

1135-37-1028

Hal L Smith* (halsmith@asu.edu), School of mathematical & Statistical Sciences, Arizona State University, Tempe, AZ 85287. *Persistence versus extinction for a class of discrete-time structured population models.*

We provide sharp conditions distinguishing persistence and extinction for a class of discrete-time dynamical systems on the positive cone of an ordered Banach space generated by a map which is the sum of a positive linear contraction A and a nonlinear perturbation G that is compact and differentiable at zero in the direction of the cone. Such maps arise as year-to-year projections of population age, stage, or size-structure distributions in population biology where typically A has to do with survival and individual development and G captures the effects of reproduction. The threshold distinguishing persistence and extinction is the principal eigenvalue of $(I - A)^{-1}DG(0)$ provided by the Krein-Rutman Theorem, and persistence is described in terms of associated eigen-functionals. Our results are illustrated by application to a plant model with a seed bank. (Received September 18, 2017)