By Jeff Mosley

Browsing the Literature

This section reviews new publications available about the art and science of rangeland management. Personal copies of these publications can be obtained by contacting the respective publishers or senior authors (addresses shown in parentheses). Suggestions are welcomed and encouraged for items to include in future issues of *Browsing the Literature*. Contact Jeff Mosley, jmosley@montana.edu.

Animal Ecology

Cedar infestation impacts avian communities along the Niobrara River valley, Nebraska. J. S. Frost and L. A. Powell. 2011. *Restoration Ecology* 19:529–536. (L. Powell, School of Natural Resources, Univ of Nebraska, Lincoln, NE 68583, USA.) Ovenbirds and red-eyed vireos were favored by eastern redcedar encroachment, whereas house wrens were disfavored. Species richness of songbirds was greatest in open and mixed habitat patches.

Effects of large-scale removal of coyotes on pronghorn and mule deer productivity and abundance. D. E. Brown and M. R. Conover. 2011. *Journal of Wildlife Management* 75:876–882. (Dept of Wildland Resources, Utah State Univ, Logan, UT 84322, USA.) "Our results suggest that coyote removal conducted over large areas increases fawn survival and abundance of pronghorn but not mule deer."

Response of rodents to wildfire and livestock grazing in an Arizona desert grassland. C. E. Bock, Z. F. Jones, L. J. Kennedy, and J. H. Bock. 2011. *American Midland Naturalist* 166:126–138. (Univ of Colorado, Boulder, CO 80309, USA.) Reductions in grass cover from livestock grazing and fire favored pocket mice and disfavored pygmy mice, harvest mice, and cotton rats.

The importance of within-year repeated counts and the influence of scale on long-term monitoring of sage-grouse. B. C. Fedy and C. L. Aldridge. 2011. *Journal of Wildlife Management* 75:1022–1033. (Natural Resource Ecology Laboratory, Colorado State Univ, Fort Collins, CO 80526, USA.) "Most sage-grouse declines in Wyoming occurred between 1965 and the 1990s and lek count numbers generally increased from the mid-1990s to 2008."

Grazing Management

Effect of grazing on soil-water content in semiarid rangelands of southeast Idaho. K. T. Weber and B. S. Gokhale. 2011. *Journal of Arid Environments* 75:464–470. (GIS Training and Research Center, Idaho State Univ, Pocatello, ID 83209, USA.) In sagebrush-steppe, litter and soil-water content were greater with short-duration grazing than either rest-rotation grazing or cattle exclusion.

Grazing management impacts on vegetation, soil biota and soil chemical, physical and hydrological properties in tall grass prairie. W. R. Teague, S. L. Dowhower, S. A. Baker, N. Haile, P. B. DeLaune, and D. M. Conover. 2011. *Agriculture Ecosystems and Environment* 141:310–322. (Texas AgriLife Research, 11708 Highway 70 South, Vernon, TX 76384, USA.) In northern Texas, short-duration grazing systems at a high stocking rate had more late seral vegetation and more soil organic matter than either light continuous grazing or heavy continuous grazing. Bare ground and sediment loss were greatest with heavy continuous grazing but did not differ between short-duration grazing and light continuous grazing.

Percent spotted knapweed (*Centaurea stoebe*) in the diets of grazing sheep. L. M. M. Surber, M. E. Rude, B. L. Roeder, T. K. Mosley, A. V. Grove, J. W. Walker, and R. W. Kott. 2011. *Invasive Plant Science and Management* 4:95–101. (R. Kott, Dept of Animal and Range Sciences, Montana State Univ, Bozeman, MT 59717, USA.) The most appropriate time to apply targeted sheep grazing for controlling spotted knapweed is in late summer, when spotted knapweed is flowering.

Hydrology/Riparian

Ecosystem response to removal of exotic riparian shrubs and a transition to upland vegetation. L. V. Reynolds and D. J. Cooper. 2011. *Plant Ecology* 212:1243–1261. (Dept of Forest, Rangeland and Watershed Stewardship, Colorado State Univ, Fort Collins, CO 80523, USA.) Russian olive removal in northeastern Arizona increased native plant cover after 2 years but did not increase groundwater levels.

Finding solutions for bird restoration and livestock management: comparing grazing exclusion levels. K. S. Nelson, E. M. Gray, and J. R. Evans. 2011. *Ecological Applications* 21:547–554. (The Nature Conservancy, 1917 First Ave, Seattle, WA 98101, USA.) In central California, riparian habitat recovered and native bird populations increased, but responses occurred faster with no grazing vs. winter cattle grazing.

