

MARY BURAK

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EDUCATION

Yale University School of the Environment, <i>Ph.D. Candidate</i> Advisor: Dr. Oswald J. Schmitz	New Haven, CT 2016 – Present
Yale University School of the Environment, <i>M.Phil</i>	New Haven, CT 2018
Providence College Biology, <i>B.A.</i>	Providence, RI 2015

GRANTS

Travel Award (\$750) , MacMillan Center	2020
Travel Award (\$500) , Yale School of the Environment	2020
MacMillan International Dissertation Research Fellowship (\$18,000)	2019
TRI Endowment Fellowship (\$10,000) , Yale Tropical Resources Institute	2017, 2019
Doctoral Dissertation Improvement Grant (\$5,000) , Yale Institute for Biospheric Studies,	2019
Early Career Award (\$9,660) , National Geographic Society	2018
Conservation Grant (\$805) , Greenville Zoo	2018
Research Grant (\$4,000) , Yale Institute for Biospheric Studies	2017
Doctoral Pilot Award (\$2,900) , Yale Institute for Biospheric Studies	2017
Schiff Fund for Wildlife, Habitat, and Environment (\$2,000) , Yale University,	2017
Undergraduate Research Grant (\$500) , Providence College	2014

FELLOWSHIPS & SCHOLARSHIPS

NSF Graduate Research Fellowship (Pre-doctoral) (\$138,000) , National Science Foundation	2016 – 2021
Saint Dominic Scholarship , Providence College	2011 – 2015

PUBLICATIONS

4. **Burak, M.K.**, Monk, J.D., and Schmitz, O.J. 2018. Eco-Evolutionary Dynamics: The Predator-Prey Adaptive Play and the Ecological Theater. *Yale Journal of Biology* 91(4): 481–489. *Invited Manuscript*.
3. Saarman, N., **Burak, M.K.***, Opiro, R., Hyseni, C., Echodu, R., Opiyo, E.A., et al. 2018. Applications of spatial genetics to improve habitat suitability modelling and inform vector control efforts of *Glossina fuscipes fuscipes*. *Ecology & Evolution* 8(11): 5336–5354. doi: [10.1002/ece3.4050](https://doi.org/10.1002/ece3.4050)
2. Richardson, J.L., **Burak, M.K.**, Hernandez, C., Shirvell, J.M., Mariani, C., Carvalho-Pereira, T.S.A., et al. 2017. Using fine-scale spatial genetics of Norway rats to improve control efforts and reduce leptospirosis risk in urban slum environments. *Evolutionary Applications* 10: 323–337. doi: [10.1111/eva.12449](https://doi.org/10.1111/eva.12449)
1. Costa, F., Richardson, J.L., Dion, K., Mariani, C., Pertile, A.C., **Burak, M.K.**, Childs, J.E., Ko, A.I., Caccone, A. 2015. Multiple Paternity in the Norway rat, *Rattus norvegicus*, from Urban Slums in Salvador, Brazil. *Journal of Heredity* 107: 181–186. doi: [10.1093/jhered/esv098](https://doi.org/10.1093/jhered/esv098)

* Indicates shared first-authorship

RESEARCH EXPERIENCE

Yale University – Dissertation Research

NSF Graduate Research Fellow, Ph.D. Candidate

Laikipia County, Kenya

2016 – Present

- I use spatial and genetic techniques to study how human activity affects large carnivore (e.g. lion) movement in a semi-arid savanna ecosystem. I collaborate with local community-based conservation initiatives and social scientists in order to strengthen my research with interdisciplinary perspectives and collaborative practices.

Yale University Center for Genetic Analyses of Biodiversity

Research Assistant for Dr. Gisella Caccone

New Haven, CT

2015 – 2016

- Population and landscape genetics study of the tsetse fly (*G. f. fuscipes*) in northern Uganda in order to inform eradication of this vector of sleeping sickness. Research included: DNA extraction, sequencing, and analysis (microsatellites, mtDNA, ddRAD); landscape resistance modeling to predict tsetse fly movement based on genetic-environmental correlations; large database organization consisting of field data from >8,000 individual tsetse flies.

Providence College Biology Department

Research assistant for Dr. Jonathan Richardson

Providence, RI

2014 – 2015

- Landscape genetics and population genetics analyses of urban rats (*Rattus norvegicus*) in Salvador, Brazil including the development of landscape resistance models to quantify movement in slums. This is part of a larger public health initiative aimed at eradicating this vector of leptospirosis.
- Urban landscape genetics and population ecology study of white-footed mice (*Peromyscus leucopus*) via small mammal trapping and handling, collection and DNA extraction of tissue

The School for Field Studies, Directed Research

Directed Research supervised by John Mwambanga, M.S.

Karatu, Tanzania

2014

- Assessment of the ecological condition of Buger Community Forest, Karatu District, TZ: identification of flora, fauna, and anthropogenic and natural disturbance, community interviews.

