DATA Nugget

A burning question

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Exploring Measures of Biodiversity:

Forests are made up of much more than just trees. Forests have layers mostly divided by height. Different species of plants are often found in different layers, although trees appear in each layer as they grow. Three simple layers of forest are the forest floor, the understory, and the canopy.

The **forest floor** contains herbaceous plants (plants without a woody stem) such as ferns and wildflowers. This layer is an important food source for animals and shows how much water and sunlight an area receives.

The **understory** is made up of plants with woody stems, such as shrubs (woody plants with several main stems coming out of the ground) and young trees, called saplings. This layer is an important source of food and habitat for many animals, especially birds.

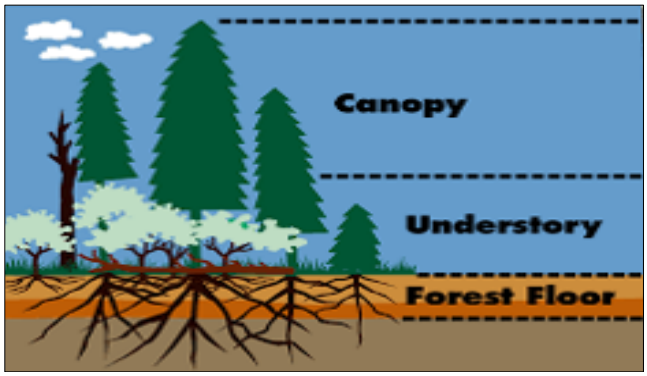

Diagram of Layers of the Temperate Forest

The **canopy** is the tallest layer in the forest. This layer contains mature trees that block some or all sunlight to the forest floor with their leaves. Both the understory and canopy trees provide habitat to animals and trees that can be harvested for wood.

Sampling for forest biodiversity involves identifying the number of plant species in each layer, known as **species richness**. A common method is to use “nested plot sampling” to record the number of plant species in three zones: 1) the forest floor, 2) the understory, and 3) the canopy.

Nested plot sampling method:

For each of the zones, use the guidelines to perform the following calculations. Remember the area of a circle is: $A = \pi r^2$

Zone 1: Herb species were counted in the blue square. If the goal was to sample 1 m^2, how long is each side of the square?

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Zone 2: Shrubs and saplings (young trees) were counted in the smaller circle. If the goal was to sample 5 m^2, how long would the radius of the circle need to be?

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Zone 3: Trees were counted in the larger circle by moving a string in a circle and recording every tree in that area. How long would the string need to be (the radius) if the researchers wanted to sample 100 m^2?

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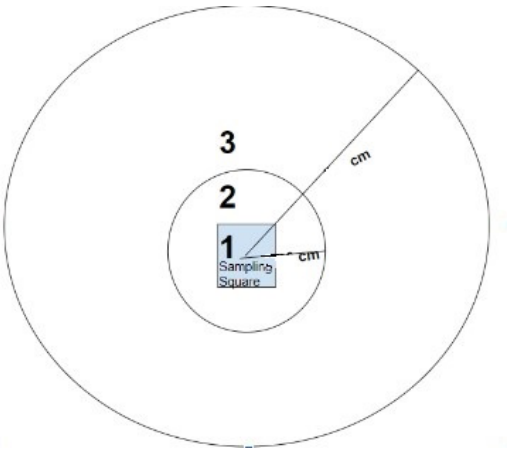

Diagram of Nested Plot Sampling Method for Measuring Species Richness in Forest Layers