

Canopy Cover and Ground Cover

Field Guide

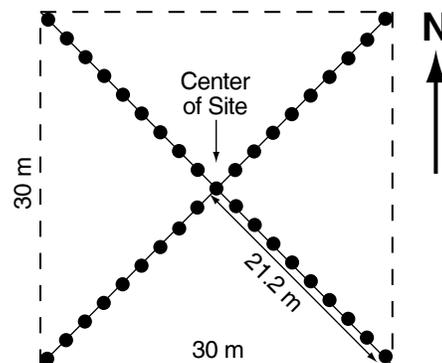
Task

Take ground and canopy cover measurements while pacing half-diagonals to determine the MUC class of your Land Cover Sample Sites.

What You Need

- Tubular densiometer
- Compass
- Tree Canopy and Ground Cover Data Sheet*
- Species ID keys and/or other local species guides
- Shrub Canopy and Ground Cover Data Sheet*
- Pen or pencil
- Clipboard

In the Field

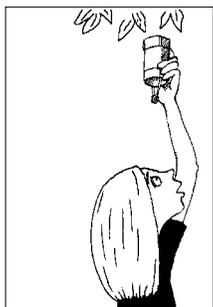


Land Cover Sample Site with the four 21.2 m half-diagonals (in the NE, SE, SW and NW directions) for sampling.

- Locate the center of your homogeneous Land Cover Sample Site. This is your starting point. Take the measurements described in Steps 2 and 3 from the center of the Sample Site by walking the distance of a half-diagonal (21.2 m) in each of the following four directions: NE, SE, SW and NW (using a compass for bearing). Stop after each pace (2 steps) to complete Steps 2 and 3.
- There are two possible data sheets to use for measuring Canopy and Ground Cover, the *Tree Canopy and Ground Cover Data Sheet* or the *Shrub Canopy and Ground Cover Data Sheet*. The following step will help you decide which one to use. However, if you are still confused about which sheet to use, you may want to choose a different site where the decision is clearer.

Steps:

1. Decide which *Canopy and Ground Cover Data Sheet* is appropriate, using the following procedure.
 - a. If the site is clearly dominated (greater than 40%) by trees (greater than 5 m tall), use the *Tree Canopy and Ground Cover Data Sheet*. Go to Step 2.
 - b. If the site is clearly dominated by shrubs (between 50 cm and 5 m) and there is less than 40% tree canopy, use the *Shrub Canopy and Ground Cover Data Sheet*. Go to Step 2.
 - c. If you cannot decide the dominant canopy cover:
 - Walk each half-diagonal (21.2 m) from the center of your site using your densiometer and the *Tree Canopy and Ground Cover Data Sheet*. Follow Step 2, marking a (+) if you see a tree at the crosshairs of your densiometer and a (-) if there is not. Record the other canopy information for any trees you record a (+) for.
 - Calculate the percent tree canopy cover (# of +'s/total number of observations from the *Tree Canopy and Ground Cover Data Sheet*). If the percent tree cover is over 40%, use the *Tree Canopy and Ground Cover Data Sheet* and walk the half-diagonals again following Step 3 to collect the ground cover data.
 - If the trees are less than 40%, walk the half-diagonals again using the *Shrub Canopy and Ground Cover Data Sheet*. Follow Step 2, marking a (+) if you see a shrub at the crosshairs even if there is a tree above it and a (-) if there is not a shrub at the crosshairs. Record the other canopy information for any shrubs you record a (+) for.
 - Calculate the percent shrub canopy cover (# of +'s / total number of observations from the *Shrub Canopy and Ground Cover Data Sheet*). If the shrubs are dominant (40% or more), use the *Shrub Canopy and Ground Cover Data Sheet* to record the ground cover data by walking the half-diagonals again following Step 3.
 - If both trees and shrubs are less than 40%, choose the *Data Sheet* corresponding with the highest percentage of canopy cover and walk the half-diagonals again following Step 3. Report the percentage of tree and shrub canopy as metadata since they help scientists understand the site. **Note:** Since neither the tree nor shrub canopy are dominant, the MUC class of this site should not start with 0 (Closed Forest), 1 (Woodland), or 2 (Shrubland).
2. Look up through your densiometer at the canopy. Make sure the densiometer is vertical and the metal nut/washer is directly below the intersection of the crosshairs at the top of the tube. Look to the highest canopy. If you are using the *Tree Canopy and Ground Cover Data Sheet*, only record data for TREES and ignore shrubs. If you are using the *Shrub Canopy and Ground Cover Data Sheet*, only record data for SHRUBS and ignore trees.



