer seedlings.
	Fall	IAE	Broadcast native seed mix where false brome was removed.
2013	Summer	IAE	Removed false brome inflorescences.
	Fall	IAE	Removed false brome inflorescences.
			Applied 2% glyphosate solution (R-11 surfactant) to false brome.
2014	Summer	USFS	Herbicide application targeting false brome.
		IAE	Removed false brome inflorescences.
			Collected 14.9g of California oatgrass (<i>Danthonia californica</i>).
			Collected seed from selfheal (<i>Prunella vulgaris</i>), toughleaf iris (<i>Iris tenax</i>), common yarrow (<i>Achillea millefolium</i>), <i>Clarkia</i> sp., woolly sunflower (<i>Eriophyllum lanatum</i>), and narrow-leaf mule ears (<i>Wyethia angustifolia</i>) for seed increase.
	Fall	IAE	Seed production beds for <i>Eriophyllum lanatum</i> , <i>Prunella vulgaris</i> , <i>Achillea millefolium</i> , <i>Clarkia purpurea</i> , and <i>Wyethia angustifolia</i> established at the FSL beds in Corvallis.
			Broadcast native prairie seed mix to lower portion of meadow.
2015	Spring	IAE	Removed Scotch broom (<i>Cytisus scoparius</i>) along road.
	Summer	USFS	Herbicide application targeting false brome, thistles (<i>Cirsium</i> sp.), foxglove (<i>Digitalis purpurea</i>), oxeye daisy (<i>Leucanthemum vulgare</i>), hairy cat's ear (<i>Hypochaeris radicata</i>), and tall oatgrass (<i>Arrhenatherum elatius</i>).
			Tree removal.
		IAE	Collected seed from FSL beds.
2016	Spring	USFS	Herbicide application targeting false brome, thistles, foxglove, oxeye daisy hair cat's ear, and tall oatgrass.
	Summer	USFS	Tree removal.
		IAE	Collected seed from FSL beds.
2017	Summer	USFS	Cut woodland and tansy ragwort with string trimmer.
	Fall	USFS	Herbicide application targeting all non-native species.
		IAE	Established photo monitoring points.

*Institute for Applied Ecology (IAE); U.S. Forest Service (USFS); Cutaway Inc. (Cutaway).

Year	Season	Personnel*	Restoration Action
2018	Spring	USFS	Herbicide application targeting all non-native species.
	Summer	IAE	Collected seed from FSL beds.
			Seed from non-native species manually removed.
		USFS	Herbicide application targeting all non-native species.
		Cutaway	Removed stumps from units 1 and 2.
2019	Winter	IAE	Sixty-five volunteers, organized by the Community Engagement and Leadership Program of Oregon State University (OSU), removed slash from the meadow (292.5 total hours).
	Spring	USFS	Herbicide application targeted non-native forbs and grasses.
		IAE	Four OSU student volunteers removed slash from the meadow (20 total hours).
			Thirty volunteers removed conifer saplings from summit meadows at Marys Peak (180 total hours used as match for Pioneer Butte. Both were part of Noble thin).
			Marked stumps with spray paint for contractor to grind.
		USFS	Herbicide application targeted non-native forbs and grasses.
	Summer	IAE	Removed flowering heads of tall oatgrass (<i>Arrhenatherum elatius</i>) to prevent seed production.
			Site visit to assess weed control and slash removal.
			Planned seed mix for fall broadcast to units 1, 2, 4, and 5.
		Cutaway	Contractor removed stumps with a stump grinder in units 2 and 6 and piled material in unit 2.
		IAE and USFS	Site visit by IAE and USFS staff to discuss restoration progress and plan for burning slash piles and other parts of the meadow.
	Fall	IAE and USFS	IAE and USFS staff hosted 26 OSU students organized by the Community Engagement and Learning Program to pile slash in the meadow (104 volunteer hours).
		IAE	Four OSU students piled slash in the meadow (21 volunteer hours).
			Broadcast native seed mixes to units 1, 2, 4, and 5.
			IAE staff and 12-person AmeriCorps Blue 5 crew piled slash in the meadow for two days.
2020	Winter	IAE	Site visit to assess weeds and seeding success.
		USFS	Spot sprayed non-native annual grasses with glyphosate.
	Spring	IAE	Site visit to assess weeds, seeding success, and take photo points.
		USFS	USFS contractor spot sprayed non-native plants with glyphosate throughout the meadow.
	Summer	IAE and USFS	Site visit with Matt Smith to discuss fall 2020 actions. Collected photo points.
		USFS	Spot herbicide application targeted non-native forbs and grasses with glyphosate in Units 2, 3, 6, and 7, clopyralid and triclopyr in units 1 and 2, and units 4 and 5 were hand weeded.
	Summer	IAE	Developed seed mix for fall broadcast to units 1, 2, 3, 4 and 5.
	Fall	IAE	Broadcast native seed mixes to units 1, 2, 3, 4, and 5.

