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The Essential Role of Livestock Grazing on Federal Lands and its Importance to Rural America

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Chairman and Members of the Committee, thank you for the opportunity to testify today about the compatibility of ranching and wildlife conservation.

My name is David Naugle, I am a 20-year applied scientist, including the last 17 years in my current position as Professor in the Wildlife Biology Program, part of the Franke College of Forestry and Conservation, at the University of Montana in Missoula. I have researched the ecology of the greater sage-grouse (*Centrocercus urophasianus*; hereafter, sage-grouse) and sagebrush and grassland systems my entire career, publishing >90 papers and two books on these and related topics. Since 2010 to present, I also serve as an independent, third-party science advisor to the U.S. Department of Agriculture's (USDA) Sage Grouse Initiative (SGI), part of the agency's Working Lands for Wildlife (WLFW) model of species conservation administered by the Natural Resources Conservation Service (NRCS).

Vast grazing lands that span the western U.S. are irreplaceable assets, producing food and fiber, supporting rural economies, generating recreational revenue, and sustaining world-class wildlife populations. Working rangelands are the common thread that weave together these economic and societal values in the western half of our nation. Thus, keeping local ranchers productive, profitable, and sustainable considering challenges they face—extended drought, commodity price swings, and societal pressures to produce more with less—is a top priority for conserving rural ways of life and wildlife populations.

Tackling these challenges across the western geography presents a unique opportunity, but limited resources necessitate a strategic, watershed-scale approach that replaces 'random acts of conservation kindness' that fall short of achieving desired outcomes. As the federal agency charged with helping private landowners solve natural resource concerns, NRCS created WLFW as its premier approach for delivering targeted and watershed-scale actions that proactively conserve America's working lands. Fueled by the Farm Bill, this proven paradigm implements existing NRCS programs across whole landscapes to restore productive agricultural lands, maximizing their benefits for people and wildlife.

On western grazing lands, WLFW exemplifies how to efficiently focus resources to yield the most effective conservation outcomes. As part of WLFW, the Sage Grouse Initiative (SGI) and Lesser Prairie-Chicken Initiative (LPCI) have proven popular with western ranchers. To date, 2,154 producers have partnered up to conserve or enhance 7.5 million acres of grazing lands, an acreage the size of Maryland, benefiting hundreds of rural communities and wildlife resources.

The U.S. Fish and Wildlife Service (FWS) recognized the value of private landowners' conservation efforts through WLFW as a factor in their decision not to list sage-grouse under the Endangered Species Act (ESA). Rancher participation in SGI remains high post-listing decision because WLFW provides win-win solutions that are 'good for the bird and good for the herd'. This winning recipe has been replicated across the country for Montana's fluvial arctic grayling, Louisiana black bear, New England cottontail and successful restoration of the Oregon Chub. Thanks to WLFW all of these species are now recovering, and ESA regulation was removed or deemed unnecessary as a result of proactive conservation.

As an independent, third-party science advisor to USDA, I help NRCS maximize returns on the federal Farm Bill investments made with private ranchers. SGI Science fills two roles: 1) develop spatial targeting tools that help practitioners pinpoint where to invest in watershed-scale conservation, and 2) quantify outcomes of resulting conservation practices to assess their effectiveness and adaptively improve delivery. The Conservation Effects Assessment Project (CEAP)—a multi-partner effort led by NRCS— has been working since 2002 to quantify effects of conservation practices and programs, improve the science base for managing agricultural landscapes, and translate science into practices that benefit environmental quality. The CEAP was a critical piece of SGI from the start and continues to play an integral role in funding and distribution of science-based tools and information across western grazing lands.

Across sage-grouse range to date, we have used science to critically evaluate the targeting and effectiveness of prescribed grazing, invasive woodland removal, conservation easements, wet meadow and riparian restoration, and fence collision risk to wildlife. Findings are cataloged in 37 peer-reviewed publications within the scientific literature. Three of these publications evaluating prescribed grazing provide new scientific evidence that further supports the importance of ranching in sage-grouse conservation. This previously unknown information fills the void identified in recent reviews: "This paucity of information highlights a need for more research that directly measures the effects of livestock grazing on grouse" (Dettenmaier et al. 2017); "We lack empirical data describing the relationship of grazing to sage-grouse…" (Connelly 2014); and "empirical evidence supporting direct effects of livestock herbivory on sage-grouse habitat is lacking" (Beck and Mitchell 2000).

