Monitoring Northern Bobwhite Populations Reduces Uncertainty About Management Effectiveness: A Paradigm of Empiricism and Hope

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ABSTRACT:

Northern bobwhite (*Colinus virginianus*) populations have been declining across their range for decades because of habitat loss, degradation, and fragmentation. Habitat restoration and management—sometimes coupled with other cultural practices—has long been the paradigm for bobwhite conservation. However, the lack of peer-reviewed empirical evidence supporting the success of active management to increase bobwhite density and growth rates has created skepticism and uncertainty among some conservationists and user groups. Thus, our objectives were to test the basic prediction that active management can increase bobwhite populations across a large spatial extent and highlight the importance of population monitoring to refine management through adaptive feedback. We developed a Bayesian N-mixture model to estimate bobwhite densities and population growth rates at 17 Wildlife Management Areas (WMAs) in four Southeastern US states. Based on expert opinion, we classified WMAs into two groups—actively managed (e.g., bobwhite specific management) and passively managed (land management in a non-specific species fashion)—to test our prediction. Populations significantly increased across the survey periods at 4 WMAs and significantly decreased at 1 WMA. Populations on actively

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managed WMAs grew at an average of 13% per year, while populations on passively managed WMAs had stable trends. Mean bobwhite densities ranged from 0.145 (95% CrI: 0.025, 0.435) to 2.853 (95% CrI: 2.131, 3.914) birds/ha—typical of estimates in the literature. On WMAs where bobwhites are a management objective, continued population monitoring is vital to reduce uncertainty and make optimal management decisions to maintain recreationally viable populations. We provide a robust approach to estimate bobwhite densities and population trends in response to management so managers can make well-informed decisions and adapt in the future. We offer the conservation community some of the first empirical evidence of positive growth rates in bobwhite populations that should stimulate hope in bobwhite restoration.