1144-92-94 **Jim Michael Cushing*** (cushing@math.arizona.edu), Department of Mathematics, 617 N Santa Rita, University of Arizona, Tucson, AZ 85721. *Difference Equations as Darwinian Models.*

Discrete-time dynamical systems defined by difference equations have a long history of use as models of population dynamics. These equations are (time) autonomous when the coefficients and terms in the equation do not depend explicitly on time. There are, however, important reasons why it is of interest to consider time varying model coefficients. Two important reasons are periodic coefficients (in the case of daily, monthly or annual fluctuating environments) and stochastic coefficients (in the case of stochastically fluctuating environments). Another important reason that model coefficients can change in time is when they are subject to Darwinian evolution. I will discuss a general modeling methodology that can be used to derive evolutionary versions of a population model equation and describe some basic, general theorems concerning model predictions of extinction or survival by means of bifurcation theory. To illustrate the theorems I will give example Darwinian versions of the classic discrete logistic (Beverton-Holt), Ricker, and Ricker/Allee difference equations. These will also be used to illustrate some biologically interesting phenomena, including backward bifurcations and strong Allee effects, evolutionary stable strategies, and climbing peaks on adaptive landscapes. (Received August 13, 2018)