Maintaining seven inches of grass height as hiding cover has been a prevailing management strategy for these ground nesting birds. But new findings that challenge this long-held tenet suggest that biased field methods are often to blame for incorrectly identifying grass height as a driver of nest success. Common practice for a generation of scientists, including myself, was to measure grass height around nests directly following nest hatch or failure without regard to timing of data collection. Field biologists typically delay data collection until nest fate is known for fear of nest abandonment by the incubating female. Scrutiny by Dan Gibson and colleagues at University of Nevada-Reno reveal that allowing nest fate to dictate timing of data collection introduces bias into analyses because hatched nests are measured later than failed nests, giving spring grasses more time to grow (Gibson et al. 2015).

Soon after, SGI scientists replicated the Gibson et al. (2015) study, and after correcting for this bias, median grass heights at hatched and failed nests were nearly identical, within the thickness of a penny of one another (0.05 inches) across re-analyzed datasets from Montana, Wyoming and Utah (Smith et al. 2018a). The implication for grazing management is that grass height may not be as crucial to nest success as previously thought. Moving forward, future studies should adjust methods to ensure unbiased grass height measures at predicted hatch date, and management guidelines that include grass height as an indicator of nesting habitat quality may need to be revisited.

SGI scientists also have assembled a complete database for the 51 sage-grouse studies for which published estimates of vegetation structure and nest survival are available. Preliminary analyses of these data suggest that nest survival is unrelated to grass height across the entire species range. Instead, sagebrush cover is a better predictor of hatching success. Despite a lack of evidence to support its nest concealing properties, grass height across the 51 studies averages 7.3 inches, which may explain the origin of a 7-inch grass height requirement in public policy. This ongoing analysis will include similar inquiries into the role of grass height in brood survival, although less data is available for this vital rate.

Additionally, SGI scientists partnered with Montana Fish, Wildlife and Parks to conduct what is to date the most rigorous and long-term evaluation of livestock grazing and sage-grouse (Smith et al. 2018b,c). In its eighth year, this study in central Montana is evaluating how rotational grazing systems affect nesting habitat quality. From 2010-12, 10 ranches voluntarily enrolled in SGI rotational grazing systems; individually planned systems each adhere to NRCS Montana Prescribed Grazing standards and the following criteria designed to benefit sage-grouse: utilization rates ≤50% of current year's growth, duration of grazing ≤45 days, and timing of grazing changed by at least 20 days each year. Nine of 10 landowners also voluntarily rested 20% of their nesting habitat from grazing for ≥15 months on an annually rotating basis. We compared SGI-enrolled ranches to >20 non-enrolled operations. Non-SGI lands encompassed a variety of grazing systems of which most were managed less intensively under season-long grazing or slower rotations through larger pastures, usually without annual changes in season of use.

Findings from this evaluation show that nest survival was similar between SGI-enrolled versus non-enrolled ranches, and long-term nest success was consistent with that of a stable population. Resting pastures from grazing did not increase nest survival. Rotational systems and rest had negligible effects on grass heights which were within a half-inch of each other on SGI- versus non-enrolled ranches. Neither livestock presence nor indices of utilization were related to nest site selection or survival. Females instead selected nest sites based on abundance of sagebrush cover and distance from roads, whereas nest failure was driven primarily by severe weather.

In the same study area, Dr. Hayes Goosey, Rangeland Entomologist at Montana State University, is evaluating whether grazing affects sage-grouse food abundance by comparing insect numbers in rotationally grazed areas to those with no livestock grazing for over a decade. Greater abundance of insect foods preferred by sage-grouse chicks in grazed areas suggests that periodic disturbance by livestock may increase food availability to growing young (Hayes Goosey, personal communication, 5 July 2018).

Taken together, new science does not support increased nest survival from rotational grazing systems or pasture rest. The need for tall grass as hiding cover throughout the range of sage-grouse may be overemphasized in public land grazing management guidelines and policy. A variety of locally appropriate grazing strategies that promote native perennial plant communities resilient to drought, exotic annual grass invasion, and wildfire may provide high quality grouse habitat. Management should instead focus on conserving areas of adequate shrub cover and preventing accumulation of roads and other human features that further fragment the remaining habitat provided by intact ranching operations.

As an example of adaptive management at its best, the NRCS is using outcomes from eight years of scientific inquiry to modify their approach to grazing management. Under their 528 Prescribed Grazing specifications, NRCS will no longer promote alterations in grazing plans to increase herbaceous hiding cover for nesting sage-grouse. NRCS offices also will no longer offer a higher incentive payment to landowners who elect to rest or defer a portion of enrolled acreage for this purpose. Because grazing management still matters for a host of ecological reasons, NRCS will continue implementing grazing plans that help keep ranchers profitable and productive, and the agency remains open to new and proven ways to reduce persistent threats to grouse through sustainable grazing.

