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## FACTORS INFLUENCING EARLY MORNING COVEY CALLING IN NORTHERN BOBWHITES

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### ABSTRACT

Data from early morning covey calling may be useful for measuring abundance of northern bobwhite (*Colinus virginianus*). However, critical assumptions about detection rates, survey timing, and seasonality effects have not been tested. Additionally, the effects of weather and covey density on call rates are unknown. We quantified call rates of 219 radiomarked coveys at 5 sites in 1998 and 2 sites in 1997 and 1999 to monitor calling behavior of bobwhite coveys. First calls for coveys ( $n = 442$ ) occurred on average 23.4 (SE = 0.5) min before sunrise and averaged  $31.4 \pm 1.9$  calls/covey. Few first calls (13%) occurred after 15 min before sunrise. Across sites, call rates averaged 58% (SE = 2.0) ( $n = 763$ ). Call rates were most variable during September and December biweekly periods and least variable during late October and early November biweekly periods. We developed 15 logistic regression models from data collected in 1998 for predicting the probability of a covey to call. Selected best models were chosen using the Akaike information criterion modified for overdispersion and small sample size. The selected best model included number of adjacent calling coveys, wind speed, cloud cover, and barometric pressure change. Parameter estimates for number of adjacent calling coveys had an odds ratio of 1.4; the 95% CI did not contain 0. A less parsimonious model, which also included biweekly period and interaction terms, was equally as likely (QAIC<sub>c</sub> = 0.32) as the selected model. The 16–31 October biweekly period had an odds ratio of 1.8; conditional 95% CI not containing 0. A *post hoc* analysis was conducted using the same candidate model list, but we replaced number of adjacent calling coveys with deviations of the number of adjacent calling coveys from site means. Results were similar to the previous analysis with the same selected best model, but model fit was improved. Selected best models were tested using observations collected in 1999 from 2 of the 5 sites monitored in 1998. Predicted call rates were relatively precise (observed call rate-predicted call rate <0.10) for biweekly periods associated with peak call rates, but call rates were less precise (range 0.12–0.27) for other biweekly periods. Constancy of call rates suggests that at bobwhite densities we observed (0.75 and 5 bobwhites/ha), covey call surveys have potential to index fall populations of bobwhites with reasonable accuracy.

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