*Institute for Applied Ecology (IAE); U.S. Forest Service (USFS); Cutaway Inc. (Cutaway).

Year	Season	Personnel*	Restoration Action
2021	Spring	IAE	Chemically treated oxeye daisy, Canada and bull thistle (<i>Cirsium arvense</i> and <i>C. vulgare</i>), foxglove), false brome, and Scotch broom with glyphosate herbicide in all units.
	Summer	IAE and USFS	Chemically treated Canada and bull thistle and non-native perennial grasses with glyphosate herbicide in unit 3.
2022	Spring	IAE	Checked previous seeding efficacy, weed treatment efficacy and new weed growth.
		USFS	Spot sprayed herbicide in all units.
	Summer	IAE	Assessed if units 3, 6, and 7 were ready for broadcast seeding in fall 2022.
	Fall	USFS	Broadcast native seed mix.
2024	Spring	IAE	Manual weed removal targeting bull thistle, oxeye daisy, foxglove, St. John's wort (<i>Hypericum perforatum</i>), and hairy cat's ear.
			Applied triclopyr (Garlon 3A) targeting hairy cat's ear.
	Summer	IAE	Manual weed removal targeting bull thistle, oxeye daisy, foxglove, St. John's wort, and hairy cat's ear.
	Fall	IAE	Broadcast 23.35 pounds of native seed including fifty-two species.
			Planted 2,325 bulbs including five species.

*Institute for Applied Ecology (IAE); U.S. Forest Service (USFS).

APPENDIX B. PHOTO MONITORING POINT LOCATIONS

Photo point	Longitude	Latitude
1	-123.47708	44.53845
2	-123.47652	44.53753
3	-123.47767	44.537
4	-123.47838	44.53768
5	-123.4779	44.53861

