

Tree Transects

Field Trip Activity

Summary

Students will sample the forest adjacent to the river, using transects or quadrants.

Background

Ecologists use a variety of techniques to study populations. Occasionally ecologists may sample every individual and get an actual count of the total population in the area. Often this is impossible and ecologists use estimates based on a subsample. Though a variety of techniques exist for studying plants, here we will discuss two: transects and quadrants.

When using transects, individual plants that touch the transect are counted and identified. All plants along the length of the quadrant can be counted, or just those at particular intervals. When using quadrants all species falling within the quadrant are counted and identified. The size of the quadrant can vary depending on the size of the plant, for grasses and shrubs quadrants from 25-100 square meters are often used while quadrants of 400-2500 square meters are often used for trees.

Procedure

For general information on organizing a field trip to the river, check our website at www.chicagoriver.org/education and click on field trips.

As always, students should be divided into small groups. Groups of about four would work well for this activity. Each group will conduct their own transect or quadrant. We would suggest a circle quadrant with a 10-15 meter radius for overstory trees and 3-5 meter radius for understory trees, or a transect 30-50 meters with sampling every 5-10 meters. You can set up the location of sampling sites in advance or have students select their sites.

For students with little experience, you can lay out the experiment for them. Mark with flags the location of the

Grade Level: 6th-12th

Duration:

Objectives:

1. Students will practice setting up a transect as a way to do ecological surveying
2. Students will identify trees.

Materials:

- ◆ Tape measure (one per group of four)
- ◆ Tree data sheet (one per group)
- ◆ Tree id books (one or two per group)

Standards:

11.A.4a, 11.A.5a, 11.A.4b, 11.A.5b, 11.A.3c, 11.A.4c, 6.C.3a, 6.D.3, 7.A.3b, 7.A.4b, 7.B.3



starting point for the students' transects or the center of their quadrants. Though scientists would place these randomly, we would suggest placing them more deliberately so that sampling areas are easy to access and do not go through areas which are difficult to sample (such as steep areas or areas high in poison ivy). Describe and perhaps demonstrate the process to students:

Transect

1. Beginning from the flag you will extend the measuring tape X meters for a transect.
2. Every X meters along the transect identify and count all the trees in the overstory and understory that touch the transect within a one meter circle.
3. Answer the questions on the back of the data sheet

Quadrant

1. Beginning at the flag use the tape measure to mark out a circle with a diameter of X. Identify and count all the trees in the overstory.
2. Beginning at the flag use the tape measure to mark out a circle with a diameter of X. Identify and count all the trees in the understory.
3. Answer the questions on the back of the data sheet.

For more experienced students you can lay out a question for them to answer and have them develop their own methodology. One question that can be looked at using tree sampling is: is there a difference between canopy tree populations and understory tree populations. Another is: if left alone will this forest regenerate its oak trees? Or you can have them develop a hypothesis to test based on research into local and historical savannas and forests.

Both questions and data findings can lead to further investigation into why. The Chicago Region used to have more Oak Savannas than it does today. Trees have been able to colonize the savannas due to suppression of fire and lack of restoration. The closing of the canopy makes it very difficult for oak seedlings (oaks were one of the dominant trees in the savanna) to grow as they need high light. Maple seedlings, on the other hand, survive and grow under oaks and a more shaded understory.

Tree Data Sheet

Trees in the Canopy

Species Name	Number of Individuals (use check marks, then add up at end)	Percent

Trees in the Understory

Species Name	Number of Individuals (use check marks, then add up at end)	Percent

Questions

1. What was the most numerous canopy tree? _____
2. What was the most numerous understory tree? _____
3. If you would return to this forest in 200 years, what do you think the canopy would look like? (Based on your tree data.)

4. If the canopy and understory tree populations are different, why is this?