

MATTHEW A. MCCARY

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EDUCATION

2016 Ph.D., University of Illinois at Chicago, Biological Sciences
 2010 B.A., North Central College, Biology

RESEARCH AND PROFESSIONAL APPOINTMENTS

2024-present Resident Faculty Associate, McMurtry College, Rice University
 2021-present Assistant Professor, Department of BioSciences, Rice University
 2020 Ford Foundation Postdoctoral Research Fellow, Yale University
 2017-2019 NSF Postdoctoral Research Fellow, University of Wisconsin at Madison

AWARDS, HONORS, AND FELLOWSHIPS

2022-2026 Early Career Fellow, Ecological Society of America
 2022-present Sigma Xi International Scientific Research Honor Society
 2021 Diversity, Inclusion, Equity, and Belonging Award (\$750), Department of Ecology and Evolution, Rutgers University
 2020 Ford Foundation Postdoctoral Research Fellowship (\$50,000), Forestry and Environmental Science, Yale University
 2017-2019 NSF Postdoctoral Research Fellowship in Biology (\$207,000), Department of Entomology, UW
 2016 Dean's Scholar Graduate Fellowship (\$22,000), Graduate College, UIC

PUBLICATIONS (*Undergraduate mentee, # Graduate student, † Co-first author, + Corresponding author, ¶ Senior author)**2024**

Nunez-Mir, G.C.‡, and M.A. McCary*. 2024. Invasive plants and their root traits are linked to the homogenization of soil microbial communities across the United States. *Proceedings of the National Academy of Sciences* 121: e2418632121. †Co-first authors
 Y. Cheng, B. Deng, P. Scotland, L. Eddy, A. Hassan*, B. Wang, B. Li, K. M. Wyss, M.G. Ucak-Astarlioglu, J. Chen, T. Si, S. Xu, X. Gao, D. Jana, M.A. Torres, M.S. Wong, B.I. Yakobson, C. Griggs, M.A. McCary, Y. Zhao, and J.M. Tour. 2024. Electrothermal mineralization of per- and polyfluoroalkyl substances (PFAS) for soil remediation. *Nature Communications* 15: 6117.
 Moyano, J., R.D. Dimarco, J. Paritsis, T. Peterson, D.A. Peltzer, K. Crawford, M.A. McCary, K.T Davis, A. Pauchard, and M.A. Nuñez. 2024. Unintended consequences of planting native and non-native trees in treeless ecosystems to mitigate climate change. *Journal of Ecology* 112: 2480-2491.
 Boldorini, G., M.A. McCary, G. Romero, K. Mills, N. Sanders, P. Reich, R. Michalko, and T. Gonçalves-Souza. 2024. Predators control pests and increase yield across crop types and climates. *Proceedings of the Royal Society B* 291: 20232522.

Potapov, A.M., E. Chen [et al., including **M.A. McCary**]. 2024. Global fine-resolution data on springtail abundance and community structure. *Scientific Data* 11: 22.

2023

Bertellotti, F.*, N. Sommer, O.J. Schmitz, and **M.A. McCary**[†]. 2023. Impacts of habitat connectivity on grassland arthropod metacommunity structure: a field-based experimental test of theory. *Ecology and Evolution* 13: e10686.

Wise, D.H., R.M. Mores, J.M. Pajda-De La O, and **M.A. McCary**[†]. 2023. Temporal constancy in the structure of a spider-focused food web with high rates of intraguild predation. *PLoS ONE* 18: e0293176.

Sponberg, A., **M.A. McCary**, C. O'Riordan, P. Padilla, and R.L. Wallace. 2023. Rethinking scholarly communication. *Frontiers in Ecology and the Environment* 21:307.

Yitbarek, Y., K. Chen, M. Celestin[#], and **M.A. McCary**[†]. 2023. Urban mosquito distributions are modulated by socioeconomic status and environmental traits in the USA. *Ecological Applications* 33: e2869.

Potapov, A.M., C.A. Guerra [et al., including **M.A. McCary**]. 2023. Globally invariant metabolism but density-diversity mismatch in springtails. *Nature Communications* 14: 674.

