

Plethodontid Salamander Summer Research Report

Benjamin E. Sadler

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During this past summer, I was a research assistant for the Herpetology Lab in Sewanee's Ecology and Biodiversity department. I worked under Dr. Kristen Cecala with four other lab assistants, all who worked on various projects throughout the summer. I had my own research that I was doing under Dr. Cecala regarding the habitat preferences of terrestrial bluff-dwelling Plethodontid salamanders. My main goal for the summer was to create a database of salamander habitat preference data. For this data collection, we selected bluff survey sites around the Sewanee domain around the perimeter trail, natural bridge, and Morgan's Steep areas. In site selection, we deliberately chose sites ranging across all of the cardinal directions and domain areas. For the sites highest in elevation and closest to the top of the bluff, we used Google Maps topographical layover. In selection of the lower elevation sites, we used ArcGIS topographical maps with 500ft elevation line overlays. Surveying selected sites was most often an individual excursion, but other lab assistants occasionally accompanied me on my survey outings. Out in the field, I marked a 1000ft transect along a bluff line on site to survey (if the site permitted) plotted out on a domain map in PDF maps. I walked the transect with a flashlight and inspected crevices in the bluff face for salamanders. When I found a salamander, I took its GPS point, then I gauged canopy cover using a spherical densiometer. I also took the temperature of the crevice using an IR thermometer and the relative humidity using a digital psychrometer. At the end of a survey, I selected random points along the transect and noted temperature, relative humidity, and

canopy cover. In addition to the survey work I did on my own, I assisted the other Herp lab students with tasks in their projects such as GIS lab work, going out on stream surveys, creating leaf litter traps, and laying out coverboards. The Herpetology lab students also participated in the Sewanee Environmental Institute PRE college experience by taking students on Herpetological excursions. The students were very engaged throughout the excursions and showed great interest in a possible future at Sewanee and in the Ecology and Biodiversity department.

Working under a recent graduate of a Ph.D. program, Dr. Cecala, was a very valuable and fruitful experience for me as an undergrad and future Ph.D. program prospective. The research methods that she exposed me to are commonplace in Ph.D. programs in Herpetology and Ecology, such as Occupancy modeling, advanced statistical analysis, and other methods not commonly taught to undergrads outside of senior seminars. She was also invaluable in explaining how to go about applying for a Ph.D. program and what professors look for in potential grad students. This summer has enlightened me to the possible future career paths I have at my disposal, and has sharpened my focus in what classes and future research opportunities I should take.

I learned a great deal about the trials and tribulations of field research this summer. The success I had in my field research at the beginning was very uncharacteristic of the pace the rest of my research took. At the beginning of the summer I found no shortage of salamanders on my surveys, but as research went on and the well known salamander sites were all surveyed, the research became much more grueling. The sites were in much more remote areas with little trail access and much steeper gradients. The slope transects I had selected proved to be difficult to traverse and more often than not were fruitless. I learned a great deal of patience is required

when researching and I am glad to have experienced every problem that came across my path, for it reassured my passion for research despite the failures. My passion for research was the most valuable thing that I learned this summer. I have heard from a good deal of people in my time at Sewanee that research was not for them, and that they switched majors because of it. I am glad that I had this summer to reaffirm my decision in studying Ecology and Biodiversity.

Before this summer I knew very little about Herpetology, but it interested me greatly. When I approached Dr. Cecala asking for research opportunities, she was more than accommodating in setting me up with research materials on salamanders and statistical analysis. It was through many outings with Dr. Cecala and the Herpetology lab students that I learned to identify most, if not all, of the salamanders on campus. I learned where and how to find them, in addition to extensive information on breeding habits, diet, and seasonal habitation. I also learned a great deal about other herpetofauna on the Sewanee domain, such as terrestrial turtles, snakes, frogs, and toads.

This summer has greatly increased my interest in the Herpetological field and I intend to continue research with Dr. Cecala during the academic year. This summer research opportunity has opened my eyes to the possibility of graduate school and possible careers in Herpetological conservation. I intend to have published works with Dr. Cecala that I can give to future grad programs to demonstrate my experience in research as an undergrad. This summer will prove to be an invaluable experience for me over the next couple years when applying for various jobs and grad programs.