Name(s)

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Project Number

S1209

Project Title

The Utilization of Empirical Math Modeling in a Predator-Prey Relationship

Abstract

Objectives/Goals

In this study it is my goal to examine whether a mathematical model can accurately represent a predator-prey relationship that includes dynamics not within the populations# control.

Methods/Materials

First, a classic predator-prey mathematical model was constructed for comparison purposes. Then data from a thirty-year study conducted in Serengeti National Park, Tanzania was converted into spreadsheets. Using these spreadsheets graphs were made for each predator and prey. With the graphs polynomial fit lines were constructed. Then the classic mathematical model was compared to the various graphs to check for compliance.

Results

The data bases and graphs in conjunction with research showed that in the years prior to the indicated canine distemper virus (CDV) outbreak a classic predator-prey model will portray the proper trends. However, the classic model no longer could accurately represent the Serengeti data as exemplified by the canine distemper virus.

Conclusions/Discussion

Utilizing real research data I was able to confirm that classic predator-prey models fail to include dynamics that influence population size.

Summary Statement

This project examines whether a mathematical model can accurately represent a predator-prey relationship that includes dynamics not within the populations# control.

Help Received

Some minimal data consultation was provided by Dr. Guy Norton, Mikumi National Park Tanzania, and Dr. Randall Swift, California State Polytechnic University, Pomona