

Atamian, M., C. Frey, and J. Sedinger. 2006. Dynamics of Greater Sage-grouse (*Centrocercus urophasianus*) Populations in Response to Transmission Lines in Central Nevada. Progress Report: Year 4. Department of Natural Resources and Environmental Sciences, University of Nevada - Reno. www.ag.unr.edu/sedinger/Progress_Report_2006.doc.

Abstract: To characterize demographic processes in Greater Sage-grouse (*Centrocercus urophasianus*), we monitored 12 lek sites in a 3800 km² area in Eureka County, Nevada. The long-term goal of this ten-year study is to assess the impact of Sierra Pacific Power Company's Falcon-Gondor transmission line on sage grouse demography and population dynamics. We used mark-recapture, lek observations, nest & brood monitoring, vegetation sampling, and radio telemetry to estimate key demographic parameters. A total of 679 sage grouse (532 male, 138 female, & 9 unknown sex young of the year) have been banded with both a color and metal band during the first three years of the study. We used lek observations, recaptures, and resighting of banded individuals to estimate demographic parameters and movement probability. We used a robust design structure to analyze capture-recapture data for males (making use of the pattern of captures among months of the lekking period) which allowed us to estimate size of the male population, annual survival of males and the probability that the average male attended a lek at least once during the spring. We used radio telemetry to locate nesting females, follow broods through fledging, and to estimate female survival. Once located, nests were monitored to estimate nest success, and nest site vegetation was measured after hatch. Nest site vegetation characteristics were evaluated as covariates in a nest success analysis in Program MARK. Our data suggested that nests with 65% total shrub cover have twice the probability of success than nests with 25% (0.29 versus 0.15 respectively). Hens with broods were checked once a week and their young counted until young were independent (45-50 days). We have tagged 184 chicks with Passive Integrated Transponder tags for permanent identification in the last two years of the study. We estimated chick survival for the first 50 days at 0.2329 (95% CI = 0.2059-0.2599) using the Kaplan Meier method of survival estimation. Program MARK known fate data type was used to estimate an annual female survival of 0.5589 (95% CI = 0.4876-0.6303). Our estimates for size of the regional male population ranged from 381 ± 37 (2004) to 472 ± 44 (2006). We estimated annual survival of males = 0.63 ± 0.04. Probability of being present on a lek during the breeding season also did not vary among years or among age classes, although there was modest evidence (sum of model weights for models containing an age effect for $\gamma = 0.4$) that juvenile males (ca. 10 months old) were less likely to be present ($1 - \gamma = 0.91 \pm 0.14$) during the entire breeding season than was true for adult males ($1 - \gamma > 0.99 \pm < 0.01$).