

WILDLIFE RESPONSE TO SPATIAL AND TEMPORAL CHANGES
IN FOREST HABITAT

Chadwick D. Rittenhouse

Dr. Joshua J. Millspaugh and Dr. Frank R. Thompson, III, Dissertation Co-Supervisors

ABSTRACT

A common goal in land-management planning is to describe the relationship between management actions, vegetation and wildlife habitat conditions for large landscapes. Achieving this goal can be challenging because ecological processes of disturbance (natural and anthropogenic) and succession affect vegetation composition and structure, which subsequently affects current and future habitat conditions for wildlife. Further, habitat suitability is often used as a surrogate for demographic response by wildlife to vegetation change yet this assumed relationship is rarely evaluated. I developed habitat suitability models for 10 wildlife species and validated two of those models as predictors of demographic responses (e.g., territory density and nest success). I then simulated future forest conditions and evaluated habitat suitability 10, 50, and 150 years from present as part of the Hoosier National Forest (HNF) plan revision. No single management alternative was best for all wildlife species. Without harvest or prescribed fire, early successional wildlife species will be extirpated from the HNF within 50 years. Harvest benefited early successional species without greatly affecting habitat suitability for late successional species. By incorporating ecological processes of disturbance and succession while retaining the resolution necessary for evaluating wildlife habitat suitability, this modeling approach contributed knowledge to the planning process and was a valuable tool for communicating differences among alternatives to stakeholders.