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 for items to include in future issues of *Browsing the Literature* are welcomed and encouraged. Contact Jeff Mosley at jmosley@montana.edu.

Animal Ecology

Birds, charcoal and cattle: bird community responses to human activities in an oak forest landscape shaped by charcoal extraction. E. Mya-Elizarraras, and J. E. Schondube. 2015. *Forest Ecology and Management* 335:118–128. (J. Schondube, Centro de Investigaciones en Ecosistemas, Universidad Nacional Autonoma de Mexico, Antigua Carretera Patzcuaro 8701, Morelia 58190, Michoacan, Mexico). In the oak forests of western Mexico, habitat use by resident and summer migrant bird species was unaffected by cattle grazing. Some winter migrants were unaffected as well, whereas other winter migrants avoided cattle-grazed areas.

Effects of grassland biomass harvest on nesting pheasants and ducks. J. M. Jungers, T. W. Arnold, and C. Lehman. 2015. *American Midland Naturalist* 173:122–132. (Dept of Agronomy and Plant Genetics, Univ of Minnesota, Saint Paul, MN 55108, USA). Harvesting relatively small-scale patches of grassland for bioenergy in late fall will not harm nesting ducks or pheasants the following spring. Unharvested areas should be designated near wetlands when large grassland tracts are harvested.

Effects of grazing and prescribed fire on resource selection and nest survival of upland sandpipers in an experimental landscape. B. K. Sandercock, M. Alfaro-Barrios, A. E. Casey, T. N. Johnson, T. W. Mong, K. J. Odom, K. M. Strum, and V. L. Winder. 2015. *Landscape Ecology* 30:325–337. (Division of Biology, Kansas State Univ, Manhattan, KS 66506, USA). Nest site selection and nest survival did not differ between areas grazed by cattle and those ungrazed.

Spatial occupancy and abundance trends of endangered Florida grasshopper sparrows at Three Lakes Wildlife Management Area. M. F. Delany, R. A. Kiltie, S. L. Glass, and C. L. Hannon. 2014. *Southeastern Naturalist* 13:691–704. (Florida Fish and Wildlife Conservation Commission, 1105 SW Williston Road, Gainesville, FL 32601, USA). Florida grasshopper sparrows were most abundant in prairie habitat that had burned within the previous 2 years.

Grazing Management

Effects of feral free-roaming horses on semi-arid rangeland ecosystems: an example from the sagebrush steppe. K. W. Davies, G. Collins, and C. S. Boyd. 2014. *Ecosphere* 5:article no. 127; doi:10.1890/ES14-00171.1; 14 p. (US Dept of Agriculture-Agricultural Research Service, 67826-A Hwy 205, Burns, OR 97720, USA). Browsing, grazing, and trampling by feral horses decreased sagebrush density, decreased plant diversity, and increased soil compaction in northern Nevada.

Livestock as a potential biological control agent for an invasive wetland plant. B. R. Stillman, T. Mozdzer, C. Angelini, J. E. Brundage, P. Esselink, J. P. Bakker, K. B. Gedan, J. van de Koppel, and A. H. Baldwin. 2014. *PEERJ* 2:article no. e567; doi:10.7717/peerj.567; 19 p. (Division of Marine Science and Conservation, Duke Univ, Beaufort, NC 28516, USA). Targeted grazing by goats, cattle, or horses can suppress common reed, an invasive grass in many North American wetlands.

The effects of timing of grazing on plant and arthropod communities in high-elevation grasslands. S. C. Davis, L. A. Burkle, W. F. Cross, and K. A. Cutting. 2014. *PLOS One* 9:e110460; doi:10.1371/journal.pone.0110460; 14 p. (Dept of Ecology, Montana State Univ, Bozeman, MT 59717, USA). Total arthropod density was unaffected by moderate cattle grazing occurring during either June or July on southwestern Montana rangeland.

Hydrology/Riparian

Empirical evaluation of the conceptual model underpinning a regional aquatic long-term monitoring program using causal modeling. K. M. Irvine, S. W. Miller, R. K. Al-Chokhachy, E. K. Archer, B. B. Roper, and J. L. Kershner. 2015. *Ecological Indicators* 50:8–23. (US Geological Survey, 2327 University Way, Suite 2, Bozeman, MT 59715, USA). An extensive sample of the Interior Columbia River Basin and Upper Missouri River Basin detected no overall differences in biologic condition between stream reaches grazed or ungrazed by livestock.

Fire and grazing influences on rates of riparian woody plant expansion along grassland streams. A. M. Veach, W. K. Dodds, and A. Skibbe. 2014. *PLOS One* 9:article no. e106922; doi: 10.1371/journal.pone.0106922; 8 p. (Division of Biology, Kansas State Univ, Manhattan, KS 66506, USA). In tallgrass prairie riparian ecosystems, burning every 1 to 2 years will slow the expansion of woody plants, but fire alone will not prevent it.

Plant-Animal Interactions

Effects of invasive plants on arthropods. A. R. Litt, E. E. Cord, T. E. Fulbright, and G. L. Schuster. 2014. *Conservation Biology* 28:1532–1549. (Dept of Ecology, Montana

State Univ, Bozeman, MT 59717, USA). This synthesis of the research literature revealed that total arthropod abundance was observed to decrease due to plant invasions in 62% of studies and increase in 15% of studies. Large information gaps remain, especially regarding the mechanisms by which invasive plants affect arthropods.

