

## LESSON PLAN: SETTING UP A STUDY PLOT LAB PROCEDURE

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Adapted from

[http://biology.arizona.edu/sciconn/lessons2/Carpenter/Unit\\_Overview3.htm](http://biology.arizona.edu/sciconn/lessons2/Carpenter/Unit_Overview3.htm) by Annette Pladevega

### Lesson overview:

Students will set up a study plot and determine the coverage by native versus non-native (alien) species in a Marianas Islands' park or forest. This lesson can be done in any sort of land, either on or off school property.

### Objectives:

Students will learn the difference between native species and non-native species, and gain an understanding of the prevalence of non-native species in the environment on their island.

**Time/duration:** 2 hours in the field, 1 hour in the classroom

### Materials:

#### For the class (to share)

- 2 survey-type measuring tapes

#### For each team of two students

- one red stake
- meter stick
- clipboard
- grid paper
- blank paper



### Background:

#### Lesson procedure

- 1) Prior to class the teacher should select areas for the plot study. For every area, you should place two yellow stakes in the ground to signify one long edge of a 3-meter wide rectangle.
- 2) At the beginning of class, set boundaries with the students (e.g. physical boundaries, areas off limits, time limits) and break students into groups of two. Each group will be responsible for mapping one 3x3 meter area.
- 3) Mark Off the Plot
  - a) There will be two stakes painted yellow already in place. The teacher and a student will tie a string between the stakes. From the yellow stakes, two blue stakes will be placed 3 meters away, and a string will be tied between the two blue stakes making a line that is parallel to the first string. This forms the borders of the rectangle that will be surveyed. Note to teachers- you may need more than one rectangular plot, depending on class and group size.
  - b) Students begin measuring from the one yellow stake along the string, placing a painted red stake with a every 3 meters. The first red stake will have a 1 written on it, and the second a 2 and so on.
  - c) Tell the teacher what number is on your stake, and be sure she marks her map to show where your plot is.

- d) Students will also measure from one blue stake along the string, marking every 3 meters with a rock. This will form squares that will become the plots used for the rest of the lesson.
- 4) "Map" the Plot (a.k.a. collect the Data):
- a) Each student will have a paper with a graph or grid marked on it. Each square on the grid represents 10 cm of the plot. Label each side of the graph with directional labels (north, south, east and west).
  - b) Starting at one corner of the plot (call it 0,0), select the plant closest to the corner. Measure from the center of the plant to closest spot on two sides of the plot with the survey tape or a meter stick. Find this location on your graph. Mark this spot with a small "x". Be careful to orientate the plant correctly on your graph.
  - c) Measure the diameter of the plant's base (the main stem or bunch of stems that come out of the ground). If it is a tree, measure this at 1.3 meters (called dbh). If it is a shrub or herb, measure it at the point closest to 1.3 meters where there is a clear stem.
  - d) Next measure the plant's canopy coverage (the area the plant takes up at its widest point or how much ground is covered by the plant). Draw a circle around the previous circle to show the coverage size.  
*Note: Your circles may overlap if plants overhang each other. Mark on your map exactly what you see; do not try to fit each plant "nicely" next to one another to make the map look neater.*
  - e) Place a number (starting with 1) inside the coverage area to identify this plant.
  - f) On a separate piece of paper keep a list of the plant number and the name of the plant. If you do not know the name of the plant, write a description of it using the characteristics we talked about in class (e.g. leaf shape, size, etc.). Write the coverage measurement next to the name of the plant. This is very important; it will be used later to calculate the percent coverage of native plants versus the coverage by alien plants.
  - g) Repeat steps 4-8 until all the plants in the plot have been mapped and identified.
- 5) Clean Up:
- a) All strings must be removed before we leave.
  - b) Pull out all red and blue stakes. **DO NOT REMOVE THE YELLOW STAKES.** You and your partner must show me the stake assigned to you **BEFORE** you may get on the bus to return to school.
  - c) No trash of any kind may be left. Remember: "Leave only footprints. Take only pictures."
- 6) In the classroom:
- a) Calculate species richness (# species/m<sup>2</sup>)
  - b) Identify species as either native or non-native. Calculate % cover by native species vs non-native species.

## Evaluation

Evaluate students based on their plot map, species identification and calculations.