By Jeff Mosley

Browsing the Literature

This section reviews new publications 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

Characterizing a contentious management tool: the effects of a grass-specific herbicide on the silvery blue butterfly. R.M. Glaeser, and C.B. Schultz. 2014. *Journal of Insect Conservation* 18:1047-1058. (Washington State Univ, 14204 NE Salmon Creek Ave, Vancouver, WA 98686, USA). Application of the grass-specific herbicide fluazipop-*p*-butyl (Fusilade) in early spring created the grassland vegetative structure preferred by butterflies and did not negatively affect the silvery blue butterfly.

Linking conservation actions to demography: grass height explains variation in greater sage-grouse nest survival. K.E. Doherty, D.E. Naugle, J.D. Tack, B.L. Walker, J.M. Graham, and J.L. Beck. 2014. *Wildlife Biology* 20:320-325. (US Fish and Wildlife Service, 134 Union Blvd, Suite 300, Lakewood, CO 80228, USA). Grass height has little effect on sage-grouse nest success where sagebrush rather than grass provides most hiding cover. But in locales where sagebrush canopy cover is sparse, grass 6 to 10 inches tall (droop height) is needed to conceal sage-grouse nests.

Modeling risk of pneumonia epizootics in bighorn sheep. S.N. Sells, M.S. Mitchell, J.J. Nowak, P.M. Lukacs, N.J. Anderson, J.M. Ramsey, J.A. Gude, and P.R. Krausman. 2015. *Journal of Wildlife Management* 79:195-210. (Montana Cooperative Wildlife Research Unit, 205 Natural Sciences Building, Univ of Montana, Missoula, MT 59812, USA). Bighorn density was the most influential factor determining whether bighorn sheep herds in Montana experienced a pneumonia outbreak during the past 35 years. A pneumonia outbreak was five times more likely when herds were at medium rather than low density, whereas outbreak risk was nearly 15 times greater when herd density was high.

Nesting ecology of grassland songbirds: effects of predation, parasitism, and weather. S.M. Ludlow, R.M. Brigham, and S.K. Davis. 2014. *Wilson Journal of Ornithology* 126:686-699. (Dept of Biology, Univ of Regina, Regina, SK S4S 0A2, Canada). Nest predation was the primary cause of nest failure (75% of all nest losses) for grassland songbirds in southeastern Alberta.

The effects of homing and movement behaviors on translocation: desert tortoises in the western Mojave Desert. D. Hinderle, R.I. Lewison, A.D. Walde, D. Deutschman, and

W.I. Boarman. 2015. *Journal of Wildlife Management* 79:137-147. (5500 Campanile Dr, San Diego, CA 92182, USA). To prevent translocated desert tortoises from returning to their source location, their release site should be at least 5 miles away from their source location.

Hydrology/Riparian

Alteration of hydrological processes and streamflow with juniper *(Juniperus virginiana)* encroachment in a mesic grassland catchment. C.B. Zou, D.J. Turton, R.E. Will, D.M. Engle, and S.D. Fuhlendorf. 2014. *Hydrological Processes* 28:6173-6182. (Dept of Natural Resource Ecology and Management, Oklahoma State Univ, Stillwater, OK 74078, USA). Encroachment by eastern red cedar into southern Great Plains grasslands can drastically reduce soil water, stream flow, and flow duration of ephemeral streams.

Effects of precipitation on nonpoint sources of nitrogen contamination to surface waters in the US Great Plains. M.A. Elrashidi. 2015. *Communications in Soil Science and Plant Analysis* 46:16-32. (USDA Natural Resources Conservation Service, National Soil Survey Center, 100 Centennial Mall North, Room 152, Lincoln, NE 68508, USA). Of the nitrate nitrogen contained in runoff that entered a small stream in southeastern Nebraska, denitrification, volatilization, and plant uptake combined to remove 95% during a dry year and 69% in a wet year.

Forage selection of native and nonnative woody plants by beaver in a rare-shrub community in the Appalachian Mountains of North Carolina. C.R. Russell Jr., S. Arico, H.D. Clarke, J.L. Horton, J.R. Ward, and S.C. Patch. 2014. *Southeastern Naturalist* 13:649-662. (Dept of Environmental Studies, Univ of North Carolina, Asheville, NC 28804, USA). Browsing by beaver stimulated suckering of both the invasive Chinese privet and the rare, federally threatened shrub Virginia spiraea.

Montane meadow hydropedology, plant community, and herbivore dynamics. L.M. Roche, A.T. O'Green, A.M. Latimer, and D.J. Eastburn. 2014. *Ecosphere* 5: article no. 150; doi: http://dx.doi.org/10.1890/ES14-00173.1. (Dept of Plant Sciences, Univ of California, Davis, CA 95616, USA). Light-to-moderate cattle grazing did not harm ecosystem function in mountain meadows of the central Sierra Nevada Mountains in California.

Plant Ecology

Postfire shrub cover dynamics: a 70-year fire chronosequence in mountain big sagebrush communities. C.A. Moffet, J.B. Taylor, and D.T. Booth. 2015. *Journal of Arid Environments* 114:116-123. (The Samuel Roberts Noble Foundation, 2510 Sam Noble Parkway, Ardmore, OK 73401, USA). In southeastern Idaho, bitterbrush canopy cover recovered and stabilized 6 years post-fire, but 19 years were needed for mountain big sagebrush cover to reach steady states where mountain big sagebrush canopy cover averaged 31%.

Rehabilitation/Restoration

Effects of aminocyclopyrachlor herbicide on downy brome *(Bromus tectorum)* seed production under field conditions. D.A. Ball. 2014. *Invasive Plant Science and Management* 7:561-564. (Columbia Basin Agricultural Research Center, P.O. Box 370, Pendleton, OR 97801, USA). When applied to cheatgrass during the early heading stage, aminocyclopyrachlor (Perspective) reduced cheatgrass seed germination 100% in both years of the study. Similarly, aminopyralid (Milestone) reduced cheatgrass seed germination 95% in the first year and 81% in the second year.

