Labs 3 and 4 Worksheet

Life tables and Population dispersion patterns

Answer/address all of the following questions. In all cases, we require that your work be typed and that you make computer printouts of spreadsheets, graphics, or statistical output.

1. Generate a spreadsheet with the length and age data for *Gambusia holbrooki* collected in the aquatic habitats that you sampled. Use age classes similar to those shown in Example 2 of Lab 3.

2. Generate a life table for each of the populations of *Gambusia holbrooki* that you sampled. Include the fecundity estimates shown in Example 2 of Lab 3. Be sure to calculate the net reproductive rate (R_o), the mean generation time (G), the intrinsic population growth rate (r), and the optimal age for sexual maturity in each table.

   (a) What kind of life tables are these?

   (b) What did you hypothesize about similarities or differences in the population structure for fish from the different habitats that you sampled? Do your life tables and resulting calculations support your hypothesis?

3. Now use the *Musculium partumeium* data provided at the end of Lab 3 to generate life tables for both the fall 1981 and spring 1982 cohorts of this freshwater clam. Be sure to calculate the net reproductive rate (R_o), the mean generation time (G), the intrinsic population growth rate (r), and the optimal age for sexual maturity in each table.

   (a) What kind of life tables are these?

   (b) What can you say regarding population growth rates for the two cohorts of *Musculium partumeium*?

4. What is the optimal age for sexual maturity in each of these two aquatic species?

5. Generate spreadsheets of your lab's population dispersion data for the plant species that you sampled. Expand these to include calculations of Poisson distribution parameters. Show your calculations for the mean value and the Poisson values.

   (a) How are each of these species dispersed? Determine the dispersion pattern of your quadrat method data by graphing the observed vs. predicted values (refer to the population dispersion section in the appendix

of your lab manual). Determine the dispersion pattern of your point-to-plant distance data by calculating the aggregation coefficient (A). Do your spatial data on the distributions of individuals support your calculations in these conclusions?

(b) Do your conclusions support your hypotheses about population dispersion in these species?