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

Association of habitat characteristics with winter survival of a declining grassland bird in Chihuahuan Desert grasslands of Mexico. A. Macias-Duarte and A. O. Panjabi. 2013. *Auk* 130:141–149. (A. Punjabi, Rocky Mountain Bird Observatory, 230 Cherry St, Suite 150, Fort Collins, CO 80521, USA). Vesper sparrows survived winter best where grasses were at least 8 inches tall and relatively sparse, shrubs were at least 3 feet tall, and forbs were abundant.

Landscape-scale factors affecting feral horse habitat use during summer within the Rocky Mountain foothills. T. L. Girard, E. W. Bork, S. E. Neilsen, and M. J. Alexander. 2013. *Environmental Management* 51:435–447. (E. Bork, Dept of Agricultural, Food and Nutrition Science, Univ of Alberta, Edmonton, AB T6G 2P5, Canada). Feral horses in southwestern Alberta preferred areas close to water, with less-rugged topography, and far from forests, primary roads, and trails used by recreationists. Feral horses and cattle used the same habitat during summer.

Grazing Management

Carbon dioxide efflux from long-term grazing management systems in a semiarid region. M. A. Liebig, S. L. Kronberg, J. R. Hendrickson, X. Dong, and J. R. Gross. 2013. *Agriculture Ecosystems and Environment* 164:137–144. (USDA-ARS Northern Great Plains Research Lab, PO Box 459, Mandan, ND 58554, USA). Carbon dioxide loss to the atmosphere did not differ between moderately grazed and heavily grazed pastures in mixed-grass prairie of central North Dakota.

Community-level consequences of cattle grazing for an invaded grassland: variable responses of native and exotic vegetation. M. J. Skaer, D. J. Graydon, and J. H. Cushman. 2013. *Journal of Vegetation Science* 24:332–343. (J. Cushman, Dept of Biology, Sonoma State Univ, Rohnert Park, CA 94928, USA). In coastal grassland of central California, light cattle grazing during winter–spring did not affect the cover of native forbs and grasses, but it did reduce reproduction of the exotic annual grass ripgut brome and increase the cover of exotic annual forbs.

Hydrology/Riparian

Elk herbivory alters small mammal assemblages in high-elevation drainages. E. W. R. Parsons, J. L. Maron, and T. E. Martin. 2013. *Journal of Animal Ecology* 82:459–467. (Wildlife Biology Program, Univ of Montana, Missoula, MT 59812, USA). In montane riparian drainages of northern Arizona, the exclusion of elk grazing and browsing for 5 years increased the abundance of voles, but decreased abundance of woodrats and mice.

Riparian grazing impacts on streambank erosion and phosphorus loss via surface runoff. M. Tufekcioglu, R. C. Schultz, G. N. Zaimes, T. M. Isenhart, and A. Tufekcioglu. 2013. *Journal of the American Water Resources Association* 49:103–113. (R. Schultz, Dept of Natural Resource Ecology and Management, Iowa State Univ, Ames, IA 50011, USA). In streamside Iowa pastures, lower cattle stocking rates can reduce sediment and phosphorus export to streams. Management should emphasize limiting livestock access paths and loafing areas within 50 feet of a stream.

Measurements

A tool for estimating impacts of woody encroachment in arid grasslands: allometric equations for biomass, carbon and nitrogen content in *Prosopis velutina*. M. P. McClaran, C. R. McMurtry, and S. R. Archer. 2013. *Journal of Arid Environments* 88:39–42. (School of Natural Resources and the Environment, Univ of Arizona, Tucson, AZ 85721, USA). Plant size dimensions (basal diameter, canopy area, height, canopy volume) can be used to estimate aboveground biomass and carbon and nitrogen mass of velvet mesquite.

Monitoring the status of forests and rangelands in the western United States using ecosystem performance anomalies. M. Rigge, B. Wylie, Y. X. Gu, J. Belnap, K. Phuyal, and L. Tieszen. 2013. *International Journal of Remote Sensing* 34:4049–4068. (US Geological Survey Earth Resources Observation and Science Center, 47914 252nd St, Sioux Falls, SD 57198, USA). Authors present a remote-sensing method that calculates the difference between actual and expected ecosystem performance to generate ecosystem performance anomalies. Sites within a landscape are rated as normal performing, underperforming, or overperforming. Disturbances, such as fires, floods, insect damage, or heavy grazing intensity, lower the rating.

