

Rocky Mountain Research Station Science You Can Use *(in 5 minutes)*

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High and Dry: Quickly Assessing Forage Losses in Western Rangelands During Drought

When drought arrives, it can create widespread damage and reductions in plant productivity. Livestock producers worry about the loss of forage. In the past, assessing which lands were most affected and which producers might be eligible for assistance was expensive and time-consuming. Assessments usually only covered small areas. According to RMRS research ecologist Matt Reeves, “We need to start thinking outside the box about quantifying the impacts to forage resources. We need tools that can accurately depict forage losses in reasonable time frames based on the best-available science.”

“With improvements in technology and decreasing costs of remotely sensed data,” Reeves notes, “we now have the ability to rapidly and accurately quantify forage losses from drought for any landscape for very low cost.” In a [recent paper](#), he and his colleagues describe the two-phase process they developed to assess drought when three northeastern Arizona counties were declared disaster areas in 2019. The first phase was an assessment of vegetation production across ecological sites in the three-county region of Arizona. The second phase was a ranking process to determine which landscapes and ownerships could receive federal assistance to aid recovery. From this effort, an idea was born for a monthly recorded series called “[A West-Wide Rangeland Fuel Assessment: Reading the Tea Leaves](#)” which started in

April 2020 and will continue through September 2021 and start next season in March.

To quantify the losses in forage, the researchers used a tool called the [Rangeland Production Monitoring Service \(RPMS\)](#) to compare productivity estimates from 2018—the drought year—to the average production from 1984 to 2017 in the three affected counties. They found that 1.5 million hectares in the three counties had experienced 50 percent or greater losses in forage production. The USDA Natural Resources Conservation Service, Plant Materials Center in Tucson, recommended seed mixtures (based in the precipitation zones of the affected areas) as part of a producer assistance program.



*This photo shows the impact of drought (black arrows) on blue grama grass (*Bouteloua gracilis*) with visible dieback. (USDA Forest Service photo by Iric Burden).*

Although the RPMS can be used to rapidly evaluate drought impacts, it can also be used to identify both newly developing drought conditions and areas that are recovering, adding important information to management plans. When used with other information, such as drought monitors, the process is a quick and cost-effective solution to the problem of assessing drought impacts and demonstrates a way that multiple agencies can work together to help producers and land managers in the western United States.

These data can be especially useful for developing Allotment Management Plans, adjusting Annual Operating Instructions, and assisting with NEPA documentation. In addition, these data provide the missing link to developing comprehensive rangeland capacity assessments since they can identify areas where forage supply and demand are out of sync. Right now, Reeves and his colleagues are also developing a science–management partnership in Forest Service Region 3 to assist in fast tracking the NEPA documentation for 12 allotments on the Apache-Sitgreaves and Tonto National Forests. If you are a rangeland manager and would like to learn how to establish

automated monitoring for all lands in your neck of the woods, just contact RMRS or Reeves at Matthew.Reeves@usda.gov.



RMRS scientists have developed rapid and accurate methods for assessing forage losses during drought. (USDA Forest Service photo by Iric Burden).

KEY MANAGEMENT CONSIDERATIONS

- Part of these projections includes a separate assessment of annual herbaceous yield (e.g., cheatgrass), enabling managers to “see into the future.” These data are produced automatically on a weekly basis and are ready for managers and planners right now.
- These data are directly applicable to:
 1. Fire behavior assessment and strategic planning: Since these data include a standing dead component, they are useful for developing burn plans early in the season or in strategic risk assessments.
 2. Improving rangeland allotment management plans: Using the RPMS, managers can identify the areas within their allotments where vegetation performance is lagging and make adjustments accordingly.
 3. NEPA Assessment: By looking back over the last 37 years, managers can automatically evaluate trends and variability in forage production to produce more defensible NEPA assessments.
 4. Plan Revision: As Forest Plans require increasing use of monitoring, the RPMS can become an integral part of the strategy to communicate to stakeholders that we are using the best available science ... and it's easy.

PROJECT LEAD

[Matt Reeves](#) is a research ecologist at RMRS, specializing in the use of remote sensing and GIS to facilitate evaluation of contemporary issues facing U.S. rangelands.

FURTHER READING

Reeves, Matt C.; Hanberry, Brice B.; Burden, Iric. 2020. [Rapidly quantifying drought impacts to aid reseeding strategies](#). Rangelands. doi 10.1016/j.rala.2020.07.001.

[A West-Wide Rangeland Fuel Assessment: Reading the Tea Leaves](#). Monthly recorded series from May to September.

The Rocky Mountain Research Station is one of seven units within USDA Forest Service Research & Development. RMRS maintains 14 field laboratories throughout a 12-state geography encompassing parts of the Great Basin, Southwest, Rocky Mountains, and the Great Plains. While anchored in the geography of the West, our research is global in scale. RMRS also administers and conducts research on 14 experimental forests, ranges and watersheds and maintains long-term research databases for these areas. Our science improves lives and landscapes. More information about Forest Service research in the Rocky Mountain Region can be found here: <https://www.fs.usda.gov/rmrs/>.

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