GREATER SAGE-GROUSE (*CENTROCERCUS UROPHASIANUS*) NEST PREDATION AND INCUBATION BEHAVIOR

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ABSTRACT

The greater sage-grouse (*Centrocercus urophasianus*) is a sagebrush obligate species. It has declined in distribution and abundance substantially since Euro-American settlement of western North America. Although nest predation is a natural component of sage-grouse reproduction, habitat changes may interact with predator communities and incubation behavior leading to sage-grouse population declines. I used continuous vidoegraphy at natural sage-grouse nests to document fine-scale incubation rhythms, identify predators, and record predation behavior in northeastern Nevada. An information-theoretic modeling approach was used to relate factors that characterized habitat, timing of incubation, and predators to nest success and incubation rhythms. I also experimentally reduced local raven numbers to measure the effects of raven reduction on sage-grouse nest success. Females exhibited relatively high incubation constancy (96%) and employed a bimodal distribution of incubation recess that peaked during morning and evening twilight. Common ravens (*Corvus corax*) and American badgers (*Taxidea taxis*) were confirmed destroying nests. Raven depredations were mostly crepuscular. Yearling sage-grouse nests failed more than those of adults, and yearling recesses were longer, more frequent, and occurred during times of greater daylight than those of adults. Recess duration, nest failure, and probability of raven-caused depredation were positively related to raven abundance. Compared to adults, yearlings appeared to face greater trade-offs between foraging and concealing eggs. Raven reduction increased sage-grouse nest success, but badgers appeared to partially compensate for removal. Nest herbaceous understory was positively related to incubation constancy. This likely was due to the effects of understory at nests on parental energy savings by reducing parent

heat loss. I detected differences in nest habitat characteristics between nests depredated by ravens and badgers, such as shrub canopy cover, herbaceous understory, and forb biomass. Canopy cover was inversely related to raven depredation. Thus, habitat characteristics appeared to interact with predator composition and abundance increasing the probability of sage-grouse nest failure. Ravens are generalist predators now occurring in high abundance in North America and forage within degraded sage-grouse nest habitat. Ravens appear to influence incubation behavior and depredation rates and in some areas may negatively influence sage-grouse productivity. In human-altered landscapes, these negative effects may be substantial.