Edition 3

ForestSHARE Newsletter

Forest Soil Health Assessment, Research, and Extension

The ForestSHARE program is well underway. The goal of this project is to help woodlot owners better understand their forest soils by developing baseline ranges for different soil properties and providing management interpretations for various forest types across the province.

Soil sample collection is currently underway, although progress has been slower than expected due to the forest fire ban and some hesitancy from landowners. We want to emphasize that **this project is not related to prospecting, mining, or resource extraction of any kind**. All information collected is confidential, and individual landowner information is not shared publicly.

In the previous magazine editions, we explained the goals of the project and how the sampling sites were selected. In this edition, we want to highlight how the samples are collected and what they are being used for.

Sample Collection

At each site, we collect about four cups of soil using a soil auger. Typically, 3–4 augers are taken from different spots to ensure the sample is representative of the site. Each auger is compared to the others to make sure that they are similar in texture and colour. We collect the soils into bags and freeze the samples as soon as possible.

At each site, we collect soil from two layers. The first is the forest floor (about 0–15 cm deep), which is mostly organic material. The second is the mineral soil (about 10–25 cm deep), made up of sand, silt, and clay. In some locations, the forest floor layer is absent, so we sample only from two different mineral layers.

Example of three auger samples from two different sampling sites.

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Sample Analysis

Once the samples are collected, they are delivered to two labs:

- Dalhousie Agricultural Campus (analyzing physical and chemical properties)
- Dalhousie Halifax Campus (analyzing biological properties)

Soil health can differ depending on the forest type, soil type, and management goals. Therefore, it is important to measure a suite of soil properties. Here are some (not all) of the soil properties we are analyzing:

- **Soil Texture:** the proportion of sand, silt, and clay in the soil. This measurement is only applicable to mineral soil (the lower soil sample). Soil texture influences drainage, nutrient retention, and how prone soil is to compaction or erosion.
- **Aggregate Stability:** soils naturally form clods (aggregates), which improve soil structure and water movement. Aggregate stability measures how well these clods hold together under stress from external forces such as rainfall or machinery.
- **Organic Matter:** often defined in soil science as "anything living, dead, or very dead in the soil." Forest soils typically have a thick organic horizon (the forest floor) rich in carbon, while the mineral soil (sand, silt, clay) contains less. Organic matter is essential for nutrient retention and serves as habitat for countless soil organisms.
- **Soil pH:** a measure of how acidic or alkaline the soil is. Soil pH influences which trees and plants thrive, as well as which nutrients are available for plant uptake.
- **Nutrients:** we will be measuring key soil nutrients such as phosphorus, potassium, calcium, magnesium, and others. These nutrients play essential roles in tree growth and health. For example, phosphorus supports root development, potassium improves stress tolerance, and calcium helps build strong cell walls. Because each tree species has different nutrient requirements, understanding which nutrients are present (and in what amounts) provides important insight into soil fertility.

Questions We're Asking

Some of the questions we are hoping to answer through this data include:

- How do these soil properties differ across forest and soil types?
- Which properties are most useful to describe soil health in different forest types?
- How can these results be translated into practical guidance for woodlot owners?
- What management insights can they provide to support healthy, resilient forests?

As the ForestSHARE project moves forward, each sample helps us better understand Nova Scotia's

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forest soils. This knowledge will be turned into practical guidance that woodlot owners can use to make informed decisions about managing their land. Whether it's choosing tree species that are well-suited to the soil, improving growth and resilience, or protecting long-term forest health, the results of this project aim to support landowners directly.

Collaboration

This project is a partnership between Murray A. Reeves Forestry, the Family Forest Network, Dalhousie University, the Department of Natural Resources, Nova Scotia Community College, and Genome Atlantic.

Want to Learn More?

For more information, please reach out to:

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Next Issue Highlights

- Sampling in Disturbed Sites

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