David Little Livestock
Range Management Endowment
AT THE UNIVERSITY OF IDAHO

2016 Project Progress Report:

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

By Courtney Conway

PRELIMINARY RESULTS for 2016:

BACKGROUND: Numbers of greater sage-grouse (*Centrocercus urophasianus*) have declined substantially during the 20th century (Schroeder et al. 2004, Garton et al. 2011). Hence, the land uses allowed with sage-grouse habitat is a topic of debate and litigation. Livestock grazing is a common land use within sage-grouse habitat, but no empirical data are available to assess the effects of spring grazing on sage-grouse demographic traits or habitat characteristics (Connelly et al. 2000). Such studies are needed to help ensure that sage-grouse persist on public lands managed for multiple-use. Hence, we launched a 10-year research project on replicate study sites across southern Idaho to evaluate the effects of spring cattle grazing on demographic traits of greater sage-grouse and sage-grouse habitat characteristics. The results will help guide management actions (and inform policy and litigation decisions) in sage-grouse habitat throughout southern Idaho and throughout the species' range. This work would also provide new insights into current habitat conditions for sage-grouse throughout southern Idaho and identify management actions necessary for ensuring healthy sage-grouse populations. Results from this proposed study would provide land managers and livestock operators with a credible answer to a debated question and thereby inform the outcome of current and future lawsuits.

HYPOTHESES AND OBJECTIVES:
We are testing the null hypothesis that spring cattle grazing has no effect on sage-grouse populations. Specific objectives include: 1) Document the effects of different spring cattle grazing regimes on sage-grouse demographic and behavioral traits; 2) Document the effects of different spring cattle grazing regimes on density and diversity of insects (species common in sage-grouse diets) within sage-grouse breeding habitat; and 3) Document the extent to which different spring cattle grazing regimes affect nest concealment, sagebrush canopy cover, density and diversity of grasses and forbs, and other vegetation features that contribute to sage-grouse habitat suitability.

PROCEDURES: We have identified five study sites (e.g., grazing allotments) that support sage-grouse breeding populations and where Wyoming sagebrush is common in the overstory. Current study areas include Jim Sage/Malta, Big Desert, Browns Bench, Sheep Creek/Grasmere, and Pahsimeroi/Challis. We are assessing the effects of spring cattle grazing on sage-grouse via two approaches: correlative and experimental. We are assessing the effects of spring cattle grazing on a suite of sage-grouse demographic and behavioral traits

including: nesting propensity (likelihood that a radio-collared female initiates a nest), nest initiation date, daily nest survival, re-nesting rate (probability that a radio-collared hen whose nest fails initiates a new nest the same season within the same area), brood size, brood survival, post-fledging movements, breeding site fidelity, and hen survival (probability that a banded or radio-collared hen that nested in an area is detected the subsequent year). For the correlative approach, we are documenting the relationships between spatial foraging patterns of cattle and our suite of sage-grouse response variables (see list above). For the experimental approach, we are experimentally changing the extent of herbaceous offtake by cattle and assessing the effects of these experimental changes in grazing intensity on the same suite of sage-grouse metrics (see list above). For the experimental approach, we are comparing three experimental grazing treatments: 1) areas where spring cattle grazing removes ~40% of the new grass biomass every other year but does not have any fall or winter grazing; 2) areas where spring and fall cattle grazing removes ~40% of the new grass biomass, and 3) areas that are not grazed for at least four consecutive years. We will compare habitat characteristics and sage-grouse demographic traits, both before and after grazing treatments are implemented, to values reported in the literature for other populations of sage-grouse.

ACCOMPLISHMENTS or RESULTS: In 2016, we deployed radio transmitter collars on 121 hens and we monitored 85 radio-marked hens whose collars were deployed the previous year. Apparent nest success for first nest attempts was 27% (n = 137) in 2016, which was lower than the first two years of this project (43% in 2014, 45% in 2015). In all three years of this ongoing project, sage-grouse nesting success was higher at Brown's Bench compared to the other study sites. Our estimates of apparent nest success are within the range (15-86%) recorded by other researchers (Connelly et al. 2011). Our estimates of nesting propensity were also within the range (63-100%) recorded by other researchers (Connelly et al. 2011). We implemented the experimental grazing treatments at two of our study sites in spring 2016 (Jim Sage and Brown's Bench); data to assess the effects of these experimental changes in grazing will begin to accumulate after another few years of data collection at those sites. Our work will inform future management and policy decisions regarding greater sage-grouse and thereby help ensure persistence of the species. The end result of this project will allow land managers and local working groups to objectively assess whether or not current management efforts are effective in providing high quality habitat for sage-grouse and thereby guide future management efforts.

PUBLICATIONS or OUTPUTS: The experiments have begun but the results are not available yet for publication. We have given numerous presentations at conferences and meetings, including:

Conway, C.J., and K.L. Launchbaugh. 2016. Summary of project goals and accomplishments. Grouse & Grazing Interagency Annual Planning Team Meeting. Arco, ID. 20 Sep 2016.

Conway, C.J., and K.L. Launchbaugh. 2016. Grouse & Grazing: How does spring livestock grazing influence sage-grouse populations? Public Lands Endowment Board of Directors Annual Meeting. Boise, ID. 7 Sep 2016.

Conway, C. J., K. Launchbaugh, A. Locatelli, D. Musil, P. Makela, and S. Roberts. 2016. Effects of spring-season cattle grazing on greater sage-grouse. USGS/BLM Grazing Research Webinar. 13 Jul 2016.

Conway, C. J., K. Launchbaugh, A. Locatelli, D. Musil, P. Makela, and S. Roberts. 2016. Effects of spring-season cattle grazing on greater sage-grouse. Western Agencies Sage and Columbian Sharp-Tailed Grouse Workshop. Lander, WY. 14 Jun 2016.

Conway, C. J., A. Locatelli, D. Musil, S. Roberts, K. Launchbaugh, and P. Makela. 2016. Effects of spring cattle grazing on greater sage-grouse: a 10-year experimental study to manipulate grazing regimes in Idaho. Sagebrush Ecosystem Conservation Conference: All Lands, All Hands. Salt Lake City, UT. 25 Feb 2016.

Conway, C. J., K. Launchbaugh, A. Locatelli, D. Musil, P. Makela, and S. Roberts. 2016. Large-scale field experiments to assess the effects of cattle grazing on greater sage-grouse. Annual Meeting of the Idaho Chapter of The Wildlife Society, Coeur d' Alene, ID. 23 Feb 2016.

Locatelli, A., C. J. Conway, D. Musil, K. Launchbaugh, S. Roberts, and D. Gotsch. 2016. Factors influencing nest survival of greater sage-grouse (*Centrocercus urophasianus*) in southern Idaho. Annual Meeting of the Idaho Chapter of The Wildlife Society, Coeur d' Alene, ID. 23 Feb 2016.

Other project outputs include a project website, a white paper/brochure, and field tours with ranchers and BLM field staff.