Miniproject # 2 for ATSC 409: Rabbits and Foxes in Daisyworld

Add two new variables (one at a time) to Daisyworld, as specified in Lab 5 question predator:

Variable 1: Concentration of rabbits that eat daisies.
Variable 2: Concentration of foxes that eat rabbits.

You'll need to come up with:

- rabbit and fox birthrates
- rabbit and fox deathrates
- a rate at which rabbits eat daisies
- a rate at which foxes eat rabbits

Note that while we've considered Aw and Ab to be non-dimensional daisy concentrations (fractions of the planet covered). They could just as easily be daisies per square km. In the same way a fox "area" of 0.1 could be 0.1 foxes per square km, or 1 fox every 10 square km.

Try to find values for your initial concentrations and birth/death and consumption rates that give an equilibrium in which black/white daisies, rabbits and foxes can all coexist. See if you can get "predator-prey" oscillations, in which the fox and rabbit populations go through periodic highs and lows.

Hand-In a notebook and pdf of the notebook, that includes:

1. A clear statement of all your assumptions
2. Plots showing the fraction of black daisies, white daisies, rabbits and foxes, demonstrating equilibrium solution and predator-prey oscillations.
3. Your code
4. A discussion of your strategy for finding the steady state
5. A discussion of whether the various rates are reasonable, given what you know about daisies and mammals (e.g. what do your birth and death rates tell you about the average lifespan of a fox or rabbit on your planet, or the number of rabbits in a litter?)