

Nevada - North Fork Humboldt River

Project Title: Restoration of Sage Grouse Habitat with Natives in Downy Brome and Medusahead-Infested Sites at Humboldt River North Fork



Location: Elko County, Nevada - approx 20 miles north of Elko

EBIPM Site Manager and Partners:

Kent McAdoo

Area Extension Rangeland Resources Specialist
775-738-7291
mcadook@unce.unr.edu

Dr. Earl Creech

State Weed Specialist
775-423-5121
creeche@unce.unr.edu

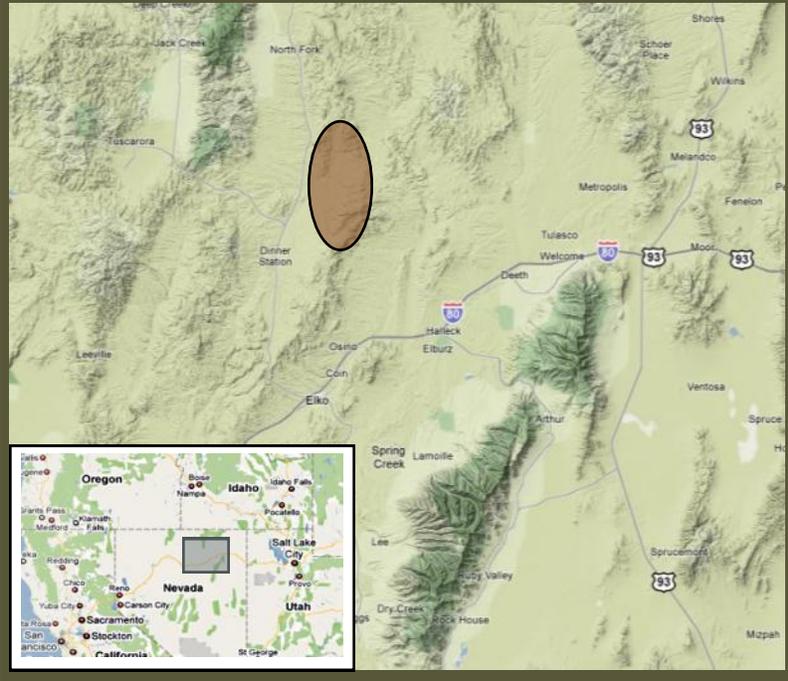
Dr. Chad Boyd

USDA-ARS
541-573-8939
chad.boyd@oregonstate.edu

Brief Area History:

The Elko and Humboldt River has a long history of human use from Native American hunters and early European trappers and explorers to an almost continuous stream of pioneers passing through en route to California. In the 1850's and 1860's, cattlemen and later shearers brought large herds of cattle and bands of sheep into the area, heavily grazing the area. This heavy grazing has had lasting effects on the landscape, especially along waterways where livestock were more likely to gather. Cheatgrass was first recorded in Nevada in 1906 and now occupies millions of acres throughout Nevada and the Great Basin. In many areas of Nevada, cheatgrass has created dangerous monocultures that greatly increase the frequency and intensity of wildfire compared with the common native vegetation. The North Fork Humboldt River area most recently burned in 1990.

Humboldt River Watershed Locator Map



The Rock Creek Watershed, north of Elko, Nevada, sits right in the heart of the Great Basin area of the West.

Geographical Information:

Elevation: 6300 ft. amsl

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

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.

Progress: Sagebrush wildlings were harvested 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 bareroot stock containerized seedlings were also purchased from a nursery. Study sites were established at 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 Study: in Elko, Nevada to be initiated in fall of 2009 or spring 2010. Five treatments will be applied when the invasive annual grasses are in the boot/early flower stage.

Small-Scale Studies: one tests the effect of 10 glyphosate rates and 3 application timings on control of downy brome/medusahead and injury to desirable plants. Application of differing amounts of product will be 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 downy brome/medusahead and desirable plant response to glyphosate.



Fields of cheatgrass and other annual grasses similar to this one in the North Fork Humboldt River Watershed, are the types of areas that EBIPM seeks to improve.



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



Using the "weed wrench" © to harvest sagebrush wildlings.



Glyphosate treatments on cheatgrass in the N.F. Humboldt River Watershed north of Elko, Nevada.

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.

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.