2025 Project Progress Report:

Title: Post-Fire Cattle Grazing on Rinker Rock Creek Ranch

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Background

The introduction of livestock grazing into areas recently impacted by wildfire is of vital interest and subject to much debate (https://tellus.ars.usda.gov/stories/articles/graze-after-fire-or-not-graze). In Idaho, areas that provide habitat for the greater sage-grouse must be rested until vegetation has recovered, and if seeded, should be rested until at least the end of the second growing season following the fire.

Although national leaders from the Bureau of Land Management (**BLM**) and the United States Forest Service (**USFS**) acknowledge that there is no national policy regarding livestock exclusion following wildfire (Personal Communications, "Campfire Session," Society for Range Management National Meeting, Reno, NV, January 30, 2024), it is common practice for BLM and USFS grazing allotments to be obligated to nonuse for two years following a wildfire. Oftentimes, this policy can interfere with ecological recovery of an ecosystem, particularly in areas populated with a high proportion of invasive annual grasses. The high variability in fire severity, soils, precipitation, and plant response to fire that exists in rangelands suggests there are important context-dependencies that can influence whether grazing, an integral ecological disturbance in rangelands, is appropriate after fire. In fact, some western landscapes have transitioned into the *burn*, e*xclude livestock, buildup of fine fuels, burn again, exclude livestock again* fire cycle. With hotter, drier climatic conditions in western landscapes, these persistent fire regimes (with the aforementioned agency policies) can derail the use of livestock grazing from land management for extended periods of time.

The expansion of invasive annual grasses is most apparent along major travel corridors where wildfires have impacted the native sagebrush/perennial grass plant communities. For example, the I-84 corridor in the Snake River Valley (Boise to Glenns Ferry) has the most wildfire ignitions (*BLM Paradigm Seeks to Break Fire Cycle* video, Life on the Range, 2016) in the entire United States.

After moderate drought conditions for approximately three months in Blaine County, Idaho, on Sept. 2, 2024, lightning ignited the Glendale Fire. The fire burned 7,542 acres, 4,653 acres of which belong to the University of Idaho's (**UI**) Rinker Rock Creek Ranch (**RRCR**). With this burn, the RRCR has become a living laboratory to test the effect of post-fire grazing during the following spring and summer.

Hypotheses and Objectives

We hypothesized that conservative grazing (≈ 30% utilization) applied 8 months after a fire will not negatively impact perennial grass recovery and effective ground cover. Additionally, we hypothesized that grazing that occurs on seeded sites will have minimal impact on perennial grass recruitment and that

grazing effects will diminish as the grazing season progresses. We also hypothesize that drone imagery will prove efficacious in monitoring ground cover and erosion potential following grazing.

Post-Fire Cattle Grazing Objectives. 1) Evaluate the effects of targeted spring and summer grazing during the first growing season after wildfire in areas with and without re-seeding with respect to effective ground cover, erosion potential, perennial grass recovery, invasive annual grass recruitment, and livestock grazing behavior. 2) Monitor livestock performance and forage utilization for yearling steers engaged in targeted grazing following wildfire. 3) Evaluate the use of drone imagery in predicting vegetation cover and erosion potential against field collected vegetation data.

