

# PLANT COMMUNITY ECOLOGY

## LABORATORY 1: OLD FIELD ECOLOGY

### Quadrat Sampling Cover Estimate Method

The purpose of this lab is to introduce you to one of the simplest and most widely used methods of estimating plant abundance: the *cover method*. Plant cover is *defined as the area of ground covered by plant material when projected downwards* (envision the projection of a cylinder and the circular area formed when it meets the ground). As defined, the method works very well for herbaceous communities dominated by forbs, grasses, and perhaps small shrubs.

Our objective is to provide a quantitative description of the vegetation of an old-field typical to southeastern Ohio and to infer something about local successional sequences.

We begin by delimiting the area of study, selecting an appropriate sampling unit, and then randomly sampling the plant community. The area that we will work in is the old-field below the Waterloo Wildlife Experiment Station (WWES) fire tower and is roughly pie-shaped as seen from above. The outer edge is delimited by a gravel road and tapers back to a blunt point where a large tuliptree resides as part of a transitional forest. We have selected a  $1 \times 1$  m square quadrat frame to use as our sampling unit. Each group will establish a linear transect (using a 50 m tape) from a point along the outer road to the tuliptree in the back corner along the forest edge. Then, starting at a random point within the first 10 m (and at every subsequent 10m point along the tape), one member of the group should flip a coin to determine if the group will sample on the left or right of the tape (this procedure introduces randomness into the sampling scheme). **BE CAREFUL NOT TO TRAMPLE VEGETATION IN THE SAMPLE PLOTS!** The easiest way to proceed is to work through the plot, species by species, assessing the percent cover of each. Conveniently, you are using a  $1 \text{ m}^2$  quadrat, thus  $10 \times 10\text{cm}$  is 1% cover. If you check, this is roughly the size of an extended hand with the last two joints curled under. Thus, you can use your hand as a 1% visual gauge. NOTE: you *can* have  $> 100\%$  total cover for a quadrat because cover is estimated layer by layer, not as a quadrat total.

Collect cover data, using the data sheets provided, on five (5) quadrats. **DO NOT RUSH!** Accuracy and precision can not be obtained via hurried carelessness. Use the accompanying list of species, field guides, and your TA/Instructor for plant identification. The list is not comprehensive, but represents the common species usually encountered in this field.

Class data will be collated by the TA and redistributed via the WWW page for this course as soon as possible. Summarize the data in a table. Calculate average cover by species and frequency of occurrence. Combine cover and frequency estimates into a synthetic importance value. Make a graph of species rank abundance and calculate Shannon-Weiner diversity. Comment on the composition and structure of the vegetation as well as successional patterns.