

This summer I interned for the Cheadle Center for Biodiversity and Ecological Restoration (CCBER). CCBER is a center under the Office of Research at the University of California, Santa Barbara. Founded in 2005, their mission is to conduct research, educate, and engage the community through restoration of campus lands and preservation and management of natural history collections. Previously the lands surrounding the campus were wetlands, however during the past few centuries, 90% have been lost through land degradation and changes in land use. The campus lands are still rich in biodiversity and CCBER's ecological restoration program focuses on encouraging land restoration and stewardship.

Some of the specific responsibilities I had as an intern were the management and maintenance of a 10-acre ecological restoration site located on the coastal bluffs between the UCSB campus and the Pacific Ocean. The Manzanita Village Restoration Project began in 2001 and features one acre of vernal wetlands, pools and marsh along with several acres of coastal sage scrub, coastal grassland, and oak woodland habitat restoration. My specific duties included, but were not limited to; removal of exotic plant species, plant propagation, planting, trail maintenance, biological monitoring of restoration sites, and a variety of aspects of education and outreach. The Manzanita Village Restoration Project was created to mitigate the destruction of the wetlands on UCSB's campus from development. Vernal pools were recreated back in 2001, and requires minimal but regular maintenance.

Fortunately for me, the months of May and June are best for collecting data from the pools. This gave me an opportunity to really work on my plant identification, and to become aware of the different plant species I was working with. Being new to the Santa

Barbara area, and in general the west coast, this was extremely helpful. It was the interns' responsibility to monitor the contents of each pool, and from the data we collected analyze the status of the pools. Invasive species were more problematic in some pools than other and we tried to determine why. There were many factors to why one pool could do better. It could depend on how accessible it was to the public or the amount of traffic coming through. At one point we were continually stumped as to how mustard plants continued to find their way into our project areas. One day we saw a maintenance crew that managed the non-restoration sites dump their clippings into our site. After communicating the problem and finding a more appropriate dump site we eradicated the mustard plant, and hope that it will not return.

Interning for Cheadle Center for Biodiversity and Ecological Restoration provided me with many skills in horticulture, proficiency in Specify, restoration site design, and techniques to implement and maintain these sites. I became knowledgeable in the local flora of the Santa Barbara region and learned properties about specific species that aided my collection and analysis of data. Working on several different sites allowed me to see the different stages of restoration. I was able to help transplant native wetland plants in the creation of a vernal pool at North Parcel, an area that had recently been disturbed. The soil on this site was made up of a high content in clay, and the pools were deeper than most of our others. There was not a lot of experience with deeper vernal pools so we planted a wider variety of plants that were more adaptable to aquatic environments.

Coal Oil Point Reserve had been established but struggled with the highly invasive ice plant that is commonly found along the coast. There are numerous ways we dealt with eradicating invasive species, and the data we collect gives us an idea of which removal

techniques are most effective.

Several eradication techniques were tested at Coal Oil Point in removal of the ice plant and the best method was solarization. The problem we continued to encounter with solarization was that it was highly disliked by the local people in the area. Early morning beach walkers and many of the younger surfers would move our tarps off the plants. They thought that what we were doing created an eyesore and did not see the point in removing such a popular species. To try and decrease resistance to the project we advertised what we were doing in pamphlets and the CCBER website, and incorporated it into our monthly education programs. Despite our best efforts there was not immediate change and we had to continue recovering the plot every week. This was very frustrating, but allowed me to see the importance of public involvement and cooperation.

Manzanita was well established so the work we did there was mainly manual weeding of invasive species and monitoring where native species were having the most success. Going into the internship I expected to learn the right way from the wrong way in recreating and preserving wetland habitat. What I learned was that there is no definite answer. One pool could be really successful with a diverse group of native wetland species, and then the exact same methods could be used in another area and have no success. Everything that we did was based off previous experience and sometimes just an inclination from a staff member. To restore a habitat to its natural state depends on what you consider natural. Even within CCBER there were some discrepancies between staff. Towards the conclusion of my internship I came to the realization that restoration is a lot of trial and error. It takes years of work and analyzing data. Having a good attitude and being open minded to trying new things makes for a more diverse and educational experience.

It was a great experience to get to work with a restoration team to see the benefits and drawbacks of the politics that went into the decision-making. CCBER is an organization that manages UCSB's mitigation of wetland destruction, and is by law required to mitigate damages when coastal habitat is disturbed. It is beneficial to have policies making the university responsible for their damages, but there is a lack of strong policy to protect the existing wetlands from development. This internship has furthered my interest in environmental policy. I aspire to make a difference on all levels starting with educational programs for youth and community participants.