

## **Final Copy – Ready for Publication**

Progressive Rancher Article

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### **The Case for Active Wyoming Big Sagebrush Management**

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Nevada citizens have long enjoyed the many values and benefits of big sagebrush – our State flower. For some, it's that sharp aroma after a hot day's thunderstorm. For others, it's knowing about the many forage and cover values that sagebrush has for wildlife. For the new calves, sagebrush can provide cover on those frigid, windy January and February days. Sagebrush, as some Nevada ranchers have discovered, is even a potential, renewable forage opportunity. And – certainly – those sagebrush stems can sure come in handy when we need to get our pickup truck out of that mud hole!

At the same time, we've all seen the challenges and risks that sagebrush can present. Sometimes despite our best management efforts (including non-use), we are unable to get new grasses and forbs established and growing beneath the sagebrush overstory. Although thick stands of sagebrush can (but not always) provide excellent wildlife habitat, they also increase the risk for catastrophic wildfire. When intense fire burns areas that lack abundant perennial grass plants between the sagebrush, cheatgrass and/or other exotic plant species typically become dominant. When this occurs, our management options have been narrowed. We either accept the exotics; or we do the often costly, risky and time-consuming vegetation repair work.

Are there ways to help avoid these kinds of situations? In this and subsequent articles, we argue that there are. We believe that the solutions lie first, in understanding the behaviors of various plant communities with and without disturbance. And second, how and when we choose to actively manage the sagebrush component within those communities.

#### **Wyoming Big Sagebrush**

There are three common subspecies of big sagebrush in Nevada: mountain, Wyoming and basin. Mountain big sage is typically found in the upper elevations where it may get covered by snow. Basin big sage typically grows on the deep, loamy, non-saline soils found in many valley bottoms.

Wyoming sagebrush occurs on drier and warmer soils below mountain big sagebrush and on soils that are not as deep where basin big sagebrush grows. It occupies more Nevada

rangeland than any other kind of sagebrush. Of the three big sagebrush community types, Wyoming sagebrush communities experience the most erratic precipitation and soil moisture patterns. This makes them the most difficult to manage and the hardest to improve or restore once they lose their perennial grass/forb understories and/or have become ridden with exotic weeds. Unfortunately, many exotic species are most competitive in these lower elevation sites.

Some of our collaborators stated that they have pretty much figured out how to manage (and what vegetation responses to expect from) mountain big sagebrush stands. In their words: "It's in the Wyoming big sagebrush stands where the questions exist." In which situations should managers seed (or not seed) following fire? What are the indicators that tell us if a particular native or introduced plant community will prosper after fire (is "resilient"), versus those that tell us a community will transition to exotic species (is "non-resilient")? What can land managers do to make non-resilient plant communities more resilient, so they can continue to provide the many values that sagebrush, perennial grasses and forbs provide? Which of the many tools that reduce competition from sagebrush are the most effective at increasing resilience of sagebrush sites? Under what conditions are they most effective for keeping these sites resilient?

## **Our Project**

Our team is looking at historical records, listening to collaborators, and doing field studies to address the fore-mentioned questions for Wyoming big sagebrush communities. Specifically, we are working to learn about vegetation change resulting from past wildfire events, Aroga moth (a native sagebrush defoliator) infestations and land treatments. We want to improve the land manager's ability to predict how Wyoming sagebrush communities might respond to different human- and non-human-caused disturbance events such as land treatments and wildfires. We are attempting to answer questions such as: What are the conditions ("states") in which these communities tend to bounce back after wildfire or other major natural disturbance (such as Aroga moth infestations)? Conversely, under what conditions will these communities not recover and instead become dominated by less productive or more weedy plants? What management actions can be applied at which times to sagebrush communities to achieve or maintain resilient states, so they can endure and prosper under the inevitable disturbances that will occur?

## **Preventative Land Treatments**

The term "preventative land treatment" is less important than the concept: actively managing (treating) vegetation when the plant community has the ability to recover from the disturbance and not transition to a cheatgrass or other exotic weed community. Many sagebrush communities have lost so many of their perennial herbaceous plants that when a disturbance occurs, there is nothing that prevents the establishment of weeds.

One option: Prior to reaching this state, and when sufficient perennial grass abundance exists, managers can apply a preventative land treatment to release these plants from competition

with sagebrush. Releasing (increasing) these plants can deter or reduce weed establishment and dominance for decades to come. This also can help improve the productivity, vigor, cover and/or density of the plant community. These outcomes benefit the many users of these products, but most importantly they can armor the community from a significant, undesired change when a wildfire or other major disturbance eventually occurs.

It is not difficult to find scientific and other literature on this topic (a visit with your Cooperative Extension Educator can provide you local information).

Some of the characteristics of preventative land treatments include the following:

1. Rehabilitative land treatments are done to repair damage that has already occurred. (In Wyoming big sagebrush sites, these are usually costly and risky). Preventative land treatments are done to keep the damage from occurring in the first place.
2. Rehabilitative land treatments normally involve seeding, whereas preventative land treatments do not. Rather, they apply management actions to change the relative abundance of the existing plant species (whether native or introduced) to improve the health and functioning of the site.
3. If there are few or no desired (native or introduced) perennial grass species in the plant community, applying a preventative land treatment usually makes the situation worse. If cheatgrass or other weedy species are present at time of treatment, you can be assured that these (along with other species) will often increase also. It is important to recognize when not to use a tool or treatment because it is being applied too late to be preventative.
4. A recent scientific study showed that preventative management is in general much more cost-effective than rehabilitation-type approaches.
5. Numerous types of preventative treatments have been applied to Wyoming big sagebrush sites in Nevada. Among these are mowing, aerating, disking, prescribed burning, herbicide spraying, and targeted livestock grazing. They typically reduce sagebrush cover and/or density, but unlike hot wildfire, do not typically eliminate all the sagebrush in a treatment site.
6. Although there can be a variety of goals associated with a particular treatment, one typical outcome is an increase in perennial grass abundance, which in turn can help prevent the site from transitioning to a cheatgrass or other weed dominated state.
7. There are many places where proper implementation of these preventative land treatments have resulted in fuels reduction, perennial grass/forb increases, soil stabilization, increased vegetation diversity, and/or highway corridor visibility (safety) improvement.

## **Next Article**

Next time around, we will discuss what we have discovered on our rangelands during the past couple years. We'll continue our discussion with some notes about how each of the major plant groups (sagebrush, perennial grasses, forbs and cryptogams) seem to interact with each other. Also, we will discuss outcomes of the wildfire events, Aroga moth infestations, and preventative land treatments that have been studied.