Procedures

Experimental Pastures and Animals. Our objective was to apply targeted livestock grazing to recently burned sagebrush steppe rangeland during the spring and summer immediately following a fall burn (eight months previous). Research occurred on the RRCR (located 11.2 miles SW of Hailey, ID) from May 19 to July 14, 2025. Our grazing trials included four replicate pastures grazed by 14 yearling steers. Our plan was to apply conservative (20 to 40% forage utilization) grazing during the spring to summer season in which recovering perennial grasses are perceived to be at the most risk. The four replicate pastures and four excluded pastures were located within the confines of the September 2024 Glendale Fire and were approximately 44 acres each in size. Each grazed pasture was created using temporary electric fence and was grazed for two weeks, commencing on May 19, 2025, and ending on July 14, 2025. Forage production was estimated prior to livestock entry using 20 replicate, random 0.16 m^2 plots and was utilized to calculate the 14-d stocking rate with a goal of 30% forage utilization. Approximately 30 to 40% of two replicate pastures had aerial seeding applied in November 2024 on south facing slopes located in the eastern area of the pasture. To determine cattle occupancy and behavior on seeded and non-seeded portions of each replicate pasture, data loggers containing GPS and accelerometer capability (Gulf Coast Data Concepts, LLC, Waveland, MS, USA) were placed on each steer. Steer locations were obtained every 30 minutes and collars were changed out after 2 weeks to ensure battery life. We used standardized procedures to determine daily grazing, resting, and walking activity (every 5 seconds) from accelerometers and daily location, travel distance, slope, elevation, aspect, elevational gain, and time spent on slopes > 15% from GPS sensors (every 30 minutes). Additionally, the home range of the steers in this study was determined within each sampling period.

The yearling steers utilized in this study had body condition scores (**BCS**) and weights recorded at the beginning and end of the research trial and each time pastures were changed for the two-week grazing periods. Weather data from the nearest on-site RRCR weather station will be compared against daily cattle behavior to quantify the effects of climate upon animal behavior.

Monitoring. Monitoring conducted before and following cattle entry in the burned pastures (and non-grazed replicates) included ground cover, plant density, plant frequency, fetch (distance to closest perennial plant), and dry weight rank (for species composition). These monitoring plots were located within seeded and non-seeded areas of replicate pasture. Primary cover estimates conformed to the BLM protocol using 4 line point intercept (LPI) transects, for a total of 400 LPI points per plot. Canopy gap intercept was also determined on each LPI transect. Additionally, these cover estimates were compared to cover estimates obtained with two cover screws located on 200 0.16 m^2 quadrat frames located on 8 transects of 25 quadrat frames using the paced frequency method (Guide to Rangeland Monitoring and Assessment; Arizona Grazing Lands Conservation Association; https://rangelandsgateway.org/dlio/153670). Forage utilization was validated for each seeded and non-seeded key area within each grazed pasture using the USFS Utilization Gauge (Utilization Studies and Residual Measurements; Interagency Technical Reference; https://www.blm.gov/sites/blm.gov/files/documents/files/Library_BLMTechnicalReference1734-03.pdf) following grazing in the fall of 2025. Forage production was obtained prior to and following grazing (fall

of 2025) as described previously. Root stability was tested for each monitoring site using a dynamometer and a set of sheet metal vicegrips (see Root Stability Video). Soil moisture was also determined. The trend data described above will be collected for one to two years following this experiment to demonstrate the long-term effects of spring livestock grazing following a short (8 month) exclusion period following fire.

Drones. To evaluate vegetation cover and seeding success at larger scales, the UI Drone Lab flew a drone equipped with a visible and multi-spectral camera over each of the replicate pastures. The drone flights coincided with the ground-based data and will be used to calibrate the estimates of vegetation cover. Before each flight, 8 ground control points were placed throughout the plot and the location read using a with a high-precision RTK GNSS. Using structure-from-motion (SfM) photogrammetry, images will be combined and orthorectified into a single image of the pasture. Vegetation cover of major functional groups on each of the pastures at the time of drone data collection will be estimated by rangeland experts using image-interpretation at 150 randomly selected points.

Statistics: Grazing behavior data will be analyzed within each sample period by mixed model procedures for repeated measures with date, seeding status, and seeding status x date as fixed effects and steer as a random effect. Production data (BCS and weight) will be analyzed using mixed model procedures with sample period (beginning or end) as a fixed effect and steer as a random effect. Vegetation and cover data will be analyzed for seeded and non-seeded areas by transect using standard t-test procedures.

Preliminary Results

When cattle were introduced into the burned pastures, the forage had barely achieved grazing readiness after being totally burned 8 months previous (See Figure 1). We successfully targeted our grazing treatments at the time when the perennial grasses are perceived to be most vulnerable. If we can successfully graze vegetation during this time period without deleterious effects, then extended post-fire grazing removal suggested by land management agencies need reexamining.

