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

Associations among breeding birds and Gambel oak in southwestern ponderosa pine forests. S. Jentsch, R. W. Mannan, B. G. Dickson, and W. M. Block. 2008. *Journal of Wildlife Management* 72:994–1000. (School of Natural Resources, Univ of Arizona, Tucson, AZ 85721, USA). In ponderosa pine–Gambel oak forests of northern Arizona and western New Mexico, Virginia's warblers, black-headed grosbeaks, and red-faced warblers were favored by pole-sized Gambel oak trees, whereas yellow-rumped warblers were favored by large Gambel oak trees.

Evaluation of electric fencing to inhibit feral pig movements. M. M. Reidy, T. A. Campbell, and D. G. Hewitt. 2008. *Journal of Wildlife Management* 72:1012–1018. (Caesar Kleberg Wildlife Research Institute, Texas A&M Univ, Kingsville, TX 78363, USA). No electric fence design tested was 100% pig-proof, but a 2-strand electric wire fence reduced pig use by 49% on southern Texas rangeland.

Factors influencing nest success of greater sandhill cranes at Malheur National Wildlife Refuge, Oregon. G. L. Ivey and B. D. Dugger. 2008. *Waterbirds* 31:52–61. (International Crane Foundation, 1350 SE Minam Ave, Bend, OR 97731, USA). Livestock grazing, haying, and predator control did not influence nest success of sandhill cranes in southeastern Oregon.

Occupancy of mountain plover and burrowing owl in Colorado. H. C. Tipton, V. J. Dreitz, and P. F. Doherty, Jr. 2008. *Journal of Wildlife Management* 72:1001–1006. (US Fish and Wildlife Service, 1339 20th St, Vero Beach, FL 32960, USA). Burrowing owls and mountain plovers in eastern Colorado were favored by active prairie dog colonies.

Recolonizing wolves and mesopredator suppression of coyotes: impacts on pronghorn population dynamics. K. M. Berger and M. M. Conner. 2008. *Ecological Applications* 18:599–612. (Wildlife Conservation Society, 205 Natural Science Building, Univ of Montana, Missoula, MT 59812, USA). Increased wolf numbers cause coyote numbers to decline, thereby reducing coyote predation of pronghorns and allowing pronghorn populations to increase.

Winter and early spring bird communities in grasslands, shrubsteppe, and juniper woodlands in central Oregon. D. P. Reinkensmeyer, R. E. Miller, R. G. Anthony, V. E.

Marr, and C. M. Duncan. 2008. *Western North American Naturalist* 68:25–35. (Eastern Oregon Agricultural Research Center, 67826-A Hwy 205, Burns, OR 97720, USA). Different species of birds are favored by different plant successional stages in central Oregon juniper rangelands. A broad range of successional stages should be maintained on the landscape to maximize bird species diversity throughout the year.

Grazing Management

Biogeochemical and ecological impacts of livestock grazing in semi-arid southeastern Utah, USA. D. P. Fernandez, J. C. Neff, and R. L. Reynolds. 2008. *Journal of Arid Environments* 72:777–791. (Institute of Arctic and Alpine Research, Univ of Colorado, Boulder, CO 80309, USA). Areas grazed by domestic livestock had 20% less plant cover and 100% less soil organic carbon and nitrogen compared with relict sites.

Comparison of low-moisture blocks and salt for manipulating grazing patterns of beef cows. D. W. Bailey, H. C. Van Wagoner, R. Weinmeister, and D. Jensen. 2008. *Journal of Animal Science* 86:1271–1277. (Dept of Animal and Range Sciences, New Mexico State Univ, Las Cruces, NM 88003, USA). On northern Montana rangeland, cows supplemented with salt and low-moisture blocks grazed higher elevations and further from water than cows supplemented with salt alone.

