

The Right Tree in the Right Place for the Right Reason

For the Spring 2023 semester, I took an Honors Seminar entitled Environmental Biology and Research in the Information Age. In the class, we discussed the United Nation's Sustainable Development Goals which are designed to encourage nations to establish programs that care for the planet and all life within. The World Health Organization declares, "The Sustainable Development Goals (SDGs) aim to transform our world. They are a call to action to end poverty and inequality, protect the planet, and ensure that all people enjoy health, justice and prosperity."

Each student was asked to design a civic engagement project based on one of the goals. My project was inspired by the United Nation's Sustainable Development Goal 15, Life on Land. It calls on nations to implement programs that will: protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Target 15.2 directs citizens to promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally. Target 15.8 aims to significantly reduce the impact of invasive alien species on land and water ecosystems and control or eradicate the priority species. These target goals directly relate to my project because they were the foundation upon which my community engagement project was built.

Because of the essential role trees play in supporting biodiversity in terrestrial ecosystems, and they are considered the lungs of the earth, I wanted to discover and volunteer with the organizations in my community that work to protect our woodlands. I located and volunteered with three local organizations that are committed to this work. I participated in a variety of ecological tasks, which I will share with you, but first I will address how my research question changed as I learned more about the state of our local woodlands.

From the first day of volunteering, I learned quickly how much effort is invested in the removal of invasive species before we can get to the fun part of planting trees. I also learned very early in my research process the importance of planting not just any species of tree, but native trees. The focus of my project narrowed from simply the importance of planting more trees to that of planting the right tree, a native species, in the right place, in an area that had historically been a woodland, and only after the ecosystem had been restored, meaning that invasive species had been removed. Also, in order to meet sustainability goals, the trees needed to be planted for the right reasons, which is to restore and protect ecosystems, and not for large corporations to pretend they were environmentally friendly.

Thus, my research question was, are there any organizations in my community that I can volunteer with that support the United Nation's Sustainable Development Goal 15, Life on Land, that focus on restoring and maintaining our forests, and focus on removing invasive species and planting native trees?

The sources I used to answer this question included library databases, websites, books, information obtained at the worksites, and emails. The library databases I utilized were Academic Search Complete and Science Direct. They helped me locate scholarly and popular articles that provided research findings and news on my topic. The more I used the library databases, I became more comfortable with utilizing the search tools provided and refining my search terms. The keywords trees, reforestation, carbon, and the Boolean operators and and or were utilized for this research. These actions helped me find more relevant data more quickly. Expert sources I referenced included the Manager of the College of DuPage Outdoor Lab, the DuPage County Forest Preserve, the Arbor Day Foundation, the United Nations, and research published in the Bulletin of the Atomic Scientists and Ecological Economics.

Now I'll tell you about the work I did in my community. It was with the DuPage County Forest Preserve, the COD Natural Areas Outdoor Lab, and the Kane County Forest Preserve District.

At the DuPage County Forest Preserve website, volunteers can sign up to participate in a restoration workday. I signed up to volunteer at Churchill Woods Forest Preserve, where a restoration team regularly meets to restore woodland that has been overrun by invasive honeysuckle and buckthorn. These invasive species rob sunlight, nutrients and space from the native oak and hickory saplings. Additionally, buckthorn is allelopathic meaning that it releases toxins into the soil which can weaken or kill nearby vegetation. This unbalances the ecosystem that has coevolved to exist with oaks and hickories. It is also why the invasive species need to be removed before native trees are planted.

Upon arrival to a restoration workday at Churchill Woods, all volunteers gather around the steward in the parking lot. We sign in on a clipboard, share introductions and listen to a safety briefing. Newcomers are presented with a three-inch length of a yard stick as an example for how close to the ground the invasive buckthorn and honeysuckle is to be cut. After selecting a tool of choice, either a saw or lopper, we then hike to the worksite. After passing by a meandering stream, some ducks, geese, and deer tracks, the group arrives at the restoration front, a clearly defined line where the invasive shrubs and trees block passage. Both species had so established themselves that it was impossible to see far into their dense intercrossed growth. Walking anywhere more than a few feet from the edge of where we had removed them was difficult. It was obvious that any saplings on the forest floor would have little if any sunlight to photosynthesize under the invasive trees. Looking around, numerous piles of previously chopped trees in huge mounds stood scattered about the woods. Some had been reduced to gray and black patches of smoldering charcoal that had been burned by forest rangers to prevent the possibility of regrowth.

After you have been at work for a short time, your ears tune out the traffic from the road and you notice the birds, squirrels and saws at work. Each time a tree or shrub is cut down, a flag is placed to mark the stump so a designated volunteer can come along and spray it with herbicide. This step is performed to hinder regenerative properties of honeysuckle or buckthorn, which can grow multiple sprouts from a stump where a bush or tree has been cut.

Periodically, you stop cutting to gather the trunks and branches and lug them to the piles being built that day. The team collectively reclaims a large portion of understory in just one quiet Sunday morning. As we gather our tools and head back to our vehicles at the end of the morning, the large oaks tower in their historical home without the encumbrance of competitors.

I also completed restoration work on campus. College of DuPage's Outdoor Lab includes forest, prairie, wetland and ponds. I am grateful that Ms. Bakker welcomed me into the group of student workers so I could participate in helping restore the natural areas on campus. While I did get to help with removing invasive honeysuckle from the woodland on the far eastern edge of campus, which directly related to my project, I also got to participate in other restoration efforts. This included spreading mulch on the boundary of the lab's wooded and prairie areas to provide a barrier against anthropogenic roadside pollution, reduce weeds, and decrease soil erosion from wind and stormwater runoff. I also participated in species identification, seed collection, and invasive plant removal.

A key takeaway I gained from my volunteering on campus is that the health of an ecosystem is an infinitely complex interconnected combination of all biotic and abiotic factors that it contains. For biodiversity to flourish, natural areas require careful management to prevent the introduction of invasive species, and a knowledge of how all species interact and grow. It may take years to witness change in a community due to the outcomes of restoration actions.

The third organization I volunteered with was the Kane County Forest Preserve District. For Earth Day 2023, volunteers gathered at Tekakwitha Woods Forest Preserve to plant trees in a reclaimed agricultural field adjacent to a historic oak woodland. A ranger delivered a welcome announcement sharing some information about the history of the area. He explained how the trees we were planting would expand the adjacent wooded area to the north. He asked us all to imagine what it might look like in 100 years. Next, rangers demonstrated the tree-planting process, and volunteers spread out across the large area to plant oak trees and other native species. I was incredibly excited to participate in a reforestation effort. After cutting down countless invasive shrubs and trees during my civic engagement project, I finally got to plant the right tree in the right place for the right reason.

By participating in invasive species removal, biodiversity conservation efforts, and a reforestation event, I feel closer to my planet. I have witnessed the power of teamwork and what can be achieved in local restoration efforts. As the world population continues to increase and more people live in urban spaces, we must remember our origins and dependence on the natural world and understand our shared impact on it. With community support and action for environmental restoration and protection, the world's single shared biosphere can be healed.

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