Pioneer Butte Restoration: 2021 Annual Report

01/18/2022

Report for the U.S. Forest Service, Siuslaw National Forest, Agreement #17-SA-11061200-016

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Institute for Applied Ecology

Institute for Applied Ecology

PREFACE

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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Cover photograph: Looking north across Unit 4 and 3 at Pioneer Butte on April 5, 2021. Photo by Rolando Beorchia

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1. EXECUTIVE SUMMARY

In 2021, the Institute for Applied Ecology (IAE) continued restoration actions at Pioneer Butte, a meadow owned and managed by the U.S. Forest Service (USFS), Siuslaw National Forest. Primary management actions were weed abatement. USFS and IAE staff applied herbicides to non-native species throughout the prairie. A native seed mix for Unit 3 was developed and purchased, but broadcasting this mix was postponed to allow for further weed treatment and ground preparation.

2. INTRODUCTION

The Institute for Applied Ecology (IAE) was funded by the U.S. Forest Service (USFS), Siuslaw National Forest to conduct habitat restoration at Pioneer Butte under Agreement #17-SA-11061200-016. This report summarizes 2021 restoration activities.

Pioneer Butte is a mid-elevation (1,285 feet) prairie located in the Oregon Coast Range, west of Corvallis. It is part of the Siuslaw National Forest and managed by USFS. IAE began conducting habitat restoration activities on a one-acre remnant prairie in 2011, with initial goals of managing non-native species, primarily false brome (*Brachypodium sylvaticum*) and collecting native mid-elevation prairie seed from the site to put into production. In 2016, 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 species, built slash piles to remove woody debris and sown native seed in Units 1, 2, 4 and 5.

Pioneer Butte 2021 project goals included:

- Treat invasive weeds with spot spray herbicide applications (USFS and IAE); and
- Purchase and sow native seed in Unit 3.

