Population ecology assignment: Life history

Do by Mon 30 Mar (not for credit)

1. (6 points in total) Scientists investigate an annual plant species for three years. The adults produce 150 seeds per year, on average. In the first year of the study, 2% of the seeds survive to become adults. In the second year of the study, 1% survive to become adults in the second year. In the third year of the study, 0.2% survive to become adults.

a. (3 points) What is the finite growth rate λ for this population in each of the three years?

b. (1 point) What is the ratio of the population at the end of the study to that at the beginning?

c. (2 points) What is the "correct" average value of λ – ie., the constant value which would give the same total growth of the population over three years?

2. (4 points in total) Scientists investigate another annual plant species for one year. The adults produce 150 seeds, on average. 1/3 of the seeds go to a place where 2% survive, 1/3 go to a place where 1% survive, and 1/3 go to a place where 0.2% survive.

a. (3 points) What is the overall proportion of seeds that survive?

b. (1 points) What is the value of λ for this population?