

Although my academic career is a bit ‘nontraditional,’ I’ve acquired a strong background in scientific research. Over the past three years I have been nearly continuously involved in various research activities, through professional employment, citizen science projects, undergraduate and graduate level research, and even through a bit of volunteer consulting work. My level of involvement has ranged from being a volunteer field assistant helping with mundane tasks to being the lead student researcher planning, analyzing and presenting laboratory research. Many of these projects involved a substantial amount of collaboration, both with other researchers and with students and the general public. Through experience in laboratory, museum, and diverse field environments these opportunities have given me a thorough grounding in research techniques, and prepared me for a life of research and public outreach.

Within three weeks of starting my studies at the Ohio State University, I successfully obtained a position as a field assistant for Meghan Rector, a graduate student studying cave ecology. That winter, 2009, I spent time in the field for a mark-recapture survey of the cave orb weaver spider, *Meta ovalis*. The project had two goals- 1) investigate the dispersal, reproduction, and population dynamics of the spiders, and 2) involve local high school students in the research process. My duties included crawling around caves in Northeast Kentucky to capture and mark spiders, and assisting the high school students as they completed independent research projects. Although I was only a field assistant, the job gave me valuable experience collecting field data and interpreting the scientific process for local students.

In summer 2009, I worked as a biological science technician at the US Geological Survey’s Patuxent Wildlife Research Center in Maryland. I worked on two main projects- the Bird Point Count Database and the National Marsh Bird Monitoring Program- as well as several side projects through the Breeding Bird Atlas Program. This included fieldwork in Delaware and Virginia to monitor population trends of breeding birds. I also independently participated in the Colorado Breeding Bird Atlas and a local BioBlitz, as well as the North American Amphibian Monitoring Program. But my primary job was to help develop and implement bird survey protocols, and use GIS programs to create maps with collated data. I gained a working knowledge of several programming languages, learned the basics of large scale data management, participated in several citizen science projects, and got to work alongside well known ornithologists, all while contributing to local and national conservation. The work also involved communication with biologists in the field across the US, giving me my first real experience discussing results with scientists and working in long distance collaborations.

Perhaps my most significant research experience was as an undergraduate researcher at the university. There I worked in the ant lab of Joe Raczkowski and Steve Rissing from June 2009 to graduation in December 2010, researching colony founding tactics and early colony growth in the introduced pavement ant, *Tetramorium caespitum*. *T. caespitum* is an important component of most urban ecosystems in the Eastern US, and our research aimed to understand the urban ecology of this region by studying the evolution and natural history of this species. The species is not native to the US, and life history studies also have potential use in any future eradication efforts. Initially I worked as a field and lab assistant, collecting females on their

mating flights and caring for live colonies in the lab. Later I was the lead student researcher on a project investigating the roles of colony foundation tactics and early colony growth in intraspecific competition. I helped design and carry out experiments, analyzed data, and then presented the results at two competitive campus research forums. Finally, I helped write the resulting manuscript. This year and a half long experience introduced me to working with ants, taught me the basics of ant reproduction, and gave me leadership experience in an academic setting. I worked through the entire scientific process, from hypothesis generation to manuscript writing, and my proposed graduate work builds naturally upon this project.

Although I wouldn't count my time traveling in North America in 2008 or in New Zealand, Australia, Asia and Africa in 2011 as scientific research, it did provide me with strong background knowledge in geography, ecology, conservation, and their links to social issues, that will undoubtedly come in useful throughout my career as a biologist and conservationist. However, while in Borneo I did some volunteer work for the Orangutan Tropical Peatland Research Project, an international primate research and conservation collaboration. The lead researchers invited me to join them in Sebangau National Park, the largest area of lowland rainforest remaining in Borneo, in order to help establish an ant-based biomonitoring program to be used by local community members. Duties involved field collection and identification of ants, proposing improvements to collecting techniques, and teaching the basics of ant identification. Working alongside European, Canadian, American, and Indonesian researchers, and local community members, I learned valuable lessons about international collaborations, community involvement, and the challenges of conservation in a developing nation.

After beginning my graduate studies at the University of Oklahoma, I've continued to be actively involved in research and outreach. Working as a graduate research assistant for Mike Kaspari's ant lab, I've gained practical experience working in both a laboratory setting and with curated specimens, and started my own independent research investigating flight morphology of ant queens from Panama. I've also participated in several outreach events, such as the Oklahoma Academy of Science annual field meeting and the Oklahoma Biological Survey's BioBlitz at the Chickasaw National Recreation Area, where I worked with the public and undergraduate students to explore and document local biodiversity. All of these experiences place me in a position to successfully pursue research and contribute to further conservation efforts.

Presentations

- Helms, J., J. Zola, H. Salhi, J. Raczkowski. Intraspecific Competition in Pavement Ants. The Ohio State University Biological, Mathematical and Physical Sciences Research Forum, Columbus, OH, April 2010.
- Helms, J., J. Zola, H. Salhi, J. Raczkowski. Intraspecific Competition in Pavement Ants. The Ohio State University Denman Undergraduate Research Forum, May 2010.

Manuscripts in Draft

- Raczkowski, J., J. Stadiem, J. Helms. Colony foundation and intraspecific competition in the introduced pavement ant (*Tetramorium caespitum*).