

## Risa Raelene Pesapane

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### EDUCATION

Ph.D. Ecology, *in progress*, University of California Davis, 2014 - present  
M.S. Wildlife Science, Virginia Polytechnic Institute and State University, 2011  
B.S. Biology, Virginia Polytechnic Institute and State University, 2007  
B.S. Wildlife Science, Virginia Polytechnic Institute and State University, 2006

### RESEARCH AND PROFESSIONAL EXPERIENCE

#### Board Member

July 2015 to Present

#### One Health Commission

*Educate, promote, and facilitate the practice of One Health*

The OHC is an international organization whose mission is to educate and create networks among One Health students and professionals. I serve as the premier advisor on ecological aspects of One Health and am a conduit between the human-animal realm and the environmental realm, an area often underrepresented in One Health. I'm also the liaison between the Students for One Health association and the Board of the One Health Commission to ensure projects by both groups complement and support our mutual interests.

#### Graduate Student, Graduate Group in Ecology

June 2014 to Present

#### Foley Laboratory of Infectious Disease Ecology, University of California at Davis, Davis CA

*Disease ecology, vector-borne disease, and One Health.*

My research is inspired by the network of direct and indirect interactions between humans and animals in the landscape. I study connectivity, both socially and spatially, among members of ecological communities that might lead to spillover of either infectious diseases or arthropod vectors. Some of my current projects include: 1) studying how rodent community composition influences hantavirus prevalence in partnership with the California Department of Public Health, 2) conservation management of the critically endangered Amargosa vole in partnership with the local community as well as state and federal agencies, 3) spillover of nasal mites among species of marine mammals off the Pacific coast in partnership with the CA Marine Wildlife Veterinary Care and Research Center, and 4) developing a theoretical framework for applying a polycentric approach to governance to improve global biosecurity efforts in partnership with the Director of the Center for Environmental Policy and Behavior at UC Davis. Beyond my research efforts, I also established a captive breeding colony of Amargosa voles at UC Davis, supervise a team of a dozen undergraduates, and manage social media to promote awareness of the Amargosa ecosystem.

#### Project Director, Prescriptive Software Designer, and Blog Manager

September 2012 to May 2014

#### Rural System, Inc., Blacksburg VA

*A company engaging in applied science with a focus on ecological principles and systems approach.*

Rural System is a concept for revolutionizing underutilized rural regions by optimizing how land is used, how the rural network interacts, achieving maximum efficiency by reducing resource waste, and improving logistics. My role was multifaceted in that I participated in project management as well as company development and outreach. Projects required that I establish collaborative relationships, including memorandums of understanding (MOU), with research institutions, state agencies, non-profit organizations, and

local community members. I worked with the company President on federal grant proposals and business plans. Two projects that I lead required the design of novel software applications: the first a prescriptive software tool to interpret soil testing results and the second a social game based on wildlife science.

**Executive Director**

**November 2012 to May 2014**

**The Cabell Brand Center for Global Poverty and Resource Sustainability, Salem VA**

*A non-profit dedicated to improving society by targeting the nexus of poverty, natural resources, and peace.*

The CBC is a water-focused non-profit organization interested in rainwater harvesting, links between socio-economic or socio-political factors and water resources, and supporting students pursuing environmental or political studies. My role in this organization was to reinvigorate a fractured Board, revise the strategic plan, and establish new collaborative relationships with other organizations. I hosted a major event titled "Poverty Today: Challenges and Opportunities" to bring community members, politicians, researchers, and educators together to find novel solutions to combat poverty in the region. This required the management of the organizations social media accounts and public image. Along with Kissito Healthcare International, I worked on the "UGANDA ONE" project involving sustainable development, Mt. Elgon zone reforestation, and clean drinking water in the Mbale. This project involved traveling to a remote region of Uganda with Engineers Without Borders to build biological filters for household water purification. During my tenure as Executive Director, the founder passed away and I helped manage the archiving historical information about the Center and Mr. Brand's scholarship legacy.

