Field Biology Techniques - Biology 378

Transect Sampling Techniques

Point-Quarter Method

Today's goal: Learn how to accurately determine location using GPS. Learn how to use a point-quarter technique. Learn the principles of transect techniques as an alternative to plot techniques.

Background: Many of the techniques for sampling in the field deal with various plot techniques in which a series of plots (areas) are sampled. Plot techniques are powerful, and have extensive applications in ecology. Still, there are limitations. For one, it is difficult to locate plots randomly, as obstructions in the field often prevent accurate placement of the sampling grid, or at the least may hinder sampling. To overcome this difficulty, many plots must be sampled. Secondly, the intensive nature of the sampling involved means that relatively little overall area can be covered. If you have to sample a lot of plots (to overcome the difficulty of random plot sampling) it will take a lot of time, and you won't cover much ground.

For certain applications, another type of technique can be used. Transect techniques involve sampling along a line. There are many variations, but most involve stopping at regular (or random) intervals and collecting data. For instance, to measure light, temperature, soil pH or moisture, or other conditions, one might extend several transects through a forest, field (or even a body of water), and simply sample every 10 feet or so.

In today's lab we will use a point-quarter technique to estimate the growth of forest in two situations. In a point-quarter technique, the transect line serves as a base for sampling. At every sampling interval, the world is divided into 4 quarters, using the transect line and a line drawn perpendicular to the transect line to divide up the quarters. Light, pH, and soil moisture are taken at the transect point; the tree closest to the transect point in each of the quarters is measured as is the canopy cover in each quadrant.

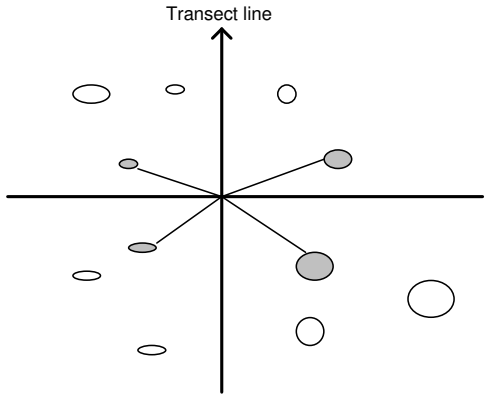

Figure 1 - Diagram of Point-Quarter Technique. Trees to be measured are shown in gray.

For our purposes, we will use a simple technique to determine distance. From a starting point, follow a compass line to form the transect line. Stop after a random number of meters (determined in advance) to take the measurements. First mark the location with a piece of tape so if you have to come back to take a measurement you can locate each point. To form the quarters, one student should face in the direction of the transect line and spread his or her arms out straight to either side. Take and record all measurements. Tree diameter and/or circumference should be measured 4 feet off the ground. Record the tree species if possible. If one of these measurements cannot be made, it can be estimated later. Record all data in pencil (pen ink can run if it gets wet). If a sampling point falls on a tree, skip that point (record a blank) and go on to the next sampling point.

In terms of data analysis, we will look to see if average sizes and canopy cover differ in each of the two situations; or if pH, soil moisture, and if other readings vary in a predictable pattern.

Sampling Rules:

1. If there is no tree within _____ meters of the point in a quadrant, skip the tree measurement for that quadrant.
2. A tree must be at least _____ meters tall to be measured.
3. The random number used between points is read off the random number sheet. If it is smaller than _____ or bigger than _____, skip it and use the next number.
4. Sample for _____ meters or _____ points, whichever comes _____ .

Location: ____

Date: ______________________________ Time: ________________________

Transect: _________ Dir: ________ Initial point: Lat: ______________________ Lon: ______________________

Point	Q	Distance	pH	Moisture	Light	Temp	Canopy Dots	Sky Dots[1]	% Canopy	Species	Diameter	Circum.
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											
	1											
	2											
	3											
	4											

[1] Canopy dots are the number of dots on the densitometer that fall on tree or leaves. Sky dots are the number that fall on open sky. Count whichever is LESS dominant; the other value is 96-the number of dots you counted. Percent canopy cover is the number of dots covered by canopy x 1.04.