

# A Landscape-scale Assessment of the Response of Birds to Land Cover, Climate, and Forest Management

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## Abstract

Climate change will likely increase temperatures across the globe as well as alter regional climates. These climate shifts have the potential to substantially change vegetation and reshape both plant and animal distributions. To mitigate these potential changes, scientists have suggested management strategies focused on forest resilience, response, and carbon sequestration. The goal of this research was to determine the current impacts of land cover and regional climate on birds in the Midwest, and use these current relationships to assess the direct and indirect effects of future climate and management on avian abundance in Missouri. I coupled the Bayesian model with a landscape simulation model (LANDIS PRO) to predict bird abundance 100 years into the future for a range of climate and forest management scenarios. Forest and canopy cover were the primary drivers of current bird abundance, however, temperature was influential for early successional species. In addition, the most significant climate related effect was for the northern bobwhite with higher abundances under warmer winters. For most birds, management had a greater impact on future abundance than climate, however, species currently exhibiting direct effects of climate showed compounded effects associated with management. Even though we expect land cover to change very little due to climate, we did see one bird (i.e., northern bobwhite) affect by climate-induced changes to vegetation. Managing forest cover will be key for mitigating the effects of future climate for birds.