Effects of normal and altered cattle urine on short-term greenhouse gas flux from mixed-grass prairie in the northern Great Plains. M. A. Liebig, S. L. Kronberg, and J. R. Gross. 2008. *Agriculture Ecosystems and Environment* 125:57–64. (USDA-ARS, Northern Great Plains Research Lab, PO Box 459, Mandan, ND 58554, USA). Supplementing cattle with condensed quebracho tannin did not decrease greenhouse gas emissions from cattle grazing on mixed-grass prairie in west-central North Dakota.

Multi-scale responses of vegetation to removal of horse grazing from Great Basin (USA) mountain ranges. E. A. Beever, R. J. Tausch, and W. E. Thogmartin. 2008. *Plant Ecology* 196:163–184. (US Geological Survey, Alaska Science Center, 4210 University Dr, Anchorage, AK 99508, USA). Grazing by feral horses decreased the frequency and canopy cover of grasses on sagebrush rangelands.

Vegetation response to seven grazing treatments in the northern Great Plains. L. T. Vermeire, R. K. Heitschmidt, and M. R. Haferkamp. 2008. *Agriculture Ecosystems and Environment* 125:111–119. (USDA-ARS, Fort Keogh Livestock and Range Research Lab, Miles City, MT 59301, USA). After 6 yr of moderately stocked cattle-grazing on southeastern Montana rangeland, vegetation did not differ among various rotational grazing systems and season-long grazing.

Hydrology/Riparian

First-year responses of cheatgrass following *Tamarix* spp. control and restoration-related disturbances. A. A. Sher, S. Gieck, C. S. Brown, and S. J. Nissen. 2008. *Restoration Ecology* 16:129–135. (Dept of Biological Science, Univ of Denver, Denver, CO 80208, USA). Aerial application of imazapyr herbicide for saltcedar control killed nearly all understory plants, including cheatgrass.

Rethinking avian response to Tamarix on the lower Colorado River: a threshold hypothesis. C. van Riper III, K. L. Paxton, C. O'Brien, P. B. Shafroth, and L. J. McGrath. 2008. *Restoration Ecology* 16:155–167. (US Geological Survey, 125 Biological Sciences East, Univ of Arizona, Tucson, AZ 85721, USA). For many bird species, abundance was highest at intermediate levels of saltcedar. Replacing 20–40% of a saltcedar monoculture with native vegetation may be more cost-effective and feasible than attempting to replace all saltcedar with native vegetation.

Measurements

Image-based monitoring to measure ecological change in rangeland. D. T. Booth and S. E. Cox. 2008. *Frontiers in Ecology and the Environment* 6:185–190. (USDA-ARS, High Plains Grasslands Research Station, 8408 Hildreth Rd, Cheyenne, WY 82009, USA). Concludes that aerial imagery using SamplePoint software is the most cost-effective way to detect changes in ground cover on rangeland areas larger than 500 acres.

Monitoring Idaho fescue grasslands in the Big Horn Mountains, Wyoming, with a modified Robel pole. D. W. Uresk and T. A. Juntti. 2008. *Western North American Naturalist* 68:1–7. (US Forest Service, Rocky Mountain Research Station, 1730 Samco Rd, Rapid City, SD 57702, USA). Presents validated regression equations for relating visual obstruction readings from a Robel pole to standing herbage in mountain grasslands.

Plant–Animal Interactions

Apparent competition with an exotic plant reduces native plant establishment. J. L. Orrock, M. S. Witter, and O. J. Reichman. 2008. *Ecology* 89:1168–1174. (Dept of Biology, Washington Univ, St. Louis, MO 63130, USA). In a California annual grassland, the presence of the exotic plant black mustard causes native small mammals to more heavily graze the native bunchgrass purple needlegrass, thus inhibiting purple needlegrass establishment.

Plant Ecology

Beargrass (*Xerophyllum tenax*) on the Olympic Peninsula, Washington: autecology and population status. D. J. Shebitz, S. H. Reichard, and W. Woubneh. 2008. *Northwest Science* 82:128–140. (Dept of Biology, Kean Univ, Union, NJ 07083, USA). In the Olympic National Forest, the

native perennial forb beargrass declined in abundance over the past 17 yr, perhaps due to harvesting for the floral industry and an increase in tree canopy due to the absence of fire.

