Plant Biodiversity

Background information

- Biodiversity is a measure of the composition of a community. It includes both species richness (number of species) and species abundance (number of plants of each species)
- High levels of biodiversity may promote ecosystem stability and affect ecosystem services such as water filtration or nutrient cycling.
- In this protocol, we identify plant species using the BEST plot plant guide and count the number of individuals of each species in a 0.25 m x 0.25 m area. Rather than collecting the plants and bringing them back to the classroom, students identify and count species right in the plots.

Timeline/Frequency

Protocol activities are performed once a year between September 15th and October 15th.

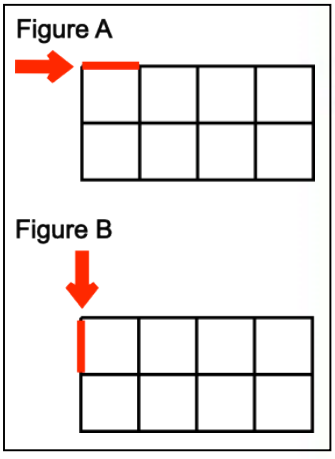
If necessary, data collection can occur up to October 30th, but plants will begin to brown and shrivel by this date making identification more difficult.

Materials

- Biodiversity Data Sheet
- Randomization Procedure Protocol
- 3-meter sticks or ropes (2 per group)
- BEST plot plant guide (in binder)
- Weed guide: fieldcrop.msu.edu/sites/fieldcrop/files/Ncr607.pdf
- Dichotomous key (in binder)
- Camera to photograph unidentifiable plants

Instructions

1. Roll a die to determine where to place the meter stick or rope along the side of the plot.
   - If you roll an odd number, place the meter stick or rope parallel to the long side of the block (see Figure A).
   - If you roll an even number, place the meter stick or rope parallel to the short side of the block (see Figure B).
2. Roll a die until you get a number 1 through 5. (Roll the die again if you get a 6.)
3. Look along your 3-meter stick or rope and find the number you rolled.
4. At the number you rolled, lay your second 3-meter stick or rope into the plot. This stick or rope is your sampling transect.

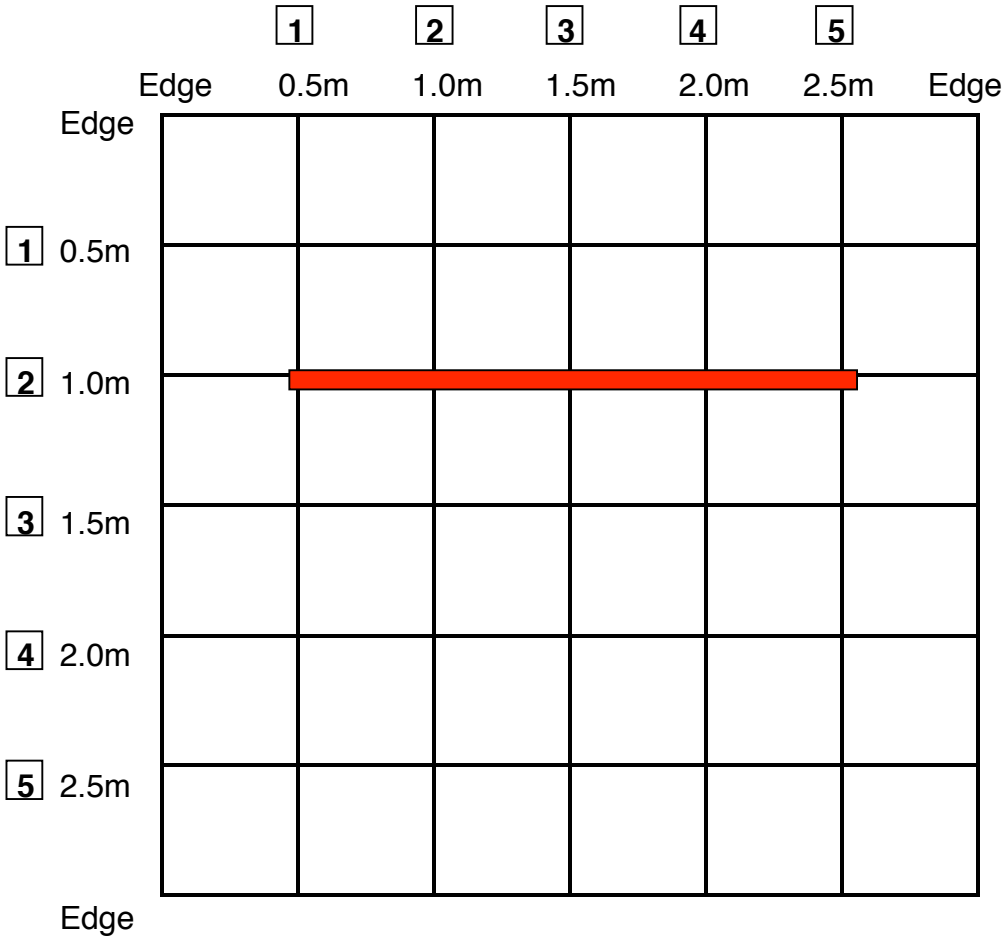


5. Starting at 0.5m and ending at 2.5m, identify each plant that touches your 3-meter stick or rope.
   - Work your stick or rope into the plants. If you have tall and short plants, count any plant that touches the rope, or lies directly below the rope.
   - Send one scout into identify each plant to reduce trampling of the plants.
   - Use the BEST plot plant guide, Weed guide and Dichotomous key to identify each plant by species.
   - If using a numbered 3-meter rope, you start at '1' and end at '5'. This corresponds to 0.5m and 2.5m.
6. Record which species and how many plants of each species you find along your transect on the Plant Biodiversity Data Sheet (attached).
   - Photograph and describe any plant you cannot identify. Identify this plant later. List as Unknown Plant 1, Unknown Plant 2, etc.
   - Remove the 3-meter stick or rope and carefully exit the plot.

   Note: Starting at 0.5m and ending at 2.5m removes "edge effects" (i.e., things that may be different at the plot edges compared to the rest of the plot).

Example:

1) You rolled a '4' on the die, which is an even number, so you placed your meter stick parallel to the short side of the block.
2) Then you rolled a '2' on the die. You located the number '2' on your first meter stick, and this is where you placed your second meter stick into the plot.
3) Your transect placement is shown by the thick bar.
4) You would measure all plants that touch the 3-meter stick within the red area (1 through 5, or 0.5m through 2.5m depending on whether you use a labeled rope or 3-meter stick).



Plant Biodiversity Data Sheet

Switchgrass = S	Fertilized = F	Harvested = H
Prairie = P	Unfertilized = UnF	Unharvested = UnH

Names:_____

School District:_____ Instructor/Fellow:_____

Date:_____ Time:_____ Weather:_____

School / Location Name: _____

Block Code: _____ Plot Treatment Description (Ex: S F UnH): _____

All of the plants we planted in the plots are listed in the table below.
Use the empty rows near the bottom of the table to write in any additional plants you may find.

Plant Common Name	# Individuals
Switchgrass	
Canada Wildrye	
Big Bluestem	
Little Bluestem	
Indiangrass	
Prairie Junegrass	
Showy Ticktrefoil	
Roundhead lespedeza	
White False Indigo	
Blackeyed Susan	
Canadian Anemone	
Butterfly Milkweed	
Cup plant	
Wild Bergamot	
Pinnate Prairie Coneflower	
Rigid Goldenrod	
Showy Goldenrod	
New England Aster	

Plant Common Name	# Individuals
