Grassland & Rangeland Science

The USDA Forest Service Rocky Mountain Research Station (RMRS) provides cutting-edge grassland and rangeland science. Rangeland vegetation information is used to prioritize management actions and identify the amount of forage available to livestock producers.

Monitoring rangeland vegetation variability, which often exceeds 40 percent on an interannual basis, can be time consuming and costly. RMRS assisted in creating the Rangeland Production Monitoring Service (RPMS) to quickly and efficiently provide estimates on the timing and magnitude of rangeland yield, improving the ability of land managers to make decisions early in the growing season. By rapidly estimating drought-induced forage loss, RPMS can help land managers prioritize areas for reseeding efforts.

RMRS worked with collaborators to develop PhenoMap, a web-based tool to assess the production and location of high quality forage. By using satellite imagery, land managers can obtain near-real-time information about vegetation conditions over large spatial areas. Managers can use PhenoMap to identify the onset of drought and adapt land use decisions accordingly.

A West-Wide Rangeland Fuel Assessment is a monthly webcast that describes current rangeland fuel conditions across the western United States. Based on an RMRS-led forage prediction and monitoring system driven by daily climate and remote sensing information, webcasts provide land managers with projected forage conditions and alerts managers to emerging hotspots.

Reseeding rangelands and grasslands after a disturbance, such as fire, is a proven way to prevent erosion and suppress invasive species. RMRS scientists conducted the first long-term study comparing reseeding mixtures in the Great Basin. Their findings indicate that seeding with native plants can effectively suppress cheatgrass while also supporting wildlife habitat, biodiversity, and the health and sustainably of rangeland resources. Additionally, RMRS research is improving reseeding success by identifying cost-effective methods for reducing seed predation, including coating seeds with substances such as chili powder to deter consumption by small mammals.

A 2020 review provides insight on sustaining pollinator populations in the Great Plains. The review found that disturbances such as prescribed fire and grazing can enhance overall pollinator habitat, though small, isolated pollinator populations may be negatively impacted by disturbance.
A grove of brilliant gold trees stands stark amid the grasses at Hat Creek on the Oglala National Grassland in Montrose, Nebraska. USDA Forest Service photo by Sarlyn McCormick.

The grasslands of the Great Plains hold the highest concentration of U.S. energy sources, including fossil fuels, biofuels, and wind. Scientists helped identify a path forward for responsible energy development. Informed planning and improved technology can lessen the impacts of energy development and production on grasslands ecosystems. Additionally, RMRS scientists created a comprehensive report that describes the effects of increased drilling and hydraulic fracturing on soils, vegetation, wildlife, and aquatic communities in the Little Missouri National Grassland. Located in North Dakota, the Little Missouri National Grassland is the largest designated national grassland in the U.S. The information in the report, which summarizes recent science on actual and potential impacts of oil and gas development, is applicable to grasslands across the northern Great Plains.

The Rocky Mountain Research Station is one of 7 Forest Service Research & Development units. Within the 12-state RMRS footprint, we maintain 14 research locations, conduct long-term ecological research on 14 experimental forests, ranges, and watersheds, and work in hundreds of research natural areas.

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