Assignment - analysis of data and figures.

Your contribution to the data analyses will be basic summary statistics, histograms, box and whisker plots, and t-test/ANOVA. You will then have a reasonably complete initial set of data analyses to present on your poster.

Each of you will analyze the complete class data set for the questions /variables your group chose or any others you think are interesting. You may work with your group but each person must do and turn in their own tables, figures, and interpretations. Think of it this way: you can share ideas, skills, and knowledge but each person needs to practice these skills themselves. You will then have your entire groups' tables and graphs to choose among to include the best (most scientifically accurate) on your group poster.

We are going to use similar procedures that you used in the assignment for making tables and figures in JMP. You will want to have that assignment in hand to review how to walk through the analyses.

Remember every table and figure MUST have an informative, complete caption. A caption should be complete enough that the reader can know what you are testing and what you found without looking at the text of your poster/paper. A complete caption includes the variables, a description of the graph or table, the results of any statistical analyses, numbers such as N, p-values, etc., and a short summary of the result.

Pre-analysis consideration

Although we tried to standardize our sampling effort at 30 person-minutes per 500 m², they ended up being unequal. If you look at column K on the raw data spreadsheet you can see the ratio of person minutes to m². As a group, you will need to decide how to proceed.

Some options I see:

- a) Ignore this difference in sampling intensity and analyze the data as is.
- b) Use the scaling factor (multiplier) to estimate what the number of individuals would be if sampling intensity was the same.
- c) Cull the data of samples that are outside of a window of similar sampling intensities. If they are more than 20% off for example they would be cut.
- d) Assign these different analytical strategies (a-c) to different group members so you will have all these options to choose from or discuss on your poster.

When we are preparing to publish this data we will probably use a more complex statistical procedure called rarefaction, but it is too deep to get into for these analyses and a multiplier is a simple version of that procedure.

Task 1 - Research questions

Review the environmental variables or questions your group was going to test. Write them out as formal questions and predictions.

For example, maybe you were comparing wet vs dry soils (scientific question). I would expect wet soils to have more snail individuals (abundance) and more snail species (species richness) (prediction).

Scientific question #1:
Prediction #1:
Scientific question #2:
Prediction #2
Descriptive statistics Task 2: In this section you will use the column of data with the Number of Species Present grouped by your environmental variables and make tables. Be sure you follow the rules for making a Scientific Tables that you learned in the Basic Tables and Figures assignment.
Insert table comparing the different levels of your variables for Scientific Question #1 here.
Insert table comparing the different levels of your variables for Scientific Question #2 here.
Make a Distribution graph (histogram) of species data that compares the variables of interest Task 3: Making Graphs of these subsets of data.
Make a box and whisker plot of grassland vs woods data. Task 4. Make box and whisker plots for each variable that compare the different levels of the environmental data, summarize results
Task 4. Make box and whisker plots for each variable that compare the different levels of the

INTERPRETATION OF BOX AND WHISKER PLOT: Write a 2 sentence summary of what the box and
whisker plot shows of your findings. Be sure to reference the mean values as well as the standard error

Conduct a t-test on species richness and answer the questions posed

Task 5: Conduct t-test (2 levels of variable) or ANOVA (>2 levels of variable) on Number of species by environmental variable.

e.g. You can do a t-test to compare the number of species per site for wet vs dry sites to find out if they are significantly different. For those variables that have more than one category (25, 50, 75, 100%) you will use an ANOVA to accomplish the same test – to tell if any group is different. You then use post-hoc tests (LSD, Tukey's HSD, Scheffe's test) to figure out WHICH groups are different from each other.

WHAT IS BEING TESTED?

t-test or ANOVA.
H _o :
H _A :
For Scientific Question #2 list the null hypothesis and alternative hypothesis you will be testing with
t-test or ANOVA.
H _o :

For Scientific Question #1 list the null hypothesis and alternative hypothesis you will be testing with a

WHAT IS THE RESULT?

H_A:

Insert data table summarizing rests of this test for scientific question #1:

Interpretation of results for Q1:

- 1. Is this a statistically significant result?
- 2. Does this result fail to reject or reject your null hypothesis?
- 3. Does this result support or reject your alternative hypothesis (research question)?

4. What does this tell you about land snail species richness in response to these environmental conditions? What did you discover about land snail community response to this variable?

Insert data table summarizing rests of this test for scientific question #2:

Interpretation of results for Q1:

- 1. Is this a statistically significant result?
- 2. Does this result fail to reject or reject your null hypothesis?
- 3. Does this result support or reject your alternative hypothesis (research question)?
- 4. What does this tell you about land snail species richness in response to these environmental conditions? What did you discover about land snail community response to this variable?