

Graminoid, Tree and Shrub Height

Field Guide

Task

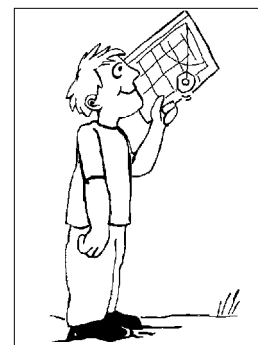
Measure the height of graminoid vegetation, shrubs and/or trees to help determine the MUC class of your Land Cover Sample Site.

What You Need

- 50 m measuring tape
- Flexible measuring tape
- Small bean bag
- [Graminoid, Tree, and Shrub Height Data Sheet](#)
- Clinometer
- Pen or pencil
- Permanent tree markers (optional)
- Species ID keys and/or other local species guides
- Blindfold

In the Field

1. Measuring Graminoid Vegetation Height (Graminoids are grass-like species.)
 - a. Stand in the center of your Land Cover Sample Site and blindfold your partner. Have him or her throw a beanbag somewhere in the site.
 - b. Using the flexible measuring tape, measure the height of the herbaceous vegetation where the beanbag landed. Measure from the ground to the top of the graminoids.
 - c. Record the height on the [Graminoid, Tree, and Shrub Height Data Sheet](#).
 - d. Repeat this process two more times and average the results.
 - e. Use this average to determine your MUC class.
2. Measuring Shrub Height (Shrubs are 0.5 m to 5.0 m tall.)
 - a. Stand in the center of your Land Cover Sample Site and blindfold your partner. Have him or her throw a beanbag somewhere in the site.
 - b. Locate the closest shrub to the beanbag. Measure the height of the shrub from the ground to the tallest branch. Do this with a tape measure if possible. If the shrub is too tall, measure it with your clinometer using the directions for *Measuring Tree Height* in the next section.
 - c. Record the height on the [Graminoid, Tree, and Shrub Height Data Sheet](#).
 - d. Repeat this process two more times and average the results.
 - e. Use this average to determine your MUC class.



3. Measuring Tree Height (Hint: Trees are greater than 5.0 m tall.)
- a. Determine your dominant (most common) and co-dominant (second-most common) tree species by counting the number of times each tree species was recorded on the [Canopy and Ground Cover Data Sheet](#). Record the names of the species on your [Graminoid, Tree and Shrub Height Data Sheet](#).
 - b. Choose:
 - the tallest tree of the dominant species
 - the shortest tree of the dominant species that still reaches the canopy
 - three trees that have heights in between the tallest and shortest of the dominant species
 - c. Permanently mark and number/label the trees if your teacher has instructed you to do so or if you will be returning to this site to take measurements over time.
 - d. Measure the height of the tree using the clinometer. If you are on ground with a slope, or using the simplified clinometer technique, then use the appropriate *Alternative Technique to Measure Tree Height Field Guide* to substitute for the steps below. Otherwise,
 - Move away from the base of the tree until you can see the top of the tree through the drinking straw of the clinometer.
 - For the best results, adjust your distance from the base of the tree so that the clinometer reads as close to 30° as possible and you are at least as far from the tree as it is tall.
 - Be sure to be on level ground so that your feet are at the same elevation as the base of the tree. Remember, if you are not on the same level with the tree, you need to use an *Alternative Technique to Measure Tree Height Field Guide*.
 - Have your partner read and record the number of degrees (°) of the angle.
 - Using the *Table of Tangents*, record the TAN of the angle on the *Data Sheet*.
 - Measure the distance between you and the tree. Have your partner help you using the 50 m tape. Record this in the table on your [Data Sheet](#).
 - Measure the height from the ground to your eye level. (You only need to do this step once!) Record this in the table.
 - Calculate the tree height using the following formula:
$$\text{Height of Tree} = \text{TAN (angle of clinometer)} \times (\text{distance to tree}) + \text{eye height}$$
and record on your [Data Sheet](#).
 - Measure the height of each tree three times and calculate the average of the three heights. If they are within one meter, record the average on your [Data Sheet](#). If not, repeat the measurements until they are within one meter.
 - e. Repeat the step above for the other four trees.
 - f. If your co-dominant species is a tree, repeat steps b-e for the co-dominant tree species. If you do not have five co-dominant species trees on your site, include other tree species to make a total of five. Note that you are using other species in the *Metadata*.