

Public Abstract

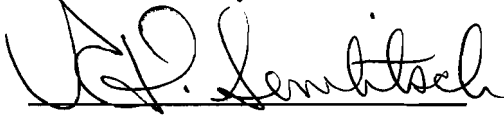
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Ph.D.

Biological Sciences

Multi-scale investigations of gray treefrog movements

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The movement of individuals within and among populations has been recognized as an important determinant of the persistence of species. Metapopulation biologists are primarily concerned with understanding the dynamics of systems of populations that exchange individuals along a continuum of inter-population movement frequencies. Metapopulations consist of multiple populations within discrete habitat 'patches' separated by inhospitable 'matrix' habitat. Movements within patches are migratory and movements among patches (i.e., through matrix) represent dispersal and ultimately gene flow. Fragmentation of terrestrial landscapes has exacerbated the need to understand the effects of changes to the core habitat of mobile organisms and has led to an increase in the use of metapopulation theory in conservation biology.

I have used direct and indirect methods to determine the capacity for movements by adult and juvenile gray treefrogs (*Hyla versicolor*). Specifically, I have determined the spatial scale of migratory movements, the location of overwintering locations, and the biotic and abiotic factors determining microhabitat use. Further, I have demonstrated the effects of matrix composition on the frequency of inter-pond movements and elucidated historical patterns of gene flow across central Missouri. My data indicate that migration through terrestrial habitat adjacent to breeding sites is extensive and significantly different for males and females. Furthermore, dispersal success is affected by matrix composition and inter-pond distance, but juvenile and adult movements are differently inhibited. Lastly, the type of metapopulation dynamics exhibited by associations of gray treefrog populations depends upon the degree of geographic isolation and the presence of barriers to movement.