1035-92-782 **J. M. Cushing*** (`cushing@math.arizona.edu`), Department of Mathematics, 617 N Santa Rita, University of Arizona, Tucson, AZ 85721, and **Sheree Lynn Arpin**, Program in Applied Mathematics, 617 N Santa Rita, University of Arizona, Tucson, AZ 85721. *Phenotypic oscillations and frequency-dependent selection.*

Temporal oscillations of phenotypic traits are considered rare, but biologists have observed such oscillations in cichlid fish populations endemic to Lake Tanganyika, Africa. The phenotypic trait in these fish (left or right asymmetry in morphology) is known to be the expression of a single locus, two allele gene. The population dynamics of these cichlids are driven by the defense behavior of a prey species. Each of two phenotypes attacks the prey differently and the prey defense behavior responds differentially, at any given time, to the phenotype of largest proportion. We construct and study a general model, based on this kind of frequency-dependent interaction, that mixes population dynamics with population genetics and show analytically under what conditions it predicts phenotypic trait and/or population dynamic oscillations. (Received September 15, 2007)