



Oak woodland understory seeding, Yamhill County, Oregon

Field Planting Case Study Report

October 2018

Objective: Wildlife habitat

County: Yamhill, OR

Average Annual Precipitation: 45 inches

MLRA: 2 – Willamette & Puget Sound Valleys

Dominant Soil Type: Jory silty clay loam

Slope: 20-30 %

Aspect: west

Elevation: 500 ft

Site Preparation: mechanically thinned and sprayed

Seedbed Condition: soil not prepped for seeding- bare ground.

Seeding Date: February 21, 2014

Seeding Rate: 17 PLS lb/ac

Seed Cost: donated by PMC

Seeding Method: broadcast with belly grinder

Acres Seeded or Plot Design: 5 acres, with 3 (30 by 60-ft) unseeded control plots and 5 (50 by 50-ft) sprayed plots

Previous Site History: dense stand of Douglas firs, oaks, blackberry, poison oak, and other shrubs

Fertilizer: none

Irrigation: none

Grazing: none

Monitoring Date: June 20, 2018



Figure 1. Corvallis PMC staff member, Amy Bartow, uses a belly grinder seeder to plant native herbaceous cover in a recently thinned oak woodland. Tarps catch some of the seed, creating unseeded areas to act as “control” plots.

Introduction

In early 2014, the Corvallis, Oregon Plant Material Center’s (PMC) assistance was requested for an experimental seeding following brush management and oak release for a EQIP project in Yamhill Co., Oregon. The thinning was done with EQIP funding through Yamhill County’s Wildland Urban Interface Conservation Implementation Strategy with the goals of fuels reduction and forest health. An additional benefit of this project will be to provide nectar and pollen food sources for insects. Insects provide high protein food for adult birds while rearing young in nearby nests in oak savannas and oak woodlands. Insects also provide food necessary to improve body condition for birds preparing to migrate in the fall.

After a year of brush management (consisting of three mechanical treatments and limited spot spraying), we visited the site in January of 2014. There was some bare ground in treated areas, but it also had a carpet of newly germinated shining geranium (*Geranium lucidum*) seedlings in some places. We felt it was important to seed the site while there was still bare ground

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available to create a native herbaceous layer under the remaining oak trees rather than let it become a patch of shining geranium.

Shining geranium is a non-native annual weed that tends to establish quickly, utilizing the abundance of early spring moisture, then dominating a site by out-competing many other early season wildflowers and seedlings of perennial native plants. As soils dry, few other plants can establish through the mats of geranium biomass. When shining geranium seed capsules are dry, they burst open, forcefully ejecting seeds in all directions, including upwind or up steep terrain, allowing infestations to penetrate otherwise undisturbed natural areas. It is also believed that this species can produce multiple generations per year when moisture conditions are favorable (ODA). This species can be difficult to control with herbicides and we weren't sure if the seeds we put down would be able to outcompete it.

The purpose of this field planting was to demonstrate the importance of seeding herbaceous cover following intensive thinning or brush management. Seeding at this crucial time (when there is bare ground and very few weeds) can create a native herbaceous layer with little effort. We created a mix of native seed that we hoped would establish quickly and thrive in the moderately shady conditions (Table 1). Two weeks before seeding, five 50 by 50-ft plots were sprayed with glyphosate to kill the geranium and other fall-germinated weeds. Just before seeding, three 30 by 60-ft tarps were spread out and placed randomly in the non-sprayed treatment area to create "control" plots. The tarps effectively blocked the seed from hitting the ground. The seed mix was applied over 5 acres using a belly-grinder spreader at approximately 17 pounds per acre on February 21, 2014. After the site was seeded, tarps were carefully picked up and the seed was collected from them.

Table 1. Species composition of a five-acre oak understory seeding in Yamhill Co, Oregon seeded on February 22, 2014.

