Maxwell B. Joseph

PhD candidate, Ecology and Evolutionary Biology, CU Boulder

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Education

University of Colorado, Boulder
Ph.D. Fall 2010-present
Advisor: Pieter Johnson
Department of Ecology and Evolutionary Biology
GPA: 4.0

University of California, Davis
B.S. Fall 2004-Spring 2008
Advisors: Louis Botsford and Sharon Lawler
Wildlife, Fish, and Conservation Biology
GPA: 3.5

Research Interests

Causes and consequences of extinctions; relationships between biodiversity and disease; host-symbiont metacommunity dynamics; causal models of species occurrence; occupancy modeling for host-symbiont systems; amphibian declines; wildlife disease management; biotic invasions

Peer-reviewed publications

- **Joseph MB**, Preston DL, Johnson PTJ. *in press.* Integrating occupancy models and structural equation models to understand species occurrence. Ecology.
- Wilkins MR, Shizuka D, **Joseph MB**, Hubbard JK, Safran RJ. 2015. Multimodal signaling in the North American barn swallow: a phenotype network approach. Proceedings of the Royal Society B 282: 20151574.
- Mihaljevic JR, **Joseph MB**, Johnson PTJ. 2015. Using multi-species occupancy models to improve the characterization and understanding of metacommunity structure. Ecology 96(7): 1783–1792.
- Mihaljevic JR, **Joseph MB**, Orlofske SA, Paull SH. 2014. The scaling of host density with richness affects the direction, shape, and detectability of diversity-disease relationships. PLoS ONE 9(5): e97812.

- **Joseph MB**, Mihaljevic JR, Orlofske SA, Paull SH. 2013. Does life history mediate changing disease risk when communities disassemble? Ecology Letters, 16(11): 1405-1412.
- **Joseph MB**, Mihaljevic JR, Arellano AL, Keuneman JG, Preston DL, Cross PC, Johnson PTJ. 2013. Taming wildlife disease: bridging the gap between science and management. Journal of Applied Ecology 50(3): 702-712.
- McMahon TA, Brannelly LA, Chatfield MWH, Johnson PTJ, **Joseph MB**, McKenzie VJ, Richards-Zawacki CL, Venesky MD, Rohr JR. 2012. Chytrid fungus Batrachochytrium dendrobatidis has nonamphibian hosts and releases chemicals that cause pathology in the absence of infection. Proceedings of the National Academy of Sciences of the United States of America 110(1): 210-215.
- **Joseph MB**, Piovia-Scott J, Lawler SP, Pope KL. 2011. Indirect effects of introduced trout on Cascades frogs (Rana cascadae) via shared aquatic prey. Freshwater Biology 56 (5): 828-838.
- **Joseph MB**, Gentles M, Pearse IS. 2011. The parasitoid community of Andricus quercuscalifornicus and its association with gall size, phenology, and location. Biodiversity and Conservation 20 (1): 203-216.
- Karban R, Hodson A, Gruner DS, Lewis EE, Karban J, **Joseph MB**, Mata T, Strong DR. 2011. Lack of susceptibility of soil-inhabiting Platyprepia virginialis caterpillars, a native arctiid, to entomopathogenic nematodes in nature. Entomologia Experimentalis et Applicata 140 (1): 28-34.

Other publications

- Ecology in silico. 2013-present. An R code blog and open lab notebook. mbjoseph.github.io
- Github: mbjoseph. 2012-present. Includes a variety of statistical resources and integrated templates for reproducible research. mbjoseph.github.com
- Joseph MB. 2009. Searching for Pratt. Alpinist 27.

Teaching experience

Fall 2015: TA Biometry, University of Colorado, Boulder

Summer 2015: TA General Biology Lab II, University of Colorado, Boulder

Summer 2015: Curriculum development: Introduction to Quantitative Inference and Thinking, University of Colorado, Boulder

Spring 2015: TA Introduction to Quantitative Inference and Thinking, University of Colorado, Boulder

Spring 2015: TA General Biology Lab II, University of Colorado, Boulder

Fall 2014: TA General Biology Lab I, University of Colorado, Boulder

Summer 2014: TA General Biology Lab II, University of Colorado, Boulder

Spring 2011: TA General Biology Lab II, University of Colorado, Boulder

Fall 2010: TA General Biology Lab I, University of Colorado, Boulder

Awards, Grants, and Fellowships

2015: CIRTL (Center for the Integration of Teaching, Research, and Learning) Network associate, TIGER (Teaching Institute for Graduate Education Research) ROAR (Research on Academic Retention) in statistics, University of Colorado, Boulder

2013: City of Boulder Open Space and Mountain Parks Research Grant

2012-2013: Boulder County Parks and Open Space Small Grants Program

2012: Beverly Sears Graduate Student Grant

2012: USGS Amphibian Specialist Group ARMI Initiative Seed Grant

2012: University of Colorado Museum of Natural History Graduate Research Grant

2011-2014: National Science Foundation Graduate Research Fellowship

2011-2012 University of Colorado Ecology and Evolutionary Biology Graduate Research Grant

2011: Chicago Herpetological Society Graduate Research Grant

2011: American Society of Ichthyologists and Herpetologists Gaige Award

2011: University of California Santa Barbara Valentine Eastern Sierra Reserve Graduate Research Grant

Contributed presentations

- **Joseph MB**. 2015. The theory of disease induced extinction. Guest lecture: Disease Ecology, University of Colorado, Boulder.
- **Joseph MB**. 2015. Empirical and theoretical opportunities in host-symbiont community ecology. Ecological Society of America Annual Meeting, Baltimore, MD.