Effects of integrating mowing and imazapyr application on African rue *(Peganum harmala)* and native perennial grasses. D.D. Johnson, and K.W. Davies. 2014. *Invasive Plant Science and Management* 7:617-623. (Dept of Animal and Rangeland Sciences, Oregon State Univ, Burns, OR 97720, USA). Mowing did not affect African rue, a poisonous, perennial forb that invades salt-desert shrub and sagebrush rangelands. On dry floodplain sites, imazapyr herbicide (Arsenal) applied at 3.9 ounces ae/acre can control African rue without harming native perennial grasses.

Fire environment effects on particulate matter emission factors in southeastern US pine-grasslands. K.M. Robertson, Y.P. Hsieh, and G.C. Glynnis. 2014. *Atmospheric Environment* 99:104-111. (Tall Timbers Research Station and Land Conservancy, 13093 Henry Beadel Dr, Tallahassee, FL 32312, USA). Timber thinning and frequent prescribed fires minimize particulate emissions from prescribed burns in northern Florida and southern Georgia.

Management of spreading pricklypear *(Opuntia humifusa)* with fluroxypyr and aminopyralid. J. Ferrell, B. Sellers, and R. Leon. 2014. *Weed Technology* 28:734-738. (Dept of Agronomy, Univ of Florida, Gainesville, FL 32611, USA). Applied in spring or fall, a mixture of aminopyralid (Milestone) + 2,4-D + fluroxypyr (Starane) provided 92% control of spreading prickly pear in central Florida.

Mowing reduces exotic annual grasses but increases exotic forbs in a semiarid grassland. J.S. Prevey, D.G. Knochel, and T.R. Seastedt. 2014. *Restoration Ecology* 22:774-781. (Dept of Ecology and Evolutionary Biology, Univ of Colorado, Boulder, CO 80309, USA). In a cheatgrass-invaded grassland in Colorado, mowing during spring reduced cheatgrass and increased both native cool-season grasses and non-native forbs.

Registration of "Centennial" sand bluestem. T.L. Springer, R.L. Wynia, and G.L. Rea. 2014. *Journal of*

Plant Registrations 8:248-252. (Southern Plains Range Research Station, 2000 18th St, Woodward, OK 73801, USA). "Centennial" sand bluestem is a new cultivar selected for greater seed germination and seedling establishment in dry environments of the central and southern Great Plains.

Trace gas fluxes from a northern mixed-grass prairie interseeded with alfalfa. L.J. Ingram, G.E. Schuman, T.B. Parkin, and M. Mortenson. 2015. *Plant and Soil* 386:285-301. (Center for Carbon, Water and Food, Univ of Sydney, Brownlow Hill, NSW 2570, Australia). Alfalfa interseeded into South Dakota rangeland increased soil nitrogen and plant productivity without increasing emissions of nitrous oxide or methane.

Ungulate exclusion, conifer thinning and mule deer forage in northeastern New Mexico. D.W. Kramer, G.E. Sorenson, C.A. Taylor, R.D. Cox, P.S. Gipson, and J.W. Cain, III. 2015. *Journal of Arid Environments* 113:29-34. (180 East Green St, Athens, GA 30606, USA). Thinning juniper and ponderosa pine increased the abundance of preferred mule deer forage species.

Using prescribed fire and herbicide to manage rank native warm season grass for northern bobwhite. J.M. Yeiser, D.L. Baxley, B.A. Robinson, and J.J. Morgan. 2015. *Journal of Wildlife Management* 79:69-76. (Kentucky Dept of Fish and Wildlife Resources, 1 Sportsman Lane, Frankfort, KY 40601, USA). Prescribed burning followed by glyphosate (Roundup) herbicide application created habitat beneficial for northern bobwhites. Glyphosate worked better than imazapyr (Arsenal), and burn-only treatments were ineffective.

Vegetation recovery in slash-pile scars following conifer removal in a grassland-restoration experiment. B. Halpern, J.A. Antos, and L.M. Beckman. 2014. *Restoration Ecology* 22:731-740. (School of Environmental and Forest Sciences, Univ of Washington, Box 352100, Seattle, WA 98195, USA). Soils and native vegetation recovered quickly after burning slash piles in an area with few non-native invasive plant species.

Soils

Effects of repeated burning on plant and soil carbon and nitrogen in cheatgrass *(Bromus tectorum)* dominated ecosystems. R. Jones, J.C. Chambers, D.W. Johnson, R.R. Blank, and D.I. Board. 2015. *Plant and Soil* 386:47-64. (Dept of Natural Resources and Environmental Science, Univ of Nevada, 1000 Valley Rd, Reno, NV 89512, USA). Three consecutive years of burning with cool fires in mid-September did not reduce soil carbon or soil nitrogen in cheatgrass-dominated Wyoming big sagebrush steppe in Nevada.

Estimating conservation needs for rangelands using USDA National Resources Inventory Assessments. M.A. Weltz, L. Jolley, M. Hernandez, K.E. Spaeth, C. Rossi, C. Talbot, M. Nearing, J. Stone, D. Goodrich, F. Pierson, H. Wei, and C. Morris. 2014. *Transactions of the American Society of Agricultural and Biological Engineers* 57:1559-1570. (920 Valley Rd, Reno, NV 89512, USA). On nonfederal rangelands of the United States, more than 50% of the average annual soil loss is generated from 20% of the land area. Overall, 23% to 29% of non-federal US rangelands are vulnerable to accelerated soil loss.

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