Figure 1. One of the four experimental replicate 44 A pastures in early spring of 2025, 7- and 8-months post-fire.

1. As expected, bare ground was high on these burned over sites (73% in spring; 60% in fall).
2. Due to reduced ground cover, forage production averaged 289 ± 125 lbs/A when cattle were placed in pastures.
3. The BLM specifies that seeded sites must demonstrate root stability before being grazed. That is why we are measuring this parameter on both seeded and non-seeded sites. Oniongrass (*Melica bulbosa*) appears to be an early successional species following fire. Unfortunately, it is also the

most easily uprooted plant. Of all the root stability test measurement failures (plant uprooted with roots attached; 16% of total) in spring/summer monitoring, 64% of the failures were with oniongrass (see Root Stability Video). The other native perennial grasses like bluebunch wheatgrass (9.4% of total failures) appeared to be more resilient. No failures were observed with Great Basin Wildrye.

4. Cattle achieved 2.34 lbs/day gain over the grazing period. Due to scattered forage, cattle appeared to wander more as they grazed, and they occupied over 90% of the total area of the pastures.
5. Cattle preferred grassy sloughs where the forage was green and abundant (See Figures 2 and 3). These areas were wetter during the fire and apparently survived the fire well.
6. We projected 30% forage utilization with our standardized stocking rate based upon animal weight, estimated forage intake (2.3% of body weight), and available forage production. The actual forage utilization measured in October 2025 averaged 24% over all sites and ranged from 16 to 29%.
7. Perhaps our most significant finding is that early season grazing (mid-May to mid-June) reduces the abundance of cheatgrass and grazing in late June prevents cheatgrass from increasing. Cheatgrass increased on all grazed sites when the grazing occurred in July. This is likely due to plant phenology and a grazing aversion to cheatgrass at this time of year. Once cheatgrass turns red in the summer, cattle usually avoid eating it. It becomes a favored forage again in late fall after seeds have dropped. See Figures 4 and 5 for more information.

Figure 2. Scott Jensen (left) and Tressa Wade (right) assist in collecting grazing behavior data to validate accelerometer data in the Rep 4 grazing pasture on 5/21/2025. A grassy slough favored by experimental cattle is present in the center of the picture.

