

PARTIAL DENSITY FUNCTION MODEL FOR ANIMAL POPULATIONS

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ABSTRACT. Pe'er et al. use an individual based model to analyze the behavior of a species of butterflies that exhibit hilltopping, “a dispersal-like behavior where males and virgin females ascend to mountain summits and mate there” [2]. We recast the model of Pe'er et al. as a stochastic differential equation. A Monte Carlo simulation program was written to calculate the histogram of butterfly density to find an approximation of the probability density function. We think the Fokker-Planck equation [2] might provide a solution for the probability density function, which would be computationally less expensive and more elegant than Monte Carlo simulations.

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