

INFLUENCE OF HABITAT SELECTION AND HABITAT QUALITY ON THE  
DEMOGRAPHY OF A NEOTROPICAL MIGRANT SONGBIRD,  
THE BELL'S VIREO (*VIREO BELLII*)

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Abstract

Individual fitness varies with the quality of the habitat occupied. Variation in habitat quality is difficult to assess, particularly in heterogeneous habitats where quality may differ within a single patch. Individuals are expected to select habitat to maximize fitness so patterns of habitat selection should reveal habitat quality. Linking fitness with habitat selection patterns may identify high quality habitat. The central US subspecies of Bell's Vireo (*Vireo belli bellii*) is a scrub breeding Neotropical migrant songbird declining throughout its range. We estimated two measures of fitness, productivity and adult annual survival, in eight populations of Bell's Vireos in central Missouri. We investigated if vireos selected territories to maximize fitness by modeling the relationship between territory settlement order, habitat quality, and territory productivity. We then used our estimates of productivity and survival to model the finite rate of population growth ( $\lambda$ ). Productivity of territories was best predicted by the order of territory settlement. Productivity was also related to the percent cover and edge density of woody vegetation within territory boundaries. However, none of the habitat characteristics we measured predicted territory settlement order. Overall, our study sites appear to be experiencing negative population growth ( $\lambda = 0.76$ ), but there was a great deal of variation between study sites ( $\lambda = 0.31 - 1.05$ ). It is unlikely our sites represent the proportion of high versus low quality sites within the region but they suggest that a  $\lambda \sim 1$  is possible for the regional population depending on the proportion of high versus low quality sites.