Rangeland Ecology & Management, May 2015

HIGHLIGHTS

Managing Medusahead (*Taeniatherum caputmedusa*): A Meta-analysis of Control Effects and Assessment of Stakeholder Needs

Jeremy J. James, Elise S. Gornish, Joseph M. DiTomaso, Josh Davy, Morgan P. Doran, Theresa Becchetti, David Lile, Philip Brownsey, and Emilio A. Laca

We combined meta-analysis with stakeholder needs to evaluate control treatments on medusahead (*Taeniatherum caput-medusa*) and to identify key knowledge gaps. On rangeland dominated by perennial and annual vegetation, all treatments provided short-term control of medusahead, although treatment effects were highly short-lived on perennial rangeland. Stakeholders listed grazing as a preferred management tool. On annual rangeland, medusahead was reduced almost twofold by timing high stocking rates to when plants have limited capacity to produce new reproductive growth and yet are still palatable. Research that addresses the four stakeholder-identified information needs identified in this study may help overcome key ecologic and economic barriers to the management of medusahead.

Success of Seeding Native Compared with Introduced Perennial Vegetation for Revegetating Medusahead-invaded Sagebrush Rangeland

Kirk Davies, Chad Boyd, Dustin Johnson, Aleta Nafus, and Matt Madsen

Disagreement exists over whether introduced or native species should be seeded to revegetate medusahead-invaded (*Taeniatherum caput-medusa*) sagebrush rangeland. We compared seeding native and introduced perennial vegetation after medusahead control with prescribed burning and pre-emergent herbicide application at five sites. Native perennial vegetation generally failed to be established, and medusahead was the dominant vegetation by the third year following seeding. In contrast, introduced perennial vegetation established in high numbers and was limiting medusahead re-invasion. These results suggest that compared with seeding native perennial vegetation, seeding introduced perennial vegetation is more likely to successfully revegetate medusahead invaded sagebrush rangeland after medusahead control.

Anchor Chainings Influence on Soil Hydrology and Seeding Success in Burned Piþon-Juniper Woodlands

Matthew D. Madsen, Daniel L. Zvirzdin, Steven L. Petersen, Bryan G. Hopkins, and Bruce A. Roundy

Broadcast seeding in burned piñon-juniper (*Pinus* and *Juniperus* ssp.) woodlands can be limited by soil water repellency. We studied whether anchor chaining diminishes soil water repellency and enhances the establishment of seeded species. Anchor chaining improved soil hydrologic parameters at one of two sites and was associated with increased establishment of seeded species. In unchained areas, water repellency was severe, seeded species failed to establish, and the site was primarily dominated by invasive annuals. These results indicate that while anchor chaining may not always be successful, forgoing effective post-fire treatments in burned piñon-juniper woodlands greatly increases the risk of poor recovery.

Biologic Soil Crust Response to Late Season Prescribed Fire in a Great Basin Juniper Woodland

Steve Warren, Larry L. St. Clair, Jeffery R. Johansen, L. Scott Baggett, and Benjamin J. Bird

We studied the impact of late-season prescribed burning on the cover, biomass, species composition, and ecologic functioning of biologic soil crusts under an early-successional juniper (*Pinus* spp.) woodland in the Great Basin. Our fire was spotty and only adversely affected cyanobacteria, lichens, and mosses in some parts of the woodland. If the intent of burning is to reduce juniper, burning of early-seral juniper woodland is appropriate. Sagebrush (*Artemisia* spp.) can also be controlled by low-intensity, cool-season fires without eliminating the biologic soil crust. Intense fire should be avoided in order to retain areas with soil crust organisms that can recolonize the burned patches.

On-Ranch Grazing Strategies: Context for the Rotational Grazing Dilemma

L.M. Roche, B.B. Cutts, J.D. Derner, M.N. Lubell, and K.W. Tate

We analyzed the 765 responses by California and Wyoming ranchers to the grazing management questions in our survey. Two-thirds of respondents reported practicing on-ranch rotational grazing strategies, which indicates that ranchers do experience benefits from rotational grazing. However, limited on-ranch adoption of intensive rotational strategies (5% of respondents) indicates potential agreement between research and management perceptions about the success of this particular strategy in achieving livestock production goals. Over 93% of all rotational grazer respondents were characterized as using extensive intragrowing season rotation with moderate (few weeks to months) grazing period durations, moderate (2.4–8 hectares/animal unit) livestock densities, and rest periods in the growing season.

