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Vegetation Monitoring Protocol for measuring and collecting ecological data

Forked from Vegetation Monitoring Protocol for measuring and collecting ecological data

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1 Works for me dx.doi.org/10.17504/protocols.io.bkfuktnw

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ABSTRACT

This protocol outlines the basic methods for measuring understory percent cover, soil moisture, tree canopy cover, and plant species richness, as well as for collecting plant specimens to be vouchered in the herbarium. These measurements estimate the abundance and presence of plant species in an area, and link them to environmental conditions (soil water and light availability) that may affect their distributions. Together, these data can reveal patterns in plant community or ecosystem processes.

The understory percent cover measurements will be made using the line-point intercept method. In this method, a 25m transect is placed along the ground with a 25m by 1m belt transect to either side of it. Percent cover is measured along the transect, along with soil moisture and tree canopy cover. Plant richness is measured in the belt transect and the plant vouchering is done outside of the transect and belt transect area.

EXTERNAL LINK

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ATTACHMENTS

Vegetation Monitoring Protocol.pdf

DOI

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PROTOCOL CITATION

Rebecca Hufft, Christina Alba, Amy Sahud 2020. Vegetation Monitoring Protocol for measuring and collecting ecological data. **protocols.io** https://dx.doi.org/10.17504/protocols.io.bkfuktnw

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MATERIALS TEXT

Ecological Sampling Materials
- 25m measuring tape
- Meter stick
- Pins
- Flags (small)
- Pin flags (tall)
- Clipboard
- Pen/pencils
- Complete plant lists
- Ackerfield Guide
- Weeds and Riparian Species Spiral Field Guides
- Grasses and Carex books
- Soil moisture meter
- Spherical Densiometer
- Camera and Photography metadata notebook
- Compass
- Rubber gloves

Plant Vouchering Materials
- Tool to unearth plants (small shovel, trowel, hori hori)
- Sheets of newspaper
- GPS
- Permanent marker
- Notebook (Floristics Field Book)
- Field Press
- Wooden plant press
- Cardboard sheets
- Herbarium blotters or several sheets of newspaper or more cardboard
- Silica, envelopes, and jewelry tags for tissue samples
- Paper bags for fungal collections
- Hand lens and plant keys

DISCLAIMER:

Describing Surevy Location

1 Before collecting ecological data, we need to record information describing the survey location in a standardized way.
Describe the location with the following physical location descriptors:
Country.
1st political division (state).
2nd political division (county).
Nearest population center, town, or village.

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Directions and distance to the collection site from that town.
Any physical landmarks or landscape features that would help locate the site.
GPS coordinates, datum, and if possible, uncertainty.

Measuring Percent Cover

2 Understory percent cover is the amount of understory canopy composed of different plant species as well as how much ground surface is covered by vegetation and non-living things such as rocks or dead plants.
Standard Methods
1. Pull out the 12m tape in between two rebar posts.
a. The line should be taut.
b. The line should be as close to the ground as possible.
2. Take origin photo of site.
a. Stand behind the post, face the endpoint, and take the picture with the post in the photo.
3. Begin at the "0" end of the line, move at 0.25m
intervals.
4. At origin (0), midpoint (6), and end (12), measure
distance from transect to bank and bank height.
5. 0.25 will be the starting point. Always stand on the same side (away from creek) of the line.
6. Drop a pin flag to the ground from a standard height of 1m next to the creek side of the tape.
a. The pin should be vertical.
b. The pin should be dropped from the same height every time.
c. Do not guide the pin to the ground, let it fall freely.
7. Once the pin flag is on the ground, record every species it intercepts.
a. The first species it hits (the highest one/farthest from the ground) is the "Top
canopy". Record the 6 letter species code of the specimen.
b. If no leaf, stem, or plant base is intercepted, record "NONE" in the "Top canopy"
column.
c. Record all additional species intercepted by the pin in the "Lower Canopy
Layers" column. Record them in order from closest to the top canopy to farthest
(highest to lowest).
d. If you hit downed woody debris that still has other plants below it (i.e. not on
the soil surface), record DWD in the lower canopy section as a hit.
e. Record each species only once, even if it is intercepted multiple times.
f. If species can't be identified at current stage, flag the plant and record location
on "Unidentified Species" datasheet and "Unidentified Species" section of the
vegetation datasheet.
g. Canopy can be alive or dead, but only record each species once.
8. Record the surface the pin flag rests on
a. Litter = L, Herbaceous litter is detached dead stems and leaves that are part of a
layer that comes in contact with the ground. Bare soil = BS, soil that is visibly
unprotected by litter, rock, standing dead vegetation, or water.
b. Rock = R, The pin flag rests on a rock (>5mm or 1/4 inch diameter).
c. Water = W, Standing water, where the pin is sitting in the water. This could be
temporary (i.e., a puddle) or permanent (i.e., the transect crosses a stream).
d. Downed woody debris = DWD, such as logs or branches.
und surface is a paved or gravel road or trail

