

EDITOR'S CHOICE

Rangeland Ecology and Management, Volume 71, Issue 4

Soil Health as a Transformational Change Agent for US Grazing Lands Management

Justin Derner, Alexander Smart, Theodore Toombs, Dana Larsen, Rebecca McCulley, Jeff Goodwin, Scott Sims, and Leslie Roche

Many early American conservationists had a huge impact on the direction of natural resource science and a few are still having an impact today. One such conservationist was Hugh Bennett, an early soil surveyor working for the federal government in Virginia. Well before the Dust Bowl, Hugh recognized the relationship between soil erosion and soil quality. He spoke and wrote passionately about soil conservation, but just like today, his peers and supervisors believed he was incorrect and often opposed his views. Out of frustration with Hugh, one supervisor wrote, "The soil is the one indestructible... asset the nation possesses... It is the one resource that cannot be exhausted." Once the Dust Bowl arrived, Hugh made the best of his passion and used it as an opportunity to reduce soil erosion and transform our nation's focus toward conserving soil quality for decades afterwards. Today, many ecologists and conservationists are seeing a parallel need and opportunity to re-energize Hugh's passion about soil. They propose refocusing on soil health and using it as a transformational change agent for US grazing lands management. These authors are the recipients of the Editor's Choice award for Volume 71, Issue 4 (July 2018) of *Rangeland Ecology & Management*.

Rangelands comprise a large part of the land in the United States. Grazing lands provide an extensive list of essential ecosystem goods and services for society, including food and fiber, soil and water resources, and space and nutrients for a diversity of plants and animals. Increasing weather variability, growing human populations, and increases in atmospheric CO₂ and global temperatures threaten the ability of rangelands to provide these life-sustaining ecosystem goods and services. Maintenance and improvement of soil health and the associated soil-plant processes are the ecological foundation of ecosystem goods and services and are critical for the sustainability and resiliency of rangelands. Physical, chemical, and biological components of soil health enable the soils to sustain basic biological processes and functions, maintain environmental quality, and promote plant and animal health and productivity. Soil health and rangeland sustainability are inextricably linked.

These authors believe there is a rapidly growing national interest in grazing lands' soil health, but the movement is tempered by limited scientific evidence clearly illustrating positive feedbacks between soil health and grazing land resilience and sustainability. The goal of their Editor's Choice article is to provide the scientific rationale and recommendations for linking soil health with grazing management considerations on grazing lands. They assert that the current soil health renaissance (now spreading in cropping systems) can help us move toward science-based management for improving grazing lands' resilience to environmental change by 1) refocusing grazing management plans on maintaining and restoring fundamental ecological processes (water and nutrient cycling and energy flow); 2) incentivizing process-based adaptive management aimed at incorporating maintenance and restoration of soil health as outcomes, supported by relevant monitoring attributes; 3) advancing holistic and integrated approaches for soil health that highlight social-ecological-economic interdependencies of these systems, with particular emphasis on human dimensions; 4) building cross-institutional partnerships on grazing lands' soil health to enhance technical capacities of students, land managers, and natural resource professionals; and 5) creating a cross-region, living laboratory network of case studies and associated process-based research involving producers focusing on soil health as a guide to their grazing land management. These authors believe this could foster transformational changes by strengthening the link between natural resource stewardship and sustainable grazing lands management through management-science partnerships in a social-ecological systems framework.

As it turns out, Hugh Bennet was not only correct in the early 1900s, but many scientists think he is still correct today. Hugh Bennet is the founder of the Soil Conservation Service, which is now the Natural Resource Conservation Service. Now you know the rest of the story. (Much of this note was lifted directly from the Editor's Choice article, which you can find in *Rangeland Ecology & Management*, 71(4):403–408).

Roger Sheley
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