1154-92-308 **Ronald E Mickens*** (rmickens@cau.edu), Dept of Physics, Clark Atlanta University, Atlanta, GA 30314-3773, and **'Kale Oyedeji** (kaleoyedeji@comcast.net), 5343 Fox Valley Trace, Stone Mountain, GA 30088. *A Three Tropic-Level Model of Interacting Populations.*

We construct and analyze a three-tropic level model of interacting populations expressed as a system of coupled, nonlinear, first-order differential equations. This model might provide a particular representation of the long running experiment on Isle Royale involving pine trees, moose and wolves [1]. Our model differs from standard mathematical models in its characterization of the birth, death, and interaction terms as products of non-integer powers of the three populations. An interesting and important feature is that the exact analytical solution can be calculated in terms of elementary functions. Since our particular model is representative of the whole class of models for three tropic levels systems, this allows us to make a number of general conclusions holding for all of them. In addition to the location of the fixed-points, and their stability properties, both local and globally, we will discuss the possibility of finite-time dynamics, i.e., conditions under which one or more populations can go to zero in a finite time.

[1] B.E. McLaren and R.O. Peterson, Wolves, Moose, and Tree Rings on Isle Royale, AAS,260, 5190 (Dec. 2, 1994) 1555-1558: www.jsor.org/Stable/2885186 (Received August 30, 2019)