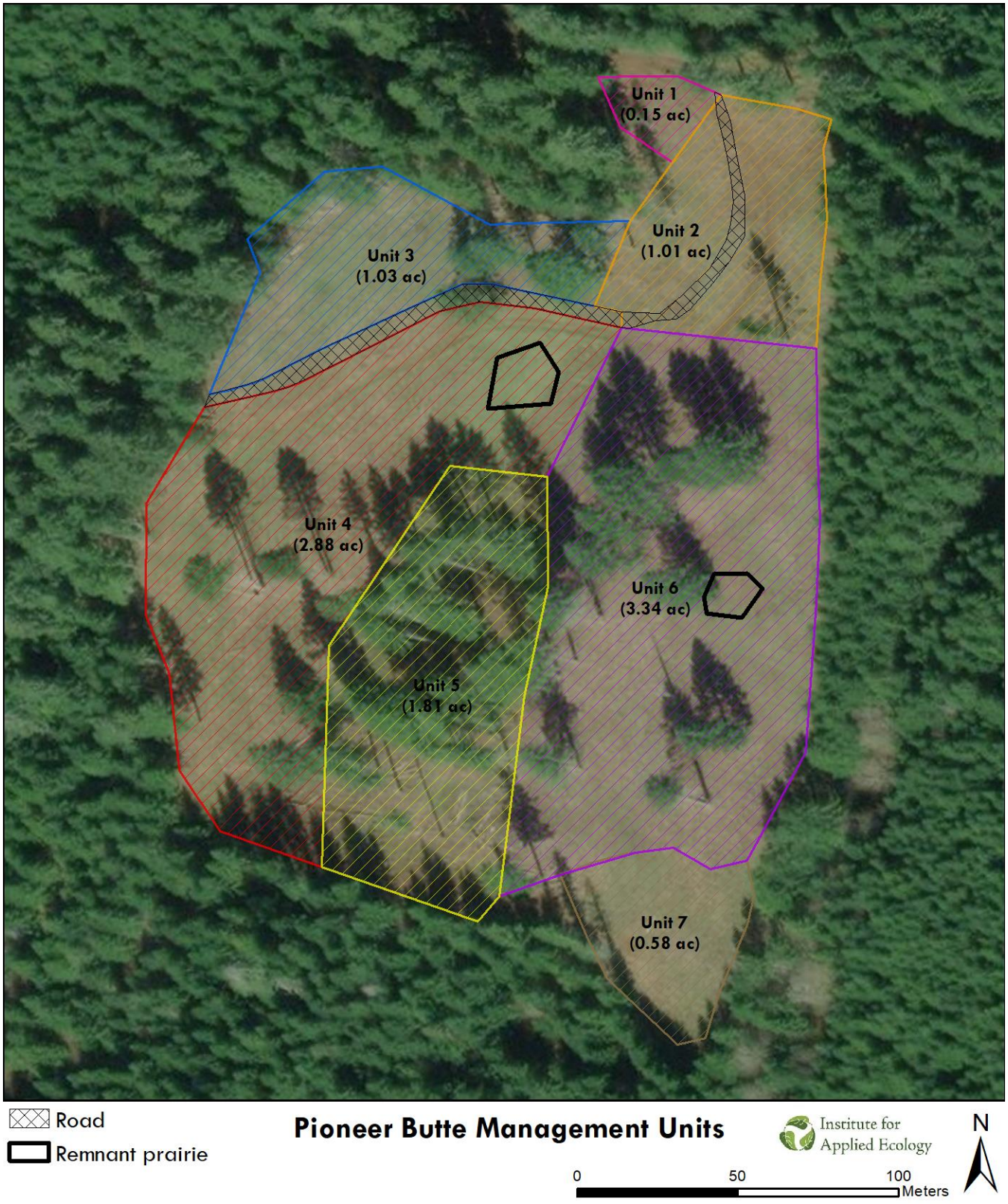


Figure 1. Pioneer Butte restoration units and remnant prairies.

3. RESTORATION ACTIONS

Restoration actions in 2021 at Pioneer Butte were completed by IAE and USFS staff. Actions are summarized in Table 1, with previous work at Pioneer Butte provided in Appendix A.

Table 1. 2021 restoration actions completed at Pioneer Butte

Date	Location	Action	Personnel*
April 5	All Units	Chemically treated oxeye daisy (*Leucanthemum vulgare*), Canada and bull thistle (*Cirsium arvense* and *C. vulgare*), foxglove (*Digitalis purpurea*), false brome (*Brachypodium sylvaticum*) and Scotch broom (*Cytisus scoparius*) with glyphosate.	IAE
July 1	Unit 3	Chemically treated Canada and bull thistle and non-native perennial grasses with glyphosate.	IAE and USFS

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

Weed control

Herbicide applications at Pioneer Butte were completed by USFS and IAE staff in 2021 to manage non-native plants throughout the meadow. Herbicide treatments were applied with backpack sprayers or from a wand attached to a UTV. Species targeted include non-native grasses, oxeye daisy (*Leucanthemum vulgare*), Canada and bull thistle (*Cirsium arvense* and *C. vulgare*), foxglove (*Digitalis purpurea*), false brome and Scotch broom (*Cytisus scoparius*).

Seeding

A native seed mix was developed for Unit 3 with guidance from the draft Pioneer Butte Revegetation Plan (Esterson, 2018) and seed was purchased from commercial nurseries. The mix was not broadcast this year due to the abundance of weeds in Unit 3 and the lack of success of previous seeding. The unit will be treated with herbicide in 2022 and we expect to sow seed in fall 2022. We expect the area will be ready for native seeding in fall 2022.

4. 2022 MANAGEMENT RECOMMENDATIONS

The following management actions are recommended for Pioneer Butte in 2022:

- Continue herbicide applications to manage non-native species;
- Begin mowing treatments on biennial cycle for managing non-native species;
- Take photo points in mid-June (Appendix B);
- Broadcast forb mix in Unit 2;
- Broadcast seed mix (Appendix C) in Unit 3;
- Order native seed for Units 6 and 7;
- Burn slash piles (USFS); and
- Support the USFS in drafting a burn plan to periodically burn the meadow.

5. REFERENCES

Esterson, A. 2018. Noble Thin Meadow Restoration Project: Pioneer Butte revegetation plan. Unpublished report for the U.S. Forest Service, Siuslaw National Forest. Institute for Applied Ecology, Corvallis, OR.

APPENDICES

Appendix A. Pioneer Butte management actions (2011-2021)

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

*Institute for Applied Ecology (IAE); U.S. Forest Service (USFS); Cutaway Inc. (Contractor); Trout Mountain Forestry contractor (TMF Contractor).

