



University of Idaho

Rangeland Center

Promoting Collaborative Solutions for Rangelands

Research Summary: Balancing sage-grouse resources with livestock production in wet meadows

AUGUST 2026

Wet meadows, also known as mesic meadows, are a valuable source of water, habitat, and forage for wildlife and livestock. Despite comprising only a small portion of the overall landscape, they provide resources for 70-80% of plants and animals. One of Idaho's Species of Greatest Conservation Need, the Greater Sage-Grouse, is reliant on mesic meadows for critical forage and habitat. Considering these areas are also important grazing areas for livestock, it is critical to identify grazing strategies that are compatible with improving or managing this important sage-grouse habitat.

Several forbs found in mesic meadows serve as important forage for Greater Sage-Grouse during summer and fall months, including the common dandelion, mountain dandelion, and nodding microseris. Understanding the relationship between livestock grazing and the health and growth of these forbs is key for developing grazing strategies compatible with sage grouse needs. Soil moisture is a critical component of a mesic meadow system, and the effects of livestock use on soil moisture had not yet been determined. University of Idaho researchers studied livestock use, sage-grouse forage cover, and soil moisture in mesic meadows to better understand the relationship between grazing in mesic meadows and forage availability for the Greater Sage-Grouse.

THE STUDY

Over a two-year period, University of Idaho researchers measured the response of preferred sage-grouse forbs and soil moisture to different levels and timing of livestock use in mesic meadows at Rinker Rock Creek Ranch in Blaine County, Idaho. Prior to the study, the vegetation in the pastures largely consisted of forage grasses, such as meadow foxtail and smooth brome, and relatively few forbs.

The research team focused on two key aspects: 1) how timing and level of livestock use impacted forbs that sage-grouse rely on, and 2) how plant composition and soil moisture responded to levels of relative use. Yearling heifer weight gain was also monitored to evaluate

KEY MANAGEMENT FINDINGS

- None of the grazing trials caused a decline in the forbs important for sage-grouse, demonstrating that there are grazing strategies that are compatible with the needs of Greater Sage-Grouse.
- Overall, early season grazing promoted establishment and growth of forbs preferred by sage-grouse between the first and second year of the study.
- Heavy early-season livestock use resulted in the greatest increase in forbs important to sage-grouse, with time remaining in the growing season for forage to regrow.
- Early season grazing combined with heavy use resulted in the highest quality and regrowth of forage for livestock.
- Neither early-season nor late-season grazing reduced availability of forbs for sage-grouse in this study.
- Grazing strategies in this study did not increase or decrease noxious weeds, such as field bindweed, diffuse knapweed, and thistle.



if different grazing strategies resulted in different livestock production outcomes.

Early-season (June) and late season grazing (August) was conducted at both moderate and high levels. The researchers also evaluated pastures fenced to exclude livestock to provide a comparison with mesic meadows that had not been subjected to grazing pressure. The sites were monitored over two consecutive years. It is unknown whether these outcomes and applications extend beyond a two-year timeframe.

OUTCOMES & APPLICATIONS

This study has several applications for land managers, livestock producers, and sage-grouse conservation work within mesic meadow systems similar to the study site.

None of the grazing strategies implemented within the study led to a decline in studied forbs, suggesting that some livestock grazing strategies are compatible with maintaining forage for sage-grouse in wet meadow habitats. Soil moisture was also not affected by livestock use.

Early season grazing actually helped to establish and promote growth of forbs important to sage-grouse between the first and second year of the study. The highest quality livestock forage (as determined by highest crude protein and lowest neutral detergent fiber) was also observed when early season grazing was combined with heavy use. Although grazing differences did not result in significant changes in heifer body weight gains within this study, there is a strong correlation between early season grazing and increased body weight. This strategy was beneficial in increasing the sage-grouse preferred forbs within this specific habitat and timeframe.

None of the grazing strategies changed noxious weed cover, such as field bindweed (*Convolvulus arvensis*), diffuse knapweed (*Centaurea diffusa*), and thistle (*Cirsium* spp.). Although potential grazing strategies for noxious weed management in mesic meadows was beyond the scope of this study, researchers did not see increases in the cover of any noxious weeds that occur at the site.