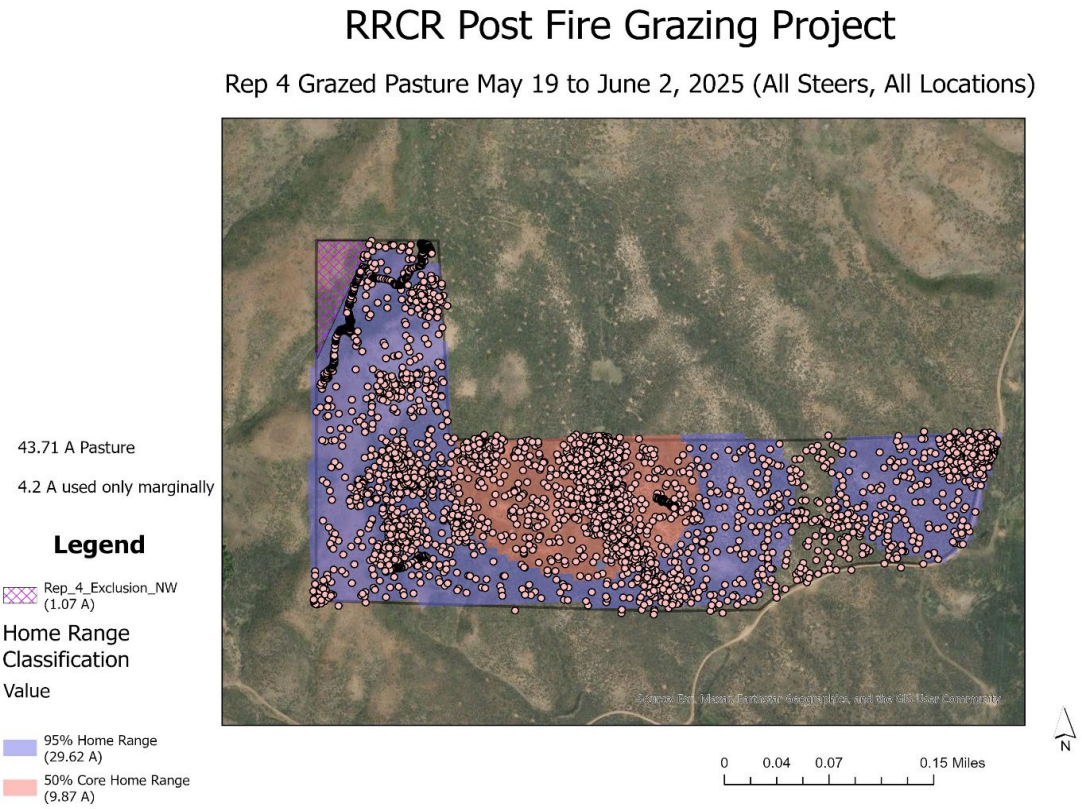

Figure 3. Home range chosen by experimental cattle in the Rep 4 pasture. Cattle spent 50% of their time on 10 A of the pasture surrounding the grassy slough shown in Figure 2. An additional 30 A captured 95% of their home range territory. Approximately 4 A of the 44 A pasture was used only marginally. Small dots are GPS locations for all cattle in the pasture, recorded at 30-minute intervals. The cluster of waypoints on the extreme right hand upper corner is by the water troughs.

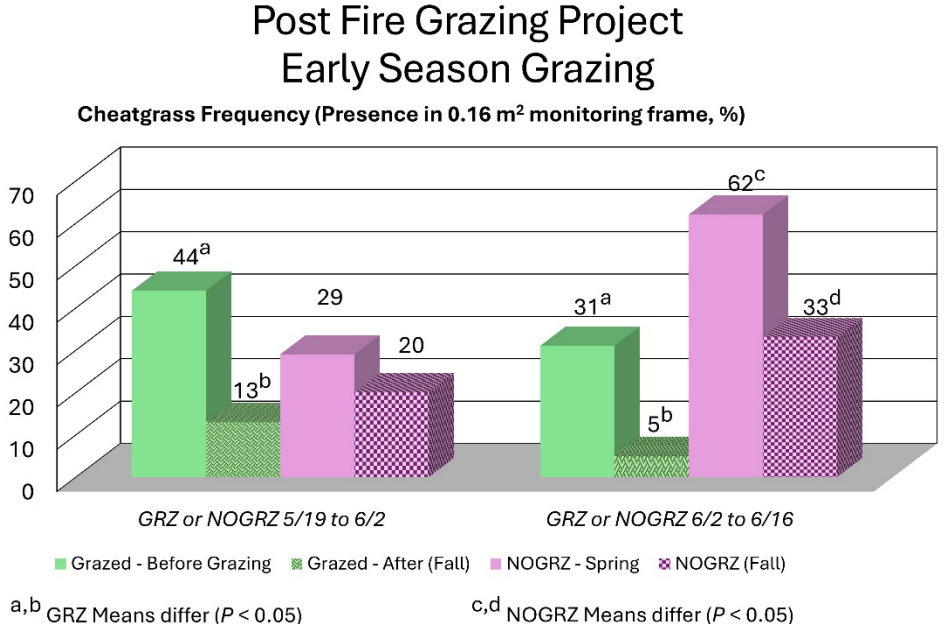

Figure 4. Effects of early season grazing upon cheatgrass abundance.