Decision-makers find themselves at a crossroads in grazing management and sagebrush conservation. One path embraces the inherent variability of western rangelands, thus expanding decision-space by supporting adaptation to local circumstances. This approach recognizes ranchers as part of the solution, who if given flexibility, may prove a valuable partner in crafting innovative solutions to the most vexing threats facing ranching and grouse. The other path implements a uniform grass height stipulation, or some other overly specific metric, that lacks the scientific backing suggestive of success. The latter, commonly referred to as 'precisionism' in the conservation sciences (Hiers et al. 2016), is strongly cautioned against. Such specificity has inadvertently homogenized habitats for other at-risk species by suppressing the system's natural variability.

The historic range of sage-grouse has been reduced by half as grazing lands succumb to higher intensity land uses. Not all threats are created equal (Figure 1; attached), and time lost arguing about grazing is better spent doubling down on the most large-scale pervasive threats that reduce usable space for ranching and wildlife. In the Great Basin, this means reducing frequency and severity of wildfire, and restoring affected watersheds at risk of invasion by cheatgrass and other exotic annuals. It also means ratcheting up mechanical removal of invading juniper trees, a practice known to increase water retention on grazing lands that space-starved grouse are quick to recolonize following restoration. East of the Rockies, common threats include subdivision, energy extraction and cropland cultivation. Keeping ranchers ranching is top priority because a single square mile of grazing land converted into new cropland negatively impacts sage-grouse in a landscape twelve times that size (Smith et al. 2016).

In closing, partners desire new tools that enable conservation to be applied at scales that match these large-scale threats. To meet this need, WLFW and University of Montana have merged machine learning and cloud-based computing with remote sensing and field data to provide the first-ever annual percent cover maps of rangeland plant types for U.S. grazing lands through time (1984 to 2017). Through an unprecedented blend of time, space, and scale, this new technology, dubbed the Rangeland Analysis Platform (RAP) will empower any user to visualize impacts of drought on perennial forage, evaluate effectiveness of cheatgrass treatments over time, identify areas in need of restoration following wildfire, and so much more (Figure 2). Powered by Google's Earth Engine, this mapping technology will be delivered to partners via a free online tool planned to launch September 2018 (https://rangelands.app).

Thank you for the opportunity to comment.

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Figure 1. Sage grouse face a number of threats across their range, varying in the severity of their impact on populations (horizontal axis) and their reversibility (vertical axis). Impacts from livestock grazing are generally localized, minor, and reversible relative to those of cropland cultivation, energy development, housing, or invasion by exotic annuals or pinyon-juniper woodlands.

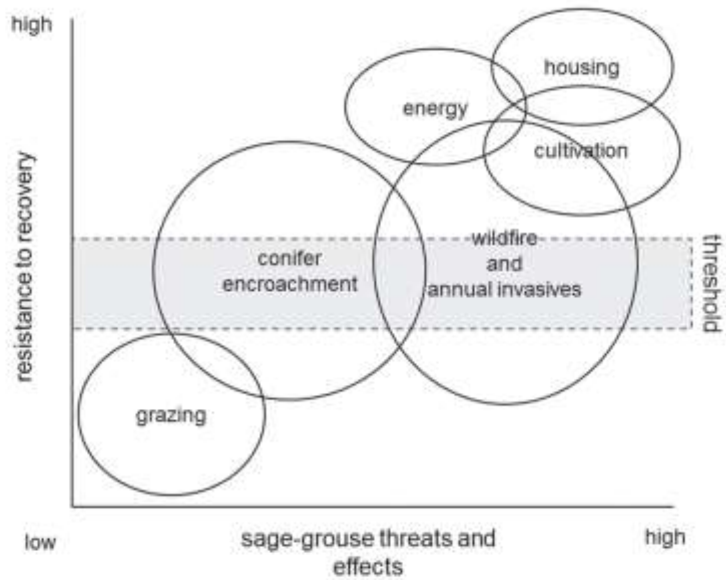

Figure 2. Bottom left is trends in annual percent cover of annual forbs/grasses, perennial forbs/grasses, shrubs and bare ground (1984–2017) in an area being invaded by cheatgrass. Bars denote Dun Glenn fire and subsequent smaller fires within original fire perimeter. Image to right is a single year of the remotely-sensed data for Dun Glenn and subsequent fires. Triangle indicates colors corresponding to a continuum of plant functional type percentages on the remotely-sensed image.