

What Is a Mother Tree?

Trees don't move, and they make no noise. And yet they communicate and cooperate. How do they do it? The answer lies underground.

Among the roots grow fungi in the form of a **mycelium**, a network of fine white threads called **hyphae**. The hyphae spread through the soil, collecting minerals and water and bringing them back to the tree roots. Through the tree roots, the mycelium exchanges the minerals and water for sugars made by the tree. Fungi cannot make food with the sun's energy because they have no green leaves, but trees can. So the tree and the fungi trade nutrients: the tree gives food to the fungi, and the fungi give water and minerals to the tree.

This **mycorrhizal network** (*myco* means fungus, and *rhizal* comes from root) serves as a transportation and communication system in the forest. Large trees with big root systems are the hubs, using vast mycorrhizal networks to send resources to the trees around them. That's why Dr. Simard calls them "mother trees."

Forest ecologist

Dr. Suzanne Simard grew up in B.C. Her research on "mother trees" has made her an international star. There are even plans to make a movie about her! To learn more, go to the UBC Forestry website: "Prof Suzanne Simard talks about mother trees."

Let's draw a mother tree!

On the facing page is an outline of a mother tree – a tall Douglas fir (*Pseudotsuga menziesii*). You can draw right on the outline. Or, if you want to share your copy of *NatureWILD*, trace the outline onto another sheet of paper.

- A regular pencil
 - A red pencil crayon
- (You might also want some green and brown pencil crayons)

Step 1

See the line for the forest floor? Make it bumpier. The forest floor has mounds and dips caused by uprooted trees and animal burrows.

This tree is an old Douglas fir, so give it rough bark. Go over the outline of the trunk, making it uneven to show deep grooves and ridges. Add a little notch at the bottom to make a good home for a squirrel or mouse.

Step 2

On the lower left of your paper, draw a circle. This will be your "magnifying glass." Here you will be adding some "close-up" images of underground life.



Step 3

The lower part of the trunk is bare, but high up are live branches with needles. See the circles and ovals representing the branches? Add wavy edges (and maybe some colour) to these shapes to make them look more like live branches. Lower down, add a few spiky dead branches, pointing up towards the living branches.

Step 4

Now give roots to your tree. Some big roots are partly on the surface, but most of the root system is underground. The roots have to branch out to reach as much soil as possible.

Step 5

Beside the big Douglas fir, add a seedling with a few needles. The big fir will help this little one survive. Add a fallen tree or nurse log to the forest floor. As the nurse log decays, it supplies nutrients to the living trees around it.

Step 6

The Douglas fir, with its big root system, is the centre of the **mycorrhizal network**. In the "magnifying glass," draw a root tip. With your red pencil, add some lines around the roots to show the fungal threads or **hyphae**. (Real hyphae are white, but we are using red so they show up in our drawing.)

Step 7

It's not always easy to see a mycelium in the forest. You have to look carefully at or under a rotting log. But another part of the fungi is easy to see: mushrooms. Mushrooms are the way the fungi reproduce. So use your red pencil to add a few mushrooms to the forest floor.

Step 8

Mother trees share resources with all the trees around them, even with trees of different species. So you could add a birch tree. Make a slender trunk with two or three branches reaching up. For leaves, add pale green clusters on the branches.

Our thanks to Dr. Julian Csotonyi for allowing us to adapt his online workshop, "Learn to Draw a Mother Tree with Suzanne Simard," sponsored by Sierra ClubBC. To see Dr. Csotonyi in action, and to find other great drawing workshops, go to the Sierra ClubBC website!

