

Personal, Background, and Future Goals Statement

Background, Educational and Professional Goals and Plans

When I was growing up, it was normal to have fruit flies trying to dive into my food, cockroaches crawling all over the silverware, and dog feces scattered throughout the house. For as long as I can remember, I slept on a giant pile of clothes or on the couch, a flurry of men coming in and out of our house to visit my mom late at night. I concealed the feelings that I had toward this dysfunctionality, and eventually my emotions manifested into crippling anxiety. I was allowed to homeschool in high school because it was apparent that this approach was the only way that I was going to graduate. My anxiety was so severe that I could not even convince myself to walk into a market without a full-fledged panic attack. Something eventually clicked with me when I was in my last year of high school. I remember sitting in the backyard of our mobile home and a thought surfaced. I knew how I was going to escape this lifestyle: Education. I beelined for the library, grabbed a pile of books, and nothing about my life was ever the same. Everything that I read at the time was exciting, both for the content itself and the prospect of building the kind of life that I wanted. The high school teacher who homeschooled me recognized this shift. I went from barely passing to graduating with a 4.0 GPA, even taking a few classes at Brigham Young University to get ahead of the game. **I grew up to be who I am today because of making a choice to say no to inheriting a life of self-destruction. I had to begin to believe in myself and all that the future held.**

My goal is to **defend my M.S. thesis** in the Spring, 2024 at the University of Illinois at Chicago (UIC) before transitioning into the PhD program to obtain a PhD in Ecology. I plan to **continue teaching and being engaged in research** each semester at UIC, and earn a **certificate** in the Foundations of College Instruction at UIC in the Spring, 2024. **A PhD in Ecology would allow me to become a university professor, doing what I enjoy most: teaching and researching.**

Intellectual Merit

Curiosity is typically what pulls someone into the scientific field and what keeps them there. Since I was an undergraduate, at every conference, seminar, course, and lecture that I attend, I have a notebook and am jotting down notes and questions. **I follow up on my notes by regularly diving into the literature to see what is known and unknown in the field.** But why am I particularly attracted to Ecology? Being a California native, I grew up being exposed to countless hikes. On these hikes I learned about the interconnectivity of ecosystems and the unique features, behaviors, and/or patterns of the biotic and abiotic that make up those ecosystems. I would get on my hands and knees, closely looking at the plants and animals around me.

We advance knowledge in Ecology by moving the boundaries of what we know, **which only begins with having the right tools at our disposal and the knowledge of how to use them.** If we do not have the tools, we have to find a way to acquire and utilize them. One day, my PI summoned me into his office and asked me if I would be interested in seeing if a luxury effect exists in Chicago. A luxury effect is an observed positive relationship between biodiversity and affluence (such as income). I agreed to look into it, and after leaving his office, he emailed me links to databases and that was it. Neither him nor my lab colleagues knew how to code or use GIS, something I learned that I needed to know to sort through all of

the data and carry out the project. I enrolled myself in crash courses, purchased paperback books, and most importantly, consistently practiced what I was learning in my books and online courses. I also sought out help from those that knew how to code. The experience of going through coding and GIS bootcamp made me realize that Ecology cannot advance forward without seeking out and taking advantage of new technology and methods. There needs to be a marriage between old methods and new ones. Equally important is that Ecology requires us to continually learn. It was good for me to know how to work with data, since before then I was only familiar with field work. Further, **I gained the ability to code, perform statistical analyses, and model in both in R and in Python.** I chose to make the luxury effect the center of my graduate thesis, with a particular interest in tree biodiversity. **I found a significant correlation between tree biodiversity and per capita income. However, the direction of this correlation was opposite of what we would expect to see if a luxury effect existed.** In Chicago, tree biodiversity is higher in areas with lower per capita income. **I am presenting these findings at the American Geophysical Union (AGU), an organization dedicated to Earth and space science, and presented this work at Argonne National Laboratory.** Simultaneously, I helped a colleague with her project and we worked as a team. This project focused on the relationship between leaf traits and the environment, and one leaf trait that was of particular interest was the stoma due to its ability to take in CO₂ and release water through transpiration. Using a compound microscope, I learned how to identify and count stomata and calculate stomatal density and stomatal aperture. The experience allowed me to be further exposed to the microscopic world, since **I was previously hired as an intern in an organic chemistry lab for 3 years at my prior college.** At that job, one of my tasks was drawing out the steps for synthesizing a certain compound and then carrying out the synthesis. Equally important was my **exposure to stable isotope signatures, the language of stable isotopes, and learning how to operate the mass spectrometer in our lab.** My aspiration to become a STEM university professor and researcher began in 2014, toward the end of my first year in college. I have fought all odds to continue seeking out my dream, including unexpectedly becoming a **single mother**, renting 8 rooms over the course of my time in college, and having to temporarily move back in with my mom after having my son to finish college. It was not until Summer, 2023 that I was able to gather enough money with a supplemental teaching position at UIC and move out. In the Spring, 2023 my toxic home environment forced me to withdraw from two coding classes at UIC. However, as is evident in my accomplishments during graduate school, I did not let my home life undermine the opportunity to learn how to code. I taught myself and continued to work with those coding instructors, including Gabriela Nunez-Mir, one of my committee members and a reference letter writer for the NSF GRFP. **A testimony of the dedication I have toward my studies is that I graduated from Arizona State University with my bachelors in biological sciences Summa Cum Laude as a single mother living with my mother at home, parenting during the day and staying up the majority of the night to work on homework and study.**

