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## EFFECTS OF RADIO-TRANSMITTERS ON BODY CONDITION, HARVEST RATE, AND SURVIVAL OF BOBWHITES

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### ABSTRACT

Numerous studies of northern bobwhite (*Colinus virginianus*) population and habitat ecology employ use of radio-telemetry techniques to relocate and monitor individuals. Radio-telemetry enables estimation of reproductive success, survival, movements, and home range at levels of resolution not otherwise possible. Unbiased estimation of these parameters via radio-telemetry assumes that survival, reproduction, and behavior of radio-marked individuals are not affected by carrying the radio-transmitter. These assumptions have not been rigorously tested for bobwhites. In 1993, we initiated a study at Divide Section Wildlife Management Area in Mississippi and at Tall Timbers Research Station to test the effects of radio-transmitters on survival, harvest rate, and body condition of bobwhites. From 1993 to 1996 we banded 221 and radio-marked 259 bobwhites on Tall Timbers Research Station. Harvest rate for radio-marked bobwhites was 18.5% and banded birds 12.7%. In 2 of 3 years, radio-marked birds experienced greater mean weight loss between capture and harvest than banded birds. From 1994 to 1995 we radio marked 188 and banded 210 birds on Divide Section Wildlife Management Area. Harvest rate for radio-marked birds was 40% and banded birds 30%. In the 1995–1996 hunting season radio-marked birds had lower mean weight gain from capture to harvest than banded birds. Based on our sample of marked birds, 34% of the fall population on this area was harvested. We have established a captive breeding colony of wild bobwhites at the Blackjack Captive Animal Research Facility at Mississippi State University. During the summer of 1996, genetically wild progeny are being produced to be used in a pen study to evaluate the effects of radio-transmitters on bobwhite body weight and lipid levels under abundant and scarce food resources. This study will provide the first harvest rate estimates for bobwhites on a public hunting area in Mississippi. Additionally, this study will evaluate the effects of radio-transmitters on bobwhite body condition, survival, and harvest rate. It will either validate the assumption of no radio effects and aid interpretation of previous and future radio studies or elucidate critical violations of fundamental assumptions of this methodology. If radio effects are detected, this study will identify the specific mechanisms creating bias in estimation of population parameters. This information will enable researchers to target radio design problems and develop new radio technology with reduced effects. Preliminary results suggest that radio-marking may marginally increase bobwhite vulnerability to harvest and potentially predation.

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