Livestock Can Help Rangelands Recover from Fires

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A 14-year study by ARS scientists found that rangelands that have been grazed by cattle recover from fires more effectively than rangelands that have been protected from livestock; a surprising finding that could impact management strategies for native plant communities. Photo courtesy of Tony Svejcar, ARS.

(PhysOrg.com) -- A 14-year study by Agricultural Research Service (ARS) scientists in Oregon found that rangelands that have been grazed by cattle recover from fires more effectively than rangelands that have been protected from livestock. These surprising findings could impact management strategies for native plant communities where ecological dynamics are shifting because of climate change, invasive weeds and other challenges.

Much of the rangeland in the western United States is threatened by the spread of cheatgrass and medusahead, invasive non-native annual grasses

that fuel wildfires and readily infest landscapes, especially after fires. These rangelands historically were burned by wildfires every 50 to 100 years, but over the past century these fires have been suppressed by humans. This suppression allowed some dead plant litter to accumulate, but when cattle were introduced to the region, their grazing helped keep litter accumulation in check.

Rangeland scientists Kirk Davies and Jon Bates and research leader Tony Svejcar, who work in the ARS Range and Meadow Forage Management Research Unit at the Eastern Oregon Agricultural Research Center in Burns, Ore., carried out studies comparing how native plants on grazed and ungrazed sagebrush rangelands recovered from fires. All the sites had similar vegetation profiles and were virtually free of cheatgrass.

In the grazed areas, cattle consumed around 40 percent of the available forage, which removed much of the potential litter. The ungrazed sites, where livestock had been excluded since 1936, had almost twice as much litter as the grazed sites.

The scientists conducted a controlled burn on all the sites in 1993, and then measured vegetation cover, vegetation density and biomass production in 2005, 2006 and 2007. They found cheatgrass had infested a large portion of the ungrazed sites, leaving these areas even more vulnerable to future fires.

However, cheatgrass did not become problematic on the sites that had been grazed. On these sites, native bunchgrass cover was almost twice as dense as bunchgrass cover on the ungrazed sites. The team concluded that the litter in the ungrazed sites fueled hotter fires that killed off much of the perennial vegetation, which allowed quick-growing invasive annuals to become established.

Results from this study were published in the September 2009 issue of

Ecological Applications. This study supports the USDA research priority of responding to global climate change.

More information: esapubs.org/esapubs/journals/applications.htm

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