

ECOLOGICAL STUDY OF A NATURAL AREA

by DR. J. Toyoshima

ASSIGNMENT

1. Read this exercise **before choosing a study site**.
2. Take this assignment, field guides, paper and pencil with you to the study site, as well as food, water, a hat, suntan lotion, etc.

INTRODUCTION

This study involves an intensive observation of a relatively small natural area. You will record your data and observations in 4 forms: a map, a species list of plants and animals you observe, a journal activity (a running account of what you saw), and paragraphs on the ecology and adaptations of two animals and one plant species.

INSTRUCTIONS

Step 1. *Select a study area.* Your study area must meet the following five criteria:

Criterion 1: the site must include a permanent body of water,

Criterion 2: your study area must be a square that is 100 feet on each side. Your square must not contain more than 25% water,

Criterion 3: your study area must contain at least 2 large trees and/or several large shrubs,

Criterion 4: your study area must contain some evidence of natural (wild) animal activity and finally,

Criterion 5: your study area must be different from that of any other student. This is NOT a group activity.

The most obvious areas would have a stream, river or pond at the edge of the study area with trees along the bank. The presence of water and trees in the study area increases the likelihood of observing animal activity. Do not use Truxtun Lakes, Lake Ming, Riverwalk or Hart Parks.

Step 2. *Construct a map of the area.* Once you have selected your study area, pace off a 100 x 100 foot square. (If you don't know how many feet there are in a pace, measure

your pace with a yardstick before you leave home. You may also measure the square with a measuring tape or yardstick.) Use the graph paper on page 5 of this assignment to accurately sketch the features of the terrain (boulders, paths, location of permanent water source, etc.) and the location of each tree and large shrub on your study site. Draw a north arrow (an arrow indicating the direction you must look to find the north pole if you are standing in the exact center of your study plot) in the margin of the graph paper. Estimate the elevation, in feet above water level, of all prominent features on your map and of the corners of your study site. Carefully write a complete description (not a map) of the route you took from Bakersfield College to your study site. Indicate distance in miles, street names, landmarks, etc. in your description. The object is to describe the route well enough that someone unfamiliar with your study site could find it.

Step 3. *Make a list of ALL plants and animals you observe in your study plot.* It is best to construct this list while you are making observations (Step 5). Use the space provided on page 6 to record your species lists. Refer to a field book to help identify the organisms you see in the study site. (Please see instructor to borrow if necessary.)

1. List both the common and scientific names of each plant and animal you see.
2. Make a short notation of how common each species is to your study plot.
3. Indicate exactly where you saw the species (in a tree, in the water, etc.).
4. If an organism is unfamiliar to you, MAKE A CAREFUL DESCRIPTION (you may include pictures) of the organisms on a separate piece of paper. NOTE: You will not be able to identify your organism unless you make careful and complete descriptions. Use the guidelines below to help with the description.

For unfamiliar PLANTS record the following information:

- a. where the plant was found on the study site,
- b. whether the plant is a tree, shrub, or herb, and indicate the division to which it belongs,
- c. trace an outline of a leaf (accurate illustration of both the blade and petiole) also sketch a pattern of the leaf venation,
- d. make a careful sketch of the flower (if present) indicating the number of sepals, petals, stamens and pistils, and record the color of each OR take a photograph of the flower. Finally,
- e. carefully describe the general shape of the plant, sketch how the leaves are attached to the branches (stems) and record the color of the leaves and bark (if present)

For unfamiliar ANIMALS record the following information:

- a. where the animal was found on the study site,
- b. the phylum and class to which it belongs
- c. record the size and color of the organism (be sure to indicate the presence and location of any spots of different color),
- d. sketch the organism OR take a picture, finally,
- e. describe how the organism moves and behaves.

CAUTION: There are endangered plant and animal species in this part of Kern County. It is a felony to collect, harass, disturb, or otherwise interfere in any way with these organisms. It is a crime to litter, to collect plants or to collect animals on public lands without a scientific collector's permit.

Step 4. *Construct a journal of activity.* Your journal should be a running account/commentary about your study site. Describe animals moving in and out of the area, wind blowing, weather, insect activity, plant activity, etc. Your journal should cover a total of 2 hours of observation and notation. We expect at least one observation every 5 minutes. Each observation should begin with the time (see example below). Observe and record feeding, nest building, courtship, fighting, hunting, etc. - any behavior observed. Record the species of the organism exhibiting the behavior. Sentences should be clear and concise -- straight reporting of what you see. Avoid anthropomorphism. Be sure your journal reflects activities, not just the presence or placement of species you observed. The journal portion of this assignment **must be typed**.

Sample Journal of Activity

Began observation at 8:00 AM.

8:02 A red tailed hawk is gliding over study plot. Its wings are motionless. It seems to be hunting for breakfast.

8:05 A honeybee is visiting a lupine near the path. The bee visits the lowest flowers first before visiting the higher flowers. When it flies away, it will carry pollen to another flower. The leaves of the lupine are pointing straight toward the sun. This would help maximize the amount of photosynthesis the lupine can perform.

Step 5. *Write one paragraph on each of two animals and one plant.* Your paragraph must consist of a topic sentence followed by subordinate sentences. Each paragraph must be grammatically correct and all words must be spelled correctly. This portion of the assignment must also be **typed**. Provide the following information for each species:

1. name,
2. a list of potential predators,
3. a list of potential prey (for animals only)
4. three reasons why this organism is adapted to its environment, and
5. one reason why this organism is NOT adapted to its environment.

MAP OF THE STUDY AREA

Elevation

Elevation

Elevation

Elevation

SPECIES LISTS

PLANTS

Common & Scientific Names

Abundance

Location in Site

ANIMALS

Common & Scientific Names

Abundance

Location in Site

Travel Directions to the Study Site