Long-Term Vegetation Response to Grazing on a Southwest Montana Foothills Range

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Long-term vegetation data collected in area under known management provides an opportunity for understanding the potential implications of vegetation response to grazing management. Short-term studies (2-3 years) are unable to capture vegetation response due to the ecological inertia of the system and temporary fluctuations due to weather patterns. When Montana State University purchased Red Bluff Ranch in 1956, it was heavily stocked but the range was thought to be in acceptable condition. Stocking rates were lowered nonetheless. In 1958, 74 vegetation monitoring transects were established. In 2017 we attempted to relocate transects in two pastures currently used for winter grazing. Of the 28 transects in both pastures, we were able to relocate and read 11. Using original methodology, we collected basal cover data along five five-foot subplots randomly located around each transect. Data were analyzed using a paired Mann-Whitney U test. Cheatgrass (Bromus tectorum) exhibited the greatest change in cover, increasing from 0.4% in 1958 to 16.1% in 2017 ($P < 0.01$), and was present at 9 of the 11 monitoring sites. Perennial grass cover increased from 4.3% to 13.0% ($P < 0.01$). Litter cover increased from 49.2% to 58.4% ($P < 0.05$). Bare ground decreased from 35.2% to 3.0% ($P < 0.01$). The increase in cheatgrass cover explains a majority of the increase in litter and the extreme reduction in bare ground. The data indicate that the condition of the range may not have been as high as first thought, and, while cover of perennial species can increase under moderate stocking, rangeland may still be susceptible to invasion by cheatgrass. The invasion of cheatgrass may be attributable to the early spring flush of organic nitrogen associated with winter grazing.