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Jim Cushing* (cushing@math.arizona.edu), Department of Mathematics, 617 N Santa Rita, University of Arizona, Tucson, AZ 85721. *Darwinian difference equation models and the evolution of semelparity versus iteroparity*. Preliminary report.

A classic question in life history strategies of biological populations concerns reproductive timing and output and, specifically, the choice between semelparity (one reproductive event only in an individual's life, e.g. annual plants) and iteroparity (multiple reproductive events, e.g. perennial plants). Under what circumstances will evolution favor one of these strategies over the other? While early investigations suggested semelparity should be favored by evolution, subsequent studies have shown there is no simple answer to this question and that many factors can be in play, including density dependence, variable environmental conditions, and many others. In this talk I formulate evolutionary versions of some standard difference equation population models and discuss their implications with regard to this question, focusing on the role of density dependence of reproduction and survival. The analysis involves equilibrium bifurcations and stability and on multiple attractor scenarios. Conditions are obtained under which semelparous equilibria and iteroparous equilibria are stable and conditions under which either type of stable equilibrium might or might not be an evolutionarily stable strategy. (Received September 19, 2018)