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Yuan Lou* (lou@math.ohio-state.edu), Department of Mathematics, Ohio State University, Columbus, OH 43210. *Ideal free distribution and evolution of dispersal.*

A dispersal strategy, which results in the ideal free distribution of a single population at equilibrium, was found in Cantrell et al. (Math Bios. Eng., Vol 7 (2010) 17-36). It was shown by Cantrell et al. that this special dispersal strategy is a local evolutionarily stable strategy when the random diffusion rates of the two species are equal, and here we show that it is a global evolutionarily stable strategy for arbitrary random diffusion rates. The conditions in Cantrell et al. for the coexistence of two species are substantially improved. We show that this special dispersal strategy is not globally convergent stable for certain resource functions, in contrast with the result from Cantrell et al., which roughly says that this dispersal strategy is globally convergent stable for any monotone resource function. This is based upon a joint work with Isabel Averill and Dan Munther. We will also report some further progress on the convergent stability of this ideal free dispersal strategy in the more general context of the evolution of two traits, based upon a joint work with Richard Gejji, Dan Munther, and Justin Peyton. (Received August 25, 2010)