**Vegetation Measurement & Assessment (REM 357 & REM 410)**

**~~Measuring Frequency~~**

**Data Summary** Assignment #6 (60 points total): Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Due by Midnight on Tuesday, October 16th through Blackboard (<https://bblearn.uidaho.edu/>)

1. **Frequency Analysis** (35 pts). Conduct a frequency analysis of some kind of vegetation community that is in your area. Here are the rules of the game:

* Select a plant community to examine. This could be a nearby field, a park, or your backyard.
* Select a plant to examine in the plant community. This could be a common plant, a weed, an endangered plant, or just a plant you recognize and are interested in.
* Create two plots or quadrats to examine the frequency of your selected plant. These plots could be frames created with a pvc pipe, a hoop you have laying around (like a hula-hoop), or simply a stick of that you will hold out in front of you and turn around in a circle to see if the plant occurs in the circle around you. You could also create a photo plot by looking at the ground with your camera. **The key is to create two plots of different sizes**. They can be the same shape or different shapes. DO NOT use a nested plot. Do two separate sets of data collection in the same community?
* Examine at least 25 plots for each sized quadrat for the existence of your plants of interest. In other words, you will need to examine at least 50 plots; look for your plant in 25 of the smaller quadrats you created and then look for the plant in 25 of the larger quadrats.
* Create some sort of field data sheet or digital device to take field data.

Write a report with the following information:

* 1. A description of the site. Where is it located? What are its general vegetative and geographic features? (Pictures and maps would be great.)
  2. Description of the plant you selected. What is the common and scientific name of the plant you selected? (Use the USDA plants data base, <http://plants.usda.gov/> for help on scientific names). Describe the plant and why it is interesting in this situation. (Yes, pictures are allowed).
  3. Describe the plots/quadrats you used. What were the shapes and sizes of your 2 plots?
  4. Raw and summarized data. Please present your raw data and the summary of the frequency of the plots you examined. You could easily do this with a table in your report or attach and excel spreadsheet.
  5. Evaluate your use of frequency in this case. Which plot size was most appropriate? Was frequency the best attribute to examine? Did you encounter any problems? What would you do differently in the future?

Be creative. You can examine grasses, trees, shrubs, or any other type of plant. You can do your examination in a wild or urban setting. The study does not need to be particularly sophisticated… I just want to see if you understand the elements of frequency well enough to apply them.

Your report cannot exceed 4 pages (including maps, photos, and data).

You will be evaluated on the 5 pieces of requested information above and you ability to clearly describe your methods and results.

1. **Nested Frequency Analysis** (25 pts). A few years ago a group of students and I conducted a nested frequency examination on a sagebrush meadow at Ponderosa State Park near McCall, Idaho. (Find Data in Spreadsheet). During our visit to Ponderosa State Park, we laid out 7 transects that radiated from a central monitoring point and we recorded nested frequency on 10 plots in each transect. The data are presented in the attached spreadsheet. Conduct the following elements of a nested frequency analysis:
   1. Complete the attached spreadsheet (in the “2008-Complete” Tab). Record the hits and frequency for each plant encountered and each of the 4 nested frequency plots on the far right-hand side of the spreadsheet.
      * Submit your completed spreadsheet as part of your assignment.
   2. Examine if Idaho Fescue, Western Yarrow, and Sagebrush have increased over the last 10 years. Notice that the spreadsheet has a tab along the bottom called “1998-Summary.” This tab is a summary of data I collected on the same site in 1998. Compare the 1998 and 2008 data to describe whether Idaho Fescue, Western Yarrow, and Sagebrush appear to have increased or decreased in the last 10 years.
      * To accomplish this you will need to select the appropriate plot size to compare over years. Recall that the appropriate sized plot yields plant frequency as close to 50% as possible and should definitely be greater than 20% or less than 80% frequency.
      * Write a summary paragraph for each plant regarding your thoughts on whether it is increasing or decreasing. Make sure to record which plot size you based your conclusion on. And, use your specific data to support your conclusion.

**~~~~ Give the Chi-Square a Try~~~**

If you really want to impress me, you could do a chi-square analysis to determine if the plants really are increasing or decreasing. Your Chi-Square Table will need to look like this table below. Also, to save you a little effort, I looked up the Chi-Square value for a test like this one with 2 columns and 2 rows and an alpha-value of 10%; it is 2.706. Therefore, if you calculate a Chi-Square value > 2.706 you can reject the null hypothesis and conclude that the plant you examined either increased or decreased from 1998 to 2008.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Chi Square Goodness of Fit Test | | | | | |
|  |  |  | Observed | |  |
|  |  |  | 1998 | 2008 | Totals |
|  |  | Present |  |  |  |
|  |  | Absent |  |  |  |
|  |  | Totals |  |  | 150 |
|  |  |  |  |  |  |
|  | **χ**2**=** \_\_\_\_\_\_ + \_\_\_\_\_\_ + \_\_\_\_\_\_ + \_\_\_\_\_\_ = \_\_\_\_\_\_\_\_\_\_ | | | | |
|  | *Then compare calculated value to "critical" (or table) value in a chi-square table:* | | | | |
|  | Compare the Chi-Square you calculated to a critical value for α of 10% of **2.706** or look in Chi-Square Critical Value Table.  If calculated Chi-square is > then 2.706 you can reject the null hypotheses that the years are not different and conclude that there is a difference in frequency from 1998 to 2008. | | | | |