

## WINTER SURVIVAL AND HABITAT SELECTION BY FEMALE GREATER SAGE GROUSE IN SOUTH PHILLIPS COUNTY, MONTANA

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Populations of greater sage grouse (*Centrocercus urophasianus*) have been seriously declining throughout their range. Most research has focused on demography, survivorship, habitat selection, and reproductive success during spring and summer. In contrast, there have been fewer ecological studies of survival and habitat and food selection during winter. We focused on over-winter survival and habitat selection of female sage grouse in South Phillips County, an area where greater sage grouse still occur in relatively high densities. We tested the long-held assumption that overwinter mortality of juvenile and yearling birds is about twice that of adult females. We followed 159 radio-marked juvenile, yearling, and adult females during the 2005 and 2006 winters. During these two winters all cohorts survived better than most published accounts (~90% survivorship) with juvenile and yearling hens surviving as well as adult hens. Greater sage grouse are sagebrush specialists during winter, subsisting almost entirely on a diet of *Artemisia* species. This narrow diet presents some physiological challenges, since sage leaves are generally difficult to digest and contain many secondary defensive compounds such as monoterpenes, sesquiterpene lactones, coumarins, and flavonoids. During winter, sage grouse in our study tended to select winter feeding sites that were relatively flat, and selected sage plants that contained higher crude protein levels than available across the landscape. We discussed general implications of our results for management and conservation of sage grouse.