Year	Season	Personnel*	Action
2018	Spring	USFS	Herbicide application targeting all non-native species.
2018	Summer	IAE	Collected seed from FSL beds.
2018	Summer	Contractor	Stumps removed on units 1 and 2.
2018	Summer	USFS	Herbicide application targeting all non-native species.
2018	Summer	IAE	Seed from non-native species manually removed.
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).
2019	Spring	USFS	Herbicide application targeting non-native forbs and grasses.
2019	Spring	IAE	Four OSU student volunteers removed slash from the meadow (20 total hours).
2019	Spring	IAE	Thirty volunteers worked to remove conifer saplings from summit meadows at Marys Peak (180 total hours).
2019	Spring	IAE	Stumps were marked with spray paint for contractor to grind stumps.
2019	Summer	USFS	Herbicide application targeting non-native forbs and grasses.
2019	Summer	IAE	Removed flowering heads of tall oatgrass (*Arrhenatherum elatius*) to prevent seed production.
2019	Summer	IAE	Site visit to assess weed control and slash removal.
2019	Summer	IAE	Planned seed mix for fall broadcast to units 1, 2, 4, and 5.
2019	Summer	Contractor	Contractor removed stumps with a stump grinder in units 2 and 6 and piled material in unit 2.
2019	Summer	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.
2019	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).
2019	Fall	IAE	Four OSU student piled slash in the meadow (21 volunteer hours).
2019	Fall	IAE	Broadcast native seed mixes to units 1,2, 4, and 5.
2019	Fall	IAE	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.
2020	Winter	USFS	USFS spot sprayed non-native annual grasses with glyphosate.
2020	Spring	IAE	Site visit to assess weeds, seeding success, and take photo points.
2020	Spring	USFS	USFS contractor spot sprayed non-native plants with glyphosate throughout the meadow.

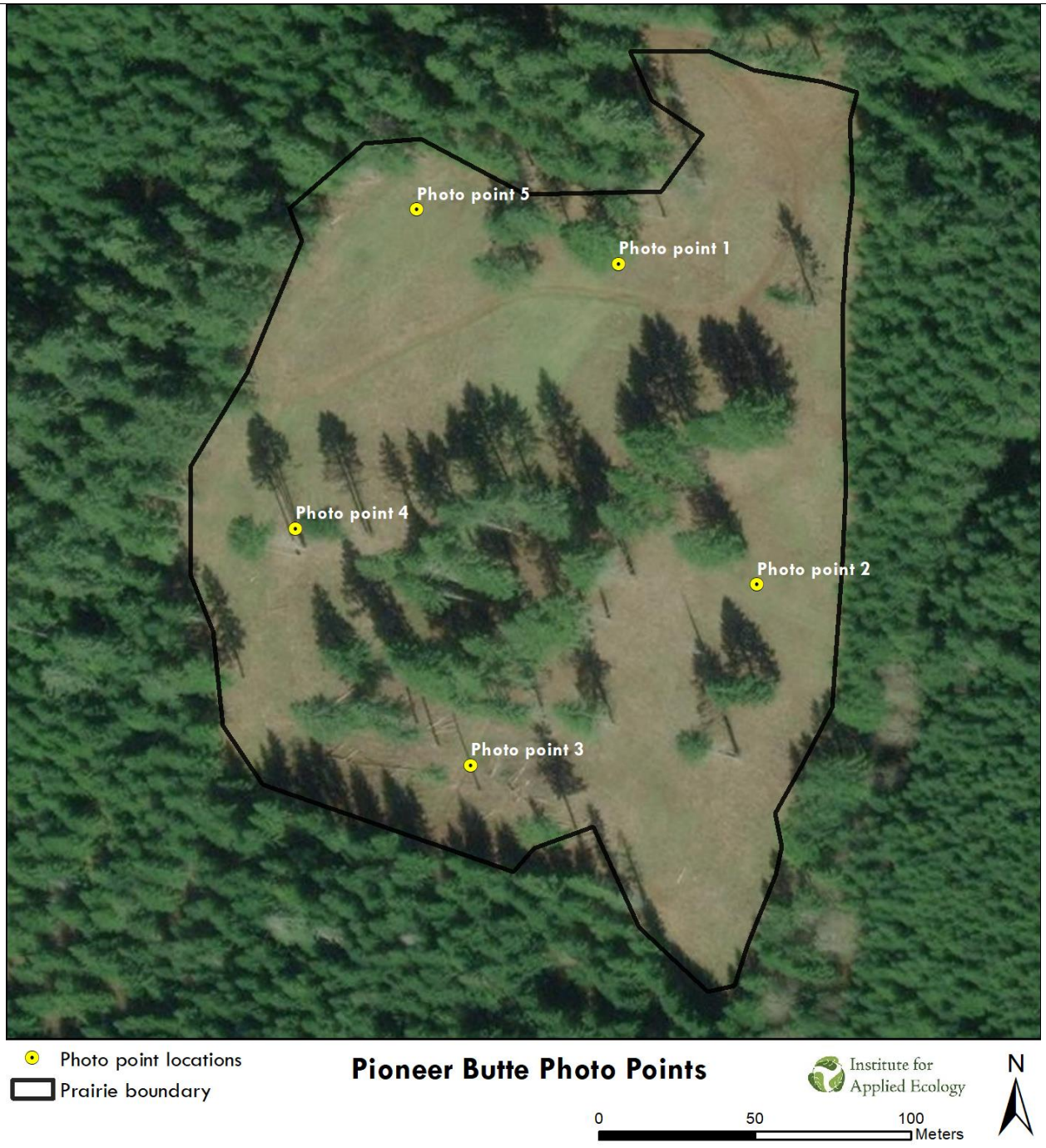
*Institute for Applied Ecology (IAE); U.S. Forest Service (USFS); Cutaway Inc. (Contractor); Trout Mountain Forestry contractor (TMF Contractor).