Measuring Soil Moisture

3 Percent volumetric soil moisture is one measure of the water content in soil. Soil moisture is a critical resource for plants. It shapes their distributions on the landscape along with light and nutrient availability. As such, we include it as a critical ecological correlate to be measured along our vegetation cover transects.
Standard Methods (Once Per Season)
1. Beginning at the "0" end of the transect, measure the soil moisture on the right side of the tape at 1m intervals, starting at 1m.
2. At each point, insert the soil moisture meter at the right side of the transect 8 inches (20 cm) deep into the soil (entire length of metal piece).
3. Record the percent volumetric soil moisture that appears on the screen.
a. If soil is very wet, meter may take several minutes to stabilize.

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b. If point is under water, record “W” for moisture level.
c. If soil is too rocky to insert the full length of the probe, record “Too Rocky” on the data sheet.
d. If soil is past saturation point, - - - - will appear on screen. Record “- - - -“ on the data sheet.
Specific Instructions for Extech MO750 (8”/20 cm probe)
1. Remove plastic probe tip cover
2. Press “power” button to turn on the meter
3. Insert the probe into the soil until the entire metal probe is in the soil and the plastic part is just above the soil
4. Read the % moisture on the display
5. Once sampling is completed at a location, wipe down the probe and cover with plastic cover until next use.

Measuring Tree Canopy Cover

4 Percent tree canopy cover is the percentage of tree cover located above the understory vegetation being measured along the line-point intercept transect. Calculating percent tree canopy cover is a way to indirectly measure the amount of light available to understory vegetation. Here, we will use a spherical densiometer to obtain a number that represents the proportion of area not covered by tree canopy to that covered by tree canopy. That number will be used later to calculate percent tree canopy cover.
Standard Methods
1. Beginning at the “0” end of the transect, and starting at the 0.5m mark, measure the tree canopy cover every 0.5m. Stand on the side of the tape furthest from the creek.
2. At each point, open the spherical densitometer.
3. Hold the densiometer out so that the bubble in the corner is in the center of its circle.
a. This means the densiometer is level with the ground.
4. Hold the densiometer about 12-18 inches away from you and low enough so you can see all 24 squares.
5. Imagine 4 dots at each corner of each of the 24 squares. Count the number of dots that are “covered”.
a. In a dense area, there will be fewer dots that are uncovered, so it is easiest to count the open dots and then subtract this number from 96.
6. Record the number of open dots.
7. Additionally, record the 6-letter species code of every tree that appears in the densiometer window.
a. If species is unknown, write UNK, and add location information to the Unidentified Species Datasheet.
Note: If sun is directly above, it may be difficult to see the squares on the densitometer. You may need to do this earlier/ later in the day, or come back to these measurements after collecting the other data.

Measuring Plant Species Richness

5 Plant species richness is the presence of plant species within the belt transect in addition to identified species on the transect.
Standard Methods
1. After measuring for percent cover, use the meter stick as a guide to search the belt transect area for any species that were not recorded while measuring percent cover.
2. Record the 6-letter species code for additional species identified that are rooted within the 25m x 2m belt.

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