Long-Term Protection from Heavy Livestock Grazing Affects Ponderosa Pine Understory Composition and Functional Traits

Robert Strahan, Daniel Laughlin, Jonathan Bakker, and Margaret Moore

Characterizing plant community response to grazing uses such measurements as species composition, which is site specific, or functional groups and functional traits that can be generalized across different rangeland types. We analyzed long-term shifts in the understory community at five sites in a ponderosa pine (*Pinus ponderosa*) forest when protected from livestock grazing. Our results indicate that functional group composition responds more rapidly than species composition and species richness following protection from grazing. Managers can expect species with thick leaves, low leaf nitrogen concentration, and high leaf dry matter content to become more abundant in sites protected from heavy grazing.

Controls of Carrying Capacity: Degradation, Primary Production, and Forage Quality Effects in a Patagonian Steppe

Rodolfo Goluscio, Hugo Santiago Bottaro, and Martin Oesterheld

Grazers face heterogeneity in primary production, forage quality, and ecosystem degradation within a landscape. Their grazing behavior may influence rangeland sustainability. We measured the proportion of primary production eaten by sheep at a low stocking rate in a Patagonian steppe landscape, which was found to increase with primary production and degradation. We also calculated the proportion of primary production that could be eaten by sheep without undermining system sustainability, which was found to increase with primary production but decrease with degradation. This suggests that at stocking rates lower than carrying capacity, sheep choose highly productive, but degraded, stands.

Tidal Suppression Negatively Affects Soil Properties and Productivity of *Spartina densiflora* Salt Marsh

Elizabeth Juliana Jacobo, Adriana M. Rodriguez, Clara M. Farina, and Yanina Paggi

We evaluated the effect of tidal suppression by the embankment and cutting frequency of a *Spartina densiflora* salt marsh in Samborombon Bay, Argentina. We compared two paddocks of a commercial cow-calf operation, one prevented from tidal flooding and another exposed to the natural tidal pattern (control). Embankment reduced soil organic matter, nitrogen content, and aboveground net primary production but increased bare soil and structural instability. High defoliation increased aboveground net primary production and crude protein only in the control paddock. Embankment did not effectively increase productivity and forage value of *S. densiflora* saltmarsh but caused soil and structural changes that may negatively alter ecosystem processes.

Improving Cattle Nutrition on the Great Plains with Shrubs and Fecal Seeding of Fourwing Saltbush

S. L. Kronberg

Increasing the diversity of grassland vegetation with coldtolerant, palatable shrubs can improve forage quality for grazing livestock from late summer through winter. In vitro trials were conducted to estimate the percentage of fourwing saltbush (*Atriplex canescens*) or winterfat (*Krascheninnikovia lanata*) needed for improved dietary digestibility when cattle graze mature cool-season grass. We also determined the percentage of these shrubs' seeds that could survive passage through cattle for fecal seeding. Increasing the intake of these shrubs improved dietary digestibility in a linear manner. Increasing fourwing saltbush in western North America grasslands may be possible by feeding its seed to cattle and establishing new plants through cattle fecal seeding.

Drought Influences Control of Parasitic Flies of Cattle on Pastures Managed with Patch-Burn Grazing

John D. Scasta, David M. Engle, Justin L. Talley, John R. Weir, Samuel D. Fuhlendorf, and Diane Debinski

Horn flies, face flies, stable flies, and horse flies cause production losses and transmit diseases to cattle on rangeland, and therefore landscape-scale control strategies are needed. We compared patch-burn grazing with traditional range management practices with regard to the abundance of these fly parasites of cattle in Oklahoma and Iowa. Horn flies and face flies were only reduced with patch-burn grazing in Iowa. No other fly species were reduced in Iowa. Potential reductions in Oklahoma were constrained by drought. Patch-burn grazing may alter fly parasite habitat and biology but may not effectively reduce populations every year in all locations.

Alternative Rangeland Management and the Nesting Ecology of Greater Prairie-Chickens

Lance McNew, Virginia Winder, James Pitman, and Brett Sandercock

Population declines of greater prairie-chickens (*Tympanuchus cupido*) have been attributed to intensive rangeland management

practices. We compared nest-site selection and nest survival of greater prairie-chickens on rangelands managed with patch-burn grazing or more common intensive fire and grazing in the Flint Hills of Kansas. Nest-site selection and nest survival of prairie-chickens were directly related to vertical nesting cover, which was determined by the fire return interval of a pasture. Nesting habitat was unaffected by stocking rate under patch-burn grazing management because the preferred nest sites were unburned patches not selected by cattle. Patch-burn grazing is an economically viable alternative management strategy that improves the nesting habitat for prairie-chickens.

Rangelands 37(3):135–137 doi: 10.1016/j.rala.2015.04.001