

## Introduction

# Wildlife Habitat Improvement Using Range Improvement Practices

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Wildfires in the Intermountain West are an annual event. The introduction and invasion of cheatgrass (*Bromus tectorum*) onto millions of hectares of rangelands has resulted in devastating wildfires. With each passing wildfire season, more and more critical wildlife habitats are consumed and converted to annual grass dominance (**Figure 1**).



**Figure 1.** Formerly big sagebrush/bunchgrass habitat and critical wildlife habitat converted to cheatgrass dominance following re-occurring wildfires.

### Suppression (resistance) and Fuels Reduction (resilience)

Shrubs are critical for wildlife species and can not recruit or persist in habitats dominated by cheatgrass. The best known method at suppressing cheatgrass, and its' associated fuels, is through the establishment of long-lived perennial grasses (**Figure 2**). This research focuses on that necessary first step.

Cheatgrass truncates secondary succession by out competing native perennial grass seedlings for limited moisture and providing a fine textured, early maturing fuel that has increased the frequency of wildfire from an estimated 60-110 years down to 5-10 years in many habitats.



**Figure 2.** Bluebunch wheatgrass and Crested wheatgrass seeded after a fire are now suppressing cheatgrass (resistance) and decreasing the wildfire cycle, allowing for critical browse (shrubs) to return to the site.

## Mechanical Control/Discing

### Methods

Treatments were conducted in late April, early May following cheatgrass emergence and before flowering (**Figure 3**). The site is a degraded/arid Wyoming big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*) community with past wildfire disturbances. Discing and following the site all summer and seeding in October to native, sandbergs bluegrass (*Poa secunda*), and introduced, Siberian Wheatgrass (*Agropyron fragile* ssp. *sibericum*) grasses.



**Figure 3.** Spring discing killed cheatgrass before seed production resulting in a decrease in cheatgrass seed banks, and thus a decrease in cheatgrass competition with seeded grasses the following year.

### Results

Spring discing of cheatgrass resulted in a cheatgrass seed bank reduction of 73-99%, cheatgrass above-ground density reduction of 83% and a reduction of associated cheatgrass fuel by more than 90%. By decreasing cheatgrass seedling competition, seeded species establishment increased 975% compared to un-discing plots (**Figure 4**).

