

North Fork Humboldt River Watershed



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Objectives:

To develop and implement a comprehensive, regional Ecologically-Based Invasive Plant Management (EBIPM) program to restore ecosystems threatened and dominated by cheatgrass in the North Fork Humboldt River watershed of northeastern Nevada.

1. Determine the influence of (a) site, (b) reduction of herbaceous competition, and (c) plant source (nursery stock versus indigenous) on survival of sagebrush transplants.
2. Demonstrate and assess, on a large-scale, the effectiveness of reduced rates of glyphosate for control of cheatgrass and determine its utility in stimulating a trajectory toward desired species,
3. Characterize the glyphosate rates, timings, and adjuvants that optimize cheatgrass control while minimizing injury to desirable species.

Accomplishments:

Sagebrush wildlings were harvested in spring during periods of high soil moisture using a "Weed Wrench" ©, a tool originally designed for removal of undesirable shrubby weeds by pulling them with roots intact. Sagebrush containerized seedlings were also purchased from a nursery.

Sagebrush were planted at study sites in each of 3 locations: 1) a cheatgrass monoculture, 2) a monoculture crested wheatgrass seeding, and (3) a native post-fire grass-forb community.

Large-Scale Herbicide Study: Initiated in spring 2010. Five variable-rate herbicide treatments were applied when the invasive annual grasses were in the boot/early flower stage.

Small-Scale Herbicide Studies: One study tests the effect of 10 glyphosate rates and 3 application timings on control of cheatgrass and injury to desirable plants. Application of differing amounts of product was timed to target various invasive annual grass growth stages and include: 1) spring green-up (but before spring growth of desirable perennials), 2) tiller/stem elongation, and 3) boot/early flower.

A second study tests the effect of adjuvants on cheatgrass and desirable plant response to glyphosate.

Progress:

In 2009 and 2010, spring-applied treatments of glyphosate (64 oz/acre) were used to reduce herbaceous cover. Ten sagebrush plants were planted in each of 8, 5 x 5 meter plots representing combinations of herbicide treatment, no herbicide treatment, and plant source (native or nursery stock) at each of the 3 study sites.

Sagebrush density was measured each fall by direct count; seedling height and perpendicular crown diameter were also recorded for each surviving transplant.

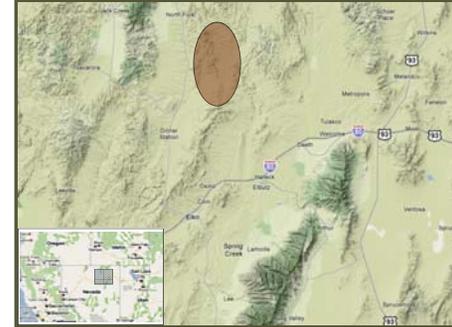
Outcomes:

Interim (2009) results for the sagebrush transplants showed that significantly more ($p < 0.05$) nursery stock established than wildling transplants in each of the 3 plant communities where herbaceous cover was reduced with herbicide. In all plant communities combined, mean survival rate of nursery stock was 54.7%, compared with 16.7% for the wildling transplants. Surviving wildlings and nursery stock were significantly ($p < 0.05$) taller and hence more vigorous within each plant community in plots where herbaceous cover had been reduced with herbicide. The study was repeated during spring of 2010, with preliminary results similarly showing increased transplant survival where herbaceous cover was reduced. However, comparative survival rates between wildlings and nursery stock were variable by site. Data analysis for the large- and small-scale herbicide studies is still in progress.

Recommendations:

Because this study is still in progress, recommendations at this time would be premature. However, we are encouraged by preliminary results.

NF Humboldt River Watershed



Geographical Information:

Elevation: approx. 6,300 feet

Annual Precipitation: 10 inches

Common Native Vegetation: Wyoming big sagebrush, basin wildrye, squirreltail, bluebunch wheatgrass, Nevada bluegrass, various forbs

Common Soil Types: Loamy, with claypan inclusions

Fire Regime: burned in 1990



Spraying cheatgrass in small plots



Using "weed wrench" © to harvest sagebrush wildlings



Glyphosate treatments on cheatgrass in the North Fork Humboldt River Watershed north of Elko, Nevada



Sagebrush nursery seedlings and native sagebrush transplants in the North Fork Humboldt River Watershed have shown promising success.