

The dynamics of a discrete-time contest-competition model with constant effort harvesting

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We discuss the dynamics of a general discrete-time model that represents a contest-competition species with constant effort exploitation. The model takes the form $x_{n+1} = x_n f(x_{n-k}) - h x_n$ where $h > 0$, $k \in \{0, 1\}$, and the recruitment function f obeys certain conditions that are typical of a contest competition. We are mainly interested in the effect of the harvesting parameter h . In the absence of delay in the recruitment ($k = 0$), we show the effect of h on the stability, maximum sustainable yield, persistence and the transition into a scramble model. When the delay in recruitment is one ($k = 1$), we show that a Neimark-Sacker bifurcation occurs and a supercritical invariant curve bifurcates from the positive equilibrium.