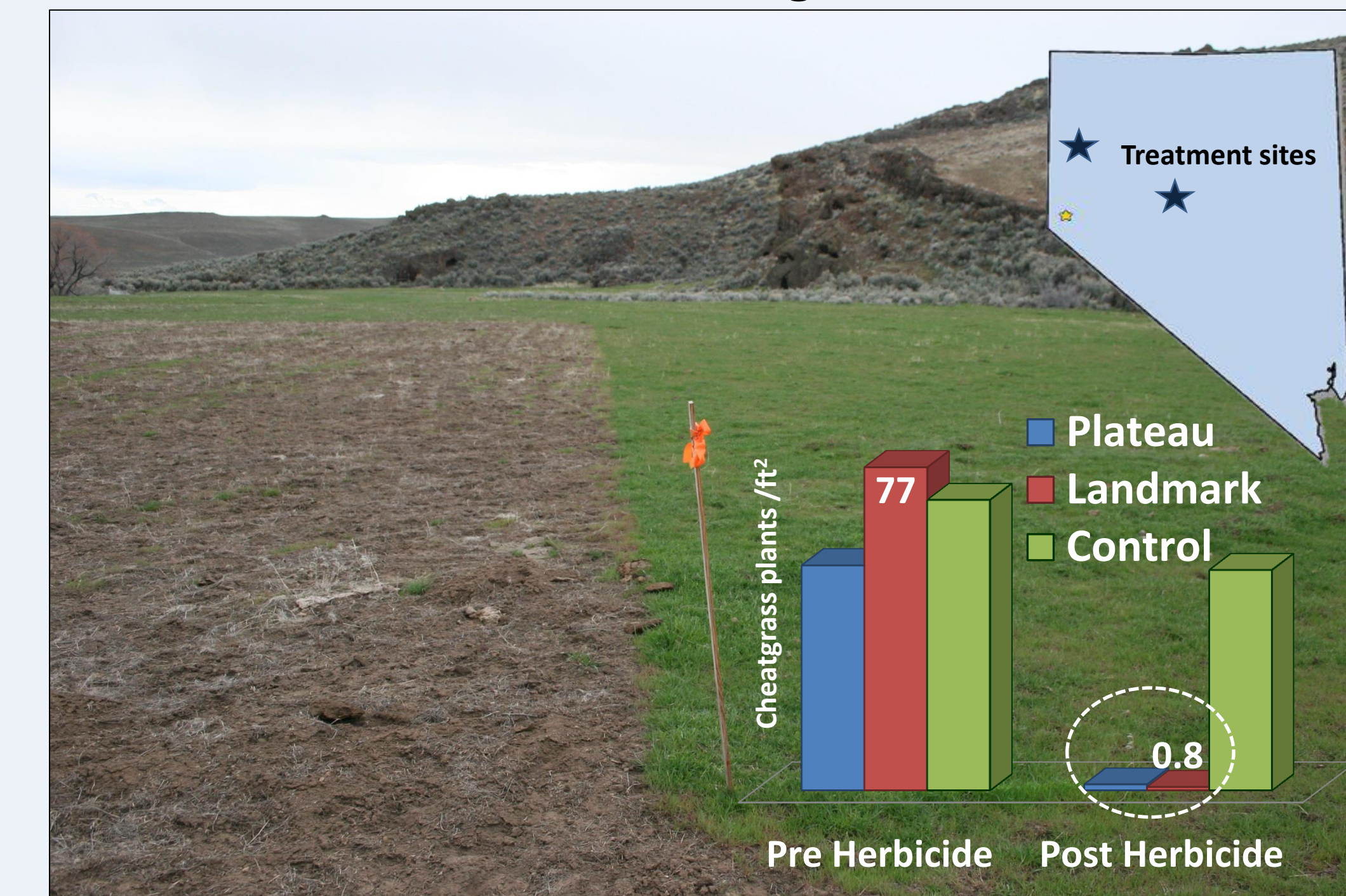


**Figure 4.** With a decrease in cheatgrass competition from discing, the increased soil moisture and nutrients led to successful establishment of long-lived perennial grasses which will now suppress (resistance) cheatgrass and decrease the chance of fire.

