My undergraduate training in biology and previous research experience has been broad, spanning subjects from evolutionary biology to community ecology. I am generally interested in evolutionary ecology and conservation of freshwaters, and my previous research experience reflects this interest. My ultimate goal is to someday teach in this exciting area of science.

Evolutionary Biology: *Undergraduate Research in the Baskin Lab*

As an undergraduate at Cal Poly Pomona, I worked in the lab of an esteemed ichthyologist, Dr. Jonathan Baskin. Dr. Baskin exposed me to the fields of evolutionary biology and systematics, and instilled in me a sense of excitement and discovery about this important work. I worked closely with Dr. Baskin on the histology and morphology of the digestive tracts of catfishes from the family Trichomycteridae. Specifically, we compared how different feeding behaviors, within the family, play a role in the coiling and composition of tissue layers of the digestive tract (Baskin et al. in prep). This study opened my eyes to the importance of ecology (e.g., feeding behavior) as a driving force of evolution (e.g., digestive tract morphology). As part of this study, I was introduced to several standard scientific methods (e.g., use of a rotary microtome, histological slide preparation, use of microscope imaging software). Additionally, I was introduced to the importance of mentoring in science, both as a mentee of Dr. Baskin and as a mentor to a high school student, Brian Diep. I worked closely with Brian as part of the Research Training Program for High School Students with the Southern California Academy of Sciences. I mentored Brian by teaching him many of the skills that I had learned from Dr. Baskin, as well as the particulars of scientific design. I found this experience hugely rewarding and plan to incorporate undergraduate students at Berkeley into all aspects of my research.

While in the Baskin Lab, I also worked closely with a graduate student, Carla Stout, on her study of nudibranchs. Here, I was exposed to standard molecular ecology techniques (e.g., DNA extractions, PCR) and, thus, to the common tools used to study contemporary evolution.

Conservation Biology: *Environmental Consulting with San Marino Environmental Associates*

After graduating, I worked as an environmental consultant with San Marino Environmental Associates. This experience exposed me to on-the-ground conservation. For example, I assisted with a study of the endangered Santa Ana sucker in the Santa Ana River, California. We were interested in determining spatial variation in population size, which forced me to contemplate the impacts of habitat change and habitat loss to spatial variation in abundance of this endangered fish. I learned a number of standard methods employed to sample stream fishes (e.g., electroshocking) as well as methods for estimating population size (e.g., 3-pass depletion). We also quantified habitat at multiple sites across years to determine interannual variation in substrate composition and flow rates at each of the sites, with the intention of correlating changes in the habitat to changes in the abundance of Santa Ana suckers. These data are currently being used to construct a viable restoration plan for the endangered Santa Ana sucker.

I also participated in a long-term study examining clinal variation in the ratio of armored to unarmored (an endangered subspecies) forms of the three-spined stickleback in the Santa Clara River. The main objective of the study was to compare our data with those of a similar study conducted in the same river by Dr. Michael Bell in 1978. Specifically, we collected stickleback with seine nets and measured each individuals' body length, length of the first dorsal spine, as well as the number of armored plates possessed by individual stickleback. Ongoing work comparing the two data sets will provide some indication of whether the habitat of the endangered (unarmored) form has changed since Dr. Bell's study in the late 1970s. This experience provided an invaluable opportunity to work with federally endangered species, and

reaffirmed my decision to pursue graduate research related to the conservation of California's native fishes.

Biogeography: *2007 Expedition to Guyana*

In November 2007, I participated in a month-long scientific expedition to Guyana. The expedition was co-led by Dr. Jonathan Baskin and Lesley de Souza, a Ph.D. student from Auburn University. A major aim of the study was to determine whether gene flow existed between the Essequibo and Amazon River basins via the Rupununi Portal, a network of tributaries connecting the two river basins. Since the expedition was funded partly by the All Catfish Species Inventory, an additional aim of the expedition was to catalogue species of catfishes and other "bycatch" fishes in the region. Furthermore, there are plans to publish a complete identification manual of fishes in Guyana using specimens collected during our expedition and specimens from previous expeditions to Guyana led by Lesley de Souza. In addition to the extensive amount of seining, I was able to participate in obtaining tissue samples in the field, since much of the study is based on molecular evidence. During the expedition, we worked very closely with the Amerindian people of the Rupununi region, the Macushi, who were instrumental in helping us determine the best fishing localities. Participation in the expedition was a tremendously enriching experience, since I was able to learn a great deal about the fishes in the region and it also gave me the opportunity to experience firsthand the amount of effort and resources required to carry out a month-long expedition.

Community Ecology: *Research Assistant in the Carlson Lab*

The summer prior to commencing graduate studies, I worked as a research assistant in the lab of Dr. Stephanie Carlson at U.C. Berkeley (now my major professor). I worked closely with Dr. Carlson and Dr. Jonathan Moore, a freshwater ecologist at U.C. Santa Cruz. Drs. Carlson and Moore aim to determine the effects of interaction between populations of the invasive signal crayfish and native steelhead trout in Scott Creek, a small coastal California stream. The study involved a manipulation of crayfish and steelhead densities in 16 isolated pools, and represented my first exposure to experimental field ecology. I learned a variety of techniques including gastric lavage (to sample stomach contents from fish for diet analysis), marking of individual fish using PIT tags, and sampling tissues for analyses of the stable isotopes of carbon and nitrogen. Moreover, I was exposed to standard methods in stream ecology including methods for estimating ecosystem processes (e.g., leaf litter bags to measure rates of leaf litter decomposition) as well as methods to determine bottom-up and top-down controls on primary production in streams (by measuring algal growth on elevated [grazers excluded] tiles versus tiles placed directly on the stream bed). This experience exposed me to a variety of techniques and methods that are directly related to my proposed research. Moreover, spending a significant amount of time in the field with Dr. Carlson (an evolutionary ecologist) and Dr. Moore (a community ecologist) resulted in many thought-provoking conversations that further excited my interest in understanding the eco-evolutionary dynamics of wild populations.

In summary, my educational background in the biological sciences, my previous research experience covering a range of topics in evolutionary biology and ecology, and my long-standing interest in conservation biology make me a strong candidate for the NSF GRF and for success in my graduate studies.