Impact and management of crested wheatgrass (*Agropyron cristatum*) in the northern Great Plains. B. M. Vaness and S. D. Wilson. 2007. *Canadian Journal of Plant Science* 87:1023–1028. (Dept of Biology, Univ of Regina, Regina, SK S4S 0A2, Canada). This paper reviews the effects of crested wheatgrass when it invades native prairie. Livestock grazing and herbicide treatments can be used to control invasive crested wheatgrass.

Linking nitrogen partitioning and species abundance to invasion resistance in the Great Basin. J. J. James, K. W. Davies, R. L. Sheley, and Z. T. Aanderud. 2008. *Oecologia* 156:637–648. (USDA-ARS, Eastern Oregon Agricultural Research Center, 67826-A Hwy 205, Burns, OR 97720, USA). Native bunchgrasses (i.e., bluebunch wheatgrass, bottlebrush squirreltail, and Sandberg bluegrass) inhibited establishment of medusahead, whereas native forbs did not.

Responses of a California annual grassland to litter manipulation. K. L. Amatangelo, J. S. Dukes, and C. B. Field. 2008. *Journal of Vegetation Science* 19:605–612. (Dept of Biological Science, Stanford Univ, Stanford, CA 94305, USA). Increased amounts of litter decreased grass germination and establishment, but increased litter did not affect forb seedlings.

The sensitivity of annual grassland carbon cycling to the quantity and timing of rainfall. W. W. Chou, W. L. Silver, R. D. Jackson, A. W. Thompson, and B. Allen-Diaz. 2008. *Global Change Biology* 14:1382–1394. (Dept of Environmental Science, Policy and Management, Univ of California, Berkeley, CA 94720, USA). Carbon cycling in California annual grasslands will be more influenced by changes in rainfall timing than rainfall quantity. A longer or later wet season will result in large losses of soil carbon.

Rehabilitation/Restoration

Fast-growing trees for cogongrass (*Imperata cylindrical*) suppression and enhanced colonization of understory plant species on a phosphate-mine clay settling area. B. Tamang, D. L. Rockwood, M. Langholtz, E. Maehr, B. Becker, and S. Segrest. 2008. *Ecological Engineering* 32:329–336. (School of Forest Resources and Conservation, Univ of Florida, PO Box 110410, Gainesville, FL 32611, USA). Planting cottonwood or eucalyptus trees can suppress the invasive cogongrass in central Florida.

Using fire and herbicide to control *Lygodium microphyllum* and effects on a pine flatwoods plant community in South Florida. R. K. Stocker, R. E. Miller, D. W. Black, A. P. Ferriter, and D. D. Thayer. 2008. *Natural Areas Journal* 28:144–154. (Center for Aquatic and Invasive Plants, Univ of Florida, PO Box 110500, Gainesville, FL 32611, USA). Biannual herbicide treatments alone or combined with prescribed fire suppressed the nonnative invasive Old World climbing fern, but frequent retreatment is necessary.

Soils

Carbon accumulation and storage in semi-arid sagebrush steppe: effects of long-term grazing exclusion. G. Shrestha and P. D. Stahl. 2008. *Agriculture Ecosystems and Environment* 125:173–181. (Univ of California, PO Box 2039, Merced, CA 95344, USA). Soil organic carbon inside and outside of 40-yr livestock grazing exclosures did not differ in three of four sites in sagebrush steppe of Wyoming.

Soil sulfur amendments suppress selenium uptake by alfalfa and western wheatgrass. C. L. Mackowiak and M. C. Amacher. 2008. *Journal of Environmental Quality* 37:772–779. (North Florida Research and Education Center, Univ of Florida, 155 Research Dr, Quincy, FL 32351, USA). In southeastern Idaho, sulfur applied as either elemental S or gypsum at 893 pounds · acre^{-1} suppressed selenium uptake by 60% in alfalfa and western wheatgrass, thereby decreasing the risk of selenium forage toxicity to livestock and wildlife.

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