Name/Date/Hour:_____ DUE:_____

Biodiversity Lab: Is this Ecosystem "healthy"?

Purpose: In this lab, you will measure and compare the diversity of different areas using materials that real scientists use in the field. Scientists use these methods to count the number of different species (biodiversity or species richness) and how many of each species (species evenness) there are. Instead of measuring a large area, scientists use quadrants or transect lines to sample an area in various places. Scientists can also use this data to measure a healthy ecosystem (such as an old growth forest) and then use that data to restore a damaged ecosystem by replanting the correct number of plants.

Materials: Square meter quadrat, notebook, hand lenses, clipboard, tape measure or string, bamboo skewers, compass

Procedure

Step 1: Choose your site

1. Choose your site for the study and record the location; be specific so a future person could find where you are. Mark your location with at least one bamboo skewer.
2. Measure out your area. (You want a section of land around the size of our classroom.)

Step 2 Biodiversity

1. Explore your chosen site. Choose at least 10 different species to observe and identify. For EACH species you will have:
   a. Drawing (in color!- you can color them when we are inside)- AT LEAST 10
   b. Observations (both quantitative and qualitative)
   c. Identification (use the guide books, internet, etc. Make sure your drawing is good enough that you can use it for identification purposes.)*1. Do not worry if you do not know the names of the plants and animals that you see right away. Use morphospecies identification (based on basic characteristics such as shape, size, and color) to fill in your data table.*
   d. Other- additional information you find interesting about these species
   e. Create a data table for your area. You should list EVERY species within your chosen area on your data table (but you can describe them rather than ID all of them). You should then identify each species as being "abundant", "frequent", or "scarce" (within your area).

Step 3: Quadrant Study

- Within your chosen site, you will select one specific area (a square meter in size) to study in even more detail. The area should be diverse enough to contain significant numbers of plant and animal species. Throw your quadrant in the area.
- Create a different data table for this area. You should list EVERY species within your chosen area on this data table, by name. You should COUNT the number of <u>each</u> species within this square meter area. (I recommend taking pictures)
- Calculate biodiversity for this area using the Simpson's Index of Diversity.

This section of your report should include a data table and written work for calculations.

Step 4: Compare your Quadrant Study

- Meet up with a different group
- Create a different data table for this area. Copy their data table with location information in your notebook.
- Calculate biodiversity for this area using the Simpson's Index of Diversity.

This section of your report should include a data table and written work for calculations.

Analysis Questions

Answer the following:

1. Compare the biodiversity of your square meter quadrant with the overall biodiversity you observed in your chosen area. Do you think the quadrant is an accurate representation of the overall biodiversity in your area? **EXPLAIN**.
2. Describe some challenges with measuring biodiversity.
3. Describe some methods scientists can use to study biodiversity rather than identifying absolutely every organism in an area.
4. Why is it so important to try to measure biodiversity?
5. What are some threats to biodiversity in this ecosystem? Explain.
6. Speculate how humans have influenced the biodiversity in this particular ecosystem.

Conclusion

Is this ecosystem healthy? Create an argument, and use evidence (data) to support your argument. Make sure you explain what your data is showing and why that is helping to support your argument about the health of this ecosystem.