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On logistic models incorporating various diffusion strategies with and without harvesting

Defining a diffusion strategy as the tendency to have a distribution proportional to a certain positive prescribed function, once a diffusion coefficient grows infinitely. We explore the interplay of harvesting and dispersal strategies and their influence on the outcome of the competition for two resourse-sharing species. While achieving extinction by excessive culling of the undesired species in many cases is a simple and efficient strategy, keeping biodiversity is a more complicated task. Proposing such heterogeneous harvesting that the two managed populations become an ideal free pair allows to guarantee coexistence. The directed movement is modeled by the term which particular form is $\Delta(u/P)$, where P is the target distribution. However, when P is not aligned with the carrying capacity of the environment, a unique positive solution u^* of the Neumann problem is different from P. Another conclusion that we manage to deduce is that, once an invading species manages to mimic the observed distribution of the host species and has some advantage in the carrying capacity, this guarantees successful invasion. However, the conditions under which the host species can sustain, other than targeted culling of invaders or trimming both populations, is still an open question.