

1098-92-172

**Michael J Crone\***, mcrone@masonlive.gmu.edu, and **Evelyn Sander**. *Investigating the Limit Cycles of the Ratio-Dependent Predator-Prey System with Constant Harvests*.

The Ratio-Dependent Predator-Prey System (RDPPS) is an ODE population model that has empirical support for its ecological accuracy. We investigate a modification of the RDPPS with constant rate harvesting subtracted from both the predator and the prey populations, to represent the populations being harvested by humans, as in a commercial fishery. Previous results have shown that the standard RDPPS model has no limit cycle solutions throughout its parameter space, but that subtracting a constant harvest from the predator or the prey in the model can lead to limit cycle solutions for certain parameter values. We present the preliminary results from a numerical investigation of the entire parameter space for the model investigating the robustness of the limit cycles. Our informal investigations have shown that these limit cycles exist for a very small region of parameter space: a 1% change in the predator harvest is observed to be more than enough to pass entirely through the region of parameter space that allows limit cycles. (Received January 24, 2014)