# Impacts of Unmanaged Grazing

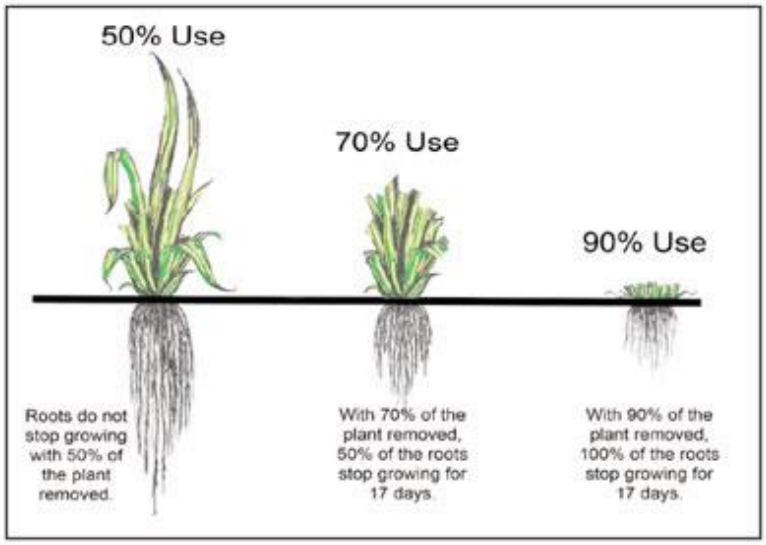
Rangelands are ecosystems that have adapted to withstand such disturbances as drought, flood, fire, and grazing. All disturbances affect plants to some extent, either directly or indirectly, depending on the **timing**, **intensity**, and **frequency** of the disturbance. Generally, the more diverse the vegetation, the better rangeland can withstand disturbance.

Rangeland plants provide nutrients—proteins, starches, and sugars—to grazing and browsing livestock and wildlife. These nutrients, or plant foods, are produced by photosynthesis. Because photosynthesis occurs only in green plant tissue and mostly in the leaves, a plant becomes less able to produce food, at least temporarily, when its leaves are removed (defoliation) by grazing and browsing animals.

Products of photosynthesis are just as important to plants as they are to animals. Like all other living things, plants need food to survive and grow. The food that plants make for themselves through photosynthesis is used for major plant functions such as surviving dormancy, growing new roots, growing new leaves in the spring, and replacing leaves lost to grazing or browsing. [1]

**Photosynthesis in plants drives soil health.** The degree of root growth below ground depends on aboveground growth. As plants grow, they also grow leaves and plant tissues that get deposited on the soil surface and may eventually decompose. This 'litter' contributes to soil health through decomposition, as well as protects the soil surface from erosion and hot temperatures in times of drought. Allowing for aboveground growth to occur is key to soil health, and resilience in drought, because it is the mechanism by which root growth occurs, and by which organic matter gets integrated into the soil profile. Consistent overuse of rangeland plants prevents aboveground growth, and similarly impacts below ground growth, making plants less resilient in drought

Failure to manage grazing can lead to overuse of plants, which in turn impacts plant vigor, diversity and ultimately soil health. As the graphic below shows, when too many leaves are removed from the plant, the growth and vigor of plant root systems slows or stops. This can reduce carbon input into the soil, result in less resilience to drought, and even grass mortality, increased soil erosion, and soil that is less able to capture water.




"Short roots can't hold the soil in place, let alone do their job of feeding soil microorganisms, creating a sponge to hold water, and pulling carbon from the air deep, deep into the soil where it can be sequestered. It's that depth that makes the difference between carbon that "breathes" back and forth between the soil and the atmosphere, and carbon that is actually held long term."[2]

[1] Source: Grazing and Browsing: How Plants are Affected by Robert K. Lyons and C. Wayne Hanselka – Associate Professor and Professor and Extension Range Specialists, The Texas A&M University System

