

FEATURE ARTICLES

**AGE-SPECIFIC VARIATION IN APPARENT SURVIVAL RATES OF MALE LESSER PRAIRIE-CHICKENS**

CHRISTIAN A. HAGEN<sup>1,3</sup>, JAMES C. PITMAN<sup>1</sup>, BRETT K. SANDERCOCK<sup>1</sup>, ROBERT J. ROBEL<sup>1</sup> AND ROGER D. APPLGATE<sup>2</sup>

<sup>1</sup>*Division of Biology, Kansas State University, Manhattan, KS, 66506*

<sup>2</sup>*Survey and Research Office, Kansas Department of Wildlife and Parks, Emporia, KS, 66801*

Manuscript received 17 October 2003; accepted 11 October 2004.

<sup>3</sup>Present address: Oregon Department of Fish and Wildlife, 61374 Parrell Rd, Bend, OR, 97702.

E-mail: [christian.a.hagen@state.or.us](mailto:christian.a.hagen@state.or.us)

*Abstract.* We used mark-recapture methods to estimate age-specific apparent survival rates for male Lesser Prairie-Chickens (*Tympanuchus pallidicinctus*), a gamebird of conservation concern. A total of 311 male prairie-chickens (135 yearlings, 176 adults) were captured and banded during a 5-year study in southwest Kansas. Time-since-marking models were used to estimate apparent survival after first capture ( $\phi^1$ ), apparent survival among returning birds ( $\phi^{2+}$ ), and probability of capture ( $p$ ) for yearling and adult prairie-chickens. Apparent survival is the product of true survival and site fidelity, and our model-averaged estimates of this parameter were ranked: yearlings after first capture ( $\hat{\phi}_{yr}^1 = 0.60 \pm 0.12$ ) > adults after first capture ( $\hat{\phi}_{ad}^1 = 0.44 \pm 0.10$ ) > returning birds ( $\hat{\phi}^{2+} = 0.36 \pm 0.10$ ). In contrast, movement data showed that site fidelity to communal display sites (or leks) increased with male age; yearlings returned to leks at lower rates (80%,  $n = 60$ ) than adults (92%,  $n = 65$ ). Thus, true survival rates of male Lesser Prairie-Chickens likely decline with increasing age, an unusual pattern found in few species of birds. We hypothesized that declines in survival as males' age may be a feature of promiscuous mating systems where competition for mating opportunities are intense. A review of annual survival rates for holarctic grouse did not support this idea; age-specific declines in male survival were not restricted to lek-mating species, and appear to be a general feature of most grouse populations.

*Keywords:* age-specific demography, grouse, Kansas, mark-recapture, Tetraonidae, *Tympanuchus pallidicinctus*.