Big Sagebrush Transplanting Success in Crested Wheatgrass Stands

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Introduction

The conversion of formerly big sagebrush (*Artemisia tridentata* ssp. *wyomingensis*)/bunchgrass communities to annual grass dominance, primarily cheatgrass (*Bromus tectorum*), in Wyoming big sagebrush ecosystems has sparked the increasing demand to establish big sagebrush on disturbed rangelands. The establishment of long-lived perennial grasses is the best known method at suppressing cheatgrass. The introduced crested wheatgrass (*Agropyron cristatum*) is the most competitive and widely used species to accomplish cheatgrass suppression. There is an increasing demand to diversify crested wheatgrass stands with desirable species such as big sagebrush. Seeding Wyoming big sagebrush is largely unsuccessful therefore transplanting of big sagebrush has become more popular. Most big sagebrush transplanting research has been conducted in Utah where warm-season precipitation is more prevalent and therefore spring-time transplanting efforts are recommended (Stevens 2004). Recent data from northern Nevada reported from 2-40% success during spring transplanting efforts (McAdoo et. Al 2013). In the cold desert of the Great Basin summer precipitation is very limiting, therefore, we designed an experiment to test the success of big sagebrush seedlings transplanted in the spring versus the fall of the year.

Figure 1. Crested wheatgrass stand at the Peterson site and Dry Valley site (top right).

Methods

We conducted research at two separate sites in northwestern Nevada; 1) Peterson, 24km north of Reno, NV and 2) Dry Valley, 88km north of Reno, NV where we compared fall versus spring transplanting of Wyoming big sagebrush into crested wheatgrass stands (**Figure 1**). One hundred Wyoming big sagebrush transplants were sown and propagated in 1.5 Liter (1.6 qt.) (4x4x9.5”) sized containers for 6 months and then transplanted to the field at 2m centers (**Figure 2**). Transplanting occurred in the middle of April and November in 2012 and 2013. A one time watering (250ml/plant) was given at time of transplant. Plots were read monthly for 12 months to record predation and mortality.

Figure 2. Six-month old big sagebrush seedling at time of transplanting.

Results and Discussion

Fall transplanting experienced the highest success, 62% (Fall 2013 Peterson), while spring transplants experienced the lowest success at 13% (Spring 2012 Dry Valley) (**Figure 3)**.

The Dry Valley site received 3.9cm of precipitation at the time of the spring transplanting 2013, versus 1.5cm in 2012 which attributed to the added survival for spring 2013.

Precipitation in northwestern Nevada following fall transplanting is more prevalent (October-March) 13.5cm than spring and summer months (April-September), 2.8cm (5 year average Peterson site). We believe this contributes to a significantly higher success rate for fall transplanting.

Predation ranged from 27% Spring 2012, Dry Valley and a low of 7% (Fall 2013, Peterson) (**Figure 4**).

Successful transplanting efforts can aid in the diversification of crested wheatgrass stands and provide future critical habitat to wildlife (**Figure 5**).

Figure 4. Predation by black-tailed jackrabbits was common.

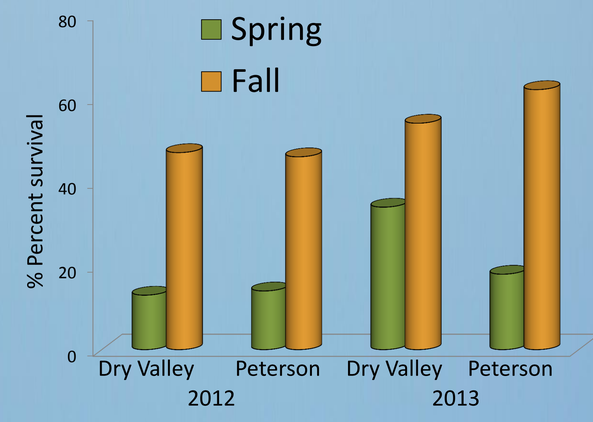

Figure 3. Big sagebrush seedling transplant survival over a 2-year period for 2 separate sites in northern Nevada.

Precipitation

Site	Total (cm)	Oct-March	April-Sept
Peterson ‘12	16.2	10.26	5.94
Peterson ‘13	27.6	13.51	14.09
Dry Valley ’12	8.1	6.1	2
Dry Valley ‘13	14.2	9.12	5.08
Average	16.52cm	9.75cm	6.77cm

Figure 5. The ability of resource managers to successfully transplant shrub species such as big sagebrush can aid in the recovery of critical habitats for species such as sage grouse.

Literature Cited:

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