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HIGHLIGHTS

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Corticosterone Metabolite Concentrations in Greater Sage-Grouse Are Positively Associated With the Presence of Cattle Grazing

M. D. Jankowski, R. E. Russell, J. C. Franson, R. J. Dusek, M. K. Hines, M. Gregg, and E. K. Hofmeister

It is uncertain whether sage-grouse (*Centrocercus urophasianus*) populations can be sustained in habitats grazed by cattle. We compared levels of the stress hormone corticosterone in grouse living in grazed habitats to levels in individuals in ungrazed habitats. Grouse sampled in areas with higher cow pat counts tended to have higher corticosterone hormone levels, and prebreeding female grouse in grazed areas had higher levels than females in ungrazed areas. Further research is warranted to quantify links between specific grazing practices, grouse hormone levels, and demographic rates because corticosterone influences fecundity and survivorship.

Grazing Intensity Influences Ground Squirrel and American Badger Habitat Use in Mixed-Grass Prairies

Lindsey N. Bylo, Nicola Koper, and Kelsey A. Molloy

Ground squirrel (*Spermophilus* spp.) and American badger (*Taxidea taxus*) burrows have a large impact on prairie ecosystems, but we have little understanding of how these species are impacted by livestock. We used a large-scale experiment to determine how abundance of burrows is influenced by cattle stocking rates. In upland habitats, the abundance of ground squirrel burrows increased while the occurrence of badger burrows decreased. There was no effect of stocking rate on burrows of either species in lowland grasslands close to riparian zones. This suggests that a diverse mosaic of stocking rates across the landscape would promote habitat required for the conservation of both burrowing mammals.

Large-Scale Downy Brome Treatments Alter Plant–Soil Relationships and Promote Perennial Grasses in Salt Desert Shrublands

Merilynn C. Hirsch-Schantz, Thomas A. Monaco, Christopher A. Call, and R. L. Sheley

Large-scale management is common on downy brome (*Bromus tectorum*)–dominated shrublands, but research is typically conducted at a small scale. We sought to identify how large-scale applications of herbicide, mowing, and burning affect plant–soil relationships on downy brome–dominated salt desert shrublands. We found that combining burning and herbicide produced the lowest downy brome cover, the highest soil nitrate availability, and the highest perennial grass cover. Furthermore, we observed an inverse relationship between downy brome and soil nitrate suggesting that control treatments can free soil resources and improve perennial grass establishment.

Grazing Management, Season, and Drought Contributions to Near-Surface Soil Property Dynamics in Semiarid Rangeland

M. A. Liebig, S. L. Kronberg, J. R. Hendrickson, and J. R. Gross

Studies evaluating grazing management influences on soil properties and greenhouse gas emissions within growing seasons and across consecutive years are limited. Yet such studies may provide insight into ecosystem resilience, particularly if the study period encompasses extreme weather conditions. Near-surface soil property dynamics and greenhouse gas emissions were evaluated over 3 years in three long-term grazing management systems in central North Dakota. Regression analyses found significant relationships between greenhouse gas emissions and soil electrical conductivity, implying the latter may serve as a useful screening property for identifying greenhouse gas "hotspots" in grazing land.