Broader Impacts

I noticed early on in college that I would hastily draw a divide between me and scientists. I wanted to be involved in science, but I convinced myself long ago that I was not smart enough to be in science. I discovered that I lacked the skill sets and confidence to do well in the field, and that **my biggest obstacle was not the science itself, but me.** I faced my deep-rooted insecurities and recreated the narrative I told myself. **I strive to cultivate the same confidence in other women and others largely underrepresented in STEM, including but not limited to ethnic minorities, those with a disability,**

immigrants, and those who have generally convinced themselves that they do not have what it takes to be in STEM. An individual gains confidence in their work and in themselves by having a positive experience in the classroom. **I can help to build a more diverse network in STEM by creating a classroom that embraces this diversity.** Instructors play a critical role in either convincing a student that they can succeed, or convincing them that they cannot do it. Every semester, my students come up to me to thank me for my efforts and claim that I am the best TA that they have had for a class. **I believe this is because I make it a point to remember the struggles and fears that I had as a student,** even if it has been years since I graduated from college. Central to my teaching approach, too, is that **I came into college as an untraditional student.** I was homeschooled and painfully introverted. My homeschooling curriculum had material in it just sufficient enough that I could pass school. Because of my withdrawn personality and the nature of my homeschooling program, I learned to seek out information on my own. In all transparency, I also had no interest or formal exposure to science before starting college. I sent shock waves through my family when I took a complete 360 degree turn in college and changed my outlook toward STEM and broke that pattern of crippling shyness. **I went from being agonizingly socially withdrawn to being in the academic spotlight as a teacher.** I am close to getting a certificate in the foundations of college instruction at the University of Illinois at Chicago. **I am a TA for 4 classes each semester, both for teaching experience and to support my 4 year old son.** My experiences have allowed me to know how to create an atmosphere that embraces diversity and structures our time together accordingly. An older, returning student that I tutored highlights the importance of a teacher making a good connection with students and reflecting patience and kindness. We routinely met throughout the semester for private tutoring sessions. Ashley, I have no idea what I am doing. Where do I start? She would admit to me. We broke problems down step by step and would only proceed onto new material once the old material was understood. By the end of our time together, she passed the class and went onto pursue a higher-level math class. The last time that I saw her, she was all smiles at the university tutoring center helping *other* students with their math homework. I have also been able to mentor interested undergraduates or point them in the direction of getting involved in research. Currently, I have one first-generation African American student and a high school senior, both helping me with my M.S. thesis project. **I have taught them how to use GIS, R and Python.** They will also get the opportunity to present a poster at AGU because of the skills they have acquired. I recall the difficulty that I had in trying to get research experience as an undergraduate. Because of that painful undertaking, I am observant in the classes that I teach in the sense that I tune in whenever I hear a student talk about what field they hope to go into one day and pay close attention to students who show an interest in STEM. I have successfully recommended two of my students and they are now active in research. I encouraged two of my other students to get involved in a STEM society, which they are now a part of and enjoying.

I hope to continue being engaged with those largely underrepresented in STEM, in both research and in the classroom as a teacher. I went from being a practically parentless, poverty-struck child, to a student who shattered every belief that I had about myself and my abilities in STEM, to struggling as a single mother, to being an aspiring scientist and professor with a PhD. I am eager to continue being a trailblazer.