Carolyn is dwarfed by the large American chestnut tree behind her, circa 2002. Photo by Dr. Brian McCarthy.

Carolyn Keiffer

TAKING ON THE TOUGH ASSIGNMENTS

By Scott Carlberg, Carolinas Chapter

A random 18-inch American chestnut seedling reached out for sunlight in Ohio in 1988, but it captured a heart instead; Dr. Carolyn Keiffer's heart. She didn't expect to find a botanical soulmate that day.

It was a love-at-first-sight kind of thing, though Carolyn didn't know it at the time. "I was in grad school at Ohio University, and on a field expedition," said Carolyn. The class was in Wayne National Forest, a quarter million acres of Appalachian foothills in southeastern Ohio. The hunt was for wildflowers in the undergrowth.

"Suddenly our leader, a quiet plant taxonomist, dropped to his knees," said Carolyn. "This quiet guy became animated as he looked at this seedling with a half dozen leaves. It was an American chestnut." The guide explained the fight that little tree made to get to sprout at all, much less grow into a mature tree.

That seedling rooted in Carolyn's memory, too. Two years later she had to pick a topic for a plant pathology class. "I chose chestnut blight. I didn't know what I was getting into." That is because Carolyn wrote to various chestnut experts for material. They did not just respond. They answered with enthusiasm, dedication, and something else: "I never met a grumpy chestnut person. They are all positive people."

One of them was Fred Hebard, known for TACF's breeding and resistance program. He urged Carolyn to apply for a TACF research grant to begin a long-term forest ecology study in West Salem, Wisconsin, in 2002. Carolyn's sense of awe grew in La Crosse County, the site of 60 acres of private forestland and the largest remaining stand of American chestnuts. "Pivotal to my understanding of what an American chestnut forest must have looked like," she says. The project continues today.

Carolyn is now a professor of botany in the Department of Biological Sciences at Miami University, Middletown, Ohio. She is a founding member of the OH-TACF Chapter, current chapter president, TACF board member, and volunteer with TACF for more than 20 years.

Trees are Carolyn's tools. Restoration ecology her career, salvaging degraded, damaged, or destroyed ecosystems. Mother Nature's go-to professionals, these people heighten plant diversity and re-establish a biological balance between nature and culture.

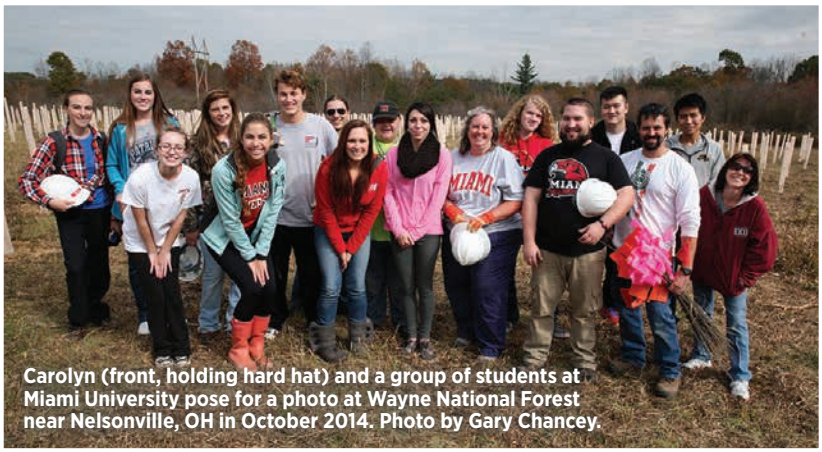
Here's an example.

The Fernald Preserve is a former uranium production facility in a rural, residential area northwest of Cincinnati. Production stopped in 1989. "An onsite disposal facility remains at the site containing approximately three million cubic yards of contaminated soil and debris," says the Ohio Environmental Protection Agency (EPA).