- Preston DL, **Joseph MB**, Esfahani ER, Pena E, Johnson PTTJ. 2015. Effect of invasive fish on wetland communities: linking field data and mechanistic experiments at multiple scales. Ecological Society of America Annual Meeting, Baltimore, MD.
- **Joseph MB** 2015. Introduction to Fungi. Guest lecture: Biology, a Human Approach 2, University of Colorado, Boulder.
- **Joseph MB**. 2015. Amphibian declines and disease-induced extinctions. Guest lecture: Conservation Biology, University of Colorado, Boulder.
- Basey JM, Francis CD, **Joseph MB**. 2015. The influence of student achievement motivation orientation and study/leisure conflict on self-regulated study during student-centered general biology labs. 26^{th} International Conference on College Teaching and Learning, Ponte Vedra Beach, Florida.
- **Joseph MB**. 2015. Git workshop: better version control. Ecology and Evolutionary Quantitative Think Tank, University of Colorado, Boulder.
- **Joseph MB**, Preston DL, Johnson PTJ. 2015. Integrating occupancy models and structural equation models to better understand community composition. Invited talk: IQBio Quantitative Biology Student Symposum, University of Colorado, Boulder.
- **Joseph MB**. 2015. Criteria for establishing causal links between climate change and disease emergence: a case study with the amphibian chytrid fungus *Batrachochytrium dendrobatidis*. Guest lecture: Infectious Diseases, Environmental Contexts, Colorado School of Public Health.
- **Joseph MB**. 2015. Shrinkage and partial pooling in mixed effects models. CU Ecology and Evolutionary Biology Brown Bag.
- **Joseph MB**, Mihaljevic JR, Johnson PTJ. 2014 Reconciling seemingly divergent effects of diversity on disease: a metacommunity approach. Ecological Society of America Annual Meeting, Sacramento, CA.
- Mihaljevic JR, **Joseph MB**, Johnson PTJ. 2014. Using multi-species occupancy models to improve inference of metacommunity structure. Ecological Society of America Annual Meeting, Sacramento, CA.
- **Joseph MB**, Mihaljevic JR, Johnson PTJ. 2014. Reconciling seemingly divergent effects of diversity on disease: a metacommunity approach. Ecology of Infectious Diseases Meeting, Fort Collins, CO.
- **Joseph MB**. 2014. Tips and tricks for reproducible workflows and research: intro to git, markdown, and make. CU Ecology and Evolutionary Biology Brown Bag.

- **Joseph MB**, Preston DL, Johnson PTJ. 2013. Uniting dynamic occupancy and generalized latent variable models to understand the effects of cattle grazing on amphibian communities. Ecological Society of America Annual Meeting, Minneapolis, MN.
- Mihaljevic JR, **Joseph MB**, Johnson PTJ. 2013. The role of host community abundance-richness relationships in pathogen transmission. Ecological Society of America Annual Meeting, Minneapolis, MN.
- **Joseph MB**. 2013. Habitat use and movement of Northern leopard frogs in Boulder, CO. Boulder County Parks and Open Space Advisory Committee Meeting.
- **Joseph MB**. 2013. Habitat use and movement of Northern leopard frogs in Boulder, CO. Invited talk: City of Boulder Open Space and Mountain Parks.
- **Joseph MB**. 2013. Does life history mediate changes in disease risk when communities disassemble? CU Ecology and Evolutionary Biology Brown Bag.
- **Joseph** MB. 2012. Causes and consequences of global amphibian declines. Public lecture: Save the Frogs Day, Natural History Museum, University of Colorado, Boulder.
- **Joseph** MB. 2012. Causes and consequences of global amphibian declines. Guest lecture: Introduction to Herpetology, University of Colorado, Boulder.
- **Joseph MB**. 2012. Non-native trout disrupt aquatic-terrestrial subsidies in montane lakes. Guest lecture: Mountain Geography, University of Colorado, Boulder.
- **Joseph MB**. 2011. Non-native trout disrupt aquatic-terrestrial subsidies in montane lakes. Guest lecture: Mountain Geography, University of Colorado, Boulder.

Working papers

- **Joseph MB**, Preston DL, Johnson PTJ. Integrating occupancy models and structural equation models to better understand ecological communities.
- **Joseph MB**, Mihaljevic JR, Johnson PTJ. Reconciling divergent perspectives on diversity and disease: host functional diversity increases symbiont richness while inhibiting transmission.
- **Joseph MB**, Stutz W, Johnson PTJ. Joint host-symbiont occupancy models reveal scale dependent processes and observation errors in symbiont distributions.

- Wilkins MR, Shizuka D, **Joseph MB**, Hubbard JK, Safran RJ. Multimodal signaling in the North American barn swallow: a phenotype network approach.
- Orlofske SA, Flaxman SM, Melbourne BA, **Joseph MB**, Johnson PTJ. Beyond frequency and density-dependence: an experimental demonstration of the importance of non-linear transmission dynamics in a host-macroparasite system.

Media coverage

Susan Moran. 2014. Tag, you're it! Advances in radio and satellite tagging reveal the secret lives of animals. Science News for Students, Society of Science.

Marty Durlin. 2013. The Chorus of the Leopard frogs. Radio show and interview KVNF.