Project Proposal Draft 1 1st Quarter 2009

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1 Title of the Project

Modeling Predator Prey Relationships with Climate Changes

2 Purpose and scope of the research project

The goal of this project is to create a working Predator Prey system with climate changes. These changes (i.e. snow or autumn leaves) will serve as either camouflage or habitat. The organisms with genes not suitable to the environment will die off, creating a survival of the fittest system until the climate changes again. Using the Lotka-Volterra Model, I will calculate possible initial values of foxes and rabbits to establish a stable oscillating environment; however, because the initial model does not incorporate evolution, I may have to modify the equation.

3 Background and review of current literature/research in this area.

Not will I only need to have an understanding of Python and Tkinter, I will also have to research the nature of a predator prey relationship as well as the confounding variables in the experiment. From the article I read on the Allee affect, I learned that chaos plays a big role in the environment. I will also have to research the Lotka-Volterra Model as well as the responses of rabbits and foxes to climate changes and their hunting nature.

4   Procedure and Methodology.

I will use python for this project. Initially, I want to make sure my code works correctly; using Tkinter, I'll display the model graphically to make sure the hunting, reproduction, camouflage, and deaths work properly. Later in the year, after finishing the code, I will have to test different initial values to find one that is stable to the environment, using some sort of automatic testing.

5   Expected Results & Value to Others

I expect to obtain some sort of relationship between each of the initial values and the end result of the environment after a certain amount of time. I will presents graphs of population vs. time to show such relationships. If I derive a working equation that models my predator-prey relationship, environmentalists or natural parks such as yellow stone can use this to predict the effect of climate, with global warming, on the population of such species.