Year	Season	Personnel*	Action
2020	Summer	IAE and USFS	Site visit with Matt Smith to discuss fall 2020 actions. Collected photo points.
2020	Summer	USFS	Spot herbicide application targeting non-native forbs and grasses in units 2, 3, 6, and 7 with glyphosate. Units 1 and 2 were spot treated with clopyralid and triclopyr. Units 4 and 5 were weeded by hand.
2020	Summer	IAE	Develop seed mix for fall broadcast to units 1, 2, 3, 4 and 5.
2020	Fall	IAE	Broadcast native seed mixes to units 1, 2, 3, 4, and 5.
2021	Spring	IAE	Chemically treated oxeye daisy (*Leucanthemum vulgare*), Canada and bull thistle (*Cirsium arvense* and C. *vulgare*), foxglove (*Digitalis purpurea*), false brome (*Brachypodium sylvaticum*), and Scotch broom (*Cytisus scoparius*) with glyphosate herbicide in all units.
2021	Summer	IAE and USFS	Chemically treated Canada and bull thistle (*Cirsium arvense* and C. *vulgare*) and non-native perennial grasses with glyphosate herbicide in unit three.

*Institute for Applied Ecology (IAE); U.S. Forest Service (USFS); Cutaway Inc. (Contractor); Trout Mountain Forestry contractor (TMF Contractor).

Appendix B. Photo point coordinates

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



Appendix C. Unit 3 seed mix

Species	Common name	Amount purchased (lbs)
Achillea millefolium	common yarrow	0.27
Aquilegia formosa	red columbine	0.57
Clarkia amoena ssp. lindleyi	farewell-to-spring	0.46
Collinsia grandiflora	large-flowered blue-eyed Mary	0.51
Eriophyllum lanatum	woolly sunflower	0.36
Festuca roemeri	Roemer's fescue	0.66
Geum macrophyllum	large-leaved avens	0.50
Gilia capitata	bluehead gilia	0.47
Iris tenax	toughleaf iris	0.40
Lomatium utriculatum	spring gold	1.19
Lupinus polycarpus	small-flowered lupine	2.41
Madia elegans	showy tarweed	1.99
Plectritis congesta	shortspur seablush	0.29
Potentilla glandulosa	sticky cinquefoil	0.17
Potentilla gracilis	slender cinquefoil	0.27
Prunella vulgaris var. lanceolata	common selfheal	1.49
Ranunculus occidentalis	western buttercup	1.18
Sidalcea malviflora ssp. virgata	dwarf checkermallow	0.88
	Total	**14.06 lbs**