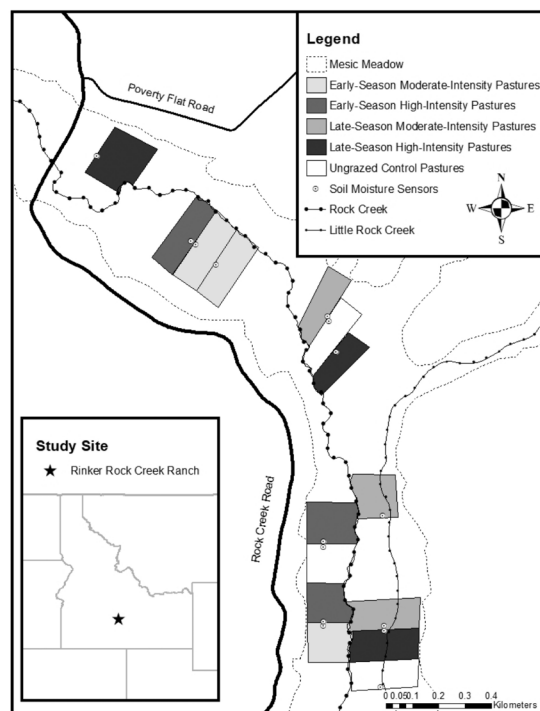


Figure 1. Study site at Rinker Rock Creek Ranch

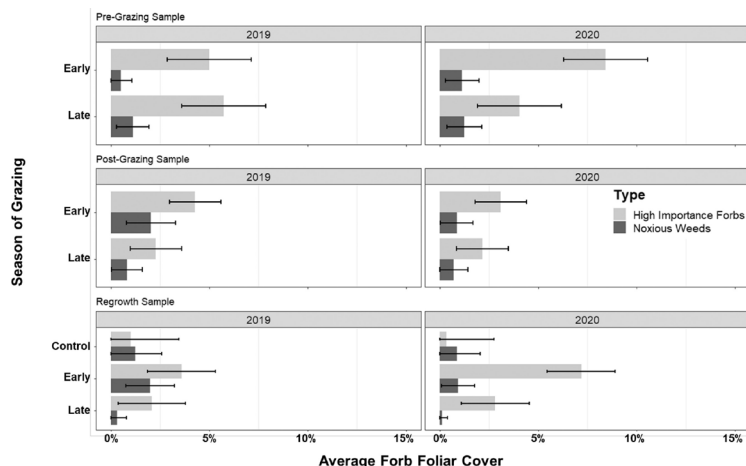
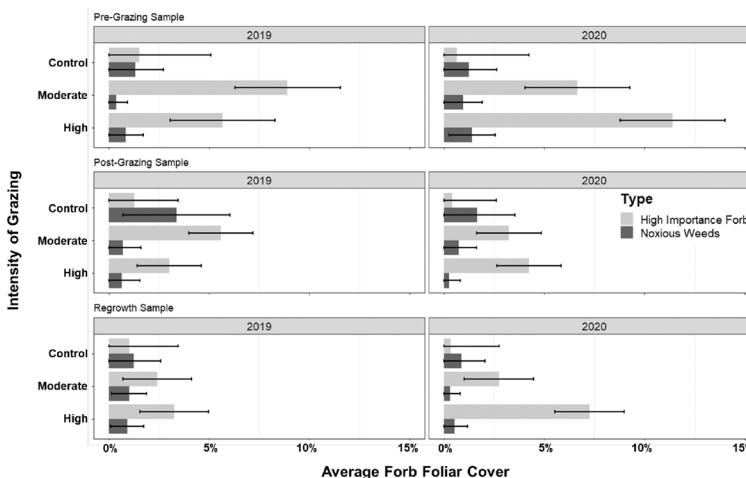


Figure 2 & 3. Means $\pm$ standard error of foliar cover (%) for preferred forbs of high importance to greater sage-grouse and noxious weeds by grazing season during the pregrazing (< 7 d), postgrazing (< 7 d), and regrowth (late September) sampling periods in early-season (early June) and late-season (early August) short-duration grazing treatments during 2019 and 2020 at Rinker Rock Creek Ranch.



K.J. Randall, M.J. Ellison, J.V. Yelich, W.J. Price, T.N. Johnson, Managing Forbs Preferred by Greater Sage-Grouse and Soil Moisture in Mesic Meadows with Short-Duration Grazing, *Rangeland Ecology & Management*, Volume 82, 2022, Pages 66-75, ISSN 1550-7424, <https://doi.org/10.1016/j.rama.2022.02.008>.

The Rangeland Center is bridging the gap between science and land management by engaging stakeholders to develop solution-based research that has valuable and real world implications for Idaho rangelands.



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