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**Ram C Neupane\*** ([ram.neupane@aggiemail.usu.edu](mailto:ram.neupane@aggiemail.usu.edu)), 3 Aggie Village Apt. E, Logan, UT 84341. *Bird-Driven Dispersal of Trees: Multi-Scale Modeling and Analysis.*

The distribution of many tree species is strongly determined by the behavior and range of vertebrate dispersers, particularly birds. Many models for seed dispersal exist, and are built around the assumption that seeds undergo a random walk while they are being carried by vertebrates, either in the digestive tract or during the process of seed storage (caching). We use a PDF of seed handling (caching and digesting) times to model non-constant seed settling during dispersal, and model the random component of seed movement using ecological diffusion, in which animals make movement choices based on local habitat type instead of population gradients. We introduce multiple scales and apply the method of homogenization to determine leading order solutions for the seed digestion kernel (SDK). Using an integrodifference equation (IDE) model for adult trees, we investigate the rate of forest migration. The existing theory for predicting spread rates in IDE does not apply when dispersal kernels are anisotropic. However, the homogenized SDK is isotropic on large scales and depends only on harmonically averaged motilities and modal rates of digestion. We show that speeds calculated using the harmonic average motility accurately predict rates of invasion for the spatially variable system. (Received September 18, 2015)