Providence College Friar Phage Hunters

Research Student with Dr. Nicanor Austriaco and Dr. Kathleen Corneley

Providence, RI

2011 – 2012

- Research on the behavior and genetic sequence of novel mycobacteriophage JOB42

INVITED TALKS

2018 Spatial-Genetic Approaches to Human-Carnivore Conflict Mitigation in East Africa. **Women in Ecology Webinar**, Saint Mary's College, Notre Dame, IN.

PRESENTATIONS

2020 **Burak, M.K.** Human Effects on the Spatial-Genetic Structure of Lions in Kenya's Ewaso Ecosystem. *Talk. International Savanna Science Network Meeting*, Kruger National Park, Skukuza South Africa.

2020 **Burak, M.K.** Applying Conservation Genetics Towards Human-Carnivore Coexistence. *Poster. Pathways Africa: Human Dimensions of Wildlife Conference*, Limuru, Kenya.

2018 **Burak, M.K.** How Can Humans and Big Animals Live Together? *UpGoer5-Style Flash Talk. Yale Forestry & Environmental Studies Research Conference*, New Haven, CT.

2018 **Burak, M.K.** Human-Carnivore Coexistence in Tanzania: What Wildlife Genetics Can Add to the Management

Perspective. *Talk*. **Yale Tropical Resources Institute Annual Symposium**, New Haven, CT.

- 2017 **Burak, M.K.** Human-Lion Coexistence Landscapes: Intersecting Genetics, Ecology, and Social Science. *Flash Talk*. **Yale Forestry & Environmental Studies Research Conference**, New Haven, CT.
- 2015 **Burak, M.K.**, Richardson, J., Costa, F., and A. Caccone. Using GIS for Landscape Genetics of the Norway rat to improve Public Health Outcomes in Salvador, Brasil. *Poster*. **International Association of Landscape Ecology World Congress**, Portland, OR.
- 2015 **Burak, M.K.**, Richardson, J., Costa, F., and A. Caccone. Using GIS for Landscape Genetics of the Norway rat to improve Public Health Outcomes in Salvador, Brasil. *Poster*. **Sigma Xi: The Scientific Research Society**, Providence College, Providence, RI.
- 2012 **Burak, M.K.** Isolation and Characterization of a Novel Mycobacterial Phage, Job42, and the Annotation of Its Genome. *Poster*. **Celebration of Student Scholarship and Creativity**, Providence College, Providence, RI.

TEACHING EXPERIENCE

Teaching Assistant

Ecological Patterns & Processes, Yale University Fall 2019
Wetlands Ecology: Conservation and Management, Yale University Fall 2018, Fall 2020
Ecosystems and Landscapes, Yale University Fall 2017

Guest Lecturer

Ecological Patterns & Processes, Yale University 2019

MENTORING & OUTREACH

Mentor

EEB Mentor Match 2020 – Present

- EEB Mentor Match is designed to help students in minoritized groups gain admission to, and fellowships for, graduate school in the ecology and evolutionary biology fields.

New Haven Science Fair Judge (Grades K-12) 2018 – Present
Yale School of Environment PhD Peer Mentoring Program 2017 – Present

- Program organizer – 2020

Women in Science at Yale 2016 – Present

- Mentor undergraduates at Yale University through the Women in Science at Yale (WISAY) organization in which we meet monthly to discuss current events within academia and science at large, goal setting, professional trajectories, and related topics

Science Communication

Virtual Classroom Speaker via *Exploring by the Seat of Your Pants* and *Skype a Scientist* 2017 – Present

- Three science communication lectures to date (one can be viewed [here](#)) reaching school children in grades 3 – 12 in Canada and the U.S. including a high school “Girls in Science” club.

LEADERSHIP & PROFESSIONAL SERVICE

Committees:

- Yale School of the Environment, Doctoral Committee 2019 – 2020
- Co-led the formation of an independent Ph.D. committee comprised of 12 students to represent the needs specific to the Ph.D. community
 - Advocated for Ph.D. students' educational, financial, and personal support due to COVID-19 disruptions
- Yale School of the Environment, Student Affairs Committee Member 2016 – 2018
- I was an elected Ph.D. representative for the Academic Affairs board and served as a liaison between the student body and the School of Environment at large. Additionally, I organized monthly Ph.D. student socials and professional skill building events.

Invited Reviewer: *Heredity, Molecular Ecology, Human Dimensions of Wildlife*

Member: Society for Conservation Biology

SKILLS

Research and Technical:

- Field: Experience operating 4x4 manual transmission vehicles, basic mechanical knowledge, animal capture and handling, radio telemetry, GPS, transect surveys, camera trapping
- Laboratory: DNA extraction and sequencing for genomics, conservation genetics, and population genetics projects

Software:

- R, ArcGIS, QGIS

Languages:

- Kiswahili (elementary), Spanish (intermediate)

Certifications:

- First Aid & CPR
- QPR Gatekeeper Training for Suicide Prevention

Workshops & Short Courses:

- Carl Zimmer Graduate Student Science Writing Workshop – 2017
- UCLA La Kretz Workshop in Conservation Genomics – 2017