

My name is Kathleen Kull (C'17), and I spent this summer in Sewanee on campus as a forest ecology intern with the Biology department. Our research was conducted out of the Sewanee Herbarium with Dr. Jon Evans as our research advisor. Our summer research team consisted of four current students, – myself, Emily Reidlinger (C'18), Zack Loehle (C'17), and Ed Haubenreiser (C'16) – the Herbarium post-baccalaureate research fellow, Callie Oldfield (C'15), and Dr. Evans. During the course of our summer, we surveyed five hectares of old-growth forest in nearby Franklin-Marion State Forest. These surveys, though varied in intensity at each site, included full tree and sapling inventories, seedling and herbaceous cover samples, duff and soil depth measurements, soil nutrient samples, and canopy cover assessment using hemispheric light photos.

Our survey plots were set up in the 1970s by George Ramseur, and two hectares had not been resampled since 1978. The other three hectares were resampled in 1995 and 2005. Because of the long-term nature of our data in these plots, we have the great opportunity to understand the dynamics of an upland deciduous forest that has not had major human impacts in over 50 years. One of our largest hypotheses relates to the gap dynamics of the forest – that is, when a large tree falls, what species fill the gap it leaves, and how large of a tree must fall to make a significant impact? The species composition in these gaps can be similar or very different from the surrounding understory and midstory, but what we are finding with our study is that the forest is almost resistant to change. This has significant implications given an uncertain future climate – further study over the coming decades could show that despite increasing CO₂ and warmer temperatures, the forest remains generally the same.

Other hypotheses relate to the change in composition upslope versus in small plateau surface valleys and the impact of certain diseases and insects on forest species, namely the American chestnut and the dogwood, both of which were almost completely wiped off of the landscape. However, these are just the questions we set out with the hope of studying.

Throughout the sampling of the plots, we found more questions than answers. Of particular interest to Dr. Evans was the apparent clonal nature of a number of trees, including sassafras, red maple, and sourwood. Even though a stem of the tree may die, the roots can shoot up another stem, and another, ad infinitum. This goes along with the apparent resistance to change that we see in the forest, because it seems that many individuals have the capability to “die” and be “reborn” in the same place. This also raises the question of whether any truly new individuals of these species are growing to substantial height in the forest, or if all of the stems we see are actually very old. All of these hypotheses are points of further study, which myself and some of my fellow researchers will likely continue into the coming semesters.

Over the course of the summer, I became familiar with over forty tree species and over seventy herbaceous species, many of which we had to sample and “key out” in the lab in order to identify. I began to learn botany terminology and identification procedures, how to use the Sewanee herbarium as an identification tool, and how to press plant specimens to be catalogued. I was introduced to GIS (global information system) software and to Microsoft Access. Less professionally, I was also warned by an angry timber rattlesnake, almost hit by a falling tree, soaked to the skin in more than one rainstorm, and celebrated as the finder of a new population of a federally threatened species. I saw toads and fledgling birds and a tiny baby fawn, and I did

all of this while performing research tasks and exercising my new botanical knowledge, a balance of work and play that has seriously altered my career trajectory.

I have known for over four years that I wanted to study plants. When people would ask me what I wanted to do when I grew up, I would loosely say “botany” and speak about my love for the outdoors. After this summer of research and fellowship with Dr. Evans and the other students, I have decided that I would like to pursue an advanced degree and one day become a professor and to foster researchers of my own. I have gained substantial knowledge about this forest ecosystem, but there is so much more to know, and I would like to know it. Though my interests for permanent settlement are farther west, I am very grateful for the opportunity to know this forest as well as I have come to.

Interestingly, the flora of Franklin-Marion State Forest varies considerably from that of the Domain due to different land use histories and the different severities of the bluff edge. Although I have almost complete knowledge of the plants in the state forest, there is even more to discover just on the Domain. I plan to continue research under Dr. Evans with an independent study in the fall semester, which I’m sure will include many more trips to Franklin-Marion State Forest as well as other studies around campus. I, along with two of the other student researchers, am also enrolled in the Ecology lab course being taught by Dr. Evans and Dr. Kristen Cecala in the coming semester, and I know that our lab projects will also likely include further study in these familiar forests.

I am incredibly grateful for the experience this summer has granted me. Beyond knowledge of botany and future plans, I learned much about myself as an individual and leader,

and I hope to begin to exercise these new skills as soon as possible. Whether I have the opportunity to spend another summer working in the forests around Sewanee or decide to go west in search of different ecosystems, I know that the research and teamwork skills I have gained are sure to help me succeed.