

Impacts of Precipitation on Northern Bobwhite Production in South Texas

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Abstract: Despite a long history of research on northern bobwhites (*Colinus virginianus*; hereafter, bobwhites), there has not been a comprehensive assessment of how bobwhite productivity varies across a landscape in relation to environmental factors such as weather. Due to concerns of global climate change and range-wide decline of the bobwhite, further understanding the relationship between weather and bobwhite population dynamics is needed. The objectives of this study were to determine 1) how do among-year bobwhite masses, age ratios, and sex ratios change at the landscape scale, 2) can fall age ratios be predicted by breeding season (April–August) precipitation at the south Texas landscape scale, 3) what is the impact of summer mean maximum temperature on fall age ratios? We based our investigation on data collected from 31 private ranches located on south Texas plains. With the assistance of ranchers and hunters during 2001–2010 hunting seasons, we collected age, sex, and body mass data from harvested bobwhites in south Texas ($n=72,797$ bobwhites). We estimated annual bobwhite production as a function of April to August rainfall using NOAA weather station data from Falfurrias and Hebronville, TX. We observed minimal among-year change in sex ratios (51.0%–54.5% male) and mean mass of bobwhites (156–160 g) across south Texas. We documented a positive, linear relationship between April–August rainfall and bobwhite age ratios ($r^2=0.94$); we also documented a negative, linear relationship between summer (June–August) mean maximum daily temperature and bobwhite age ratios ($r^2=0.38$). Rainfall seems to be an adequate predictor of south Texas bobwhite production at the regional scale, given that adequate usable space exists. Managers obviously cannot control the weather and must use habitat management techniques to increase usable space for bobwhites.

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