- a. If you see vegetation, twigs or branches at the crosshairs:
 - Record a (+) on the *Canopy and Ground Cover Data Sheet*. Remember, if you are using the *Tree Canopy and Ground Cover Sheet*, only record a (+) if the vegetation you see is from a tree. If it is from a shrub, record a (-) instead and skip the next steps. The opposite will be true if you are using the *Shrub Canopy and Ground Cover Sheet*.
 - Identify the species name. If you do not know the genus and species but know the common name, record the common name. If you do not know the common name, collect a leaf or describe or sketch it for identification later in the classroom.
 - Record the canopy type as Evergreen (E) or Deciduous (D).
 - b. If you do not see vegetation, twigs, or branches at the crosshairs:
 - Record a (-) on the *Canopy and Ground Cover Data Sheet*.
3. **Stand with your feet shoulder-width apart, look down and observe any vegetation that is touching your foot or leg below the knee.** Do not pick up your foot; only use vegetation touching you without moving. Also, do not measure ground cover by looking down through the densiometer!



- a. If the vegetation is green (alive), record a (G) on the *Canopy and Ground Cover Data Sheet*.
 - b. If the vegetation is green, record if it is graminoid (GD), forb (FB), other green vegetation (OG), Shrub (SB) or Dwarf Shrub (DS).
 - c. If the vegetation is brown but still attached, record a (B).
 - d. If there is no vegetation, record a (-) on the *Canopy and Ground Cover Data Sheet*.
4. After you have completed your pacing and measurements, fill out the summary tables on the bottom of the *Canopy and Ground Cover Data Sheet* using the formulas below for reference in calculating percentages. **Note:** If other groups walked other half-diagonals, compare your “% Canopy Cover” and “% Ground Cover” with the other group’s diagonal data. Average the percentages from all the groups and use these averaged values to determine the dominant land cover and for reporting to GLOBE.
5. If you have enough information to determine the MUC class of your site at this point, you are done. If tree, shrub or graminoid height cannot be estimated, follow the *Field Guide for Graminoid, Tree and Shrub Height*.

Determining the Percentage of Tree or Shrub Canopy Cover (Column 1):

Calculate the percent of tree or shrub canopy using the data collected. Use the following equation as a model.

$$\% \text{ Tree or Shrub Canopy Cover} = \frac{\# \text{ of +}'s \text{ (Tree or Shrub Canopy)}}{\# \text{ of Total Observations}} \times 100$$

Determining the Percentage of Evergreen or Deciduous Canopy Cover (Column 3):

Calculate the percent of tree or shrub canopy that is evergreen or deciduous using the data collected. Use the following equation as a model.

$$\% \text{ Evergreen} = \frac{\# \text{ of E}'s \text{ (Evergreen Observations)}}{\# \text{ of E}'s + \# \text{ of D}'s \text{ (Total Canopy Cover Observations)}} \times 100$$

Determining the Percentage of Ground Cover (Column 4):

Calculate the percent ground cover using the data collected. Use the following equation as a model.

$$\% \text{ Ground Cover} = \frac{\# \text{ of G}'s \text{ (Green)} + \# \text{ of B}'s \text{ (Brown)}}{\# \text{ of Total Observations}} \times 100$$

Determining the Composition of Herbaceous Coverage (Column 5):

Calculate the percent of the ground that is graminoid, forb or other green vegetation using the data and the following equation as a model.

$$\% \text{ Graminoid} = \frac{\# \text{ of GD}'s \text{ (Graminoid Observations)}}{\# \text{ of GD}'s + \# \text{ of FB}'s + \# \text{ of OG}'s + \# \text{ of SB}'s + \# \text{ of DS}'s \text{ (Total Herbaceous Ground Observations)}} \times 100$$

Determining Total Shrubs (Column 6):

$$\% \text{ Total Shrubs} = \frac{\# \text{ of +}'s \text{ (Shrubs Present)}}{\# \text{ of Total Observations}} \times 100$$