Objective:

To familiarize students with commonly used techniques of vegetation inventory, particularly those used for estimating density and frequency, and to illustrate differences/limitations of sampling vis-à-vis complete counts.

Key concepts:

- Fixed-area plots
- Species-area relationships
- Sampling vs. complete counts

Assigned Readings:


Equipment:

- Calculator
- Random number table
- Watch
- Compass
- Logger’s tape
- Surveyor’s stakes
- Colored flagging/twine
- Meter stick

Lab Problem, Objectives, and Data Needs:

A private landowner is interested in obtaining a Conservation Easement for land he owns in Cache Valley. The land has high development potential and the owner has been approached by two different developers in the past six months who would like to build custom homes on this land. The owner has a special affinity to this land and feels it should be protected because of its unique vegetation by having the Utah Division of Wildlife Resources (UDWR) purchase the development rights through the Conservation Easement Program. This program is designed to retire the development possibility for land with important habitat value. If deemed valuable by the UDWR, the owner can be paid money equal to the extra development value of the land. Once the development rights are purchased by the UDWR program, the land can no longer be developed even if it is sold to someone else.

You are employed by the UDWR as a habitat specialist. Your supervisor has asked you to determine whether this property has unique value because of its vegetation and to give her a recommendation as to whether the UDWR should enter into a Conservation Easement agreement with the landowner.
Problem Statement: ____________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________
________________________________________________________________

Objectives:
1) ________________________________________________________________
2) ________________________________________________________________
3) ________________________________________________________________
4) ________________________________________________________________

Data Needs:
1) ________________________________________________________________
2) ________________________________________________________________
3) ________________________________________________________________
4) ________________________________________________________________

Methods:
1) ________________________________________________________________
2) ________________________________________________________________
3) ________________________________________________________________
4) ________________________________________________________________
Lab Outline:

A. Plot-based Vegetation Inventory

- Methods of using sample plots for vegetation species inventory
- Influence of plot size
  - species-area relationships
  - effect on species richness
  - effect on density estimation
- Influence of plot shape
  - boundary decisions
  - effect on density estimation
- Influence of plot number
  - ability to detect differences and estimate variation
- Effort/time expended

*Students will learn how to select appropriate size, shape, and number of sampling units to establish efficient and cost-effective sampling protocols.*

B. Sampling vs. Complete Counts (Census)

Lab Report: *(Due Wednesday, September 17, 2003 at the beginning of lab)*

Your lab report should include the following:

0. **Problem statement**

1. **Objectives**

2. **Date needs**

3. **Methods** – describe the methods you used to collect data to meet objectives

4. **Results** – present findings of your field data collection and answer the following questions.
   a) How many species did you find and how many of them are native?
   b) What is the influence of plot size on the number of species?
   c) What plot size did you select as optimal and why?
   d) How did density estimates based on counts on sample plots compare to complete counts?
5. **Assessment** – evaluate following questions.
   a) Are the data collected sufficient to meet the objectives?
   b) What might you change in the sampling to better meet the objectives?
   c) What would you recommend to your supervisor with respect to the original question of establishing a conservation easement?

### Species List for Ron Ryel’s Pasture:

**Forbs**
- Fuller’s teasel (*Dipsacus fullonum* L.)
- Mallow
- Prickly lettuce (*Lactuca serriola* L.)
- Morning glory (*Ipomoea* sp.)
- Goat’s rue (*Galega officinalis* L.)
- Rumex (*Rumex* sp.)
- Thistle 1
- Thistle 2
- Milkvetch (*Asclepias* sp.)
- Burdock

**Grasses**
- Kentucky bluegrass (*Poa pratensis* L.)
- Smooth brome (*Bromus inermis* Leyss.)
- Orchardgrass (*Dactylis glomerata* L.)
- Foxtail (*Alopecurus* sp.)
- Meadow ryegrass (*Lolium pretense* (Huds.) S.J.Darbyshire)
- Western wheatgrass (*Agropyron smithii* A. Löve)
- Slender wheatgrass (*Elymus trachycaulus* (Link) Gould ex Shinners ssp. *trachycaulus*)
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