

I have been captivated with urban ecology since learning about the detrimental impacts humans and cities can have on the environment in high school. Since then, I have sought to gain skills in fields relevant to urban ecology (e.g., behavioral ecology, movement ecology) to learn how to provide actionable science that motivates conservation policies for wildlife directly impacted by human behavior. My interest in studying the underpinnings of urban ecology has led me to pursue a Ph.D. in Environmental Science, Policy and Management at the University of California, Berkeley.

I am applying to the Environmental Science, Policy, and Management (ESPM) doctoral program at the University of California, Berkeley, to work in Dr. Christopher Schell's lab. The ESPM doctoral program will provide me with the expertise needed to integrate relevant disciplines (e.g., sociology) with urban ecology and translate this knowledge into policy and management initiatives relevant to conservation. Further, ESPM's interdisciplinary doctoral training will allow me to advance my understanding of social science (e.g., redlining, socioeconomic status) that is crucial for understanding ecological processes. As a graduate student, I plan to (1) collaborate with individuals across disciplines (i.e., wildlife managers, ecologists, sociologists) to address how wildlife are adapting to urban spaces, (2) incorporate community science to engage the public in meaningful scholarship and serve as a resource for wildlife managers, and (3) develop community engagement and K-12 educational programs that facilitate hands-on experiences with wildlife ecology and environmental science techniques, especially pre-dominantly low-income and racially minoritized schools in the East Bay.

My position as a research technician at Florida State University (FSU) in Dr. Emily Duval's lab working with the now Dr. Jessica Cusick was the first time I was able to apply my understanding of important biological concepts from course work in a research context. I analyzed videos of complex parental care and fledging behavior in wild brown-headed nuthatches to assess how a juvenile's behavior affected dispersal and future cooperation. I developed behavioral assessment and database management skills and learned the importance of constructing a clear hypothesis-driven framework for research. I then joined Dr. Don Levitan's lab as a research assistant for the next two years, where I assisted in a study investigating the mechanisms that shape mating system evolution in sea squirts. We extracted and analyzed DNA to understand the evolutionary forces shaping genetic variation within a population. This experience piqued my interest in using integrative frameworks combining various scientific methods (i.e., behavioral observations, genomic tools, and physiological assays) to understand the ecological and evolutionary mechanisms shaping the phenotypes.

My interests in integrative biology were further developed as a field technician under the tutelage of Dr. Ben Dantzer with the Kluane Red Squirrel Project (KRSP), a long-term study of North American red squirrels in Canada. In my work with KRSP under the supervision of Dr. Ben Dantzer, I designed a novel trapping method, which used radio telemetry to locate squirrels and trap them based on real-time movement and territoriality. In this observational fieldwork, I learned that individuals could adapt to fluctuating environmental conditions by altering their reproductive efforts, movement, and physiology. Upon returning to FSU, I combined my conceptual knowledge with the skills I gained in the field to design and conduct an independent project assessing anthropogenic impacts on marine invertebrates in the Levitan lab. My research tested the effects of microplastics on fertilization success and sperm availability in purple sea urchins. I found that microplastics significantly lowered fertilization success, but low fertilization could not be explained by sperm depletion. I presented my results at the Ecological Society of America's 2020 Conference and Princeton's EEB Scholars Program. This project solidified my interest in studying human-driven disturbances on biological outcomes in fauna and additionally served as a comprehensive experience where I was responsible for developing scientific questions, implementing the appropriate methodology, and practicing effective scientific communication.

After graduating from FSU, I further pursued research and accepted a full-time research technician position at Hastings Natural History Reservation, a biological research station in California. Currently, I am collaborating with Dr. Eric Walters on his long-term study on acorn woodpeckers investigating how sociality influences fitness. I translated my interest of how environmental pressures shape an organism's behavior and further impact community dynamics into a project assessing the effect of social neighborhoods (i.e., familiarity with neighbors) on survival rate and reproductive success. At Hastings, I have honed my

skills in experimental design, writing manuscripts, data management, and R programming while continuing to develop my understanding of how individuals respond to changes in their environment.

For future research, my goal is to combine the summation of my research experiences and skills to understanding how organisms survive and thrive in urban systems. I am especially interested in urban ecosystems because they provide compelling model systems to address how human-driven disturbances impact organismal biology, lending itself to application, management, and conservation policy. In addition, rapid population growth and intensive urban development are urging us to develop strategies that mitigate habitat loss and human-wildlife conflict. Within urban ecosystems, novel disturbances (e.g., noise pollution), which can vary within and among cities, create stressful environments for wildlife. These disturbances are shaped by various factors and can have bottom-up effects (Fig. 1). Thus, it will be critical to understand these effects to help managers develop natural areas for urban wildlife. To investigate these complex effects, researchers must use a multidisciplinary approach, incorporating multiple methods (e.g., behavior observations, physiological assays) and perspectives from various disciplines (e.g., urban studies, sociology). I plan to use a transdisciplinary approach to uncover how human-driven impacts on habitat and diet shape a mesocarnivore's ability to cope metabolically with anthropogenic stressors.

Dr. Schell is the ideal advisor for me to continue working towards diversifying ecology and investigating how wildlife are adapting to urban spaces. The Schell lab uses interdisciplinary methods to investigate how socio-ecological drives shape carnivore adaptation to urban environments, making it the perfect fit for my research interests in urban ecology. I am eager to build on top of Dr. Schell's research by investigating how urban stressors vary along an urban-socioeconomic gradient and the consequence of this on the physiology of mesocarnivores (see attached GRFP Research Statement). Additionally, the Schell lab focuses on actively integrating community members into data collection to engage the public in research and inspire the next generation of scientists, which aligns with my passion for making science broadly accessible. I believe that by having overlapping identities with Dr. Schell, I will be well-supported for completing a rigorous degree with the unique challenges I face as an Afro-Latino student pursuing Ecology in a predominately white field. Moreover, I am confident that the Schell lab will equip me with the tools needed to become an independent researcher, make significant contributions to the field of urban ecology, bridge the gap between STEM and underrepresented communities, and develop effective outreach methods.

My career goal is to become a research professor who furthers our knowledge of the impact of urbanization on wildlife and influences conservation policies. Further, I plan to collaborate with local K-12 educators to create and provide commonly unfunded resources and materials in STEM. I strongly believe that the ESPM program at Berkeley is the ideal program to build a strong foundation for attaining my ultimate professional goals. The intellectual diversity within ESPM and adjacent departments (e.g., Integrative Biology) will push me to think creatively about the eco-evolutionary dynamics in urban wildlife. Further, pursuing my interests at Berkeley would surround me in a network of potential collaborators at the forefront of conservation and environmental justice research, such as Drs. Justin Brashares and Dana O'Rourke, which would be pivotal in my development as an urban ecologist who aims to intertwine his work with conservation and environmental justice. Participation in the ESPM doctoral program will allow me to have access to exceptional resources and facilities for building my skills as an urban ecologist (e.g., Museum of Vertebrate Zoology). I am eager to advance my breadth of knowledge and learn from expert faculty members in the fields of environmental justice, conservation biology, behavioral ecology, and urban studies. At Berkeley, I will be trained as a future colleague in ecology, preparing me for my desired career in an academic position. Thank you for your consideration.



Figure 1. Here, I depict the cascading effect of urbanization. Urbanization directly influences habitats which can alter food availability. These factors can vary within cities, changing the phenotypes of urban wildlife (e.g., physiology).