

Highlights

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Twice-Over Rotational Grazing and Its Impacts on Grassland Songbird Abundance and Habitat Structure

Cristina L. Ranellucci, Nicola Koper, and Darcy C. Henderson

The majority of native prairie has been lost throughout North America and much of the remaining prairie is used for livestock grazing. Sustainable grazing practices may contribute to the conservation of grassland species. We compared bird abundances on pastures grazed twice-over rotationally, pastures grazed season-long, and ungrazed fields. Season-long pastures supported a higher diversity and more species of grassland birds than twice-over pastures. Season-long grazing may actually benefit grassland birds by producing a stable but varied habitat that may support a larger diversity of species. We found little evidence that twice-over grazing contributed to the conservation of grassland songbirds in northern mixed-grass prairies.

Stocking Rate and Riparian Vegetation Effects on Physical Characteristics of Riparian Zones of Midwestern Pastures

Douglas A. Bear, James R. Russell, Mustafa Tufekcioglu, Thomas M. Isenhardt, Daniel G. Morrical, and John L. Kovar

The effects of grazing management on nonpoint source pollution of pasture streams have been poorly studied in the Midwest. A 3-year study evaluated the effects of cattle stocking rates on forage sward heights, proportions of bare and manure-covered ground, and bank erosion along streams in riparian zones of 13 southern Iowa pastures. Increasing stocking rates resulted in increased manure-covered ground and decreased forage sward heights in the riparian zones, but did not affect stream bank erosion. Management practices reducing stocking rates or altering cow distribution

will reduce the risks of nutrient loading, but not bank erosion, along pasture streams.

Effects of a Rest-Rotation Grazing System on Wintering Elk Distributions at Wall Creek, Montana

Julee Shamhart, Fred King, and Kelly Proffitt

We evaluated the effects of four different grazing cells (spring grazing, summer growing-season grazing, fall grazing, and resting) on wintering elk resource selection within the Wall Creek Range in southwest Montana from 1988 to 2007. Within the grazing system, elk groups preferentially selected rested pastures over pastures grazed during the previous spring (1 May–1 June), summer (1 June–15 July), and fall (15 September–30 September). Pastures grazed during the summer were least used by elk the following winter. This work suggests rested pastures play an important role in rotation grazing systems by conserving forage for wintering elk.

Comparing Dung Beetle Species Assemblages Between Protected Areas and Adjacent Pasturelands in a Mediterranean Savanna Landscape

Catherine Numa, José R. Verdú, Cristina Rueda, and Eduardo Galante

Despite the ecological importance of dung beetles to pasture ecosystems functioning, little is known about their relationships with grazing management. We compared dung beetle diversity in grasslands of a national park and a sheep farm in Spain. Dung beetle species number was similar between both areas, but total abundance and biomass were greater in the park than in the farm. Species composition and abundance by functional groups (rollers, tunnelers, dwellers) were different between the areas. Plowing and veterinary

substances affect soil structure and dung quality and could be important factors altering dung beetle assemblages and ecosystem services they provide in farms.

Centrality of Ranching Lifestyle and Attitudes Toward a Voluntary Incentive Program to Protect Endangered Species

Michael G. Sorice, J. Richard Conner, Urs P. Kreuter, and R. Neal Wilkins

We examined the proposition that centrality of the ranching lifestyle influences rangeland owners' decisions about participating in a cost-share program to protect endangered habitat for songbirds. We characterized landowner lifestyle centrality based on self-identification as a rancher, dependence on land for income, and rootedness to the land. We then examined the ability of lifestyle centrality along with a measure of attitude to explain intention to participate. Lifestyle centrality was related to participation, but only via landowner attitudes. Understanding this indirect relationship between participation and lifestyle centrality is necessary to better predict how program design and recruitment efforts may affect participation.

Long-Term Effects of Aeration and Fire on Invasion of Exotic Grasses in Mixed-Brush Plant Communities

Felix Ayala-A., J. Alfonso Ortega-S., Timothy E. Fulbright, G. Allen Rasmussen, D. Lynn Drawe, David R. Synatzske, and Andrea R. Litt

We tested the hypothesis that aeration and prescribed burning increase exotic grasses. We evaluated four treatments: aeration, warm-season burn, aeration followed by a warm-season burn, and control. Relative cover of exotic grasses was 31% higher in the control than in the prescribed burn treatment. Relative cover of native grasses was 30% higher in prescribed burn than in the control treatment. A major concern is that disturbance associated with brush management may facilitate ingress of exotic grasses; however, our results indicate that this is not always the case.

