

Overview of My Conservation Ecology Internship with Dr. Melissa Youngquist

My time at the Shedd aquarium working with Dr. Melissa Youngquist has been a challenging, eye-opening and rewarding, from learning new skills in the lab and the field to exploring the inner workings of such unique habitats as vernal pools and observing the radical changes that can occur in such rapidly shifting environments. The focus of the project was to study the effects of habitat restoration on the ecology of vernal pools by measuring presence and relative abundance of amphibians and invertebrates in each pool as well as tree cover, and vegetative population surveys. The results of each of these surveys will then be compared to the results of surveys performed last year at some of the 12 current sites. The importance of this study is that by understanding the effect that invasive plant species on amphibians and aquatic invertebrates, which are notorious for being extremely vulnerable to environmental changes, we can better manage and restore natural areas around Chicagoland.

Fieldwork was done at a series of vernal pools spread between La Grange Park woods, Salt Creek nature preserve and Possum Hollow woods in the La Grange Park area, a number of which had been treated for invasive plant species like buckthorn by either clear cutting or controlled burning in a 10 to 15 meter radius around the pond, while the rest were left as they were. The breeding season for amphibians in northern Illinois usually lasts from March to anywhere between late June and August, so our primary method for measuring species presence and abundance was to first explore each pond and count and identify egg masses laid, and then collecting, identifying and counting tadpoles once the eggs hatched, recording any features such as metamorphic stage or presence of adults. Capturing tadpoles was done with the use of dip nets over a period of time relative to the size of the pond-anywhere between 10 minutes to an hour. The tadpoles were all added to a bucket and then sorted and counted, paying attention to features such as skin markings, eye and mouth placement and tail size and length for species identification. Some of the species that were identified for this study were Chorus frogs, Leopard frogs, Bullfrogs, Tiger salamanders and tree frogs.

Around each pond were also an audio logger, trail camera and within the pond were two electronic thermometers, one to record air temperature and the other for water temperature. The audio loggers were set to record for 10 minutes in the early morning and evening to capture any calls from mating frogs that could be later identified and compared to the tadpole data collected at each site. The camera traps were meant to take photos of terrestrial birds and mammals that frequented the sites for later analysis as well. Collecting data from each of these involved visits to each site once every two weeks and then later, once a month. Each audio logger and camera trap contained a micro SD card that was removed and its contents were downloaded onto a computer for later analysis.

Invertebrate collection was performed in a similar fashion as with our amphibians, but instead of simply skimming the nets along the bottom of the pond, we aimed to scoop some of the leaf litter from the bottom, so to collect any invertebrates hiding in the litter as well as any detritivores. The contents of our collections were then placed into one gallon plastic bags and preserved with alcohol. They were then brought to the lab at Shedd where I would pour the contents into a petri dish and sift through them with the use of a microscope and tweezers. After the invertebrates were collected, I then used a dichotomous key along with other resources to identify each, disregarding any terrestrial invertebrates that may have been collected as they were not the focus of the study.

8/30/2021

When I first began interning with Dr. Youngquist, all these experiences were completely new to me. I had never used a dichotomous key, or caught tadpoles with dip nets and I certainly could not identify frog tadpoles. Needless to say I have learned more from this work than I would have ever thought possible. From dip netting and identification to vegetation surveys and using a densiometer, each new task brought with it something new, and there was a level of satisfaction when studying and measuring each item. For example, after spending over an hour attempting to identify a beetle larvae, its satisfying to find that I was right, or at least close to the answer. This let me know that not only I knew what I was looking for, but also that my skills with invertebrate anatomy and identification were improving. I am grateful for this opportunity and all the skills that I learned and honed that will help me when I eventually head to graduate school and beyond.



Myself and a volunteer sorting tadpoles.



More tadpole sorting, this was one of our first surveys.



This is me again during one of our egg mass observations.



Tiger salamander larvae (left) with chorus frog tadpoles. The two middle tadpoles had begun to morph and are showing legs.



Tiger salamander egg mass. Each mass was about 3 inches long and an inch across and in murky conditions they can be very difficult to spot!



A metamorphosing chorus frog, this one has nearly completed metamorphosing in which time it will “absorb” its tail and be a fully developed juvenile.



This image shows an adult chorus frog performing its namesake mating call.



An adult chorus frog.



Adult Bullfrogs resting on a log at one of our research ponds.



An adult Gray tree frog camouflaged on a leaf.



Northern Leopard frog tadpole caught in one of our dip nets.



Close up of a leopard frog egg mass. These masses were relatively large, measuring about 5 to 6 inches across.



One of our research sites at Salt Creek nature preserve. On the right hand side is a bucket with some of our dip nets.



This is myself holding a young Garter snake that we had found crossing one of the trails. While not part of our study, it's sometimes nice to stop and appreciate the other wildlife.



This is a newly emerged American toad. They bred and laid their eggs late in the season and emerged at some of our sites by the hundreds. Needless to say they are not so easy to spot in the undergrowth.