

1146-35-263

**Jerome Goddard II\*** (jgoddard@aum.edu), **J. T. Cronin** (jcronin@lsu.edu) and **R. Shivaji** (shivaji@uncg.edu). *Effects of patch matrix and individual movement response on population persistence at the patch-level.*

Fragmentation creates landscape-level spatial heterogeneity which in turn influences population dynamics of the resident species. This often leads to declines in abundance of the species as the fragmented landscape becomes more susceptible to edge effects between the remnant habitat patches and the lower quality “matrix” surrounding these focal patches. In this study, we formalize the connection between small-scale movement and patch-level predictions of persistence through a mechanistic model based on the reaction-diffusion framework. A major advantage of this framework is that the model involved contains explicit parameters that can be estimated through empirical studies and used to predict critical population metrics like persistence and minimum patch size under the context of changing landscape structure. We mathematically analyze the model’s predictions of persistence with a general logistic-type growth term and explore their sensitivity to demographic attributes both in the patch and matrix, as well as patch size and geometry. Finally, we illustrate the utility of this framework with a well-studied planthopper species (*Prokelisia crocea*) living in a highly fragmented landscape. (Received January 24, 2019)