## Chemical Control/Herbicide

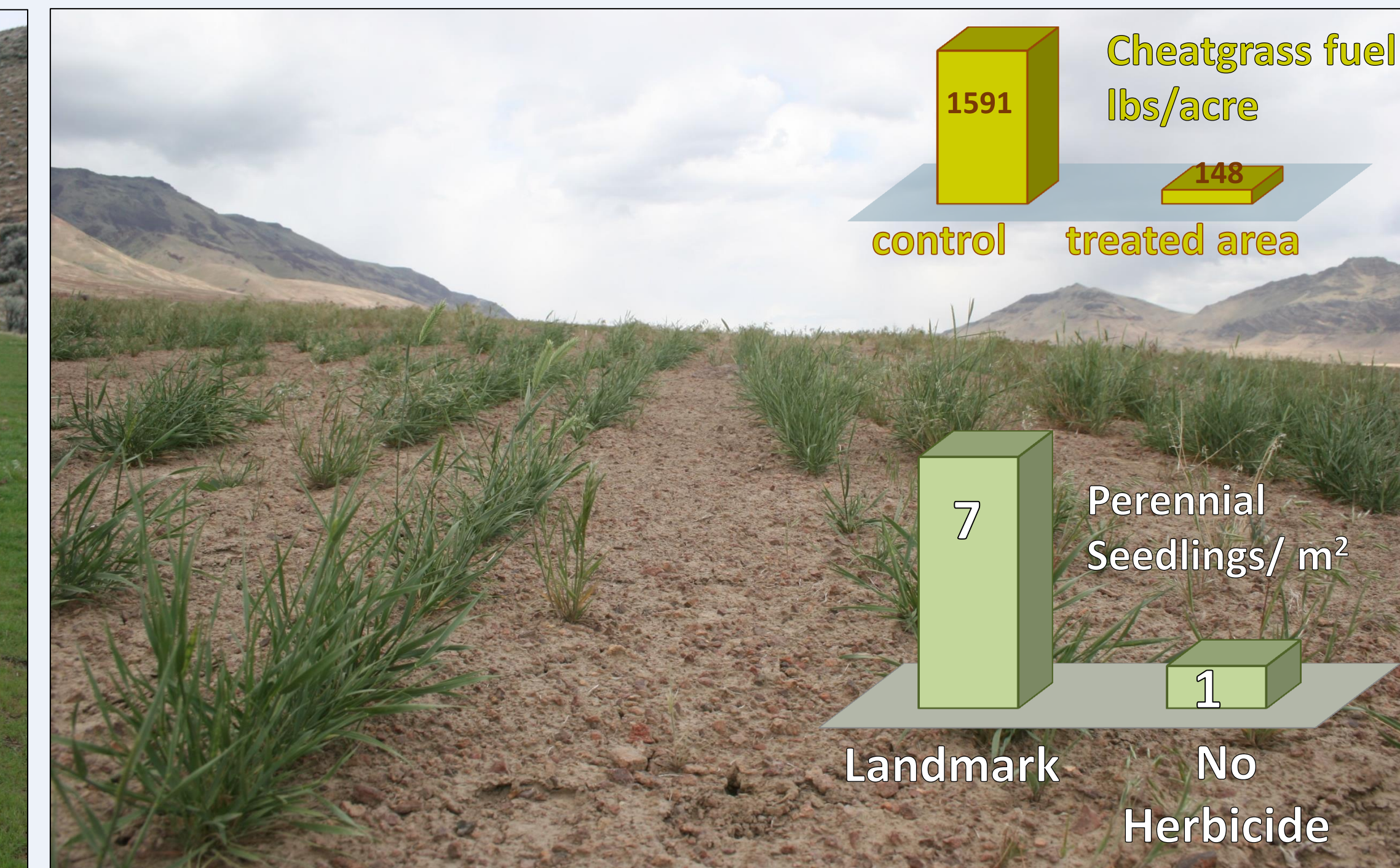
### Methods

Treatments were applied in the fall (October), followed for one full year and seeded the following October to native and introduced perennial grasses. The herbicide application of Landmark XP, *Sulfometuron Methyl*, @ 1.75 oz/acre rate and Plateau, *Imazapic*, @ 6 oz/acre rate were applied and replicated at each site using a ground spray rig. Because of the 12 month activity period of these soil active herbicides it is important to allow 12 months minimum time before seeding.



### Results

Using Landmark (*Sulfometuron Methyl*) resulted in significant cheatgrass density reductions of 98.7%, and with Plateau (*Imazapic*), 95.6% (**Figure 5a**). Followed with proper seeding methodologies (fall seeding, seeding depths, selected species) seeded species establishment greatly increased, compared to non-herbicide treatment plots, and resulted in a 91% reduction in cheatgrass fuels (**Figure 5b**).



**Figure 5a and 5b.** Herbicides can be a very effective tool in controlling cheatgrass thus decreasing the competition during seeded species seedling establishment. We have found that controlling cheatgrass prior to seeding can nearly double available soil moisture compared to non-herbicide treatment plots.

## Discussion

Range improvement practices using mechanical and chemical applications can improve success rates of rangeland rehabilitation efforts, which ultimately benefits the wildlife species that depend on these habitats. Without suppressing cheatgrass (resistance) and decreasing fire cycles, the critical shrub component of the plant community can not develop or persist. Wildlife species such as mule deer (*Odocoileus hemionus*), the only declining big game species in North America, and the very sensitive sagebrush obligate upland bird, sage grouse (*Centrocercus urophasianus*) rely on shrubs for browse and cover. (**Figure 6 a,b,c**).



**Figure 6a.** With a decrease in fire frequency and cheatgrass presence, shrubs can return to the plant community. (**6b**) Wildlife species are dependent on the persistence of a shrub component in the plant community. (**6c**) Maintaining a diverse plant community co-dominated by shrubs, perennial grasses and forbs will benefit wildlife species as well as improve domestic animal and wildlife interfaces.