Grazing management effects on sediment, phosphorus, and pathogen loading of streams in cool-season grass pastures. K. A. Schwarte, J. R. Russell, J. L. Kovar, D. G. Morrical, S. M. Ensley, K. J. Yoon, N. A. Cornick, and Y. I. Cho. 2011. *Journal of Environmental Quality* 40:1303–1313. (J. Russell, Dept of Animal Science, Iowa State Univ, Ames, IA 50011, USA.) Streambank erosion was the greatest contributor of sediment and phosphorus to the stream in central Iowa; contributions from surface runoff and cattle were much less and minimized by grazing management practices that reduced congregation of cattle near the stream. Fecal pathogen loading was almost zero.

Invasive sweetclover (*Melilotus alba*) impacts native seedling recruitment along floodplains of interior Alaska. B. T. Spellman and T. L. Wurtz. 2011. *Biological Invasions* 13:1779–1790. (School of Natural Resources and Agricultural Sciences, Univ of Alaska, Fairbanks, AK 99709, USA.) Sweetclover canopy decreases the amount of light available to native plant seedlings, causing greater seedling mortality.

Plant Ecology

Broom snakeweed (*Gutierrezia sarothrae*): toxicology, ecology, control, and management. M. H. Ralphs and K. C. McDaniel. 2011. *Invasive Plant Science and Management* 4:125–132. (USDA-ARS, Poisonous Plant Research Laboratory, 1150 East 1400 North, Logan, UT 84341, USA.) Article synthesizes current knowledge about broom snakeweed, a native half-shrub weed that is widely distributed across rangelands of western North America.

Does browsing reduce shrub survival and vigor following summer fires? T. E. Fulbright, E. C. Dacy, and D. L. Drawe. 2011. *Acta Oecologica* 37:10–15. (Caesar Kleberg Wildlife Research Institute, Texas A&M Univ–Kingsville, Kingsville, TX 78363, USA.) Browsing by white-tailed deer after fire did not increase mortality or reduce vigor of shrubs in thornscrub communities of southern Texas.

Long-term impacts of invasive grasses and subsequent fire in seasonally dry Hawaiian woodlands. C. M. D'Antonio, R. F. Hughes, and J. T. Tunison. 2011. *Ecological Applications* 21:1617–1628. (Environmental Studies Program, Univ of California Santa Barbara, Santa Barbara, CA 93106, USA.) "…despite decades of fire suppression, native species show little recovery in burned Hawaiian woodlands. Thus, burned sites appear to be beyond a threshold for 'natural recovery'…."

Protection from livestock fails to deter shrub proliferation in a desert landscape with a history of heavy grazing. D. M. Browning and S. R. Archer. 2011. *Ecological Applications* 21:1629–1642. (USDA-ARS, Jornada Experimental Range, PO Box 30003, MSC 3JER, New Mexico State Univ, Las Cruces, NM 88003, USA.) During the 74-year period from 1932 to 2006, protection from livestock grazing did not deter velvet mesquite encroachment in southeastern Arizona, but actually promoted it relative to grazed areas. Results suggest that thresholds for grassland resistance to shrub encroachment had been crossed by the 1930s, and fire management rather than grazing management may be key to restoring and sustaining these desert grasslands.

Rehabilitation/Restoration

Control of orange hawkweed (*Hieracium aurantiacum*) in southern Alaska. S. S. Seefeldt and J. S. Conn. 2011. *Invasive Plant Science and Management* 4:87–94. (USDA-ARS, Subarctic Agricultural Research Unit, Univ of Alaska, Fairbanks, AK 99775, USA.) In areas where grasses are

preferred to forbs and shrubs, aminopyralid herbicide has an advantage because it controls a broader array of forbs than clopyralid. In areas where biodiversity of forbs mixed with willows and grasses is preferred, clopyralid is the better choice.

Effects of sagebrush treatments on multi-scale resource selection by pygmy rabbits. T. L. Wilson, F. P. Howe, and T. C. Edwards, Jr. 2011. *Journal of Wildlife Management* 75:393–398. (Department of Wildland Resources, Utah State Univ, Logan, UT 84322, USA.) Large no-treatment buffers around active pygmy rabbit burrows are not necessary when sagebrush is thinned with a Lawson aerator.

