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MONITORING SCALED QUAIL OCCUPANCY AND COLONIZATION POST-TRANSLOCATION ON A LARGE LANDSCAPE

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ABSTRACT

Large landscapes are important for sustaining quail populations in semiarid climates where annual variation in vital rates, and thus population volatility, tends to be larger than in subtropical climates. Translocations may need to be conducted on a similar scale to ensure long-term success. Large landscapes pose challenges for monitoring release sites in terms of costs and logistics. However, large landscapes also provide an excellent opportunity to evaluate habitat preferences and suitability because they inherently hold more variation in habitat type. Multiseason occupancy surveys are a potential monitoring tool for translocations where population persistence is a benchmark for success. Occupancy (i.e., presence–absence) data for quail are relatively easy to collect compared to more intensive surveying (i.e., mark-recapture or distance sampling) and can be analyzed in a framework that allows for the estimation of detection, colonization, and extinction as functions of spatial or temporal covariates. We used a multiseason occupancy survey to monitor a reintroduced population of scaled quail (*Callipepla squamata*) on a large landscape. Our objectives were to: 1) evaluate occupancy post-translocation, and 2) determine how landscape characteristics and distance from release points influenced colonization and extinction. Over 800 scaled quail were translocated to a >40,000-ha study area of contiguous rangeland in Knox County, Texas, USA from 2016–2017. We collected presence–absence data during a 10-day period in March just prior to release (2016) and for 2 years after first release (2017–2018). We sampled 73 locations on a 1.5-km × 1.5-km grid 3 times per year. We were unable to estimate true occupancy and thus any influence of covariates, because of low detection probability ($p = 0.05$, standard error = 0.02). However, we found that naïve occupancy based on detection within and outside of surveys increased from 1% in 2016 to 23% and 10% in 2017 and 2018, respectively. We recommend that monitoring programs prioritize survey methods that increase detection, such as sampling only during peak calling and call-back surveys, and using more than one method of detection.

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Key words: *Callipepla squamata*, colonization, occupancy, scaled quail, Texas, translocation

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