[2] Source: https://onpasture.com/2015/11/09/great-grass-farmers-grow-roots/

August 30, 2021

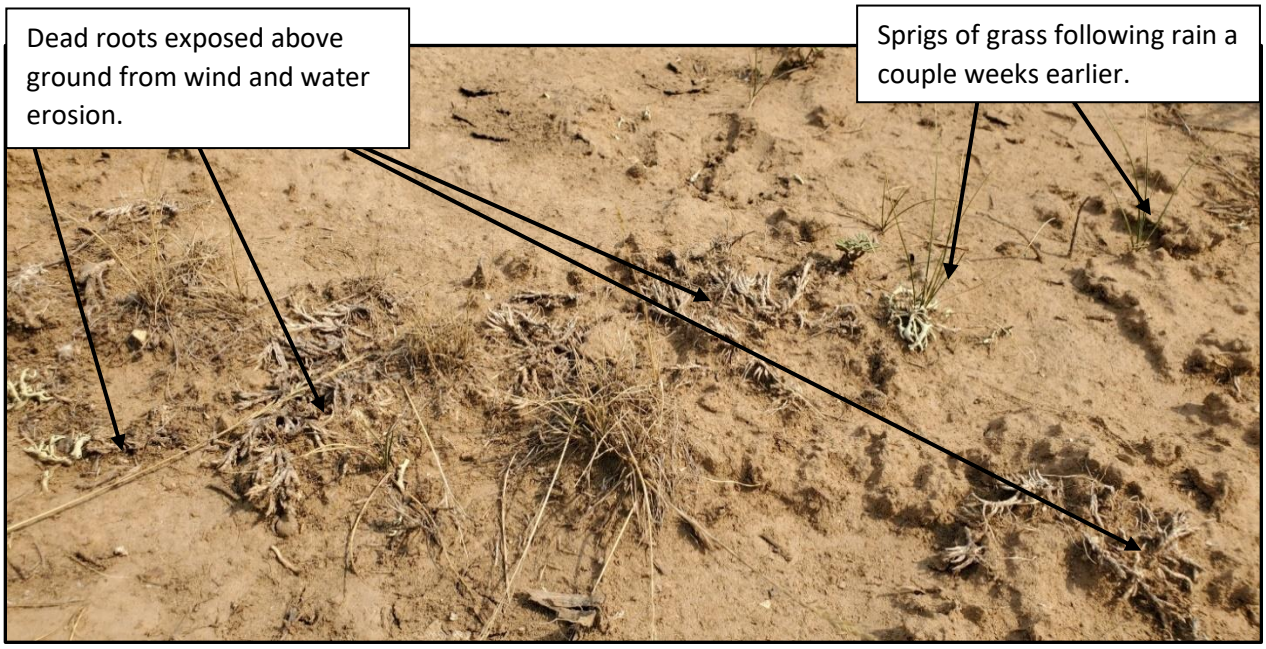
**Natural Resource Tour of Piceance East-Douglas Herd Management Area (PEDHMA)**

PEDHMA's Appropriate Management Level: **135 – 235 horses**

PEDHMA's (inside and outside) population estimate per BLM Survey Memo 6/10/21: 1,060 horses

**(1,060 horses + 20% annual population increase for 2021 & 2022 = 1,526 horses in 2022)**

Tour participants hearing and observing the results of the range monitoring data conducted 2018 – 2021.




**Close-up view of "grass mortality"**

Years of excess horses in the area caused severe impacts to the rangelands by unmanaged year-long grazing until the root systems could no longer sustain growth and succumb to the pressures.

**Wind and water erosion has removed soil where live plants no longer exist, exposing grass roots.**

Cattle are permitted in the PEDHMA on a seasonal basis.

Horses remain in the PEDHMA year-round, so the grass never gets rest.

# The Value of Managed Grazing

When not properly managed over the long-term, grazing can have negative impacts to the sustainability of rangeland resources; however, when managed properly grazing can provide ecological benefits compared to no grazing. Research has shown that in arid and semiarid areas, grazing at use levels below 40 percent can have positive impacts to forage plants compared to exclusion of grazing.[1]

Research conducted in western Colorado in mountain big sagebrush communities found no significant effects from 40-50 years of grazing exclusion on cover or frequency of grasses, biotic crusts, or bare soil and that grazing exclusion decreased above ground net primary production and biodiversity.[2]

In a synthesis of scientific literature on long-term rest in the sagebrush steppe, Davies et al.[3] found that long-term rest and properly managed grazing produced few significant differences, and in some situations, negative ecological effects from long-term rest.

On the other hand, consistent heavy use by grazing can produce long-term effect that ecosystems may take years or decades to recover from, especially during drought[4,5].

September 5, 2021
Grazing Allotment
North of Hwy 64
Rio Blanco County, CO
Livestock Permitted utilizing managed grazing.
No Horses are on this allotment.

[1] Holechek, J.L., T.T. Baker, J. C. Boren, and D. Galt. 2006. Grazing Impacts on Rangeland Vegetation: What We Have Learned. Rangelands 28:7-13.
[2] Manier, D.J. and N. T. Hobbs. 2006. Large herbivores influence the composition and diversity of shrub-steppe communities in the Rocky Mountains, USA. Oecologia 146: 641. doi:10.1007/s00442-005-0065-9
[3] Davies, K.W., M. Vavra, B. Schultz, and N. Rimbey. 2014. Implications of longer term rest from grazing in the sagebrush steppe. Journal of Rangeland Applications 1:14-34.
[4] Bestelmeyer, B. T., Duniway, M. C., James, D. K., Burkett, L. M., & Havstad, K. M. 2013. A test of critical thresholds and their indicators in a desertification-prone ecosystem: More resilience than we thought. Ecology letters, 16: 339-345.
[5] Souther, S., Loeser, M., Crews, T. E., & Sisk, T. 2019. Complex response of vegetation to grazing suggests need for coordinated, landscape-level approaches to grazing management. Global Ecology and Conservation, 20, e00770.