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NORTHERN BOBWHITE AGE RATIOS AND PRODUCTIVITY AT THE INDIVIDUAL PROPERTY SCALE IN SOUTH TEXAS

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ABSTRACT

Annual adult survival rate ($\hat{S}$) and finite rate of population growth (λ) are critical parameters that must be considered when subjecting a species to annual harvest. We used a data set of 148 estimates of northern bobwhite (*Colinus virginianus*) juvenile: adult age ratios (R) derived from hunter-harvested wings in the South Texas Plains to estimate these parameters. Data were collected from 1940 to 1976 and from 1983 to 2008. We used adjusted estimates of R to account for higher harvest vulnerability of juveniles, and the regional estimate of $\hat{S}$ (30.6% based on a stable population) to calculate estimates of λ at the ranch (~800–2,000 ha) scale. Mean ($\pm$ SE) adjusted R was 2.79 ± 0.13 juveniles: adult. Assuming a stable population (i.e., $\lambda = 1$), mean ($\pm$ SE) regional $\hat{S}$ was $30.6 \pm 0.1\%$. Given an annual $\hat{S}$ of 30.6%, mean regional λ was 1.16 ± 0.04 , and single year λ estimates ranged from 0.40 to 3.03 among individual properties. These data have important implications for bobwhite harvest management because they identify the potential for highly variable population growth rates (λ) at a localized scale. There is an increased probability of overharvesting the population when local populations are declining. Our data indicate using only a regional estimate of λ may mask local population trends, which has the potential for mismanagement of harvest within a given property by making harvest recommendations that are too high (overharvest) or too conservative (loss of opportunity).

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Key words: *Colinus virginianus*, northern bobwhite, population growth, survival, Texas

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