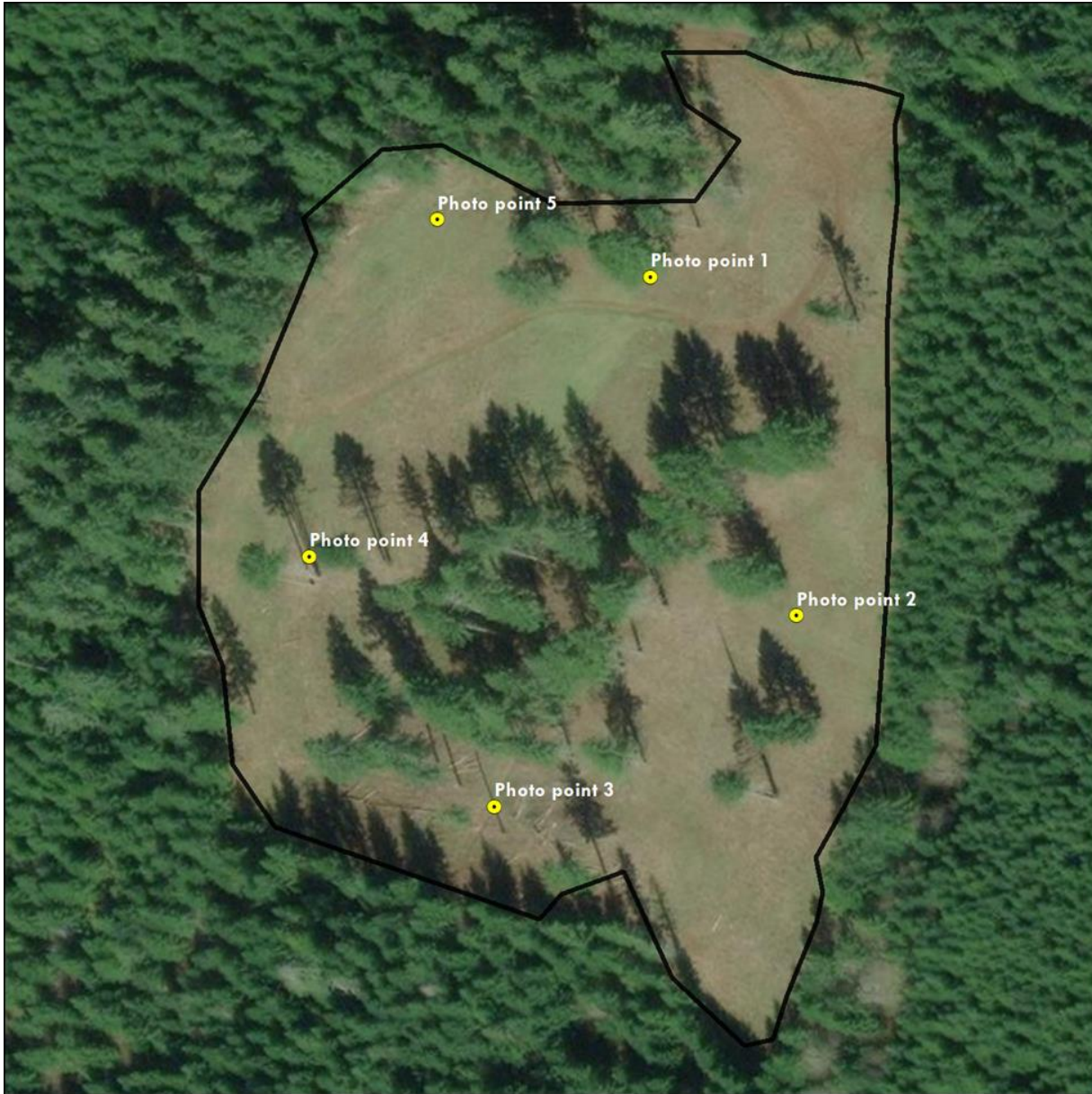


 Photo point locations
 Prairie boundary

Pioneer Butte Photo Points

 Institute for
Applied Ecology

0 50 100
 Meters



APPENDIX C. COMPREHENSIVE PLANTING AND SEEDING RECORD 2012-2024

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.								
		2012	2014	2015	2019	2020	2021	2022	2023	2024
<i>Achillea millefolium</i>	common yarrow	1.0	0.02	0.12	2.69	1.11	0.27	0.68	1.0	0.14
<i>Acmispon americanus</i>	American bird's-foot trefoil	1.0				0.85		1.36		
<i>Allium amplexans</i>	narrow leaved onion							2.12		0.27 {600}
<i>Amsinckia intermedia</i>	common fiddleneck									0.62
<i>Aquilegia formosa</i>	red columbine	0.1				0.98	0.57	1.76		
<i>Barbarea orthoceras</i>	American yellowrocket									0.09
<i>Bromus carinatus</i>	California brome				7.95	7.83		6.53		
<i>Calochortus tolmiei</i>	Tolmie's star-tulip							0.57		
<i>Camassia leichtlinii</i> var. <i>suksdorfii</i>	tall camas				0.58 {80}					1.18 {900}
<i>Carex pachystachya</i>	Chamisso sedge							0.43		
<i>Carex tumulicola</i>	splitawn sedge				0.73	2.29		1.21		0.44
<i>Clarkia amoena</i> ssp. <i>lindleyi</i>	farewell-to-spring	4.0	0.02		1.25	0.62	0.46	1.18		0.24
<i>Clarkia purpurea</i>	winecup clarkia			0.02	0.12	0.05				0.11
<i>Clarkia rhomboidea</i>	diamond clarkia									0.22
<i>Collinsia grandiflora</i>	large-flowered blue-eyed Mary					1.91	0.51	1.35		0.49
<i>Collomia grandiflora</i>	large-flowered collomia							2.68		1.40
<i>Danthonia californica</i>	California danthonia		0.18			0.56		2.80		
<i>Dichelostemma congestum</i>	ookow									{125}
<i>Elymus glaucus</i>	blue wildrye				3.92	5.4		2.27	1.0	0.3
<i>Elymus trachycaulus</i>	slender wheatgrass									0.24
<i>Epilobium densiflorum</i>	denseflower willowherb									1.04
<i>Eriophyllum lanatum</i>	Oregon sunshine	1.0	0.02	0.02	1.62	0.97	0.36	0.70		0.29
<i>Erythronium oregonum</i>	giant white fawn-lily									0.06
<i>Festuca roemerii</i>	Roemer's fescue		0.06		10.0	20.68	0.66	1.71		0.30