**Graduate Researcher, Laboratory Technician and Manager**

**December 2009 to April 2012**

**Wildlife Health Lab, Virginia Tech, Blacksburg VA**

*Disease emergence at the human-wildlife interface, transmission dynamics of zoonotic diseases, water quality and human health.*

My MS thesis was titled "Tracking Pathogen Transmission at the Human-Wildlife Interface: Banded Mongoose (*Mungos mungo*) and *Escherichia coli* as a Model System in Chobe, Botswana." I developed an ecological model using Banded Mongoose as a sentinel species to research the transmission dynamics of microorganisms between humans and wildlife at the interface of a borderless national park protecting numerous endangered species. This research required that I conduct international field work for a total of 7 months in the developing region of Chobe, Botswana; create and evaluate modified laboratory techniques in DNA extraction, bacterial culture and antibiotic susceptibility testing for use in challenging field conditions; and perform capture, handling, immobilization, collaring, and blood collection from wildlife. Skills acquired included molecular techniques such as standard PCR, BOX-PCR, and Multilocus Sequence Type-PCR; proficiency with genetics bioinformatics software such as Arlequin, FPQuest, and Geneious; transect and non-invasive sampling methods; identification of feces from 23 species of wildlife; the culture of *Escherichia coli* and extraction of DNA from numerous animal and environmental sources; and writing grant proposals, IACUC protocols, and standard operating procedures for BSL-2. In addition to my thesis research, I participated in research on *Brucella abortus* (Rose Bengal and FPA testing), *Mycobacterium mungi*, and *Aeromonas salmonicida*. The nature of this work required that I work with international collaborators and be sensitive to cultural differences. I also had oversight of 6 laboratory researchers and field assistants from diverse backgrounds.

**Research Technician, Research and Development**

**August 2009 to December 2009**

**TechLab, Inc., Blacksburg VA**

*Medical corporation that develops, manufactures, and distributes rapid non-invasive intestinal diagnostics for gastrointestinal pathogens.*

I researched and developed rapid bench-top assays for identification of *Clostridium difficile* infection. Skills acquired included enzyme linked immunosorbent assays (ELISAs), DNA extraction, standard PCR, anaerobic bacterial culture, lateral flow tests, and clinical data collection. The Federal Drug Administration monitored this work and my research and notes had to be in compliance with their standards.

**Laboratory Specialist II**

**August 2007 to August 2009**

**Molecular Neuroendocrinology and Genetics Lab, Virginia Tech, Blacksburg VA**

*Role of bHLH transcription factors in hypothalamic gene expression, especially in the regulation of body weight, exercise and motivation using transgenic and knockout mice as model animals.*

My responsibilities in this position mirrored that of a laboratory and colony manager. I conducted genotyping, breeding, and record keeping for 3 strains of BSL-1 knockout and mutant mice as well as purchasing, grant budgeting, IACUC protocols, and safety compliance for the lab. Oversight of the lab also meant supervision of 7 laboratory researchers from diverse backgrounds. Skills acquired included DNA and RNA isolation, standard and real time PCR, primer design, gene sequence analysis, electron mobility shifting assays (EMSA), and cell culture.

**Research Specialist, Field Station**

**May 2006 to August 2007**

**Yerkes National Primate Research Center, Emory University, Lawrenceville GA**

*Center for primate breeding, behavioral research, vaccine development and production of specific-pathogen-free (SPF) animals. Captive population studies for applied international conservation practices as well as insights for cognitive capacity and social behavior of primates.*

My responsibilities in this position were to assist with colony management, obtain blood samples for research purposes, assist with health assessments, and conduct behavioral observations of socially housed primates. The research goal was to use simian immunodeficiency virus (SIV) –positive primates as comparative models for HIV and to maintain breeding colonies free of Herpes simian B virus to supply safer research animals to other facilities. I had oversight of 500 Rhesus macaques (*Macaca mulatta*) and 60 Sooty Mangabeys (*Cercocebus atys*) and developed the ability to individually identify more than 150 by face alone. Skills acquired included venipuncture and Ketamine; blood, tissue, and bone sample collection and processing in a BSL-2 environment; creation of genealogies, dominance hierarchies and cohort life tables; and the capture, handling, and training of captive primates.

**Student Technician**

**August 2004 to August 2005**

**Marcella Kelly's Camera Trapping Lab, Virginia Tech, Blacksburg VA**

*Remote sensing photography for studying the ecology and population dynamics of mammal species, especially large predatory cats as well as ecosystem biodiversity for conservation purposes.*

I set, retrieved, and maintained our remote cameras as well as reviewing the photos.

**Student Technician**

**September 2002 to May 2004**

**Neural Basis of Behavior Lab, Virginia Tech, Blacksburg VA**

*Neuroethology and sensory ecology using knockout mice, *Drosophila*, newts and frogs as model animals.*

I managed the mouse colony and participated in research data collection.

## PEER-REVIEWED PUBLICATIONS

**Pesapane, R**, Ponder, M, Alexander KA (2013). "Tracking Pathogen Transmission at the Human–Wildlife Interface: Banded Mongoose and Escherichia coli." *EcoHealth*: 1-14.