Plant Ecology

Allelopathic exudates of cogongrass (*Imperata cylindrical*): implications for the performance of native pine savanna plant species in the southeastern US. D. L. Hagan, S. Jose, and C. H. Lin. 2013. *Journal of Chemical Ecology* 39:312–322. (School of Agricultural, Forest, and Environmental Sciences, Clemson Univ, Clemson, SC 29634, USA). This greenhouse study indicated that cogongrass, an invasive nonnative grass in the southeastern United States, exudes allelopathic chemicals that limit the growth of some native grass and tree species.

Biomass production potential of grasslands in the oak savanna region of Minnesota, USA. P. A. Gillitzer, D. L. Wyse, C. C. Sheaffer, S. J. Taff, and C. C. Lehman. 2013. *Bioenergy Research* 6:131–141. (D. Wyse, Dept of Agronomy and Plant Genetics, Univ of Minnesota, Saint Paul, MN 55108, USA). More ethanol can be produced by warm-season grasses than cool-season grasses.

Climate warming and precipitation redistribution modify tree–grass interactions and tree species establishment in a warm-temperature savanna. A. Volder, D. D. Briske, and M. G. Tjoelker. 2013. *Global Change Biology* 19:843–857. (Dept of Horticultural Sciences, Texas A&M Univ, College Station, TX 77843, USA). Eastern redcedar abundance is predicted to increase as the climate warms and summer droughts intensify.

Cool season invasive grasses in Northern Great Plains natural areas. E. S. DeKeyser, M. Meehan, G. Clambey, and K. Krabbenhoft. 2013. *Natural Areas Journal* 33:81–90. (School of Natural Resources, North Dakota State Univ, Fargo, ND 58108, USA). Mixed-grass prairie sites in central North Dakota that were dominated by native grasses and forbs before livestock exclusion are now dominated by the invasive smooth brome and Kentucky bluegrass after 23 years of livestock exclusion.

Effects of climate change on range forage production in the San Francisco Bay area. R. Chaplin-Kramer and M. R. George. 2013. *PloS ONE* 8:e57723. doi: 10.1371/journal.pone.0057723. 15 p. (California Institute for Energy and Environment, 2087 Addison St, Second Floor, Berkeley, CA 94704, USA). Climate change is predicted to increase forage production on annual grasslands of northern California, but longer periods of inadequate forage nutritive quality and more frequent droughts will increase livestock production costs.

Geomorphic–vegetation relationships using a geopedological system, northern Chihuahuan Desert, USA. G. A. Michaud, H. C. Monger, and D. L. Anderson. 2013. *Journal of Arid Environments* 90:45–54. (H. Monger, Dept of Agronomy and Horticulture, New Mexico State Univ, Las Cruces, NM 88003, USA). Mesquite dominates the basin floor when the parent material is sand; biological soil crust dominates the basin floor when the parent material is gypsum; creosotebush dominates rocky slopes, regardless of parent material; and grasslands dominate the alluvial slopes beneath the rocky hills regardless of bedrock type.

Role of biotic interactions in regulating conifer invasion of grasslands. R. D. Haugo, J. D. Bakker, and C. B. Halpern 2013. *Forest Ecology and Management* 289:175–182. (Nature Conservancy, 32 North 3rd St, Suite 412, Yakima, WA 98901, USA). Douglas-fir seedlings did not establish in low-elevation prairie of western Washington wherever competing vegetation was present and shade was absent.

Using structural equation modeling to test the passenger, driver and opportunistic concepts in a *Poa pratensis* invasion. S. R. White, S. Tannas, T. Bao, J. A. Bennett, E. W. Bork, and J. F. Cahill, Jr. 2013. *Oikos* 122:377–384. (Dept of Biological Sciences, Univ of Alberta, Edmonton, AB T6G 2E9, Canada). Kentucky bluegrass invasion into a native grassland occurred mainly via the driver model, where changes to the native plant community were driven by the invasive species. Therefore, management actions to limit the invasion should emphasize controlling Kentucky bluegrass abundance rather than enhancing the native species.

