

Introduction: My mother was determined to give her kids the best possible life when she moved from the U.S. Virgin Islands to Florida, but when she enrolled me in public school, the administration heard her broken English and decided to place me in a slower-paced educational program. They assumed I would be an underperforming student because of my background. After continued encounters with covert racism, my mother vowed to find me the best education she could, but private school was far outside the budget of a single mom of three children. Determined, she applied for scholarship after scholarship to fund my education until we received one. When I entered this private school, I noticed that there were no Black or Latinx teachers, and very few students were racial or ethnic minorities like myself. There were so many career paths I felt excluded from because I was Afro-Latino; I have realized that being educated in a privatized system that fails to provide minorities with proper representation can stunt professional growth. This inspired me to create initiatives that allow underrepresented students to fully engage with academic spaces and connect their identity to their work.

In high school, I heard the term “climate change” for the first time in an environmental science class. I was shocked to learn of the various ways that human activity has been detrimental to the environment on a global scale and began asking questions about how humans influence ecosystem dynamics, particularly in urban settings. With my growing interest in how humans interact with the environment, I entered Florida State University (FSU) as an environmental engineering major — a good compromise between what my family thought was a respected career (Engineering) and my own interests in the environment. Through the combination of major and general coursework, **I realized that studying the interface between urban and behavioral ecology was my true passion.**

After establishing this passion for ecology, I was driven to become the representation I never saw in academic fields. I intentionally sought out research positions where I gained valuable experience to prepare for graduate school and become an independent researcher and mentor. Mentorships and collaboration were integral to my early research experiences. **These experiences solidified my desire to become a cross-disciplinary researcher, science communicator, and educator who fosters inclusivity and representation** of scientists from all backgrounds. As a researcher, I combine my passion for advocating for marginalized voices with my interdisciplinary interests in science.

Intellectual Merit: My first opportunity for hands-on ecology research was a technician position assisting then Ph.D. candidate Jessica Cusick. I processed data associated with investigating variation in cooperative behavior in brown-headed nuthatches and analyzed videos of complex parental care and fledging behavior of wild birds to assess how a juvenile’s behavior affected dispersal and future cooperation. While working with Dr. Cusick, I developed behavioral assessment and database management skills and learned the importance of constructing a clear hypothesis-driven framework for developing research questions. This research allowed me to apply my understanding of important biological concepts for the first time to understand how an individual’s natal environment and body condition can influence adult phenotype.

I was eager to learn more about how an individual’s phenotype could be shaped by its surrounding environment and learn more about the different approaches a researcher could take to answer these questions. To explore this further, I joined Dr. Don Levitan’s lab, a prominent marine ecologist. I assisted a study on the mechanisms that shape mating system evolution in sea squirts by using components of population genetics. We used microsatellites to calculate the relatedness among colonies and understand the force shaping genetic variation within the population. Through this research experience, an interest sparked in analyzing tissue samples to understand the ecological and evolutionary mechanisms shaping the phenotypes within urban populations.

Desiring to understand more about how proximate and ultimate mechanisms can shape an individual’s phenotype, I became a field technician for Dr. Ben Dantzer at the Kluane Red Squirrel Project, a renowned longitudinal study in Canada. During my time here, I began to see myself, not as a student, but as a scientist and a team leader. As a core member of this project, I worked in harsh conditions to track and handle red squirrels and independently managed a 40-hectare research grid in the boreal forest. Due to changes in food availability during the field season, female squirrels changed their nesting behavior and avoided traps, making critical trapping and data collection difficult. **I designed a novel trapping method**

using telemetry to locate individuals and trap them based on real-time movement and location, rather than setting traps in the squirrel's territory where they may no longer be. My method was integral to the success of our field season, as we successfully collected the nest and behavioral data we needed. This project developed my understanding of how individuals adapt to altered environmental conditions by changing their reproductive efforts, movement, and physiology. I learned the value of adjusting study methods to suit the study species and gained experience in creatively designing new field techniques.

Upon returning to FSU, I wanted to pursue my fascination with behavior and physiology while learning how to review and analyze current literature. I **joined an interdepartmental reading group** focused on behavioral ecology led by Dr. Emily DuVal where I critically evaluated scientific papers, developing a nuanced understanding of ecology across subfields. This gave me an appreciation for the importance of diversity in both ecological systems and scientific perspectives. I combined my existing skills and knowledge with these critical thinking skills and interdisciplinary approaches to design and conduct an independent project evaluating the impact of urbanization on invertebrates (supervised by Dr. Don Levitan). **My independent research** investigated the influence of microplastics on fertilization success and sperm availability in purple sea urchins by testing how urchins performed under environmental stressors and anthropogenic pollutants. I found that microplastics significantly decreased fertilization success, but low fertilization could not be explained by sperm depletion. This project exposed me to all the facets of research: developing scientific questions, finding the methods to answer them, and practicing effective scientific communication. I presented these results at the 2020 Ecological Society of America's (ESA) Conference and at Princeton's Ecology and Evolutionary Biology Scholars Program. **I am writing up results in a first-authored manuscript to be submitted to *Global Change Biology*.**

Each position has provided me with the conceptual framework and tools to address fundamental and interesting questions in ecology. To further develop and apply these skills, I accepted a technician position at Hastings Natural History Reservation, an interdisciplinary biological research station. Here, I am collecting behavioral data for a long-term study of acorn woodpeckers and conducting an independent study in collaboration with Dr. Eric Walters and his research group. I am using the long-term data to investigate how the breeding season shapes social networks and collaborating with two Ph.D. students to understand the response of acorn woodpeckers to major disturbance events, **with the ultimate goal of publishing my work.** At Hastings, I have continued to hone my skills in experimental design, writing, and preparing work for publication as I continue to develop my understanding of how individuals respond to changes in the environment around them. Additionally, I am refining my proficiency in data management and R-coding by conducting social network analyses. These skills will be critical to my success in graduate school, preparing me to analyze complex datasets that will be a part of my dissertation research.

