Population ecology assignment: Population structure

Not for credit; aim to finish Fri 11 March

1. A population of elk has $\mathcal{R} = 1.5$ and $\lambda = 1.05$ at its stable age distribution. 60% of individuals counted at age 1 survive to age 2.

a. (2 points) What is the ratio between the number of individuals born in year x to year $x + 1$ if the age distribution is stable?

b. (3 points) What is the ratio between the population of age class 1 and age class 2 in the stable age distribution?

2. A scientist studies a population of mice. She finds that they reproduce once a year, that a reproducing one-year old female produces (on average) 0.6 female offspring who survives to reproduce, and that a reproducing two-year old female produces (on average) 2 female offspring who survive to reproduce. She also finds that 40% of females survive from the first to the second year and no individuals survive beyond this.

a. (5 points) Make a life table for this population. Should you count before reproduction or after? Why?

b. (2 points) What is the reproductive number $\mathcal{R}$ for this population?

c. (2 points) What do you *guess* would be the stable finite growth rate λ for this population?