Classroom Cover

(20 minute activity)

Objective

Students will be able to:
1) Estimate percentages of existing classroom items

Materials

- ❑ Chalk board or whiteboard
- ❑ Chalk or Pens

Background

Botanists and ecologists typically estimate vegetation cover when mapping an area. They look at plants at all levels from herbs to trees - and estimate absolute cover. This enables them to ascertain the importance or dominance of the various plants. One reason to do this is to help predict the plant communities in a given ecosystem. The prediction extends to wildlife known to occupy certain vegetative areas. Knowledge such as this is extremely valuable especially when planning land use activities and for making management decisions, including wildlife habitat development, timber management, forest insect and disease control, fire management, recreation, and maximizing the benefits of natural spaces in developed areas.

Absolute cover includes several levels above the ground. Its features can (and usually do) add up to more than 100%. Overhead, the tree *canopy* casts a shadow that can range from open, allowing a great deal of sunlight through, to very dense, with little light filtration to the levels below. Beneath the tallest trees is the understory layer, with a variety of shrubs and smaller tree species. These, too, can be open and sparse or thick with broad leaves.

Herbs such as *forbs* and grasses, as well as *cryptogams* such as ferns, fungi, lichens and mosses are also part of the understory. All of these features are a function of the climate and availability of water. Their characteristics will affect the amount of light and water reaching the ground, and influence the percentage of bare ground and the makeup of the litter covering the soil.

Background continued

In contrast to absolute cover, relative cover considers the relationship of various plant groups and how much area they take up as a percentage of the total. The dominant plant groups can give clues to the types of wildlife that might be found in the vicinity and the function of the plant community. For example, the dense understory plants of a riparian area offer more food sources, travel corridors, and breeding grounds for small animals than do more open, sparsely covered areas. The shrubs and grasses provide dense root systems to hold soil and prevent erosion. Their many flexible stalks and branches are especially important during flood periods. They absorb the energy of the high water, helping it to slow down and spread out. This reduces the erosive force of the water and aids *infiltration*. The stored water is slowly released during the following periods of low flow.

Relative cover can be illustrated by envisioning the shadow beneath each plant group at high noon in a specified plot of land. Imaginary lines drawn straight down from the outermost branches define the perimeter of the plants. Subtract a portion for the amount of light filtering between the branches of the tree or shrub. The area covered by the shadow is estimated and expressed as a percentage of the total area in the sample plot. For example, in a 20-foot square plot on the school grounds, there might be a tree, two large shrubs, a border of flowers and ground cover, and some lawn grass. The estimates for these elements might look like this:

Tree Canopy (perimeter minus light filtering through)	60 sq. ft.	15%
Shrubs (same method as for trees)	40 sq. ft.	10%
Flowers/ground cover (forbs)	80 sq. ft.	20%
Lawn grass	200 sq. ft.	50%
Bare ground/plant litter	20 sq. ft.	5%
Total	**400 sq. ft.**	**100%**

In the example plot, the dominant plant group is grasses. It makes up 50% of the total area. Plants growing under a plant from another group are not considered in estimating the total (such as mosses or small plants under a tree or shrub).

During *Riparian Rx,* students must estimate vegetation relative cover at every stop along the transect and record it on field worksheets. This simple classroom activity is essential for their understanding of the station dynamics.

Procedure

1. Tell students they will be estimating relative cover. Have them look around the classroom while you explain that everything in it covers a portion of the floor, and the cover plus the open spaces add up to 100%. For example, cover could include desks, tables, chairs, trash cans, you and the students, etc. Do not count the ceiling or overhead fixtures.

2. As a class or divided into groups, have them calculate the percentage of floor space filled with computers, with tables, with desks, with people, etc. Record their answers. Assist them with their estimation techniques, making certain numbers do not add up to more than 100%.

Assessment

Ask students to:

- ❑ Draw a schematic of their home, with everything in it.
- ❑ Estimate the percent of items in it. (For example, what percent of their home is empty space? What percent has tables, etc.?)

Extensions

Ask students to:

- ❑ Go outside and mark off an area about the size of an average classroom.
- ❑ Estimate plants and other objects within the study plot (The transect plots will be circular. Try doing the same exercise in a circular plot).
- ❑ Repeat the process by creating a circular plot.
- ❑ Practice this concept in the classroom by drawing various-sized colored circles on a paper plate.
- ❑ Estimate the percent of cover of the circles, grouping them by color (You could also use paper cutouts, and overlap the circles slightly with the color representing trees on the top layer. These would be counted first, followed by the visible portions of the next layer).