2017 Project Progress Report:

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

By Courtney J. Conway

PERSONNEL:

Courtney J. Conway (Leader, Idaho Cooperative Fish & Wildlife Research Unit)
Andrew Meyers (Research Scientist, Department of Fish and Wildlife Sciences)
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Ian Riley (Graduate Research Assistant, Department of Fish and Wildlife Sciences)
Janessa Julson (Graduate Research Assistant, Department of Forest, Rangeland, and Fire Sciences)
Emilia Breitenbach (Field Crew Leader, Department of Fish and Wildlife Sciences)
And 24 seasonal field technicians, numerous agency collaborators, and ranchers

PRELIMINARY RESULTS for 2017:

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 that are considered compatible with sage-grouse is a topic of debate and litigation. Livestock grazing is a common land use within sage-grouse habitat, but no experimental 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. This project is a 10-year research study with replicated experimental grazing treatments at sites across southern Idaho. The project is designed 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 will 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 on rangelands. Results will provide land managers and livestock operators with a credible answer to a debated question and thereby inform the outcome of current and future lawsuits.

HYPOTHESIS or 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: 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; renesting 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.

ACCOMPLISHMENTS or RESULTS:

In 2017, we monitored 117 radio-collared sage-grouse hens and we found and monitored 95 sage-grouse nests at the 5 study sites. Nesting propensity (the proportion of hens that initiated at least one nest) was 81%. Our estimates of nesting propensity were also within the range (63-100%) recorded by other researchers (Connelly et al. 2011). Renesting propensity (the proportion of hens who renested after nest failure) was 26%. Apparent nest success was 24%, and varied among the five study sites: lowest at Browns Bench (20%) and highest at Big Desert (Big Butte) (35%). Body mass of hens was lower in 2017 compared to the previous four years, likely because of the harsh winter. Brood survival was 39%. The experimental grazing treatments have been implemented for 2 years now at 2 of our study sites (Jim Sage and Browns Bench). Average grass height and average forb height were both taller at successful nests than failed nests or random plots. Percent shrub cover was higher at nests compared to random plots, but didn't differ between successful and failed nests.

PUBLICATIONS or OUTPUTS:

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

1. Conway, C. J., K. Launchbaugh, A. Meyers, D. Musil, P. Makela, and S. Roberts. 2017. The Grouse & Grazing Project. Public Forum. Burley, ID. 27 Oct 2017.
2. Conway, C.J. 2017. Summary of project goals and accomplishments. Grouse & Grazing Interagency Annual Planning Team Meeting. Twin Falls, ID. 26 Oct 2017.
3. Conway, C.J. 2017. Relationships between livestock grazing and wildlife populations. Rangeland Center Fall Forum. Boise, ID. 6 Oct 2017.
4. Gotsch, D., C.J. Conway, D.D. Musil, and S. Roberts. 2017. Prey for sage-grouse: Impacts of livestock grazing. Annual Meeting of The Wildlife Society. Albuquerque, NM. 27 Sep 2017.
5. Meyers, A.R., C.J. Conway, D.D. Musil, K. Launchbaugh, and S. Roberts. 2017. Effects of Spring Cattle Grazing on Nest Survival of Greater Sage-grouse in Southern Idaho. Annual Meeting of The Wildlife Society. Albuquerque, NM. 27 Sep 2017.
6. Launchbaugh, K., and C. Conway. 2017. Grouse & Grazing: How does spring livestock grazing influence sage-grouse populations? Public Lands Endowment Board of Directors Annual Meeting. Flagstaff, AZ. 21 Sep 2017.
7. Conway, C. J., K. Launchbaugh, A. Meyers, D. Musil, P. Makela, and S. Roberts. 2017. Effects of grazing on sage-grouse and other shrub-steppe birds: a collaborative project to inform management of sage-steppe rangelands. Great Basin Landscape Conservation Cooperative Webinar Series. 13 Sep 2017.
8. Conway, C. J., K. Launchbaugh, A. Meyers, D. Musil, P. Makela, and S. Roberts. 2017. Effects of Cattle Grazing on Greater Sage-grouse and Other Sagebrush-steppe Birds. Special Symposium at the Annual Meeting of the American Ornithological Society. East Lansing, MI. 5 Aug 2017.
9. Conway, C.J., K. Launchbaugh, D. Musil, P. Makela, and S. Roberts. 2017. Effects of Livestock Grazing Intensity on Greater Sage-grouse. BLM Idaho Leadership Team meeting, Boise, ID. 11 Apr 2017.
10. Conway, C. J., K. Launchbaugh, D. Musil, P. Makela, and S. Roberts. 2017. Effects of Livestock Grazing Intensity on Nesting Success and Brood Movements in Greater Sage-grouse. Annual Meeting of the Idaho Chapter of The Wildlife Society, Boise, ID. 2 Mar 2017.

11. Gotsch, D., C. J. Conway, and D. Musil. 2017. Prey availability for sage-grouse chicks: effects of cattle grazing and vegetative structure. Annual Meeting of the Idaho Chapter of The Wildlife Society, Boise, ID. 2 Mar 2017.
12. Conway, C. J., K. Launchbaugh, D. Musil, P. Makela, and S. Roberts. 2017. The Idaho Grouse & Grazing Project: a collaborative, landscape-scale experiment to assess the effects of cattle grazing. Annual Meeting of the Idaho Bird Conservation Partnership, Boise, ID. 27 Feb 2017.
13. Julson, J., K. Launchbaugh, E. Strand, C. J. Conway, and A. Locatelli. 2017. Relationships among spring livestock grazing, sage-grouse nest fate, and climate in sagebrush-steppe communities. Society for Range Management Annual Conference. St. George, UT. 29 Jan 2017.
14. Julson, J., K. Launchbaugh, and C. J. Conway. 2017. How to Estimate Utilization of Grasses: Ocular Estimation or Height-Weight Method? Society for Range Management Annual Conference. St. George, UT. 29 Jan 2017.

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