Alexander KA, Blackburn JK, Vandewalle ME, **Pesapane R**, Baipoledi EK, et al. (2012) "Buffalo, Bush Meat, and the Zoonotic Threat of Brucellosis in Botswana." *PLoS ONE* 7:e23842.

(In prep) **Pesapane, R**, Roy, A, Enge, B, Bronson, L, Clifford, DJ, and Foley, JE "Island in the Sun: The absence of Sin Nombre Virus in an isolated Mojave Desert wetland"

(In prep) **Pesapane, R**, Lam, JC, Allan, N, Bellini, N, Roy, A, Clifford, DJ, Foley, JE. "Biology of the Amargosa Vole: A Century in Review"

(Submitted) Imai, DM, **Pesapane, R**, Conroy, C, Alarcon, CN, Allan, N, Fung, J, Foley, JE, Murphy, BG, Verstraete, FJM. "Molar apical elongation in captive *Microtus* voles; disease characteristics, risk factors and management implications for an endangered species (*M. californicus scirpensis*)"

(In prep) **Pesapane, R**, Pinkerton, KE, Arrandale, VH, Pinter, B, Barnes, T, Schlesinger, L, Heederik, D, Martin II, WJ, Goldstein, T, Smith, WA. "One Health: Humans, Animals, and the Environment; Exploring interactions to better understand respiratory disease."

## NON-PEER-REVIEWED PUBLICATIONS

**Pesapane, R**. (2009). Seizures in a colony of genetically obese mice. *Lab Animal* 38(3):81

## AWARDS AND HONORS

National Science Foundation Graduate Research Fellowship Program Award (2015)

National Science Foundation S-STEM Scholar (2010-2012)

Who's Who Among Students in American Universities and Colleges (2011-2012)

Burd Sheldon McGinnes Graduate Fellowship (2011)

Exemplary Interdisciplinary Research of the Year 2011 Award (2011)

2<sup>nd</sup> Place, Oral Presentation, 27<sup>th</sup> Annual Graduate Research Symposium (2011)

Graduate Research Development Program Award (2010)

Phi Sigma Biological Sciences Honor Society, Alpha Psi Chapter (2010-2012)

Gamma Sigma Delta Honor Society of Agriculture (2011)

Iota Delta Rho Interdisciplinary Research Honor Society (2010-2012)

## LEADERSHIP & OUTREACH

Mentor Graduate Academic Achievement and Advocacy Program, UC Davis, Davis CA	2015 to 2016
President, Founding Member Iota Delta Rho Interdisciplinary Research Honor Society, Virginia Tech, Blacksburg VA	2011 to 2012
Program Chair Graduate – Undergraduate Mentoring Program (GUMP), Virginia Tech, Blacksburg VA	2011 to 2012
Committee Member University Strategic Planning 2012-2016 Student Advisory Committee, Virginia Tech, Blacksburg VA	2011 to 2012
Educational Volunteer Center for African Resources: Animals, Communities, And Lands (CARACAL), Botswana non-profit	2010 to 2012

## TEACHING AND PRESENTATION EXPERIENCE

### Graduate Teaching Assistantships:

Principles of Ecology and Evolution, BIS 2B Laboratory Section, UC Davis (2015)  
Structure and Function of Biomolecules, BIS 102, UC Davis (2014)  
Principles of Fisheries and Wildlife Management, FiW 2114, Virginia Tech (2011)  
Wildlife Biology, FiW 2314, Virginia Tech (2011)

### Moderator:

Panel Discussion “Should I Stay or Should I Go? The pros and cons of staying for graduate school at your undergraduate institution.” Tenth Annual Undergrad Research Conference, Virginia Tech (2012)

### Conference Presentations:

The Western Section of The Wildlife Society’s Annual Meeting. “Tecopa North: A captive colony of the endangered Amargosa vole” (2016) Oral presentation.  
Explorit Science Center Lecture Series. “Re-VOLE-utionizing the Mojave Desert: Conservation and Captive Breeding of the endangered Amargosa vole.” (2015) Oral presentation.  
International Conference on Emerging Infectious Disease (ICEID) “Tracking Pathogen Transmission at the Human-Wildlife Interface” Center for Disease Control (2012). Oral presentation.  
American Society for Microbiology, Annual Meeting “Tracking Pathogen Transmission at the Human-Wildlife Interface” Virginia Tech (2011). Oral presentation.  
27<sup>th</sup> Annual Graduate Research Symposium “Tracking Pathogen Transmission at the Human-Wildlife Interface” Virginia Tech (2011). Oral presentation.  
6<sup>th</sup> Annual Undergraduate Research and Prospective Graduate Student Conference “ESA Recovery Plan Review: Biological Predictors of Success” Virginia Tech (2008). Poster presentation.