

1135-92-1591

**Yu Jin\*** (yjin6@unl.edu). *Population persistence in a benthic-drift river environment.*

We consider a river environment where species grow on the benthos, drift in the water column, and transfer between the water column and the benthos. We use reaction-diffusion-advection equations coupled with ordinary differential equations to describe the dynamics of a single species and of two competitive species. We study the population persistence criteria, based on persistence measures, including the net reproductive rate and eigenvalues of corresponding eigenvalue problems. We then use these measures to numerically investigate the influences of factors, such as the birth rate, various flow regimes, diffusion rates, competition rates, transfer rates, and spatial heterogeneity on population persistence. The theory developed here provides the basis for effective decision-making tools for water managers. (Received September 23, 2017)