Common name	Species	Total PLS lbs used	seeds /lb	Percent of mix	Seeds /ft ²
Blue wildrye	<i>Elymus glaucus</i>	8.00	120,000	28.7	22.0
Riverbank lupine	<i>Lupinus rivularis</i>	4.00	30,000	3.6	2.7
Great camas	<i>Camasia leichlinii</i>	2.38	80,000	5.7	4.4
Roemer's fescue	<i>Festuca roemeri</i>	0.64	450,000	8.6	6.6
Slender wheatgrass	<i>Elymus trachycaulus</i>	0.72	145,000	3.1	2.4
Sea blush	<i>Plectritis congesta</i>	0.60	1,300,000	23.3	17.9
Oregon sunshine	<i>Eriophyllum lanatum</i>	0.50	1,200,000	17.9	13.8
Western buttercup	<i>Ranunculus occidentalis</i>	0.04	200,000	0.2	0.2
Farewell to spring	<i>Clarkia amoena</i>	0.07	900,000	1.9	1.4
Lanceleaf selfheal	<i>Prunella vulgaris</i> var <i>lan.</i>	0.05	400,000	1.0	0.7
Oregon iris	<i>Iris tenax</i>	0.09	46,000	0.1	0.1
Slender cinquefoil	<i>Potentilla gracilis</i>	0.09	1,200,000	3.2	2.5
Meadow checkermallow	<i>Sidalcea campestris</i>	0.08	100,000	0.2	0.2
Hall's aster	<i>Symphotrichum hallii</i>	0.05	1,600,000	2.4	1.8
		17.2			77

Results



Figure 2. Native seeding successfully outcompeted shining geranium. The lighter green rectangle is the area that was covered by a tarp and not seeded with natives. It has a dense cover of shining geranium. The darker green surrounding area was seeded 15 months earlier and was heavily dominated by blue wildrye and other native species. May 2015.

native cover, which was mostly comprised of blue wildrye and riverbank lupine. These two native species generally grow quickly even in their first growing season, which probably helped them suppress the geranium. The “control” unseeded areas were a nearly solid stand of geranium. The plots that had been sprayed with glyphosate prior to seeding were identical to the unsprayed areas, suggesting that spraying geranium in early spring was not very effective and probably not worth the cost. Shrubs such as poison oak, snowberry and blackberry were growing back quickly, and we worried that the site would return to a dense shrub understory if left unmanaged.

We visited the site again in June 2018 (4.5 years after

We returned to the field planting in the spring of 2015 (15 months after seeding). The results were stunning. Not only did the seeding establish very well, but the native cover dominated the shining geranium. Small, scattered geranium plants existed among the



Figure 3. Four years after seeding, the blue wildrye (Elymus glaucus) was a major component of the shadier areas of the oak woodland. June 2018.



Figure 4. Riverbank lupine (Lupinus rivularis) thrived in the sunniest areas of the oak savanna and dominated this hillside at 15 months after seeding (May 21, 2015).



Figure 5. Even four years after seeding, the riverbank lupine (Lupinus rivularis) remained a dominant species in the seeded area. June 21, 2018.

seeding) and expected to see a shrub-dominated understory. We were pleasantly surprised to find an open oak woodland with an almost entirely native herbaceous understory. The landowner manages the shrub component by brush-hogging the site every other fall and spot spraying blackberries. The herbaceous cover was very similar to what it looked like three years earlier, mostly consisting of blue wildrye and riverbank lupine with scattered selfheal, checkermallow, and Oregon sunshine. The landowners were very pleased with the lupine. They loved the massive floral display that occurred in spring, turning the hillside purple. Most importantly, the unseeded areas had remained perfect rectangles of shining geranium.

Summary and Discussion

This site demonstrated the importance of early understory seeding following brush removal in an oak woodland for

establishing a native herbaceous plant community before the weeds had a chance to become established. Unseeded areas remained a solid cover of weeds even after four seasons of native seed rain around the edges of the plots, while seeded areas maintained a dominant cover of native herbaceous species. The seeding was unusually successful considering that the soil was not prepped, there was a thick layer of leaf litter in some areas, and it was seeded in late February (rather than fall, which is the ideal seeding time for most natives).

A diverse native seed mix such as the one used in this trial can be very expensive or difficult to find on the commercial market. However, since just two species dominated the planting, landowners or restorationists on a tight budget might achieve similar results with a much simpler seeding. If this 5-acre site had only been seeded with blue wildrye and riverbank lupine at similar rates, the total cost would have been around \$1180. This simple understory could later be augmented by planting plugs, and/or spraying out patches and re-seeding with a more diverse native mix.

References:

<https://www.oregon.gov/ODA/shared/Documents/Publications/Weeds/ShinyGeraniumProfile.pdf>

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