

Public Abstract

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Department:Biological Sciences

Degree:PhD

Title:THE ROLE OF TERRESTRIAL HABITAT IN THE POPULATION DYNAMICS AND CONSERVATION OF POND-BREEDING AMPHIBIANS

In my research, I used both population modeling and experimental field research to understand the role of terrestrial habitat in the population dynamics and conservation of pond-breeding amphibians. I have focused on questions that ask how the quantity and quality of terrestrial habitat available to amphibians affects growth and survival and how these changes can affect populations. I used literature data to develop demographic models for two pond-breeding amphibian species, and used these models to determine the potential effects of a range of terrestrial habitat areas on population size and extinction for both species. I next carried out field experiments designed to improve model accuracy. In the first of these experiments I manipulated terrestrial densities of wood frogs and American toads. Results from this experiment suggest that terrestrial density can affect vital rates of juvenile amphibians and should be considered in models of amphibian population dynamics. I also carried out field experiments to determine the effects of forestry practices on juvenile wood frog and American toad survival. The results of these experiments indicate that forestry practices interact with existing landscape structure to determine microclimate and thereby influence amphibian survival. I used the results of these field experiments to develop a population model designed to evaluate the potential effects of specific forestry practices on wood frog populations in Missouri. The results of my research indicate that the quantity and quality of terrestrial habitat available to pond-breeding amphibians can have substantial population level consequences including increased extinction probabilities and decreased population sizes.