

Grouse and Grazing: How Does Spring Livestock Grazing Influence Sage-Grouse Populations?

Greater sage-grouse (*Centrocercus urophasianus*) were once widespread within sagebrush-grassland ecosystems of western North America, but populations have declined since the mid-1960s. Sage-grouse were petitioned for listing under the Endangered Species Act, but the US Fish and Wildlife Service (USFWS) concluded in 2010 that the species was ‘*warranted but precluded*’ from listing. Litigation followed and the USFWS is required to make a final listing determination in 2015. The USFWS finding indicated that the major threats to sage-grouse are habitat loss and the lack of regulatory mechanisms to prevent loss and fragmentation of habitat.

Grazing is the most extensive land use within sage-grouse habitat and the effects of spring livestock grazing on sage-grouse are often debated. Some people view livestock as a significant threat to sage-grouse. Others argue that spring livestock grazing may have a large-scale positive impact on sage-grouse because spring grazing may reduce fuel loads and result in fewer and smaller wildfires. No empirical data are available to assess either claim, and no experimental studies have examined the effects of spring grazing on sage-grouse demographic traits or habitat characteristics.

If sage-grouse are listed in 2015, numerous actions may prompt new restrictions on, or complete removal of, grazing within sage-grouse habitat: biological opinions issued through the ESA consultation process, adoption of stricter grazing standards to comply with ESA-listed species in planning documents, or litigation. Even if sage-grouse are not listed in 2015, this research is needed because the USFWS will likely receive future petitions for listing if sage-grouse populations continue to decline. Moreover, all but one of the previous eight decisions on petitions for listing sage-grouse were later challenged by litigation. Research that examines the influ-



Greater sage-grouse (*Centrocercus urophasianus*)

ence of different levels of spring cattle grazing on sage-grouse populations will inform land management decisions regardless of whether or not sage-grouse are listed in 2015.

Fire in sagebrush ecosystems adversely affects sage-grouse, but how does spring grazing affect fire behavior? Given the ubiquity of livestock grazing within sage-grouse habitat in Idaho and the lack of rigorous scientific data to inform the debate regarding the effects of spring grazing on sage-grouse habitat suitability (including its effect on frequency, extent, and severity of wildfire), we propose a collaborative effort to conduct a 10-year, replicated research project across southern Idaho. This proposed project would address the effects of spring cattle grazing on: 1) demographic traits of greater sage-grouse; and 2) sage-grouse habitat characteristics, fuel loads, and wildfire behavior.

To meet the first research objective, we would use replicated field experiments to evaluate the effects of spring cattle grazing on a suite of sage-grouse “vital rates” including: breeding site fidelity, site occupancy, nesting propensity, nesting success, natal recruitment, chick survival, and hen survival. We would use aerial photos, GIS, and meetings with the Bureau of Land Management, Idaho Depart-



ment of Fish and Game and private landowners to identify study sites (e.g., grazing allotments) that support sage-grouse breeding populations and meet study design criteria. The replicate study sites will be restricted to areas dominated by Wyoming sagebrush (*Artemisia tridentata wyomingensis*) that typically receive less than 12 inches of annual precipitation. We will randomly assign experimental study pastures to one of two treatments: 1) pastures that continue to receive spring cattle grazing, and 2) pastures that are not grazed for three consecutive years. We will also include the intensity and duration of spring grazing as a covariate in the analysis because both traits vary among pastures and likely influence whether spring grazing affects sage-grouse populations. We will estimate demographic traits of sage-grouse in each study pasture over a 10-year period, including more than two years before and two years after treatment. We will also strive to identify a subset of replicate pastures that will not be grazed for five consecutive years so that we can examine whether additional years are needed before removal of spring grazing has any effect on our response parameters (i.e., the sage-grouse “vital rates” identified above). Ten years will allow us to use a “staggered entry” design whereby different allotments will be removed from spring grazing during different years. A staggered entry design will allow us to control for annual variation in weather patterns, which are known to affect vital rates of sage-grouse and plant response to grazing.

The second objective of the proposed research study will use the same study design as the first but will include measurement of a suite of sage-grouse habitat features, both before and after treatment, including sagebrush overstory cover, grass and forb understory, and other features related to sage-grouse habitat suitability. The measured values of these habitat features will be compared to characteristics of “healthy” sage-grouse breeding and brood-rearing habitat described in peer-reviewed literature. We will also measure forage and fuel characteristics both before and

after treatment to model the effects of spring grazing on variables associated with fire effects, including: propensity to carry flames, fire intensity, severity of fire effects, and post-fire plant community characteristics.

The proposed research will require a ten-year investment and a commitment to a rigorous experimental study design. The team approach will involve collaboration among a diverse set of individuals and organizations, including experts in sage-grouse ecology, fire behavior, GIS, and rangeland management. Current team members include representatives from the University of Idaho, Idaho Department of Fish and Game, U.S. Bureau of Land Management, and Eastern Idaho Grazing Association: Kerry Reese, Jack Connelly, Courtney Conway, Karen Launchbaugh, Tom Rinkes, Don Kemner, Eva Strand, and Wendy Pratt.

Next steps will include seeking partnerships with land management agencies, wildlife managers, range managers, and livestock operators to develop a thorough study plan to address the question of how spring cattle grazing affects sage-grouse. For more information, contact: Jack Connelly at Idaho Department of Fish and Game (jack.connelly@idfg.idaho.gov) or Courtney Conway (cconway@uidaho.edu) or Karen Launchbaugh (klaunchbaugh@uidaho.edu) at the University of Idaho.



Spring cattle grazing in sage-grouse habitat. The proposed research will examine the effects of different spring grazing strategies on greater sage-grouse populations.
