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 transmi t er collars on 121 hens and we monitored 85 radio-marked hens whose collars were deployed the previous year. Apparent nest success for first nest a t empts 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 nes ng success was higher at Brown's Bench compared to the other study sites. Our es mates of apparent nest success are within the range (15-86%) recorded by other researchers (Connelly et al. 2011). Our es mates of nes ng 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 e ects of these experimental changes in grazing will begin to accumulate a er another few years of data collec on 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 objec vely assess whether or not current management e orts are e ec ve in providing high quality habitat for sage-grouse and thereby guide future management e orts.

PUBLICATIONS or OUTPUTS: The experiments have begun but the results are not available yet for publica on. We have given numerous presenta ons at conferences and mee ngs, including:

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

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

Conway, C. J., K. Launchbaugh, A. Locatelli, D. Musil, P. Makela, and S. Roberts. 2016. E ects of spring-season ca t le 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. E ects of spring-season ca t le 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. E ects of spring ca t le grazing on greater sage-grouse: a 10-year experimental study to manipulate grazing regimes in Idaho. Sagebrush Ecosystem Conserva on 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 e ects of ca t le grazing on greater sage-grouse. Annual Mee ng of the Idaho Chapter of The Wildlife B Bfb bd2ó eoÂmene я яM'L. –