A Common-Garden Study of Resource-Island Effects on a Native and an Exotic, Annual Grass After Fire

Amber N. Hoover and Matthew J. Germino

The interspersed resource islands, or coppice mounds (e.g., under shrubs), and relatively bare interspace microsites is common in semiarid rangelands, and could relate to disturbances and exotic annual invasion. Cheatgrass (*Bromus tectorum*) and bluebunch wheatgrass (*Pseudoroegneria spicata*) were compared among microsites in burned and unburned areas, and on soils transferred to a common garden from

each microsite. Both grasses were more abundant on coppice soils in the garden, but only bluebunch wheatgrass was more abundant on coppice mounds in the field. Native herb presence on coppices that are formed primarily by shrubs may be a key element of site resistance to cheatgrass after fire.

Postfire Seeding and Plant Community Recovery in the Great Basin

S. M. Kulpa, E. A. Leger, E. K. Espeland, and E. M. Goergen

Rangeland wildfires are often seeded to improve plant community recovery. We monitored how slope and aspect affected seeding, quantifying the presence of seeded species, cheatgrass (*Bromus tectorum*), and other weeds, and the recovery of nonseeded species within five fires in Elko County, Nevada. In general, cheatgrass densities were higher on south aspects, particularly 3 and 4 years after fire, whereas nonseeded natives, if present, were more abundant on north aspects and flat areas. Seeding was most effective in flat areas. North slopes and flat areas with existing native vegetation may recover without seeding, whereas new methods may be required to revegetate south slopes.

Comparison of Postfire Soil Water Repellency Amelioration Strategies on Bluebunch Wheatgrass and Cheatgrass Survival

Matthew D. Madsen, Steven L. Petersen, Bruce A. Roundy, Bryan G. Hopkins, and Alan G. Taylor

Soil water repellency can limit post-fire reseeding efforts. In a glasshouse study, we evaluated the effectiveness of wetting agent and soil tilling for improving seedling survival in water-repellent soil for the native perennial, bluebunch wheatgrass (*Pseudoroegneria spicata*), and invasive annual, cheatgrass (*Bromus tectorum*). Both species had a similar response to the treatments. Wetting agent increased plant density and biomass twofold. Tilling had no influence on plant density, but also increased biomass twofold. These results indicate that tilling and wetting agents can increase establishment of both desired and invasive species.

Canopy Area and Aboveground Mass of Individual Redberry Juniper (*Juniperus pinchotii*) Trees

R. J. Ansley, M. Mirik, B. W. Surber, and S. C. Park

There is increasing interest in using canopy area to quantify biomass of invasive woody plants on large land areas of rangelands for a variety of reasons. Our objective was to determine the utility of external canopy measurements (area, volume, and height) for predicting aboveground biomass of individual redberry juniper (*Juniperus pinchotii* Sudw.) plants

in Texas. We found a strong linear relationship between canopy area and above ground biomass ($r^2 = 0.94$). This relationship could be used for a variety of purposes, including estimation of biomass for bioenergy or quantification of regional carbon stocks.

A Technique for Estimating Rangeland Canopy-Gap Size Distributions From High-Resolution Digital Imagery

Jason Karl, Michael C. Duniway,
and T. Scott Schrader

The size and distribution of vegetation canopy gaps is an important indicator of processes such as erosion, but expensive to measure in the field over large landscapes. Through interpretation of 2–3-cm (0.8–1.2-inch)-resolution color infrared aerial images by observers and statistical image classification techniques we estimated canopy gaps from sites in Idaho, Nevada, and New Mexico and compared results to field measurements. We show canopy-gap size distributions can be reliably estimated from high-resolution imagery in a

variety of rangeland types. Techniques such as this may help meet requirements of monitoring vast landscapes at scales fine enough for management decision-making.

Indirect Measurement of Leaf Area Index in Sagebrush-Steppe Rangelands

Julie A. Finzel, Mark S. Seyfried, Mark A. Weltz,
James R. Kiniry, Mari-Vaughn V. Johnson,
and Karen L. Launchbaugh

A rapid method for determining leaf area index (LAI) in situ is needed to provide accurate inputs for ecosystem process models. Decagon's ceptometer was used to measure LAI in sagebrush-steppe ecosystems, a vegetation type unlike the agronomic crops for which it was designed, and tested against point-frame LAI data. The ceptometer produced inaccurate and imprecise results that did not correlate with point-frame LAI data. Therefore, using the methods described in the paper, it was shown that the ceptometer provides a poor estimate of LAI in sagebrush-steppe ecosystems.