

**Northwest Colorado Great Sage Grouse Comments  
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**The greater sage grouse (*Centrocercus urophasianus*), human activity, and cheatgrass (*Bromus tectorum*): Opportunities and limitations based on an ecological perspective of community interactions and invasive species.**

**A Historical Perspective on a Fragile Ecosystem**

The badlands and sage shrublands of the Colorado West make up the landscape of a fragile ecosystem. Currently, this landscape out of balance from historical and present grazing, recreation, and more recent high and heavy traffic from oil and gas exploration and extraction. All of these activities also allow for, and assist with, the transfer of invasive species to the area. A healthy ecosystem can many times resist wide spread invasive overtake, however a degraded ecosystem lacks this function.

Grazing in the West predominantly dates back to the Homestead Act of 1862 (as early as the 1600's, the Spanish were bringing livestock to graze the Southern Rockies) (Reuth et al, 2008). What the homesteaders failed to recognize was that the grazing land of the west was a far different landscape than that of the plains and could not support the same amount of livestock based on forage and water resources. Still as recent as the last decade, 40% of Rocky Mountain livestock operations had over 100 head of cattle, whereas only 20% of operations in other parts of the country exceeded 100 head (Reuth et al, 2008). Today, much of the cryptobiotic soil bed essential for growth of small grasses, forbs, and sage, historically tolerant of deer, elk, and bison movement, has been destroyed by overgrazing operations of large livestock.

Recreation also has historical implications on the sage shrublands of the West. The BLM and the Heritage Program recently set a precedent in the Little Book Cliffs by creating and managing a specific trail for recreational purposes. The trail attempts to avoid endangered species occurrences, and seeks to deter bandit trails (Malone, 10/25/13). Trails are a source of habitat fragmentation and habitat alteration to the fragile ecosystem of the Colorado Plateau.

Another large anthropogenic contributor to habitat fragmentation and alteration are extractive industries. Specific to this area, current and historic oil and natural gas exploration and extraction activities are highly prevalent. Roads and well pads required for industry activities, along with extreme and heavy traffic further the degradation of sage shrubland ecosystems. A healthy landscape context relies on the connectivity of its internal ecosystems, whereby species are able to travel between those systems and other natural processes occur. Widening roads and heavy, loud traffic are not conducive with safe and effective species migration.

All three of these anthropogenic alterations to this fragile ecosystem directly and indirectly impact species and biodiversity. The Greater Sage Grouse and other endangered species rely on the maintained connectedness of sage shrublands. The most common characteristic of the above mentioned alterations is that they are all pathways or agents for invasive species.

**Cheatgrass: an invasive in the Sage Shrublands**

Cheatgrass is the most "notorious plant invader in the United States" (Smith & Smith, 2012). In the 1800's it was introduced to Colorado, and because the soils of the west were degraded by overgrazing, it spread rampantly. It is a nutrient poor grass, with a fire regime shorter than the

reproduction time of sage. Cheatgrass burns every three - ten years and sage reproduces about every 13. The correlation is that sage does not have enough time to re-seed and grow to a viable reproducing age before it is destroyed by fire. Also according to Smith & Smith, "Cheatgrass is the primary source of fire throughout the Western United States" (Smith & Smith, 2012).

The reinforcing feedback loop is evident. Grazing and other human alteration create loss of diverse sage shrublands, replacement of sage shrublands occurs with nutrient poor cheatgrass, cheatgrass burns often and rapidly, further degrading any intact communities or functions. At some point, there will no longer be grazing because cheatgrass is insufficient forage. We are left with barren land, which lacks biodiversity, and is unsatisfactory for grazing. This begs the question, "what do we really want to do with our badlands?"

### **Sustainable Habitat with a Focus on the Greater Sage Grouse**

From a ecological sustainability perspective, a loss of biodiversity is not sustainable. Also, from a species perspective, continuously fragmented habitat is not sustainable. The greater sage grouse is an endangered species which requires *intact* sage shrublands as habitat. Without this, recovering this endangered population to a viable and stable population is impossible.

Sage creates essential camouflage for male sage grouse. Greater sage grouse mate in a communal courtship ground called a lek. Males put on a display of courtship and the females choose a mate. Sage grouse viability is highly linked to these mating grounds because, one, if leks are predominantly cheatgrass, male grouse have a higher rate of predation due to lack of camouflage from sage. And two, if males or females are unable to migrate to a lek due to habitat fragmentation, one or the other of the necessary breeding pair is missing.

Further importance of sage shrublands for the greater sage grouse is that female greater sage grouse selects against shrublands with cheatgrass for nesting. The ultimate effect of less sage and more cheatgrass is lower recruitment in the greater sage grouse population (Malone, 11/25/13). Lower recruitment means less offspring, means less greater sage grouse, and this does not equal removal from the endangered species list.

If the goal is to remove the a species from the endangered species list, then the habitat they require to live, forage, and most importantly reproduce, must remain protected and intact. How do we manage this?

### **Two Questions: What do we really want to do with our badlands? And, how do we protect proper intact greater sage grouse habitat?**

The invasion of cheatgrass is a result of nearly two centuries of overgrazing fragile Western soils in combination with continued habitat degradation from recreation and oil and natural gas industries. To the sustainable effect that all parties should have a chance to enjoy the sage shrubland ecosystems, a compromise is in order. Furthermore, to facilitate and preserve this public area sustainably, a priority should lie with the protection of an endangered species.

In order to accomplish this, a systematic approach to the solution is necessary. If our goal is to protect an endangered species, we must give up our desire to use its habitat for other ventures while managing its recovery. Reducing greater sage grouse habitat, and further fragmenting the area with new infrastructure is the antithesis of protection for the greater sage grouse.

We are working against historical degradation, it is not the answer to continue to degrade. We must now manage appropriately to facilitate the recovery of our beloved West.

**Sources:**

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