Kimberly A. Rivera CV

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EDUCATION/ CERTIFICATIONS:

Bachelor of Science Degree with Distinction in Environmental Science, University of Delaware May 2016

- Double minor in Wildlife Conservation and Spanish Language
- Concentration in Organismal Biology and Ecology
- **Cumulative GPA:** 3.5
- **GRE:** Verbal (76 percentile), Quantitative (73 percentile), Analytical (82 percentile)
- **Adult and Pediatric First Aid/CPR/AED** American Red Cross January 2018

HONORS:

- **National Science Foundation, Graduate Research Fellowship Program:** Honorable Mention (2018)
- **Senior Thesis:** Analysis of land cover changes and the effects on migratory songbird stopover sites through weather radar systems: *http://udspace.udel.edu/handle/19716/19616*
- **Recipient of Delaware Environmental Institute Scholarship**: granted funding to support environmental research, attended workshops, and present research at final symposium
- **University of Delaware Academic Scholarship** (2012-2016)
- **University of Delaware Dean's List** (2012-2016)

RELATED WORK EXPERIENCE:

Delaware Division of Fish & Wildlife, Smyrna, DE April 2018-August 2018

Supervisor: Audrey DeRose-Wilson

Shorebird Technician & Volunteer Coordinator

- Recruit and manage large team of volunteers for the Migratory Shorebird Project
- Capture, band, weigh, and resight shorebirds with spotting scope and cannons nets
- Data entry, analysis, and preparation of outreach materials and training

Pennsylvania Game Commission, Susquehannock State Forest, PA January 2018-April 2018

Supervisor: Christopher Rosenberry

White-tailed deer biologist aid

- Capture, tag and collar deer (i.e. sex, age, tissue collection, etc.)
- Physically restrain and immobilize deer
- Select, set, and maintain traps (clover and rocket nets) and trap sites
- Conduct telemetry via hiking and 4WD driving; dropping and recovering GPS collars
- Conduct pellet transect surveys
- Conduct flir and spotlight surveys

USGS Wolf and Deer Project, Superior National Forest, MN February 2017-October 2017

Supervisor: Shannon Barber-meyer

White-tailed deer technician (February-March 2017)

- Captured, tagged, and collared white-tailed deer (collapsible clover traps)
- Immobilized and processed deer (i.e. administered drugs (IM and IV), collected measurements, tooth extraction, etc.)
- Selected, set, and maintained traps and trap sites
- Conducted necropsies on deer and wolf carcasses via snowshoeing, hiking and cross-country skiing
- Monitored wolf and deer movements via ground and aerial telemetry

Wolf technician (May 2017-October 2017)

- Captured, tagged, and collared timber wolves using foothold traps; handled non-target species
- Immobilized and processed wolves (i.e. administered drugs (IM and IV), monitored vitals, collected and processed samples (whiskers, hair, and blood), etc.)
- Hiked, canoed, and portaged trap lines across dense forest and wilderness
- Extensive backpacking/canoeing (16 day trips) with heavy gear
- Monitored animals through telemetry, scat collection, howl surveys and necropsies

Clint Epps Lab, Oregon State University, Mojave Desert, CA June 2016-October 2016
Supervisor: Daniella Dekelaita
Bighorn sheep technician

- Established, maintained and monitored camera traps; managed and analyzed camera data
- Monitored and tracked bighorn sheep (using telemetry, GPS, fecal samples, and waterhole counts) through extensive hiking and 4WD driving
- Conducted necropsies and disease analysis; collected observations on sheep mortalities
- Backpacking and vehicle maintenance; collection of animal collars (drops and mortalities)

Aeroecology Research Lab, University of Delaware, Newark, DE June 2015-May 2016
Supervisors: Jeffery Buler & Jaclyn Smolinsky
Aeroecology Research Lab Technician

- Determined patterns of songbird migration for conservation of stopover sites within North Carolina
- Processed, analyzed and managed radar data with R programing; created maps and models in ArcGIS
- Experience updating protocols, writing interim reports, giving presentations and literature reviewing

Plumpton Park Zoo, Rising Sun, MD January 2014-May 2015
Supervisor: Erica Perrin
Zoo Keeper (March 2014-May 2015)

- Experience in husbandry and handling of reptiles, small mammals, and birds; worked closely with larger mammals including bears, wolves, tigers, bobcats, and cougars in varying field conditions
- Assisted in veterinary transport, capture, and administering medication
- Communication skills developed while working closely with the public during animal shows, zoo tours, and volunteer orientations
- Timber wolf training research and program administer

Intern (January 2014-March 2014)

- Cleaned animal enclosures, prepared diets, and maintained enclosures and zoo esthetics

RELATED VOLUNTEER EXPERIENCE:

Gotham Coyote, Bedford, NY November 2016-current
Supervisor: Chris Nagy

- Analyze and enter coyote camera trap data using online tools

Kangaroo Rat Trapping, Mojave National Preserve, CA October 2016
Supervisor: Jason Wallace

- Set Sherman traps with appropriate materials on predetermined trap lines
- Identified and removed captured rodents

Graduate Student Assistance, University of Delaware June 2015-March 2016

- Assisted mist netting and banding wood thrushes
- Telemetry work with white-tailed deer
- Entry of camera trap data for cat conservation in Bangladesh

Phinda Private Game Reserve, North Uthungulu, South Africa June 2014
Supervisor: Axel Hunnciut

