California Tiger Salamander Pond Sampling

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Acknowledgements:

Many people should be thanked for their effort in making this internship a success. Arlene Haffa was the professor that offered me the chance to have one of the USDA internships. Josh Harwayne, Jamie Davis, Matt Johnson, and the rest of Denise Duffy & Associates, Inc. took me in graciously. I have grown a lot from my time there, thanks to their guidance and teaching outside of the classroom. Of course, none of this would have been possible without the project being supported by Agriculture and Food Research Initiative Competitive Grant no. 2011-38422-31204 from the USDA National Institute of Food and Agriculture.

Executive Summary:

The main purpose of my project was to assist the Natural Resource Division of Denise Duffy & Associates, Inc. (DD&A) at one of their project sites in the Santa Lucia Preserve in Carmel Valley, California. Every day I checked pitfall traps set along a silt net fence in order to record the movement and size of *Ambystoma californiense* metamorphs as they moved out from the pond. This project lasted between May 2012 and July 2012. After July, I became a general intern for DD&A and helped with pond sampling in the Santa Lucia Preserve, plant restoration and wood rat nest removal in Big Sur, and data entry.
**Project Objectives:**

A property owner in the Santa Lucia Preserve wants to build their house on their land, but within the habitable area surrounding Road Runner pond, which is located inside the Palo Corona Regional Park. Road Runner pond is one of the most successful breeding ponds for *Ambystoma californiense* or California Tiger Salamander (CTS) in the area. This CTS population has been found to be 100% CTS, which is genetically significant since most populations of CTS on the central Coast are hybridized with a non-native tiger salamander. In order for the property owner to begin construction, she needs to get the permits necessary with the knowledge that CTS could be harmed during the process. A two year study was started and I was able to participate in both years of the study.

California Tiger Salamanders are amphibians with unique life cycles. They spend most of the year in mammal burrows. When it starts to rain during the spring months they begin to come out of these burrows and head towards a vernal pool or pond where they can mate successfully. Their larval form is completely aquatic, and over the course of the spring the young of the year will gain legs and lungs and be able to walk out of their ponds before it completely dries up. California tiger salamanders are very prone to hybridization with other tiger salamander varieties. A tiger salamander was introduced to California as bait for fish during the last 100 years. Since then, most of the Monterey area’s California tiger salamander populations have become hybridized. This is why Road Runner pond is special; the salamanders that breed there are not hybridized.
When I was not working on that project I worked on a few other projects, including one for the Santa Lucia Preserve. We sampled the many ponds and a lake throughout the preserve. There are 28 ponds that get checked three times a year in March, April, and May. The purpose of these samplings is to determine the presence or absence of several key species within the pools: California tiger salamanders, California red legged frogs, and the invasive bullfrog. Other species also occur in these pools including western toads, California newts, and various bugs and crustaceans. I played a small role in a few other projects throughout the year. I helped with plant surveys in Fort Ord as well as Big Sur and at the Hastings reserve. I also collected seeds for restoration purposes in Big Sur.

My goals for this project were simple. I wanted to learn skills from the company I was working for and apply those skills. Since this internship was not focused on one single project, I was able to get a much wider range of experience than if it was on just one project. This internship prepared me for a potential career in the USDA. As a wildlife biologist in the Forest Service, my experience with pond sampling for listed species would be valuable. Learning how to take down a wood rat nest safely is another skill that could transfer from my internship to a job as a wildlife biologist.

**Project Approach:**

During the CTS trapping project, I had to walk along the distance of the traps and check the contents of each one. I would find newts and fence lizards and sometimes
CTS. When a CTS was found in a trap, I would call Josh Harwayne or Matt Johnson depending on who was available, and wait for them to arrive so they could supervise me while I measured and released the CTS. I removed traps that were no longer needed from a pond down the road called Dead Pig pond. During the second phase of the project I helped maintain the silt fences by bracing them against the wind with zip ties while checking them.

While working on pond sampling in the Santa Lucia Preserve, I wore waders and carried a dip net, sein, and the field binder that had the pond sampling data sheets in it. I would fill in a few physical features of the pond and environment, and then walk into the ponds and catch what I could. When the pond sampling was done, Matt or Jamie would tell me what they saw and I would add it into the data sheets along with the things that I saw. Later on, I started compiling previous year’s studies into spreadsheets that could be used to analyze populations of different species. This was a special request from someone within the Santa Lucia Conservancy. This data entry portion was interesting because it involved jumping from year to year to find different collections of data for the same ponds that the man wanted to have available.

I helped Jamie Davis on a number of plant related projects. We picked California native seeds for a restoration effort from a hiking trail in Big Sur. We looked for Monterey Manzanita near the Los Padres dam and for Sand Gilia near CSU Monterey Bay. This involved searching an area marked on a map for the specific plant and marking the individuals or groups with a GPS unit for eventual GIS use.
**Project Outcomes:**

The CTS trapping portion of my internship can be considered a success because I did catch CTS metamorphs leaving Roadrunner pond for their upland habitat. There were no casualties during the period I was checking traps as well. In the other areas of work during my internship I finished the tasks that I was given as accurately and within a reasonable amount of time. My time spent as an intern at Denise Duffy & Associates was a good thing because of the experience that I received from them in many different areas. I also proved to myself that I had an aptitude for field work, which means that I can now begin looking for jobs related to this field.

**Conclusions:**

Working with California tiger salamanders has exposed me to so many new species that I didn’t know occurred in my home state. I didn’t even know what a California tiger salamander was when I first started, but now I not only know what they are, but I care about their conservation into the future. The projects that I worked on showed me all about the various amphibian and invertebrate species that exist in the same habitat. I learned about the protocol methods for CTS study. The skills I have learned during this internship are very valuable, and I hope that this is not the last time I will use them. I would enjoy working with California tiger salamanders again in the future, whether it is with the USDA, DD&A, or another group that researches them.
Appendices:

Figure 1: A California tiger salamander in a pitfall trap in the Santa Lucia Preserve

Figure 2: A woodrat nest I am working to take apart in Big Sur. This picture shows the main living space inside of a three foot tall nest.
Figure 3: Road runner pond. I checked traps located around the pond designed to catch salamanders on their way in and out. Across the road and up the hill is the area where a landowner wants to build their house.