

California - Smoke Creek

Project Title: Restoration of Sage Grouse Habitat with Natives in Cheatgrass and Medusahead-Infested Sites at Smoke Creek



Location: Lassen County, California - Near Susanville and Alturas, California

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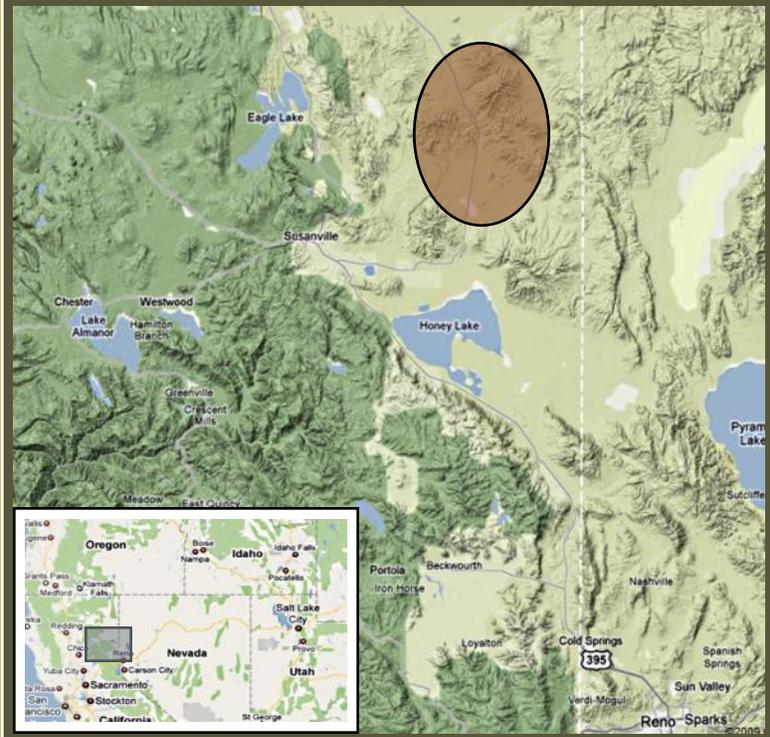
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Smoke Creek Watershed Locator Map



Brief Area History:

The Smoke Creek watershed sits within the Big Valley area, located in the Northeast corner of California. Livestock and forage crop production are the prominent land uses. Both sites are rangeland that has become infested with medusahead. Sites have been seasonally grazed for several years. Downy brome and medusahead are the most problematic invasive annual grasses in rangelands of the western United States. In California, medusahead is the

most widespread invasive annual grass for ranchers and land management agencies.

Geographical Information:

Elevation: 4,200 feet (approx.)
Annual Precipitation: 12-14 inches
Common Native Vegetation: big sagebrush, low sagebrush, rabbitbrush, bunchgrasses (squirreltail, bluebunch wheatgrass, creeping wildrye, California brome), various forbs
Common Soil Types: Cobbly loam



View of the Plateau treatment sites in the sagebrush community. The Sagebrush area in the foreground has dramatically lower cover of medusahead (less green) compared to untreated background sagebrush.

Objectives:

First, to demonstrate the effectiveness of Plateau on the large scale control of downy brome and medusahead, and to determine its utility in sage grouse habitat restoration of desirable native species without the need for expensive re-seeding efforts. Second, we considered alternative methods of control with and without re-seeding efforts, and evaluated the best seeding method when active restoration practices are necessary. The small plots studies are critical to EBIPM efforts in that they allow us to use adaptive management practices to best achieve our long-term objectives. We expect that several methods will be shown to be successful in selecting for desirable species and improving the habitat for sage grouse.

Accomplishments:

Large-Scale Study: three sites in northeast California were treated with plateau at 6 oz/acre in fall 2008 and have been grazed by landowners using their normal practices. In the season after applications, Plateau gave better than 90% control of medusahead and cheatgrass, without harming the sagebrush or many other species within the community.

Small-Scale Study: We evaluated the effect of three fall-applied, and one spring-applied, herbicides or combinations on the control of medusahead and cheatgrass in two 5-acre sagebrush communities in northeastern California. The treatments were compared to untreated control plots. Each plot was 30 x 30 m. The backpack herbicides treatments included Plateau (imazapic) at 6 oz/acre, Matrix (rimsulfuron) at 4 oz/acre, Landmark (sulfometuron + chlorsulfuron) at 0.75 oz/acre, and Roundup (glyphosate) at 1 lb/acre. All treatments were made in September to early November, 2008, except Roundup (mid-April 2009) and plots were evaluated in June 2009. Plant species cover was estimated using point-intercept transects, and biomass samples were taken for each plot. Landmark provided 100% control of the two invasive annual grasses at both sites, but also damaged resident perennial grasses and caused some injury to sagebrush. In contrast, Matrix gave 100% control of downy brome and an average of 96% control of medusahead without damaging perennial grasses or sagebrush. Plateau and Roundup were inconsistent, providing between 29% and 100% control of the two grasses, depending on the site. From these results, we feel that Matrix is a very effective tool for invasive annual grass control without damaging desirable perennial grasses or sagebrush. For this reason, we used Matrix in the large plots in the second year of treatment.



Sagebrush with heavy infestation of medusahead between shrubs captures more soil moisture and nutrients and also impacts the available habitat for sage grouse.



Sagebrush with little invasive annual grass infestation between plants allows better capture of resources by desirable species.

Progress: **Large-Scale Study:** In fall of 2009, the site was aerially sprayed with 4 oz/acre Matrix (rimsulfuron), as small plot studies show that this herbicide is more consistent in its control of these invasive annual grasses. These sites will be re-evaluated in early summer of 2010.

Small-Scale Study: In the second year of the study, we seeded desirable perennial grasses into the plots using two seed mixes and three seeding techniques. The two seeding treatments included broadcast seeding without incorporation. This simulates an aerial seeding treatment. A second seeding technique was a surface broadcast with churning to incorporate seeds into the soil. This method simulates a one-pass churning that is commonly used by BLM range managers. The two seed mixes included native grasses, sagebrush, and forbs, as well as crested wheatgrass, sagebrush, and forbs. Perennial grasses made up at least 50% of the seed mix. Both were chosen by local researchers and land management agencies and were designed to meet forage and wildlife needs in the areas. The seeds were planted in fall 2009 and establishment will be monitored over the next two years.

Outcomes: The state-and-transition models developed for the Smoke Creek area are very similar to that of the Jordan Valley watershed. It can be described in five general states, including (a) shrub over story with perennial herbaceous under story, (b) invasive annual grass with a large component of desirable perennial herbaceous and shrub species, (c) invasive annual grass fire cycle state, (d) seeded non-native perennial herbaceous state, and (e) seeded native perennial herbaceous state. Like the Jordan Valley, our goal is to demonstrate the use of Plateau to stimulate the transition from state "b" to state "a". We expect both cheatgrass and medusahead will be suppressed by the herbicide application while native species will be improved with reduction in competition. In fact, this was observed in the Plateau and Matrix plots in the small plot study after the first treatment. The transition to a native dominated community, particularly sagebrush, will also have a positive effect on the establishment of sage grouse habitat and the hydrology of the site.



Rangeland near Adin, California, with aerial application on the right and untreated area with visible green medusahead infestation on the left.