

Lyon, A.G. 2000. The potential effects of natural gas development on sage grouse (*Centrocercus urophasianus*) near Pinedale, Wyoming. Master's Thesis, University of Wyoming, Laramie. 121 p.

Abstract: Sage grouse (*Centrocercus urophasianus*) populations have been declining over the last half of the century due to such factors as habitat degradation and loss. As natural gas development has increased in Wyoming, so has the concern over how this type of development might effect sage grouse populations. Therefore a study was initiated on the Pinedale Mesa to examine the effects of natural gas and oil development on use, productivity, general movements and habitat use of sage grouse. A total of 80 grouse (60 adult and 20 chicks) were captured and radio-collared on six leks on the Pinedale Mesa between March-August 1998. Lek classification was determined by the presence of natural gas development within a 3 km buffer and topographic features surrounding the leks. The grouse were monitored and located (using radio telemetry techniques) on a weekly basis to determine lek use, nest site, early brood rearing, late brood rearing, summer and winter habitat selection. Vegetative data collected at use and random sites included: sagebrush density, canopy cover and height, grass and residual grass height and cover and forb cover. Results from the study indicated that hens captured on disturbed leks demonstrated lower nest initiation rates, traveled twice as far to next sites, and selected higher total shrub canopy cover and live sagebrush canopy cover than hens captured off of undisturbed leks. Also, most grouse chicks were lost during extreme early brood rearing from hens that mated on all leks. Therefore extreme early brood survival appears to be the limiting factor in sage grouse population stability on the Pinedale Mesa. Finally, four roosters, and five hens moved up to 60 miles to breed and next after capture on the Mesa. Consequently we hypothesize that the Mesa is critical winter range for multiple populations of sage grouse spanning a large demographic area.