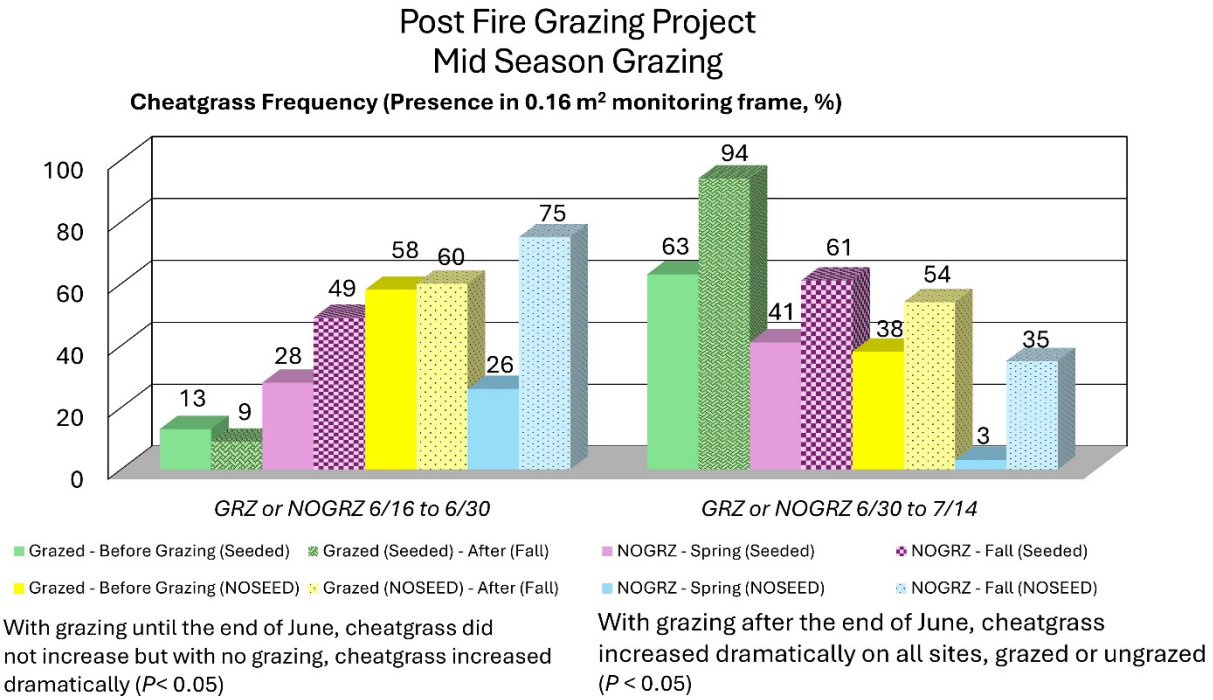

Figure 5. Effects of summer season grazing upon cheatgrass abundance.

Conclusions

In conclusion, our preliminary results indicate that conservatively grazing sagebrush steppe pastures at RRCR 8 months after a fire does not appear to be detrimental. In fact, grazing may help reduce cheatgrass abundance as vegetation is repopulating the landscape. Cattle used in this project achieved acceptable average daily gains and remained in good condition and health throughout. We would like to thank the many volunteers who helped with this project. All total, approximately 20 people assisted in range monitoring data collection for this project. We would also like to thank the David Little Livestock Range Endowment for making this project possible. We will continue to gather range monitoring data in the spring/summer and fall of 2026 and will be submitting another grant of reduced amounts to help support that effort.

Publications

Sprinkle, J., Jensen, S., Karl, J., Lauritzen, D., Wade, T., Winford, E., Weskamp, C., Prescott, W., Johnson, T., & Hall, J. (2025, October 15). Post-Fire Grazing Research at Rinker Rock Creek Ranch. Line Rider Magazine. https://issuu.com/idahocattleassoc/docs/october_2025_line_rider

Sprinkle, J. (Ed.). (August 2025). Post-Fire Grazing Project Update. In Rangeland Center Member Update. https://rangelandcenter.org/news-events/

Sprinkle, J. (Ed.). (June 2025). Post-Fire Grazing Project Update. In Rangeland Center Member Update. https://rangelandcenter.org/news-events/

Figure 6. Experimental cattle resting at the top of a ridge in the Rep 3 pasture on a beautiful morning on June 3, 2025.