Broader Impacts: Inclusion begins with creating equal opportunities for everyone, ensuring STEM education is accessible to all and committing to anti-racism. As an Afro-Latino scientist, working toward inclusion has become the focal point of my career. It is vital to build a support network for the next generation of ecologists, particularly those from historically excluded groups, to retain these researchers. It is for this reason that **I am passionate about excelling in a role where I can serve as a mentor, create supportive spaces to learn, be a role model, and create effective educational tools.**

My undergraduate career at FSU solidified my desire to become a mentor, educator, and science communicator to diversify ecology. I actively worked to integrate environmental education and mentorship into the positions I held. I created green programs such as "SustainabiliTEA" that gathered participants to discuss carbon footprints, recycling, and steps to take towards conservation. I also **co-founded the SEEDS (Strategies for Ecology Education, Diversity, and Sustainability) Chapter of ESA** that focuses on increasing diversity within ecology. Through SEEDS, I organized educational opportunities including speakers, field trips, and panels based on the needs of the student body. I created a **mentor system within SEEDS that paired interested undergraduates with an ESA mentor to provide guidance and support with their endeavors in Biology.** I also **mentored an undergraduate student by providing feedback on her research applications, connecting her with a graduate mentor for research, and supporting her career path in ecology.** I learned through this process that to be an effective mentor, you must adjust to

the needs of your mentee and allow them to forge their own path in ecology. During my time as President, SEEDS grew from four chair members to a student body of twenty-five, with eighteen coming from underrepresented backgrounds, and we connected four individuals with research opportunities.

I am committed to advancing STEM towards a more diverse, inclusive, and equitable space for all. At the University of Washington, I will work with aspiring young ecologists and build up the next generation of scientists by paying the investments made in me forward. With the support of the GRFP, I will devote my efforts to secure financial resources to support ecologists from marginalized groups and hire them to aid in data collection. Further, I will encourage new researchers to pursue independent projects. Ecology loses many bright minds and potential mentors by retaining unpaid/low-paying positions and limiting participation in these research opportunities to those that can independently finance themselves. To move the field of ecology forward, we must continue to ask (1) who the positions we create are for and, (2) when we publish scientific articles in peer-reviewed journals, what is the audience we have in mind? I aim to make this knowledge accessible to non-scientists via online media in addition to publishing in peer-reviewed journals to ensure we are not missing our largest audiences, K–12 and early college students.

My dedication to reaching non-scientists and making research accessible for all has led me to join the *Life in the City: Evolution in an Urbanizing World* blog as a contributor where **I translate complex research papers in urban evolution into digestible concepts for a lay audience.** I am also currently working with a first-grade teacher in Chattanooga, TN to develop a learning activity that links outdoor education to the classroom to spark interest in ecology for young children. For example, we have created a lesson that breaks down birdwatching into a math, writing, and reading assignment. As an NSF GRFP Fellow, I will continue to develop appropriate educational tools based on classroom needs.

Future Plans: While pursuing a career in ecological research, I will make it my cornerstone to leave the field of ecology better than how I found it. I will support young, underrepresented scientists and assure them they are needed and supported in this field. As **an Afro-Latino first-generation scientist**, I recognize the need to be proactive in order to increase representation. I will continue working towards total inclusion while focusing on networking, outreach, and research to advance the discipline of ecology.

Dr. Christopher Schell, a prominent behavioral and urban ecologist at the University of Washington, is the ideal mentor for me to continue working towards my goals to diversify ecology and investigate how wildlife are adapting to urban spaces. The Schell lab focuses on actively integrating community members into data collection to further engage the public in research and inspire the next generation of scientists. Moreover, his lab will expose me to interdisciplinary research approaches to answer fundamental questions in urban ecology. Dr. Schell and I have already discussed joining his lab, my fit for the program, and my dissertation investigating the effect of urbanization on the physiology of coyotes within his current system. I am confident that with Dr. Schell, I will be equipped to become an independent researcher, bridge the gap between STEM and underrepresented communities, and develop effective methods of outreach to ensure no one is excluded based on financial or racial disparity.

To be an effective researcher, educator, and science communicator, **I will (1) work with individuals across disciplines** (i.e., ecologists and sociologists) to address the interactions of wildlife within urban environments; **(2) incorporate community science** to engage the public in meaningful scholarship, focusing on youth, and serve as a resource for wildlife managers; and **(3) develop outreach programs with K–12 educators and researchers** to enable and encourage underrepresented groups to pursue their interests in the natural world. **I aspire to become a conservation research scientist who influences policy while working with local educators in schools where STEM is underfunded to bring relevant science education into their classrooms.** As a graduate student, I will use an integrative approach that combines behavioral observations and physiological assays to investigate how wildlife adapt to the stress of urban environments and how this may change along a socioeconomic gradient.

When I reflect on my goals, I am reminded of my mother who fought hard to ensure I had access to the education I rightfully deserved and that the playing field was even. Like my mother, I will continue to advocate for historically excluded voices and ensure that those who want a place in ecology have the support and resources needed to attain their goal regardless of status or background.