

Teton County Best Practices Analysis

Protecting Agricultural Open Space for Wildlife

Rangelands in the western United States are widely acknowledged in the scientific literature for providing important benefits such as wildlife habitat, watershed protection, recreation and tourism, as well as the maintenance of traditional ranching culture (Huntsinger and Hopkinson 1996; Brunson and Huntsinger 2008; Sayre et al. 2012). Active rangelands usually retain higher levels of biological diversity compared with croplands or plantation forests (Sayre et al. 2012) or residential development (Knight et al. 1995; Maestas et al. 2003). Ranching is also considered the most ecologically sustainable segment of the U.S. meat industry because it depends on on-site ecological processes rather than imported, often non-renewable, inputs (Sayre et al. 2012). Agricultural and natural resource economists have argued that the full value of rangelands to tourists and local residents is not captured in the marketplace. It is easy to reveal the value of converting landscapes, but less easy to understand the value of not converting them (Ellingson and Seidl 2009).

Ecological research has demonstrated the following broad generalizations about current levels of grazing in Rocky Mountain grasslands: (1) grazing probably has little effect (positive or negative) on native plant species richness at landscape scales; (2) grazing probably has little effect on the spread of most exotic plant species at landscape scales; (3) grazing does impact plant species composition and cover at local scales; (4) soil characteristics, climate, and other forms of disturbance may have a greater effect on plant species diversity than do current levels of grazing; and (5) few plant species show consistent, directional responses to grazing or cessation of grazing (Stohlgren et al. 1999).

Maestas et al. (2003) conducted a study to explicitly compare the value of private ranchlands with exurban development and public protected lands for birds, mammalian predators and plants in Colorado. This study found that seven bird species, characterized as human commensals or tree nesters, reached higher densities on exurban developments than on either ranches or reserves. Six bird species, characterized as ground and shrub nesters, reached greater densities on ranches and reserves compared with exurban developments. Domestic dogs and house cats were observed only on exurban developments, whereas coyotes were detected more frequently on ranchlands. Ranches had plant communities with higher native species richness and lower non-native species richness and cover than did the other types of land use. They conclude that these results confirm that ranches are important for protecting biodiversity and that conservation efforts should focus on private working lands as well as on reserves.

To conserve some of the most productive and biodiverse rangeland landscapes, ecologists have thus argued that ranching must not just be tolerated as a means to an environmental end, but valued and planned for, ecologically, socially, and economically (Huntsinger and Hopkinson 1996). In order to create positive feedbacks between economic return from rangelands and

ecological diversity, incentives should be aligned to sustain ranching in ways that also sustain associated public benefits (Sayre et al. 2012).

Some factors to consider in managing rangelands for wildlife and other benefits include:

1) Manage for a heterogeneous plant community

Livestock have the potential to function as ecosystem engineers (e.g. creating ecological conditions that support a diversity of plants and animals) but prevailing management practices promote homogenous plant communities by managing only for the most palatable forage species for cattle (Fuhlendorf and Engle 2001). The evolutionary history of grazing in many western ecosystems suggests that biodiversity can be sustained and enhanced by mimicking temporal and spatial grazing patterns that occurred before European Settlement. Heterogeneity-based management practices such as rotational grazing have been used successfully to alter vegetation structure for grassland bird habitat (Derner et al. 2009).

2) Account for foraging niche overlap between livestock and wild ungulates

Torstenson et al. (2006) studied foraging niche overlap among Rocky Mountain elk (*Cervus elaphus nelsoni*), Rocky Mountain mule deer (*Odocoileus hemionus hemionus*), and cattle (*Bos taurus*) for 2 years on 37 000 ha of nonforested foothill and mountain habitat in northwestern Wyoming. Cattle in summer and fall had $\geq 60\%$ foraging niche overlap with elk in spring, indicating that, in spring, elk foraged in many of the same places (largely sagebrush grassland) and ate diets similar in botanical composition to what cattle did during summer and fall. Foraging niche overlap also was high (41%-51%) between elk in winter and cattle in summer and fall. The authors conclude that if competitive or complementary relationships existed between elk and cattle, these interactions most likely occurred on sagebrush grasslands where cattle use in summer-fall was followed by elk use in winter-spring. A similar study elsewhere in Wyoming evaluated the most economical combination of wildlife and domestic livestock production. This study concluded that the value of antelope and cattle would have to be quite different before “multiple use” is not preferred in this region (Bastian et al. 1991). Thus, previous research demonstrates that cattle and wild ungulates can co-exist despite diet overlap. However, managers may wish to be cognizant of reducing competitive interactions that could have negative impacts on either wildlife or cattle during some parts of the year and in some vegetation communities.

3) Avoid overgrazing, particularly in riparian areas

Overgrazing by cattle changes the vegetation community with subsequent potential negative impacts on wildlife and the long-term sustainability of a ranching operation (Wilson and McLeod 1991). Whether or not overgrazing occurs is dependent on the density of grazing animals, the temporal and spatial pattern of grazing by these animals, the tolerance to grazing of the forage plants, soil quality, slope, and other characteristics of the ranch operation and

ecosystem (Mysterud 2006). Overgrazing is probably most detrimental to wildlife in riparian areas (e.g. along streams, rivers and other water bodies) because riparian areas serve as important sources of food and water, shade and movement corridors (Naiman et al. 1993).

Ecological restoration of riparian areas that have been degraded by decades of overgrazing by livestock is of paramount importance for the improvement of water quality and fish and wildlife habitats in the western United States. An increasingly common approach to the restoration of habitat for terrestrial and aquatic species is to exclude livestock from streamside communities. A recent study in Oregon compared ecosystem properties of meadow communities at three sites that had been managed for sustainable livestock production with three sites where livestock had been excluded for 9-18 years as a means of riparian and stream restoration. They found that livestock removal was effective, resulting in significant changes in soil, hydrological, and vegetation properties that, at landscape scales, would likely have important positive impacts on water quality and wildlife (Kauffman et al. 2004).

Other possible characteristics of rangelands that have negative impacts on wildlife include fencing that is not designed to allow wildlife movement (Paige 2008), and predator control, which often destroys wildlife without realizing benefits to ranchers (Berger 2006). We suggest that agricultural exemptions be designed such that they acknowledge and support the benefits provided by rangelands in Teton County, but explicitly discourage practices that have been demonstrated to have strong negative effects on wildlife such as heavy grazing in riparian areas, grazing practices that lead to overgrazing and homogenization of vegetation and/or competitive exclusion of wildlife, and fencing that does not allow movement by native ungulates.

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