Forage kochia (*Kochia prostrate*) increases nutritional value, carrying capacity, and livestock performance on semiarid rangelands. B. L. Waldron, L. K. Greenhalgh, D. R. ZoBell, K. C. Olson, B. W. Davenport, and M. D. Palmer. 2011. *Forage and Grazinglands* doi:10.194/FG-2011-0301-01-RS. (USDA-ARS, Forage and Range Research Laboratory, 695 North 1100 East, Logan, UT 84322, USA.) Forage production was six-fold greater on Utah rangeland where forage kochia was seeded into degraded crested wheatgrass stands.

Forage yield of grass–alfalfa and grass–forage kochia mixtures on semiarid rangelands. M. D. Peel, K. B. Jensen, B. L. Waldron, and J. G. Robins. 2011. *Forage and Grazinglands* doi:10.1094/FG-2011-0516-01-RS. (USDA-ARS, Forage and Range Research Laboratory, 695 North 1100 East, Logan, UT 84322, USA.) Forage yield increased 94–200% where forage kochia was planted into monocultures of Siberian wheatgrass and Altai wildrye.

Growth inhibition of Dalmatian toadflax, *Linaria dalmatica* (L.) Miller, in response to herbivory by the biological control agent *Mecinus janthinus* Germar. M. Schat, S. E. Sing, R. K. D. Peterson, F. D. Menalled, and D. K. Weaver. 2011. *Journal of Entomological Science* 46:232–246. (R. Peterson, Dept of Land Resources and Environmental Sciences, Montana State Univ, Bozeman, MT 59717, USA.) Dalmatian toadflax growth was decreased when more than five stem-mining weevils were present per stem of Dalmatian toadflax.

Native and exotic grass competition with invasive hoary cress (*Cardaria draba*). K. P. Puliafico, M. Schwarzlander, W. J. Price, B. L. Harmon, and H. L. Hinz. 2011. *Invasive Plant Science and Management* 4:38–49. (Dept of Plant, Soil and Entomological Sciences, Univ of Idaho, Moscow, ID 83844, USA.) "Based on our results, we recommend the use of [bluegrass] species for restoration of riparian and disturbed sites following the control of hoary cress infestations to restrict recolonization."

Population dynamics and impacts of the red-headed leafy spurge stem borer on leafy spurge (*Euphorbia esula*). R. A. Progar, G. Markin, J. Milan, T. Barbouletos, and M. J. Rinella. 2011. *Invasive Plant Science and Management* 4:183–188. (US Forest Service, Pacific Northwest Research Station, 1401 Gekeler Lane, La Grande, OR 97850, USA.) "Red-headed leafy spurge stem borer did not demonstrably reduce leafy spurge biomass in our study."

Rehabilitating downy brome (*Bromus tectorum*)–invaded shrublands using imazapic and seeding with native shrubs. S. M. Owen, C. H. Sieg, and C. A. Gehring. 2011. *Invasive Plant Science and Management* 4:223–233. (US Forest Service, Rocky Mountain Research Station, 2500 South Pine Knoll Drive, Flagstaff, AZ 86001, USA.) Efforts to increase shrub density by seeding Wyoming big sagebrush and Mexican cliffrose, or shrub seeding in combination with imazapic herbicide application, were unsuccessful. Imazapic reduced cheatgrass cover by 20% and nontarget forb cover by 25%.

Soils

Interactive effects of grazing and burning on wind- and water-driven sediment fluxes: rangeland management implications. J. P. Field, D. D. Breshears, J. J. Whicker, and C. B. Zou. 2011. *Ecological Applications* 21:22–32. (School of Natural Resources and the Environment, Univ of Arizona, Tucson, AZ 85721, USA.) On the Santa Rita Experimental Range in southern Arizona, cattle grazing alone did not affect sediment transport, but wind-driven and water-driven soil erosion were increased by prescribed burning and prescribed burning followed by cattle grazing.

Soil nutrient losses in an altered ecosystem are associated with native ungulate grazing. T. M. Gass and D. Binkley. 2011. *Journal of Applied Ecology* 48:952–960. (Dept of Ecosystem Science and Sustainability, Colorado State Univ, Fort Collins, CO 80523, USA.) Intensive grazing by Rocky Mountain elk in Rocky Mountain National Park was correlated with drier, compacted soils that contained less soil carbon and nitrogen.

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