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

Achieving better estimates of greater sage-grouse chick survival in Utah. D. K. Dahlgren, T. A. Messmer, and D. N. Koons. 2010. *Journal of Wildlife Management* 74:1286-1294. (Dept of Wildland Resources, Utah State Univ, Logan, UT 84322, USA). "… Arthropod abundance may be an important driver of chick survival, particularly during the early brood-rearing period and, therefore, sage-grouse populations may benefit from a management strategy that attempts to increase arthropod abundance via brood habitat management."

Disturbance of lekking lesser prairie-chickens (*Tympanuchus pallidicinctus*) by ring-necked pheasants (*Phasianus colchicus*). R. D. Holt, M. J. Butler, W. B. Ballard, C. A. Kukal, and H. Whitlaw. 2010. *Western North American Naturalist* 70:241–244. (Dept of Natural Resources Management, Texas Tech Univ, Lubbock, TX 79409, USA). Authors documented disturbance of lekking lesser prairie-chickens by ring-necked pheasants. Interspecific competition by pheasants, in addition to conversion of rangeland to cropland and excessive livestock grazing, is another possible cause for the dramatic decline in lesser prairie-chicken populations following Euro-American settlement of the Great Plains.

Does feeding area restriction inhibit social learning of toxic weed ingestion in cattle? K. T. Jackson, A. F. Cibils, W. R. Gould, J. D. Graham, and C. D. Allison. 2010. *Animal* 4:1577–1587. (Dept of Animal and Range Sciences, New Mexico State Univ, Las Cruces, NM 88003, USA). Yearling heifers that previously avoided eating white locoweed began eating the toxic plant species when they were grouped together with other heifers that readily consumed it.

Landscape-level assessment of brood rearing habitat for greater sage-grouse in Nevada. M. T. Atamian, J. S. Sedinger, J. S. Heaton, and E. J. Blomberg. 2010. *Journal of Wildlife Management* 74:1533–1543. (Washington Dept of Fish and Wildlife, 2315 North Discovery Place, Spokane, WA 99216, USA). Higher-elevation, moist sites with riparian shrubs or montane sagebrush were highly preferred by greater sage-grouse during late brood rearing in east-central Nevada.

Grazing Management

Climate change and cattle nutritional stress. J. M. Craine, A. J. Elmore, K. C. Olson, and D. Tolleson. 2010. *Global Change Biology* 16:2901–2911. (Division of Biology, Kansas

State Univ, Manhattan, KS 66506, USA). Climate change that brings increasing temperatures and declining precipitation will result in increased nutritional stress for grazing livestock that will require increased supplemental feeds to maintain livestock growth at current rates.

Relative cattle preference of 24 forage kochia (*Kochia prostrata*) entries and its relation to forage nutritive value and morphological characteristics. B. L. Waldron, B. W. Davenport, J. C. Malechek, and K. B. Jensen. 2010. *Crop Science* 50:2112–2123. (USDA-ARS, 696 North 1100 East, Logan, UT 84322, USA). "…Forage kochia is a palatable shrub for grazing during the fall, with preference and utilization of some entries being comparable to alfalfa and greater than winterfat."

Shining light on manure improves livestock and land management. J. Walker and D. Tolleson, eds. 2010. Texas AgriLife Research and Society for Range Management Technical Bulletin SANG-2010-0250; 95 p. (Texas AgriLife Research, 7887 US Highway 87 North, San Angelo, TX 76901, USA). This bulletin summarizes the historical development and current state of the science of fecal near-infrared reflectance spectroscopy technology to estimate the nutrient content of grazing animal diets.

The potential role of annual forage legumes in Canada: a review. D. McCartney and J. Fraser. 2010. *Canadian Journal of Plant Science* 90:403–420. (Lacombe Research Centre, Agriculture and Agri-Food Canada, 6000 C&E Trail, Lacombe, AB T4L 1W1, Canada). Annual legumes can be used in crop and pasture rotations as forages and green manure crops to improve soil fertility, control soil erosion, and suppress weeds, but high production costs and scarcity of seed limit their current use.

Hydrology/Riparian

Changes in soil chloride following shrub removal and subsequent regrowth. G. W. Moore, D. A. Barre, and M. K. Owens. 2010. *Geoderma* 158:148–155. (Dept of Ecosystem Science and Management, Texas A&M Univ, College Station, TX 77843, USA). Groundwater recharge was enhanced within the first 5 years after honey mesquite control in Texas. Grass growth peaked 5 years after mesquite control.

Plant–Animal Interactions

Insect assemblages change along a gradient of invasion by a nonnative grass. A. R. Litt and R. J. Steidl. 2010. *Biological Invasions* 12:3449–3463. (Caesar Kleberg Wildlife Research Institute, Texas A&M Univ, Kingsville, TX 78363, USA). In grasslands of southeastern Arizona, insect abundance decreased 14% with every 892–pound per acre increase in biomass of Lehmann lovegrass.

Plant Ecology

Native perennial forb variation between mountain big sagebrush and Wyoming big sagebrush plant communities. K. W. Davies and J. D. Bates. 2010. *Environmental Management* 46:452–458. (USDA-ARS, 67826-A Highway 205, Burns, OR 97720, USA). Mountain big sagebrush plant communities had greater native perennial forb diversity and produced more than four times as much native perennial forb biomass as Wyoming big sagebrush plant communities.

