HIGHLIGHTS

Rangeland Ecology & Management, March 2016

Spatially Explicit Rangeland Erosion Monitoring Using High-Resolution Digital Aerial Imagery

By Jeffery K. Gillan, Jason W. Karl, Nichole N. Barger, Ahmed Elaksher, and Michael Duniway

Soil erosion has a negative impact on air and water quality, and overall rangeland health. We measured fine-scale soil topography change over a 1-year period using aerial photogrammetric methods to quantify erosion and deposition in a piñon-juniper (*Pinus* spp-*Juniperus* spp.) woodland in southeastern Utah. On average, we were able to detect surface elevation change of ± 3 -3.5 inches and greater, but detecting more subtle erosion could be achieved with finer-scale imagery. This method could be useful for monitoring soil erosion on broader scales than is feasible with field-based methods.

Factors Influencing Winter Mortality Risk for Pronghorn Exposed to Wind Energy Development

By Kaitlyn Taylor, Jeffrey L. Beck, and Snehalata V. Huzurbazar

Energy development may impact winter survival for pronghorn (*Antilocapra americana*) populations already coping with harsh environmental conditions. We modeled mortality risk for 47 adult female pronghorn over three winters on crucial winter range developed for wind-generated electricity in south-central Wyoming. Thirteen of 17 pronghorn deaths occurred during the winter with the highest snow accumulation. Exposure to wind energy infrastructure did not directly influence mortality risk. Mortality increased with decrease in average distance to major roads, reduced time spent in sagebrush, and decrease in terrain ruggedness. Pronghorn mortality may be impacted by larger-scale wind energy developments by influencing these characteristics of pronghorn habitat.

Seed Dormancy Mechanisms in Basalt Milkvetch and Western Prairie Clover

By Thomas A. Jones, Doug A. Johnson, B. S. Bushman, Kevin J. Connors, and Robert C. Smith

Seeding native legumes may increase biodiversity of restored rangelands, but seedling establishment is often limited by seed dormancy. We measured germination response of seed of two native legumes, basalt milkvetch (*Astragalus filipes*) and western prairie clover (*Dalea ornate*). Basalt milkvetch responded to mechanical scarification, prechilling, and germination on moist sand, but western prairie clover responded only to scarification. We can now recommend scarification of *D. ornata* seed, and scarification combined with prechilling of *A. filipes* seed before seeding both rangelands and seed fields.

Temporal Variability in Microclimatic Conditions for Grass Germination and Emergence in the Sagebrush Steppe

By Stuart P. Hardegree, Roger L. Sheley, Sara E. Duke, Jeremy J. James, Alex R. Boehm, and Gerald N. Flerchinger

The harsh environmental conditions and high variability in precipitation and temperature found in sagebrush (*Artemisia* spp.) steppe ecosystems contribute to failure in rangeland restoration projects. We evaluated long-term simulations of seed germination response to soil temperature and moisture and characterized potential mortality from freezing and drought. Study-year precipitation and temperature are insufficient to describe the seasonal timing of germination relative to potential mortality due to water and thermal stress. If future seeding studies include both a description of long-term variability in seasonal precipitation and temperature, and associated probabilities of microclimatic drought and thermal stress, it may strengthen inferences derived from short-term field experiments.

Topographic Context of the Burn Edge Influences Post-fire Recruitment of Arid Land Shrubs

By Lea Condon and Peter Weisberg

Land managers in the Great Basin aim to promote native shrub species recovery following fire. We examined shrub species recruitment after a wildland fire, hypothesizing that the topography of the burn edge would determine the recruitment pattern of shrub species. Where the burn edge fell on a ridge, the frequency of mountain big sagebrush (*Artemisia tridentata vaseyana*), which depends on seed to colonize, decreased with distance from the burn edge. Where the burn edge fell behind a ridge, there were fewer shrubs overall and a greater proportion of resprouting species. Topographic position of the burn edge and fire related species traits can be used to prioritize sites for restoration efforts.

Forage and Weather Influence Day- vs. Nighttime Cow Behavior and Calf Weaning Weights on Rangeland

By Mohammed Sawalhah, Andres Cibils, Huiping Cao, Dawn Vanleeuwen, Jerry Holechek, Christina Black Rubio, Robert Wesley, Rachel Endecott, Travis Mulliniks, and Mark Petersen

Levels of forage allowance associated with moderate stocking rates and weather conditions linked to thermal stress increased piñon-juniper (*Pinus* spp-*Juniperus* spp.) woodland habitat utilization by cows. However, excess forage in the light stocking rate treatment was associated with increased nighttime activity of cows, which appeared to have detrimental effects on the weaning weights of steer calves. Our results suggest that in rangeland environments, a cow's spatial behaviors are of consequence to its steer calf's weaning weights and could therefore affect the economics of rangeland-based cow-calf operations. Light stocking rates promoted less desirable foraging behavior patterns in cows, which apparently resulted in decreased productivity of their steer calves.

Grasshopper Responses to Fire and Postfire Grazing in the Northern Great Plains Vary Among Species

By David H. Branson and Lance T. Vermeire

Rangeland management practices, such as burning and grazing, may affect grasshopper populations. This study focuses on examining grasshopper responses to late-summer fire and post-fire grazing in mixed prairies. Fire reduced grasshopper density 36% to 53% across the study area, but the effects of burning plus grazing depended on the species of grasshopper. Late-summer fire appears to be a useful management tool to reduce populations of some grasshopper species in the northern Great Plains, while other species declined in response to food limitation by post-fire grazing.

Voices of Change: Narratives from Ranching Women of the Southwest US

By Hailey Wilmer and María E. Fernández-Giménez

The gendered contexts of ranch decision-making and rangeland management are not well understood. These researchers interviewed 19 ranching women in Arizona and New Mexico about the changes they experienced in ranching over their lifetimes. Their narrative analysis suggest that women are innovative managers who transfer cultural and technical ranching knowledge across generations, but who can face gendered barriers that may be especially challenging for aging ranch women. These findings suggest that ranchers' needs for decision-making support are gendered and dynamic throughout ranchers' life-stages. Women are active managers, advocates, leaders, and collaborators in all aspects of rangeland systems, and deserve attention from researchers, educators, and policy-makers.

Corrigendum to 'Temperature and precipitation affect steer weight gains differentially by stocking rate in northern mixed-grass prairie '.

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