- Assisted park monitor with tracking, photographing, updating big 5 (elephant, rhino, buffalo, cheetah, and lion) books, radio telemetry, and cyber-tracking individuals (logging in GPS location and behavior information)
- Assisted in collecting and analyzing data for Nyala and Spotted Hyena researchers using camera traps and transect counts

Nature Educator, DiChiaro's Elementary School, Yonkers NY September 2012-current
Supervisor: Pat Langan

- Conduct guest lectures and activities for grades ranging from pre-K to 5 on the environment and wildlife

Kimberly Rivera Abstract

I am proposing a graduate study examining conflict between rural communities surrounding Andasibe-Mantadia National Park (AMNP) and Euplerids, Madagascar's only native carnivores. I will conduct interviews in communities surrounding AMNP to evaluate perceived depredation threats using methods by Kotschwar Logan et al. and Suryawanshi et al .[1,2] The questionnaire will address what issues participants face in raising livestock. If predatory threats exist at a household, participants will identify the species though photographs of both native and non-native carnivores. To document actual depredation risk, I will use 40 triggered camera traps to survey livestock coops 24 hours a day. Participants will maintain their individual camera trap and keep a record of depredated livestock. Native predators have low to no occurrence in degraded habitats near protected areas[3]. Therefore, *I hypothesize that depredation will more frequently be a result of non-native species.* I will conduct field studies and use historical data sets to jointly evaluate data in a hierarchical modeling framework. I will estimate latent process components while integrating sampling and parameter uncertainties to provide a clear evaluation of predictor variables which may influence perceived and actual depredation. The predictor variables I will measure are: prey availability, abundance and distribution of native and non-native carnivores, habitat structure, and livestock husbandry. To estimate prey availability, I will conduct a mark-recapture study using Sherman, Tomahawk, and pitfall traps[10]. I will also incorporate lemur line-transect surveys collected by the Mad Dog Initiative (MDI). Through my collaboration with MDI, I will have access to historical camera trap data in AMNP to estimate the abundance and distribution of native and non-native carnivores. I will use satellite land cover imagery collected from MDI, The Association Mitsinjo and Google Earth to evaluate relevant habitat metrics into my model. Through interviews with livestock owners, I will gather and characterize data on livestock husbandry. Ultimately, by considering both ecological and societal factors, my model will result in an estimate of the cultural carrying capacity for endangered carnivores in Madagascar, providing useful and practical data on how animals and humans affect one another in this complicated feedback system.

[1]Suryawanshi et. al. 2013. *J. Appl. Ecol.* 50:550-560. [2]Kotschwar Logan et. al. 2015. *Anim. Conserv.* 18:82-91. [3]Farris et al. 2015. *Plos One* 10(9): e0136456. [4]Raxworthy et al. 1994. *Biol. Conserv.* 69: 65-73.

Kimberly Rivera Statement of Interest

Since graduating from the University of Delaware, I have sought out opportunities to enhance my knowledge and skills in the field of biological conservation. To be a part of E^2M^2, would help further my goal of life-long learning. This winter, I will be joining Dr. Cara Brook to co-manage her research on disease transmission and fruit bats in Madagascar. Much of this research is mathematically based and with E^2M^2, I will be better equipped in understanding, analyzing and communicating this research. I have basic-level experience working with programs like R and creating my own models for real life data. During this year long research opportunity working on Cara's program, I would like to both utilize Cara's methods and create my own to answer deeper questions pertaining to disease transmission and fruit bat ecology in Madagascar. With the help of E^2M^2, I can practice the building and application of models to real data. Having experienced and diverse mentors in this clinic to guide me during this learning process is especially important and will help me to view modeling from various scientific perspectives.

E^2M^2 poses a unique opportunity to learn modeling through a variety of mediums: lectures, tutorials and group activities. This breakdown will not only help to improve my own understanding of applied mathematics but improve how I can communicate this skill to others. I am currently proposing a graduate research study with the National Science Foundation that will rely on a mixed model approach. I would like to hone my ability to ask the right questions and integrate the best equations to answer my hypotheses. Beyond modeling, I also believe this clinic is an important opportunity to meet local scientists and better understand how people in Madagascar are working to study biological processes. My graduate proposal is focused on working with rural communities in Madagascar to better understand conflict with Malagasy carnivores. Therefore, making connections and getting to understand the scientific process in Madagascar is important to the success of my project.

On the long-term scale, my goal is to study human-wildlife conflict, especially in developing nations where resources to coexist may not be readily available or known. I aspire to work for organization like the Smithsonian Institute and the World Wildlife Fund who rely on mathematically sound data and scientific transparency for the success of their programs and research. The tools I will gain from E^2M^2, such as software use and statistical modeling application, will build the foundation of my analytical background that will allow me to succeed with such organizations. In addition, I hope to build a rigorous publishing background which will rely heavily on a clear mathematical understanding.

As a scientist and citizen, I hope to improve the understanding of biological science in the wake of growing human development and environmental threats that have negative societal, economical and ecological implications. Machine learning is growing rapidly and understanding modeling on a fundamental level is becoming more and more relevant in today's science and problem-solving. With the ever-improving development of technology, larger and critical data sets will become more accessible. This calls for a linear growth of computer modeling and I aspire to be in the center of this learning process to combat threats that exist to our global community.