



By Matt Germino

Browsing the Literature

In this edition of *Browsing the Literature* we cover a paper that is global in scope, two papers from Arizona, two from Tibet, and one from Kenya.

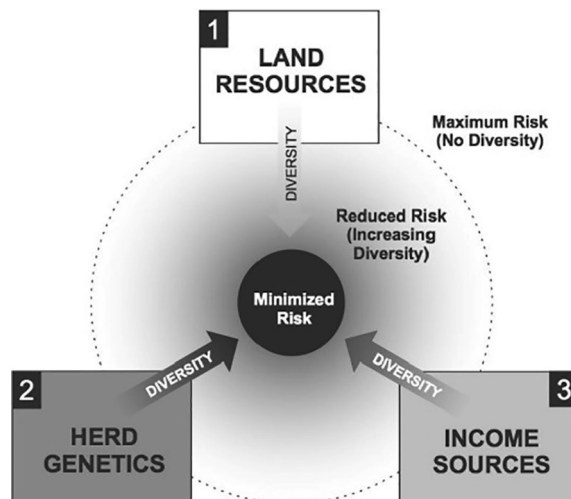
As always, please let me know of forthcoming literature in journals other than Rangeland Ecology & Management or Rangelands. If you provide a summary using the style and format below, I will also include it in the column and acknowledge you

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Papers of global scope

Managing risks related to climate variability in rangeland-based livestock production: What producer driven strategies are shared and prevalent across diverse dryland geographies? Espeland, E.K., Schreeg, L. and Porensky, L.M. 2020. *Journal of Environmental Management* 255: <https://doi.org/10.1016/j.jenvman.2019.109889>

They conducted a literature review on ways that livestock producers deal with climate variability, globally. The strategies could be categorized into the decision-making areas of profit and return options, land use, and herd management. Across the many contexts evaluated, diversification and use of social networks were commonly observed across all decision-making areas. Dynamic management of 1) forage supply was observed in the land-use strategy, and 2) animal demand in herd management was common. Diversification of herds, income sources, and land resources generally increased sustainability of producers (see figure), although there are exceptions and potential short-term costs. The lead author has



recently and sadly passed away prior to publication, which is a significant loss to the rangeland ecology community.

From the USA (Arizona)

Soil loss from small rangeland plots under simulated rainfall and run-on conditions. Polyakov, V.O., Nearing, M. A. and Stone, J.J. 2020. *Geoderma* 361: <https://doi.org/10.1016/j.geoderma.2019.114070>

They simulated rainfall and overland flow across many plots on different rangeland sites in Arizona to determine how much water erosion results from raindrop impactation compared to shallow overland flow considering different vegetation abundances. Many times, more sediment was generated by the rainfall treatment than the overland flow treatment, at the same discharge rates. Sediment yield was weakly and negatively related to plant foliar cover, structure, and surface litter.

Drought exacerbates negative consequences of high-intensity cattle grazing in a semiarid grassland. Souther, S., Loeser, M., Crews, T.E. and Sisk, T. 2019. *Ecological Applications* (In press).

They evaluated the role of climate in regulating the effect of cattle grazing on plant communities using long-term data for high-elevation grasslands in ponderosa pine forests of the Colorado Plateau in Arizona. Community composition varied more with climate, including exotic species invasions following drought, where grazing was intensive and species richness was less. However, moderate grazing tended to stabilize communities, increase drought resilience, and promote native plant diversity and fewer invaders.

From Tibet

Changes in seed germination strategy along the successional gradient from abandoned cropland to climax grassland in a subalpine meadow and some implications for rangeland restoration. Liu, K., Liang, T., Qiang, W., Du, G., Baskin, J.M., Baskin, C.C., Bu, H., Yang, H. and Xiao, S. 2020. *Agriculture, Ecosystems & Environment* 289: <https://doi.org/10.1016/j.agee.2019.106746>

Germination is a bottleneck to restoration of abandoned crop fields on the Qinghai-Tibetan Plateau, where overgrazing creates different successional gradients. Germination lab tests revealed that germination strategies differ among the species assemblages in pioneer to climax communities. For example, the optimal temperature range for germination was narrower and is more dependent on alternating temperatures. The diversity of germination traits decreases as succession progresses, even though species richness increases.

Net neutral carbon responses to warming and grazing in alpine grassland ecosystems. Lv, W., Luo, C., Zhang, L., Niu, H., Zhang, Z., Wang, S., Wang, Y., Jiang, L., Wang, Y., He, J. and Kardol, P. 2020. *Agricultural and Forest Meteorology* 280: <https://doi.org/10.1016/j.agrformet.2019.107792>

They evaluated the effects of even years of experimental warming with or without summer and winter grazing in a Tibetan alpine grassland. Soil carbon uptake decreased under summer grazing or warming but not in response to winter or rotational grazing. The rotation of grazing among two seasons in a grazing system is proposed to benefit both animal production and soil carbon.

From Argentina

Plant litter decomposition in a semiarid rangeland of Argentina: species and defoliation effects. Ambrosino, M. L., Busso, C.A., Torres, Y.A., Ithurrart, L.S., Martínez, J.M., Minoldo, G., Cardillo, D.S. and Palomo, I.R. 2020. *The Rangeland Journal* 41:371–381.

In the rangelands of Argentina, they observed litterbags of either cut leaves or root litter for 2 years of the desirable forage species (*Poa ligularis* and *Nassella tenuis*) and the less desirable species, *Amelichloa ambigua*. Leaves of the desirable species had greater nitrogen content and faster decomposition than the less desirable species, but the opposite was observed for root litter.

From Iran

Effects of grazing management on leaf litter decomposition and soil microbial activities in northern Iranian rangeland. Kooch, Y., Moghimian, N., Wirth, S. and Noghre, N. 2020. *Geoderma* 361: <https://doi.org/10.1016/j.geoderma.2019.114100>

They evaluated the biogeochemistry and litter decomposition in the rangelands of Iran that were grazed continuously, intermittently, or were ungrazed. Litter quality decreased where grazing occurred, particularly continuously. Litter quality and decomposition were greater in rangelands with more woody species.

From Kenya

A coupled forage-grazer model predicts viability of livestock production and wildlife habitat at the regional scale. Kowal, V.A., Jones, S.M., Keesing, F., Allan, B.F., Schieltz, J.M. and Chaplin-Kramer, R. 2019. *Scientific Reports* 9:1–12.

They used the Century ecosystem process model integrated with a ruminant diet selection and physiology model (GRAZPLAN) to evaluate the interaction of livestock grazing and wildlife forage needs. The modeled grazing intensity related reasonably well to cattle and buffalo utilization was estimated with dung counts measured in the Kenyan rangelands that were the focus of the study. While wildlife-only use left about 85% of forage on site, livestock left approximately 55%.

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doi: <https://doi.org/10.1016/j.rala.2020.01.003>