

Climbing the Redwoods

Before 1997 little was known about the canopies of the giant old growth redwoods. They were thought of as desert-like. Nobody had climbed into the canopies of these ancient trees. That's not surprising – the bottom of the canopy can be twenty stories above the ground. Then Dr. Steve Sillett of Humboldt State University in Northern California began climbing some of the oldest trees and studying their canopies with his research team.

When they got into the canopy, they saw that the branches had other redwoods growing on them. And on the branches of these redwoods, other redwoods were growing. The same pattern was repeated many times, decreasing in size each time. They counted as many as 220 trunks on one of the old growth trees named Ilúvatar.

This repeating but diminishing in size pattern is called a 'fractal' or 'reiteration'. In math a fractal is a shape that echoes its own shape at smaller and smaller scales of size. The tree reiterates itself, making smaller and smaller copies of itself as it attempts to fill space and gather light.

Sillett's map of Ilúvatar's canopy showed that this ancient tree had reiterated itself so many times it became a forest within a forest. Its 220 trunks had been reiterated into 6 levels of hierarchy. Ilúvatar is one of the most structurally complicated living organisms that have ever been discovered.

And this all goes on in redwood time. Some of these ancient trees are a thousand to three thousand years old. It is thought that Gaia, the oldest redwood, is anywhere from three thousand to five thousand years old. There is lots of space to grow into too. The tallest redwood is 38 stories high.

But it wasn't just redwood growing on redwood that the canopy explorers found. In the crown of these giants, soil collects and can be up to a metre in depth. Tanoak, flowering rhododendrons, laurel, hemlock, Douglas fir, and even Sitka spruce were growing there. Ripe huckleberry, elderberry, and current were growing. Salal was everywhere.

There were great mats of fern, some weighing as much as 2 tons when saturated with water after a rain. The fern mats were sprinkled with copepods, tiny shrimp-like aquatic creatures. Copepods are the most abundant animals in the ocean and a major part of the diet of baleen whales and small fish. Nobody knows how they got into the redwood canopy. Also, there was such a variety of mites in the fern mats that Sillett started to think the redwood rain forests have a greater biodiversity of soil mites than the tropical rain forests. Many species of moss, lichen and liverwort were identified as well.

Voles and salamanders that had never set foot on the ground were thriving up in the canopy; an unidentified species of large pink worms was in the canopy soil. In a grove of giants, a new species of ant was found on only one of the trees – a separate ecosystem.

One night Marie Antoine, one of the researchers, was in a hammock high in the redwoods. She heard the canopy come alive – little chirps and squawkings, fluttering of wings and rustlings. The secretive Marbled Murrelet nest in the canopy of old growth redwoods. They use the large limbs thick with lichens and mosses. These birds are rarely seen because they fly out to the ocean at daybreak and return near dusk. Also, flying squirrels are abundant in the redwoods but are seldom seen. Flying squirrels are nocturnal and their nests are high in the trees.

The canopy of the redwood giants is another world and another time. To quote Steve Sillett: *A tree is a being. It's not conscious the way we are but it has perfect memory.*



Sources: The Wild Trees by Richard Preston
Humboldt Magazine – Tallest Trees Unveiled (Fall 2009)
TED lecture:http://www.ted.com/talks/richard_preston_on_the_giant_trees_html.