

## Key Players

The **forest tent caterpillar** (*Malacosoma disstria*; FTC) is a defoliator native to North America. A generalist, the larva can feed off many deciduous tree species, but its preferred hosts are the sugar maple in temperate forests and trembling aspen in the boreal mixedwoods. During its epidemic phases, populations of FTC can completely defoliate the canopy of mature trees and expose the understory to intense sunlight. They can also potentially add nutrients to the soil via their feces and their corpses.



**Soil** serves as a substrate for plant establishment and as a nutrient (N, P, K, Ca, Mg, etc.) storage for their nutrition and growth. Because of increased light and nutrient availability, tree saplings could potentially have better nutrition, photosynthetic activity, and growth during FTC outbreaks. Understanding soil physiochemistry and how it changes with the nutrients added from FTC is key to fully comprehend the impact FTC outbreaks have on tree growth and forest dynamics.



### *Populus tremuloides*

- Shade-intolerant
- Pioneer species
- Dominates early successional stages
- Vegetative clonal propagation



### *Acer saccharum*

- Shade tolerant
- Long-lived slow growing species
- Dominates late successional stages.
- Reproduces via seeds when mature.

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Sugar maple leaf: <https://macphallwoods.org/nature-guides/trees/sugar-maple/>

Trembling aspen leaf: [http://www.nwplants.com/business/catalog/pop\\_tre.html](http://www.nwplants.com/business/catalog/pop_tre.html)

## RESEARCH QUESTION

How do FTC outbreaks (i.e. through corpses and feces deposition on the forest floor, as well as canopy defoliation) affect soil physio-chemistry, and the growth and abundance of *Populus tremuloides* and *Acer saccharum* saplings in boreal mixedwoods and temperate forests?

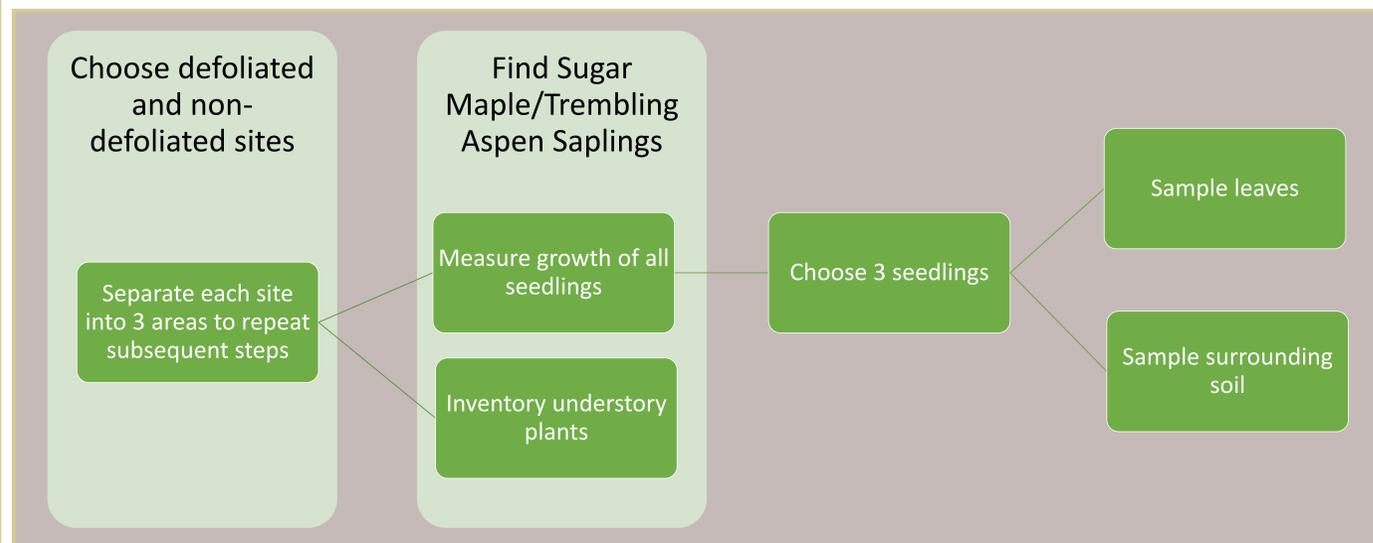
## GENERAL OBJECTIVE

Quantify how Forest Tent Caterpillar outbreaks influence soil nutrient availability and regeneration of both *Populus tremuloides* and *Acer saccharum* in boreal mixedwoods and temperate forests respectively.

## WHY STUDY FTC EFFECT ON SUGAR MAPLE AND TREMBLING ASPEN IN THE TEMPERATE AND BOREAL MIXEDWOODS FORESTS?

Trembling aspen and sugar maple are valuable species both at ecological and economical levels. Trembling aspen can compose pure stands, quickly regenerate after wildfires, and is extensively used by the forest industry. Sugar maple is an indicator of the forest's age, has a valuable essence quality, and is the sole resource for maple syrup production. Understanding how FTC outbreaks influence the regeneration of these two species in forest stands will help better adapt ecosystem management strategies in boreal mixedwoods and temperate forests.

## METHODOLOGY



Leaf and soil samples will be analysed to check the nutrient concentration levels and compare them between FTC infested forests and undisturbed ones. The growth of saplings will help find whether there is a tendency for increased height increment in the saplings of exposed understory compared to shaded understory saplings.

## ANTICIPATED RESULTS

### *Acer saccharum*

Individual growth → Advantaged due to added nutrients.

Population abundance → Disadvantaged due to decrease in energy production and interspecies competition for sunlight.

### *Populus tremuloides*

Individual growth → Advantaged due to added nutrients and increased sunlight availability

Population abundance → Advantaged due to fast regeneration after perturbation and quick response to sunlight exposure.

