

# Soil Studies

## Collecting Samples

Measure 1 square foot (0.9 square meters) of ground within the forested plot. (Corners can be marked with sticks.) Try to choose a site that closely represents the overall forested plot. For example, if your forest plot is mostly wet and covered with ferns, don't choose a spot that is dry and has no ground cover. Within the plot remove and examine the leaf litter layer (identifiable dead matter on the surface of the floor) and the humus layer (decomposed, unidentifiable organic matter below the litter). Then collect soil samples at depths of about 3 inches (7.5 cm), 6 inches (15 cm), and 1 foot (30 cm) (use paper cups or small plastic bags to store samples).

Record results for the following information on the "Soil Elements Recording Chart."

### SOIL MOISTURE

Determine moisture level at each of the three depths. By feeling the soil, you can tell whether the soil is xeric (dry, low soil fertility), mesic (good moisture and soil fertility), or hydric (saturated soils, high water table). The depth of organic matter is an important factor influencing soil moisture. Measure how far the organic matter extends into the soil.

### SOIL TYPE

Characterize each soil depth as loam, sand, or clay. Use the "Soil Analysis Chart" as a reference. Examine the soil for other characteristics such as color, smell, and the presence of glacial till and erratics.

## Soil Analysis Chart

Soil Type	Soil Squeezed Dry	Soil Squeezed Moist
Sand	falls apart when pressure is released	forms a cast (molds when formed) but crumbles when touched
Sandy Loam	forms a cast that will readily fall apart	forms a cast that will bear careful handling without breaking
Loam	forms a cast that will bear careful handling	forms a cast that can be handled quite freely without breaking
Silt Loam	forms a cast that can be handled freely without breaking	forms a good cast that will not "ribbon" but will give a broken appearance
Clay Loam	breaks into hard clods or lumps	will form thin "ribbon" that will break readily, barely sustaining its own weight

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# Soil Studies

## **MICROORGANISMS**

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Detect microorganisms in the soil by mixing a teaspoon of soil in 500 ml of water, then putting 0.5 ml (about 12 drops) of this diluted mixture on agar in a petri dish. Place the petri dishes in a dark place to incubate at room temperature. After one week, record the number and type of colonies that form on the agar. Compare microorganisms in samples taken at 3 inches (7.5 cm), 6 inches (15 cm), and 1 foot (30 cm).

## **pH**

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- 1 Measure 1 tablespoon of soil from each depth and place into individual petri dishes, or any similar glass or plastic containers. Be sure to label each dish appropriately. Wet each soil sample with 5 drops of distilled water (from an eyedropper). Allow to sit for 3 to 5 minutes.
- 2 Place one piece of pH paper on each soil sample. (Use pH paper with a range from at least 5-10.)
- 3 Determine the approximate pH or acid/base level of your soil.

### **Soil Elements Recording Chart**

<b>Soil Elements</b>	<b>Sample 1 3 inches (7.5 cm)</b>	<b>Sample 2 6 inches (15 cm)</b>	<b>Sample 3 1 foot (30 cm)</b>
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**Soil Type:**

(loam, sand,  
or clay)

**Moisture Level:**

(xeric, mesic,  
or hydric)

**Number of types of  
microorganisms:**

**pH:**

**Overall Characteristics:**

color, smell,  
glacial till/erratics,  
abundance of leaf litter,  
humus, evidence of  
human activity, plant  
material, etc.

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# Soil Studies

Draw a soil profile showing the different types of soil at each depth. Include the overall characteristics of the soil.

3 inches (7.5 cm)

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6 inches (15 cm)

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1 foot (30 cm)

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