Lab 2. Population growth in *Lemna*

*Questions due March 11, 2003*

1) Make 5 graphs of N (population size) vs. time (days), each with the class data set (average values of N combined for all groups) plotted and your individual group's data for the same population. Thus, on each graph, there should be 2 lines (make sure you use different symbols or line types and include a "key" to identify which symbols represent which data set).

2) Estimate K and r for the class average data sets and your group's data sets plotted in #1 above. For estimates of K, you decide whether you should use a single point or the average of several values of N to estimate K. Make sure it is obvious to me how you estimated K! If the population "crashed", do not use the numbers (N) that were collected during or after the crash. Estimate r for each of the data sets plotted in #1 above as shown in the examples on the following sheets. Use the K values you just estimated in these calculations. You decide which time intervals to use when calculating r (2 days, 4 days, etc.) and which, if any, data you want to discard (due to obvious sampling errors for example). Show your calculations!

3) Make a graph plotting the K (y-axis) vs. the r values (x-axis) for each experimental treatment grown in the light. Do this for the class average data only.

Answer the following questions using the class average data and graphs you produced...unless otherwise noted:

a) Do any of the graphs look like a logistic growth model might be used to describe *Lemna* population growth dynamics? Why or why not? Are there reasons why a logistic model might not work for these organisms?

b) Did r and K values vary positively with one another? In other words, did treatments with high r values also have high K values? Or was there a negative or lack of relationship? Interpret their relationship to each other.

c) Your calculations of r and K for your group's data alone probably varied from the class average data set. Which estimates of r and K do you think are more accurate for *Lemna* populations. What are some advantages and disadvantages of "pooling" data from the entire class?

d) Did keeping these organisms in the dark (eliminating photosynthesis) for 3 weeks reduce the population size to zero? If not, can you think of any natural conditions in which *Lemna* must be able to survive periods of no photosynthesis?