

IMPACT

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FOSTERING HEALTHY RANGELANDS

THE ISSUE

California rangelands cover nearly 40 million acres, providing environmental and economic benefits such as livestock forage, wildlife habitat, and plant biodiversity. They are also important for cycling nutrients, sequestering carbon, and generating more than 85 percent of California's drinking water supply.

Yet, our rangelands are at risk of degradation. Considerable oak tree removal has occurred over the past century for fuel wood harvest and short-term gains in grazing capacity. Persistent invasions of troublesome weeds such as medusahead and yellow starthistle reduce livestock carrying capacity and plant and animal diversity. Continuous heavy livestock grazing can negatively affect ecosystem functions. However, proper livestock grazing can enhance biodiversity and nutrient retention, suppress weeds, and help mitigate climate change impacts.

A crucial need exists for scientific information on grazing so that ranchers, land managers, and public agencies can modify practices and establish policies for the long-term ecological health and economic viability of California rangelands.

WHAT WE ARE DOING

The California Rangeland Watershed Laboratory (<http://rangelandwatersheds.ucdavis.edu>) is a valuable resource for the rangeland community. "Our research and outreach focuses on the diverse



managed ecosystems that comprise California rangelands," says UC Davis rangeland watershed specialist Kenneth Tate. "We study and promote management to support the multitude of services that rangelands provide to society and believe that the application of sound science, adaptive range management, and excellent stewardship enhances water quality, soil quality, stream and floodplain function, aquatic and terrestrial habitat, native plant and wildlife species, and agricultural productivity."

Tate and fellow UC Davis scientists partner with affiliated research laboratories, UC Cooperative Extension advisors, ranchers, and rangeland

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managers, as well as natural resources conservation, management, and regulatory organizations. Since more than 50 percent of California rangelands are privately owned and managed for cattle production, effective collaboration with ranchers is essential to advance scientifically sound grazing practices.

Tate and other scientists are engaged in a long-term project to develop grazing management strategies to sustain ecosystem health and ranching enterprises in the West. The researchers are working with ranching communities in California and Wyoming to integrate management expertise, ranch-scale research, and other research information to identify grazing options that can be prescribed to meet multiple goals. Wyoming has perennial, summer rangelands, while California has a winter rangeland system dependent on annual grasses.

Environmental science and policy professor Mark Lubell is conducting a survey of 1,500 rangeland grazing managers to determine the social, cultural, economic, and institutional factors influencing grazing decisions. The aim is to understand how managers receive, assess, and use grazing management information, and to determine perspectives on grazing intensity, grazing season, and rest from grazing for ecosystem restoration.

A 10-year experiment with beef cattle at the UC Sierra Foothill Research and Extension Center is also part of the project. This study is investigating and demonstrating prescribed grazing strategies for restoring ecosystem services. Research by plant sciences professors Valerie Eviner and Kevin Rice, in

collaboration with Carolyn Malmstrom at Michigan State University, has shown that grazing in March and April can decrease end-of-season prevalence of forage species and increase prevalence of noxious rangeland weeds and native legume frequency—vegetation shifts that can impact ecosystem functions.

The project also is developing online information about prescribed grazing and restoration; site-specific grazing management and monitoring options; and opportunities to network with others about prescribed grazing and restoration. The challenge is to integrate information for application at the ranch enterprise scale.

“Managers often focus on operational and socio-economic outcomes at the ranch-scale, while researchers emphasize ecological processes of vegetation-soil-herbivore interactions within plant communities and ecological sites,” Tate says. “These are both important scales to evaluate grazing management. Through this project we hope to bridge the gap in scale and communication in order to integrate prescribed grazing research and management expertise.”

A SHARED VISION

The prescribed grazing study is one of many projects by UC Davis and cooperating scientists to help keep the state’s rangeland healthy and productive. These projects help environmental groups, ranchers, land managers, and other stakeholders work together more effectively. “There used to be much more conflict over grazing on rangelands,” Tate says. “Now I see a lot of willingness to resolve problems and get to common solutions that work for everybody.”

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