Rehabilitation/Restoration

Establishment of a native bunchgrass and an invasive perennial on disturbed land using straw-amended soil. P. D. Desserud and M. A. Naeth. 2013. *Journal of Environmental Management* 114:540–547. (Univ of Calgary, 2500 Univ Dr NW, Calgary, AB T2N 1N4, Canada). Adding straw as a soil amendment helped plains rough fescue to establish on sites disturbed by construction of oil and gas wells.

Extent of vegetation-free zone necessary for silvopasture establishment of eastern black walnut seedlings in tall fescue. J. H. Houx III, R. L. McGraw, H. E. Garrett, R. L. Kallenbach, F. B. Fritschi, and W. Rogers. 2013. *Agroforestry Systems* 87:73–80. (Division of Plant Sciences, Univ of Missouri, Columbia, MO 65211, USA). A minimum of 8-feet-diameter vegetation-free zone, created with glyphosate herbicide, should be used when planting black walnut trees into tall fescue pasture.

Herbicide treatment and timing for controlling Kentucky bluegrass (*Poa pratensis*) and tall fescue (*Festuca arundinacea*) in cool season grasslands of central Kentucky, USA. J. K. Adkins and T. G. Barnes. 2013. *Natural Areas Journal* 33:31–38. (T. Barnes, Dept of Forestry, Univ of Kentucky, Lexington, KY 40546, USA). The most effective herbicide treatment overall for suppressing Kentucky bluegrass and tall fescue was 0.2 pounds ai/acre imazapic + 1.0 pounds ai/acre glyphosate, applied in spring. However, the resulting bare ground was invaded by musk thistle.

Natural recovery of rough fescue (*Festuca hallii* (Vasey) Piper) grassland after disturbance by pipeline construction in central Alberta, Canada. P. A. Desserud and M. A. Naeth. 2013. *Natural Areas Journal* 33:91–98. (Univ of Calgary, 2500 Univ Dr NW, Calgary, AB T2N 1N4, Canada). Plains rough fescue grassland in central Alberta recovers better when narrow trenching with plow-in techniques is used for pipeline construction rather than topsoil stripping followed by seeding.

Understory plant community responses to hazardous fuels reduction treatments in pinyon-juniper woodlands of Arizona, USA. D. W. Huffman, M. T. Stoddard, J. D. Springer, J. E. Crouse, and W. W. Chancellor. 2013. *Forest Ecology and Management* 289:478–488. (Ecological Restoration Institute, Northern Arizona Univ, Flagstaff, AZ 86011, USA). In northern Arizona pinyon-juniper woodlands, thinning and prescribed burning treatments to reduce wildfire fuels did not dramatically affect understory production or composition within 5 years.

Use of warm-season grasses managed as bioenergy crops for phytoremediation of excess soil phosphorus. M. L. Silveira, J. M. B. Vendramini, X. L. Sui, L. E. Sollenberger, and G. A. O'Connor. 2013. *Agronomy Journal* 105:95–100. (Range Cattle Research and Education Center, Univ of Florida, 3401 Experiment Station Rd, Ona, FL 33865, USA). Elephantgrass grown for biofuel can be used to remediate excess soil phosphorus, and elephantgrass is more effective than sugarcane, switchgrass, or stargrass.

Soils

Soil-litter mixing accelerates decomposition in a Chihuahuan Desert grassland. D. B. Hewins, S. R. Archer, G. S. Okin, R. L. McCulley, and H. L. Throop. 2013. *Ecosystems* 16:183–195. (Dept of Biology, New Mexico State Univ, MSC 3AF, Las Cruces, NM 88003, USA). Soil-litter mixing was a strong driver of litter decomposition, and soil-litter mixing was unaffected by simulated losses of grass cover due to livestock grazing or shrub encroachment.

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