

The following research experiences occurred in five different countries from 2001-2004:

GRADUATE RESEARCH

2004-Top-down and bottom-up controls of invasive species

This research project was in collaboration with graduate students, undergraduates, and professors within the Department of Ecology and Evolutionary Biology. The purpose of this research was to examine top-down versus bottom-up controls of invasion by plants. My role in this project was to collect and analyze data from field and greenhouse experiments. Independently, I put together a presentation of our project and I presented our results at a regional ecology conference,

Location: University of Tennessee, Knoxville, TN

UNDERGRADUATE RESEARCH

2004-Geographic shifts under climate change: examining the limits of biodiversity

I was a research assistant with **Dr. Jessica Hellmann** of the University of Notre Dame. In this project, we studied the effects of global climate change on the population biology of several butterfly species at their northern range limit in British Columbia. My role was to help collect field data on butterfly communities and rear caterpillars for transplant experiments. I worked both with a field crew and independently collecting data.

Location: Vancouver Island, B.C.

2004-Evolutionary trade-offs of toxic nectar production

I was a research assistant with **Dr. Rebecca Irwin**. In this project, we studied the evolutionary trade-offs of toxic nectar production in the flowers of Carolina Yellow Jasmine. My role was to collect data in field and greenhouse experiments, make pollinator observations, and perform laboratory work relating to pollination. I worked both with a field crew and independently collecting data.

Location: University of Georgia, Athens, GA

2003-Direct and indirect effects of ant-aphid mutualisms on arthropod biodiversity

I designed my honors thesis to examine the interactions between ants, aphids, and shelter-building caterpillars in willow trees. For this research, I worked both independently and in collaboration with **Dr. Nathan Sanders**. During my honors thesis, I have learned how to independently design and collect the data necessary to address the ecological questions, statistically analyze these data, and write up the results in a scientific paper (Crutsinger & Sanders *submitted*).

Location: Humboldt State University, Arcata, CA

2003-Diversity and impacts of army ants in four neotropical forests

I was a research assistant with **Dr. Michael Kaspari** of the University of Oklahoma working on a National Geographic Society grant. This project examined the diversity and impacts of army ants. For all but two weeks of training in the summer, I worked independently in the lowland tropical rainforest collecting data and samples for this project. I was responsible for data collection in the field, processing samples in the lab, and transporting samples back to the United States. As an independent project, I designed and collected data for a comparison of ant communities in leaf litter and understory palm trees. From this research experience, I learned how to collect field data independently for several months at a time. I also became skilled at how to choose and establish research plots, design a study to address ecological questions and live and do research abroad.

Location: La Selva Biological Station, Costa Rica

2002- Impacts of elevated [CO₂] on arthropod communities

In this research assistant position, I worked with **Dr. Nathan Sanders**. My responsibilities included processing samples from a project examining the impacts of elevated CO₂ on arthropod communities from the Oak Ridge (Tennessee) Free Air Carbon Enrichment site. The majority of time was spent on my own determining arthropod species richness and abundances from these samples and then with Dr. Sanders, running the statistical analysis. In this experience, I learned how to process samples from research on the effects of global climate change, enter data into spreadsheets, and use statistical methods to analyze the significance of the results.

Location: Humboldt State University, Arcata, CA

2002-Amphibian decline and chytrid fungal infection in South African frogs

This research internship was funded from a grant I was awarded by the Explorers Club (\$1500) to study amphibian taxonomy and decline with **Dr. Alan Channing**. During this internship, I worked with a group of South African graduate students and biologists to survey African frogs for chytrid fungal infection. My independent project for the summer was the description of a new species of frog that I collected the previous year in Tanzania (Crutsinger et al. 2004). From this internship, I learned methods of histology to survey for infections and to accurately represent taxonomic features through drawing for scientific papers. Most importantly, I learned how to write and submit scientific papers for publication.

Location: University of the Western Cape, Belleville, South Africa

2001-Amphibian diversity in the Eastern Arc Mountains of Tanzania

This field internship was with biologist **David Moyer (WCS)**. My main responsibility was to survey amphibian communities in the Udzungwa Mountains. These mountains are part of the Eastern Arc chain in Kenya and Tanzania and are recognized as one of 24 globally important "hot spots" for forest biodiversity. For up to two weeks at a time in the field, I worked with a Tanzanian research assistant to record amphibian calls and collect specimens. I also worked with a team of biologists to survey the endangered Kihansi spray toad (*Nectophrynoides asperginis*) in a population monitoring program involving WCS, Norplan (a Norwegian consultancy), and the World Bank. From this internship, I learned how to collect and preserve specimens, monitor populations of an endangered species, and do prolonged field research in developing countries, which included hiring porters, getting permits, and tackling language barriers.

Location: Wildlife Conservation Society (WCS), Central Highlands, Tanzania

PUBLICATIONS

Crutsinger, G., M. Pickergill, A. Channing, and D. Moyer. 2004. A new species of *Phrynobatrachus* (Anura: Ranidae) from Tanzania. *Journal of African Zoology* 39 (1): 19-23

Crutsinger, G & NJ Sanders. (*Submitted*) Interactions between willows, ant-aphid mutualisms, and shelter-building caterpillars affects arthropod biodiversity. *American Midland Naturalist*

PRESENTATIONS

Gregory Crutsinger, Matthew Fitzpatrick, Martin Nuñez, Christopher Oswalt, Jill Stephens, Nathan Sanders, Phil Allen and Jake Weltzin. 2004. **Top-down and bottom-up controls of invasion by *Lespedeza cuneata***. Southern Appalachian Man and the Biosphere Conference in Gatlinburg, TN, November 17th, 2004