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.								
		2012	2014	2015	2019	2020	2021	2022	2023	2024
<i>Geum macrophyllum</i>	Oregon or large-leaved avens				1.26	1.58	0.5	1.14		0.20
<i>Gilia capitata</i>	globe gilia	0.38	0.02		1.07	1.03	0.47	0.96		0.17
<i>Grindelia integrifolia</i>	Puget Sound gumweed									2.09
<i>Heuchera chlorantha</i>	tall alumroot									0.01
<i>Iris tenax</i>	toughleaf iris	0.5	0.48				0.4	3.93	2.0	
<i>Juncus tenuis</i>	slender rush									0.0033
<i>Koeleria macrantha</i>	prairie Junegrass									0.05
<i>Ligusticum apiifolium</i>	celery-leaved lovage									0.84
<i>Lomatium dissectum</i>	fern-leaved biscuitroot									2.04
<i>Lomatium nudicaule</i>	barestem biscuitroot	5.85								1.47
<i>Lomatium utriculatum</i>	spring gold						1.19	2.96		0.42
<i>Lotus purshianus</i>	bird's foot trefoil									0.22
<i>Lupinus bicolor</i>	bi-colored lupine	1.0								
<i>Lupinus polycarpus</i>	small-flowered lupine						2.41	8.41		0.52
<i>Luzula comosa</i>	Pacific woodrush				1.01					0.06
<i>Madia elegans</i>	showy tarweed		0.12			1.92	1.99	3.83		0.71
<i>Madia gracilis</i>	grassy tarweed									0.25
<i>Microseris laciniata</i>	cutleaf silverpuffs									0.21
<i>Perideridia gairdneri</i>	Gardner's yampah									{400}
<i>Phacelia nemoralis</i> var. <i>oregonensis</i>	Oregon woods phacelia									0.38
<i>Plagiobothrys figuratus</i>	fragrant popcornflower									0.09
<i>Plectritis congesta</i>	shortspur seablush				1.39	0.45	0.29	0.66		0.13
<i>Poa secunda</i>	pine bluegrass									0.10
<i>Potentilla glandulosa</i>	sticky cinquefoil				0.63	0.81	0.17	0.60		0.11
<i>Potentilla gracilis</i>	slender cinquefoil				1.21	0.65	0.27	0.62		0.22
<i>Prunella vulgaris</i> var. <i>lanceolata</i>	common selfheal	1.0	0.06	0.06		2.08	1.49	1.51		0.78
<i>Ranunculus occidentalis</i>	western buttercup					1.43	1.18	2.06		0.47
<i>Ranunculus uncinatus</i>	disappointing buttercup				1.83					
<i>Rumex salicifolius</i>	willow dock									0.59

Scientific name	Common name	Amount seed (lb.) and number of plugs or shrubs {quantity}.								
		2012	2014	2015	2019	2020	2021	2022	2023	2024
<i>Sanguisorba occidentalis</i>	western burnet									0.33
<i>Sanicula bipinnatifida</i>	purple sanicle									1.11
<i>Scrophularia californica</i>	California bee plant									0.03
<i>Sidalcea campestris</i>	meadow checkermallow									0.72
<i>Sidalcea malviflora</i> spp. <i>virgata</i>	rose checkermallow	0.2	0.18		6.46	1.25	0.88	3.09		0.71
<i>Sisyrinchium idahoense</i>	Idaho blue-eyed grass									0.28
<i>Solidago elongata</i>	Cascade Canada goldenrod									0.02
<i>Symphyotrichum hallii</i>	Hall's aster									0.05
<i>Triteleia hyacinthina</i>	hyacinth brodiaea									{300}
<i>Viola praemorsa</i>	prairie violet									0.26
<i>Wyethia angustifolia</i>	narrowleaf mule's ear							4.29		0.25
	Totals:	16.03 lb.	1.16 lb.	0.22 lb.	43.72 lb. 80 bulbs	54.46 lb.	14.06 lb.	59.41 lb.	4 lb.	23.35 lb. 2,325 bulbs
	Number of species:	11	10	4	17	21	18	28	3	55
Seed sources include Marys Peak, Pioneer Butte, Twin Prairie, and the Willamette Valley (2014 and 2016 annual reports).										