Plant Ecology

Assessing the importance of multiple threats to an endangered globose cactus in Mexico: cattle grazing, looting and climate change. C. Martorell, D. M. Montanana, C. Ureta, and M. C. Mandujano. 2015. *Biological Conservation* 181:73–81. (Departamento de Ecología de los Recursos Naturales, Universidad Nacional Autónoma de México, México City 04510, México). Moderate to high cattle grazing intensity is recommended to sustain the geographically rare globose cactus in northern Mexico.

Climate change and land management in the rangelands of central Oregon. M. K. Creutzburg, J. E. Halofsky, J. S. Halofsky, and T. A. Christopher. 2015. *Environmental Management* 55:43–55. (Dept of Environmental Science and Management, Portland State Univ, Portland, OR 97207, USA). The authors predict that climate change will cause sagebrush steppe to decline and salt desert shrub to expand by the end of the 21st century in central Oregon.

Plant community response to the East Amarillo Complex wildfires in the Southern High Plains, USA. D. B. Wester, S. Rideout-Hanzak, C. M. Britton, and H. Whitlaw. 2014. *Community Ecology* 15:222–234. (S. Rideout-Hanzak, Caesar Kleberg Wildlife Research Institute, Texas A&M Univ-Kingsville, Kingsville, TX 78363, USA). In southern mixed-grass prairie, few seedlings of either native or exotic species established after wildfire. Ground cover was fully recovered within 3 years.

Rehabilitation/Restoration

Controlling an invasive plant at the edge of its range: towards a broader understanding of management feasibility. Z. Tzankova, and A. Concilio. 2015. *Biological Invasions* 17:507–527. (Dept of Environmental Studies, Univ of California-Santa Cruz, Santa Cruz, CA 95064, USA). Cheatgrass in eastern California exists in low-density patches. Cheatgrass can be controlled effectively with herbicides, but public land managers feel constrained to use them because cheatgrass is not listed as a noxious weed in California and because they fear public opposition to herbicide use.

Fire induced reproductive mechanisms of a Symphoricarpos (Caprifoliaceae) shrub after dormant season burning. J. D. Scasta, D. M. Engle, R. N. Harr, and D. M. Debinski. 2014. *Botanical Studies* 55:article no. 80; doi:10.1186/s40529-014-0080-4; 10 p. (Dept of Ecosystem Science and Management, Univ of Wyoming, Laramie, WY 82071, USA).

In Iowa tallgrass prairie, dormant season burning reduced buckbrush canopy cover but triggered basal resprouting and layering by buckbrush.

The joint effects of fire and herbivory on hardwood regeneration in central Texas woodlands. C. M. Andruk, C. Schwoppe, and N. L. Fowler. 2014. *Forest Ecology and Management* 334:193–200. (Dept of Biology, Albright College, Reading, PA 19610, USA). Deer browsing likely needs to be controlled after prescribed fire to enhance regeneration of oaks and other hardwoods in central Texas.

Socioeconomics

Governmental provisions to manage and eradicate feral swine in areas of the United States. T. J. Centner, and R. M. Shurman. 2015. *Ambio* 44:121–130. (School of Forestry and Natural Resources, Univ of Georgia, Athens, GA 30602, USA). State government statutes and regulations are unlikely to ensure sufficient control of feral swine populations. More localized plans coupled with a national disease control program are needed to address these invasive animals.

Historical land use and altered habitats in the Great Basin. L. R. Morris, and R. J. Rowe. 2014. *Journal of Mammalogy* 95:1144–1156. (Badgley Hall 205, Eastern Oregon Univ, La Grande, OR 97850, USA). This paper highlights the extensive and interactive effects of historical land uses on the vegetation of the Great Basin. This knowledge is needed to inform contemporary land management goals, objectives, and strategies.

Rangeland ecosystem services: shifting focus from supply to reconciling supply and demand. L. Yahdjian, O. E. Sala, and K. M. Havstad. 2015. *Frontiers in Ecology and the Environment* 13:44–51. (K. Havstad, US Dept of Agriculture-Agricultural Research Service, PO Box 30003, MSC 3JER, New Mexico State Univ, Las Cruces, NM 88003, USA). The authors suggest a framework for making

rangeland management decisions based on relative societal demands for ecosystem services.

Soils

Long-term grazing effects on rough fescue grassland soils in southern British Columbia. M. Krzic, S. F. Lamagna, R. F. Newman, G. Bradfield, B. M. Wallace. 2014. *Canadian Journal of Soil Science* 94:337–345. (Faculty of Land and Food Systems, Univ of British Columbia, Vancouver, BC V6T 1Z4, Canada). "...soils in these grazing-sensitive grasslands need more than 75 years to fully recover from the impacts of overgrazing."

Plant diversity effects on soil microbial functions and enzymes are stronger than warming in a grassland experiment. K. Steinauer, D. Tilman, P. D. Wragg, S. Cesarz, J. M. Cowles, K. Pritsch, P. B. Reich, W. W. Weisser, and N. Eisenbauer. 2015. *Ecology* 96:99–112. (D. Tilman, Dept of Ecology, Evolution and Behavior, Univ of Minnesota, Saint Paul, MN 55108, USA). In Minnesota perennial grassland, soil microbial communities tolerated the increased soil temperatures predicted by climate change models.

Smooth brome changes gross soil nitrogen cycling processes during invasion of a rough fescue grassland. C. L. Piper, E. G. Lamb, and S. D. Siciliano. 2015. *Plant Ecology* 216:235–246. (E. Lamb, Dept of Plant Science, Univ of Saskatchewan, Saskatoon, SK S7N 5A8, Canada). Total soil nitrogen increased after smooth brome invaded rough fescue grassland in central Saskatchewan.

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