

PLANT ECOLOGY
LABORATORY 2: WETLANDS ECOLOGY

Belt Transects & Wetland Delineation Methods

BACKGROUND

In recent years, considerable attention has been given to the determination of boundaries surrounding wetlands. The interest in determining wetland boundaries is primarily regulatory in nature—property owners are generally forbidden by law to fill, dredge, build on, or substantively alter a wetland. Therefore, rules and regulations were developed to help determine these boundaries.

Typically, one employs the "three parameter approach" which utilizes data from vegetation, soils, and hydrology to make a determination. However, for the purposes of this plant ecology laboratory, we will concentrate on the use of only one parameter—vegetation.

The essence of the vegetation parameter is the notion of the "phytometer," a concept developed by Clements whereby plants are used as indicators of certain habitat conditions based on known facts about their tolerance and ecological amplitude. Hydrophytes (plants growing in water or wet/anaerobic soils) are used as indicators of wetland vegetation.

Because hydrophytic vegetation is considered a characteristic of wetlands, the federal government has compiled a national list of plant species which contains information on taxonomy, community affiliation, and their hydrologic phytometer status. Each species is categorized into one of five categories:

<i>Code</i>	<i>Status</i>
OBL	Obligate wetland
FACW	Facultative wetland
FAC	Facultative
FACU	Facultative upland
UPL	Upland

Most wetland scientists recognize OBL and FACW species as being good wetland phytometers, as well as some FAC species depending upon geographic location, environment, ecotype, etc.

Wetland scientists frequently employ the "50% Rule" to ascertain wetland boundaries. This rule states that when > 50% of the community (or sample unit) is composed of hydrophytes then one is in a wetland. This rule can be applied in various ways. For our purposes, we will consider a transect running at a perpendicular angles to a putative wetland boundary. The break point, or wetland delineation, is made by flagging the point where the vegetation shifts to > 50% hydrophytes.

The purpose of today's laboratory is several fold: (1) to provide you with an introduction to freshwater wetland habitat types, (2) to gain experience with a modified use of the quadrat method known as the belt transect, and (3) acquire an introduction to the use and interpretation of phytometer data.

FIELD METHODS

One ~100m transect will be established running along a gradient from upland forest, through wetland swamp forest, and in to open marsh vegetation, culminating at the edge of Fox Lake in Athens County.

The transect runs roughly perpendicular to a putative wetland boundary. We will divide up in to 3 (or 4) groups for field sampling. We will use 1m² square quadrat frames for sampling and % cover will be used as the measure of abundance (as in the previous lab). Make sure to look up to sample woody vegetation as well as shrub and herb species. A *belt transect* is formed by sampling each quadrat, end to end, for the full length of the transect (like a belt). We will use a *modified* belt transect approach and sample *every other* 1m along the transect (i.e., 0-1, 2-3, 4-5m, etc.).

NOTE: We will use a coin flip at the beginning to choose one side of transect to sample and one side to walk on to avoid trampling.

LAB METHODS & REPORTS

- 1) Classify each species into its appropriate wetland guild type (OBL, FACW, etc.). Using cover (%) alone, determine where the wetland break should occur (i.e., apply the 50% rule). The result of this should be a 100% bar chart with the sample distances on the X-axis and percentages on the Y-axis (each bar will have 5 stacked percentages within it). Thus, your chart should have ~50 bars on it.
- 2) Now, split the data set in to two based on the wetland boundary. Analyze each data set separately and create a summary table for each habitat listing the species, cover, frequency, and importance.
- 3) Calculate Simpson's Index of diversity for each habitat and construct a rank abundance plot showing curves for both habitats.
- 4) Evaluate the indicator (phytometer) species method/concept.
- 5) Integrate your data in to a lab report discussing the ecology of wetlands in the region.

Summary	100% bar chart
of products:	Rank abundance plot
	Table of upland vegetation
	Table of wetland vegetation
	2 Simpson's Values