Persistence and expansion of ponderosa pine woodlands in the west-central Great Plains during the past two centuries. M. W. Kaye, C. A. Woodhouse, and S. T. Jackson. 2010. *Journal of Biogeography* 37:1668–1683. (School of Forest Resources, Penn State Univ, University Park, PA 16802, USA). Tree ring analyses documented that ponderosa pine established in all but one decade (1770s) from 1750 to 2000. Establishment was low from 1940 to 1960, but very high from 1980 to 2000.

Reconciling contradictory findings of herbivore impacts on spotted knapweed (*Centaurea stoebe*) growth and reproduction. D. G. Knochel and T. R. Seastedt. 2010. *Ecological Applications* 20:1903–1912. (Dept of Ecology and Evolutionary Biology, Univ of Colorado, Boulder, CO 80309, USA). Results refute earlier studies that suggested herbivory by biological control insects increased spotted knapweed dominance. A seed feeder (*Larinus minutus*) and a root feeder (*Cyphocleonus achates*) reduced seed production of spotted knapweed.

Rehabilitation/Restoration

Dominant grasses suppress local diversity in restored tallgrass prairie. K. N. S. McCain, S. G. Baer, J. M. Blair, and G. W. T. Wilson. 2010. *Restoration Ecology* 18(Suppl. 1):40–49. (Missouri Dept of Conservation, 3815 East Jackson Blvd, Jackson, MO 63755, USA). Selective removal of 100% of big bluestem tillers increased light availability and allowed seeded forb species to establish.

Ecological effects of prescribed fire season: a literature review and synthesis for managers. E. E. Knapp, B. L. Estes, and C. N. Skinner. 2009. USDA Forest Service General Technical Report PSW-GTR-224; 80 p. (Publications Distribution, Pacific Southwest Research Station, 240 West Prospect Rd, Fort Collins, CO 80526, USA). This bulletin summarizes the ecological effects of different seasons of prescribed burning in several regions across the continental United States.

Impacts of the introduced biocontrol agent, *Rhinocyllus conicus* (Coleoptera: Curculionidae), on the seed production and population dynamics of *Cirsium ownbeyi* (Asteraceae),

a rare, native thistle. M. E. DePrenger-Levin, T. A. Grant, III, and C. Dawson. 2010. *Biological Control* 55:79–84. (Denver Botanic Gardens, 1007 York St, Denver, CO 80206, USA). Despite inflicting consistent damage for 8 years, a small population of the flowerhead weevil released to suppress musk thistle did not decrease the population of Ownbey's thistle, a rare native thistle found in northwestern Colorado, northeastern Utah, and southwestern Wyoming.

Loss of foundation species increases population growth of exotic forbs in sagebrush steppe. J. S. Prevey, M. J. Germino, and N. J. Huntly. 2010. *Ecological Applications* 20:1890–1902. (M. Germino, Dept of Biological Sciences, Idaho State Univ, Pocatello, ID 83209, USA). Sagebrush removal in southern Idaho benefited growth of salsify and wild lettuce, two species of forbs that are preferred forage plants for sage-grouse.

Non-native competitive perennial grass impedes the spread of an invasive annual grass. K. W. Davies, A. M. Nafus, and R. L. Sheley. 2010. *Biological Invasions* 12:3187–3194. (USDA-ARS, 67826-A Highway 205, Burns, OR 97720, USA). Desert wheatgrass seedings impeded the advancement of medusahead infestations. The establishment of competitive vegetation around invasive plant infestations may be an effective way to limit the spread of invasive plants.

Prescribed burning to affect a state transition in a shrub-encroached desert grassland. K. M. Havstad and D. James. 2010. *Journal of Arid Environments* 74:1324–1328. (USDA-ARS, Box 30003, MSC 3JER, Las Cruces, NM 88003, USA). A single prescribed burn followed by livestock exclusion did not restore black grama grassland that had been encroached by honey mesquite.

Restoration of C-4 grasses with seasonal fires in a C-3/C-4 grassland invaded by *Prosopis glandulosa*, a fire-resistant shrub. R. J. Ansley, T. W. Boutton, M. Mirik, M. J. Castellano, and B. A. Kramp. 2010. *Applied Vegetation Science* 13:520–530. (Texas AgriLife Research, 11708 Highway 70 South, Vernon, TX 76384, USA). Prescribed fires in summer, rather than only in winter, were necessary to shift herbaceous composition toward C-4 midgrasses, but repeated summer fires (two fires in 3 years) were too extreme and favored less-productive C-4 shortgrasses rather than C-4 midgrasses.

Socioeconomics

Biofuels: efficiency, ethics, and limits to human appropriation of ecosystem services. T. Gomiero, M. G. Paoletti, and D. Pimentel. 2010. *Journal of Agricultural and Environmental Ethics* 23:403–434. (D. Pimentel, College of Agriculture and Life Sciences, Cornell Univ, Ithaca, NY 14853, USA). Authors warn that large-scale conversion of croplands, rangelands, and pastures to cellulosic ethanol production may have serious detrimental social and ecological consequences.

Quantifying economic impacts of large-carnivore depredation on bovine calves. A. P. Sommers, C. C. Price, C. D. Urbigkit, and E. M. Peterson. 2010. *Journal of Wildlife Management* 74:1425–1434. (Upper Green River Cattle Association, PO Box 266, Pinedale, WY 82941, USA). Based on 14 years of data from western Wyoming, equitable reimbursement of cattle owners for cattle depredation losses to grizzly bears requires a compensation rate of 3.8:1, whereas cattle depredation losses to wolves require a compensation rate of 6.3:1.

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