"It was my very first solo research project as a new faculty member," said Carolyn. "I wondered if this was a chance to try chestnuts." She did, and the results were good she said, although, "White tail deer like to eat chestnuts." All for a good purpose either way.

Restoration returned natural plant and animal communities to the site. The Fernald Preserve is now a green space park with wetlands, ponds, prairies and upland forest areas.

Carolyn's botanical knowledge rescues strip mining areas, too. Over some eight decades, since the use of huge mechanical shovels, bulldozers and draglines, parts of Ohio had strip mining, or, surface mining, operations. Rock and soil above the coal seam is removed and the coal is taken away. Reclamation shows varied degrees of success.



Carolyn (front, holding hard hat) and a group of students at Miami University pose for a photo at Wayne National Forest near Nelsonville, OH in October 2014. Photo by Gary Chancey.

Carolyn poses by one of the large American chestnut trees in the West Salem Stand in 2002, alongside Dr. Brian McCarthy, TACF's current board chair. Photo by Ron Bockenhauer.

Carolyn, standing beside Dr. Janise Bauman, observes large leaves of an American chestnut tree in the West Salem Stand in 2007. Photo by Dr. Keith Gilland.

"In Ohio there are thousands of acres of old strip mine lands," said Carolyn. "Many never reclaimed or reclamation didn't work. I felt if we got the right plants in the right places, something good would happen."

Heavily compacted soil covered the sites, mostly from heavy mining equipment. Only weedy herbaceous plants grew. "Our earliest sites were just coal and shale. Nothing you or I would call soil, with a low pH, in the 4s. Maybe some lichens and a few stunted yellowish pines," said Carolyn.

Early tests tried small stands of trees, sometimes even bird stands built of two-by-fours, just for places to land and nest. "If you can get a tree to live, others will come in. Mother Nature will help them turn back into a forest." She got a few chestnuts to grow. "They weren't happy, though."

Heavy equipment plowed the rock-hard surface, ripping cross hatch patterns, giving plants places to set roots. Pure American trees and about 1,200 early chestnut hybrids were planted. Also in this project: Dr. Brian McCarthy, now TACF board chair, and Jenise Bauman, a doctoral student of Carolyn's at the time. "I visited this past fall, which is 12 years from the start. Some chestnuts are blighted, but some are 25 feet tall. New woody seedlings are coming in."

As a professor of botany, Carolyn cultivates other kinds of seedlings. The minds of students. "I hear some people say that college students are spoiled and jaded. I find that students love to help, like to get things done."

Jenise is a case in point. She is now an associate professor at Western Washington University in, maybe not surprisingly, restoration ecology. "Carolyn expected hard work and professionalism from her students. As my PhD advisor, she balanced student support and guidance while encouraging my own independent growth as a scientist."

As a professor Carolyn has sent more than two dozen scientists out to jobs as diverse as college professors, US EPA, natural food flavorings, The Nature Conservancy, soil and water conservation service and the Ohio Department of Natural Resources.

Not just scientists, though. "I teach an environmental course for non-science majors. They come into the class uninformed about the environment. What bothers me is when they do not care they are uninformed and say, 'I don't want to know because it is too depressing.' I try to help them understand and care."

Since Carolyn is a botanist, one question stands out: "Carolyn, why do you love the American chestnut instead of another tree species?"

Considering that Carolyn cannot grow the American chestnut where she lives because of the high pH and limestone, her answer is especially interesting. "Chestnuts are amazing trees. They have food productivity that is important for wildlife. The grain is pretty, and the wood has been useful. The tree grows fast compared to other nut-producing trees. Historically, people and livestock have depended on the American chestnut for food."

The American chestnut has supported our nation as it expanded, and, said Carolyn, "When the trees were gone, we really lost something. While its history is a story itself, its tenaciousness is something else. We can go out in the forest and possibly find a chestnut, even from a root system 100 years old. The trees have been doing their best for 100 years and we have the science and the will to save it. And we should."