

# Movement Ecology of Juvenile Pond-breeding Salamanders: Implications for the Management and Conservation of Amphibian Populations

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## Abstract

Human-induced habitat change is widely regarded as a primary factor threatening the persistence of species. One major consequence of habitat alteration is its effect on the movement behavior of individuals. Spotted salamanders (*Ambystoma maculatum*) are forest-dependent, pond-breeding amphibians. I used a combination of empirical studies of juvenile spotted salamander movement and individual-based modeling to investigate the influence of habitat amount and arrangement on juvenile salamander survival.

Salamanders moved straighter and with fewer turns through field habitat compared to both forest and early successional habitat. Movement in forest was well approximated by a correlated random walk. Salamanders oriented movement toward forest when released at most 10 m from the forest edge. Different movement strategies were optimal under different habitat modification scenarios. The strength of movement bias toward habitat had a significant effect on the probability of individuals locating habitat. The degree to which movement bias affected the probability of locating habitat differed based on assumptions of habitat clumping and density-dependent mortality. My results indicated that the amount and configuration of habitat surrounding wetlands affect optimal movement behavior, and habitat managers should consider the configuration of habitat surrounding wetlands when designing conservation measures.