Cheng, S.J., K.M. Gaynor, A.C. Moore, K. Darragh, C.O. Estien, J.W. Hammond, K.L. Mills, C. Lawrence, M.D. Baiz, L. Khadempour, **M.A. McCary**, D. Ignace, M.M. Rice, S.J. Tumber-Dávila, and J.A. Smith. 2023. Championing inclusive terminology in ecology and evolution. *Trends in Ecology and Evolution* 38: 381-384.

2022

Ferraro, K., O.J. Schmitz, and **M.A. McCary**[†]. 2022. Effects of ungulate density and sociality on landscape heterogeneity: a mechanistic modeling approach. *Ecography* e06039.

Kuebbing, S.[#], **M.A. McCary**[#], D. Lieurance, M.A. Nuñez, M.C. Chiuffo, B. Zhang, H. Seebens, D. Simberloff, and L.A. Myerson. 2022. A self-study of editorial board diversity at *Biological Invasions*. *Biological Invasions* 24: 321-332. [#] co-first authors

Nuñez, M.A., M.C. Chiuffo, H. Seebens, S. Kuebbing, **M.A. McCary**, D. Lieurance, B. Zhang, D. Simberloff, and L.A. Meyerson. 2022. Two decades of data reveal that *Biological Invasions* needs to increase participation beyond North America, Europe, and Australasia. *Biological Invasions* 24: 333-340.

Lieurance, D., S. Kuebbing, **M.A. McCary**, and Martin A. Nuñez. 2022. Words matter: How to increase gender and LGBTQIA+ inclusivity at *Biological Invasions*. *Biological Invasions* 24: 341-344.

2021

Yitbarek, S., K. Bailey, S. Tyler, J. Strickland, **M.A. McCary**, and N. Harris. 2021. Inclusive sustainability approaches in common-pool resources from the perspective of blackologists. *Bioscience* 71: 741-749.

McCary, M.A.⁺, M.D. Kasprzak, J.C. Botsch, D. Hoekman, R.D. Jackson, and C. Gratton. 2021. Aquatic insect subsidies influence microbial composition and processing of detritus in near-shore subarctic heathland. *Oikos* 130: 1523-1534.

McCary, M.A.⁺, and O.J. Schmitz. 2021. Invertebrate functional traits and terrestrial nutrient cycling: insights from a global meta-analysis. *Journal of Animal Ecology* 90: 1714-1726.

McCary, M.A.⁺, R.D. Jackson, and C. Gratton. 2021. Vegetation structure modulates ecosystem and community responses to spatial subsidies. *Ecosphere* 12: e03483.

McCary, M.A.^{#+}, J.S. Phillips[#], T. Ramiadantsoa, L.A. Nell, A.R. McCormick, and J.C. Botsch. 2021. Transient top-down and bottom-up effects of resources pulsed to multiple trophic levels. *Ecology* 102: e02593. [#] co-first authors

Before 2020

McCary, M.A.⁺, and D.H. Wise. 2019. Plant invader alters soil food web via changes to fungal resources. *Oecologia* 191: 587-599.

Hoekman, D., **McCary, M.A.**⁺, J. Dryer, and C. Gratton. 2019. Reducing allochthonous resources in a subarctic grassland alters arthropod food webs via predator diet and density. *Ecosphere* 10: e02593.

McCary, M.A.⁺, M. Zellner, and D.H. Wise. 2019. The role of plant-mycorrhizal mutualisms in deterring plant invasions: insights from an individual-based model. *Ecology and Evolution* 9: 2018-2030.

McCary, M.A.⁺, E. Minor, and D.H. Wise. 2018. Covariation between local and landscape factors influences the structure of ground-active arthropod communities in fragmented metropolitan woodlands. *Landscape Ecology* 33: 225-239.

McCary, M.A.⁺, R. Mores, M. Farfan, and D.H. Wise. 2016. Invasive plants have different effects on trophic structure of green and brown food webs in terrestrial ecosystems: a meta-analysis. *Ecology Letters* 19: 328-335.

McCary, M.A.⁺, J.C. Martinez, L. Umek, L. Heneghan, and D.H. Wise. 2015. Effects of woodland restoration and management on the community of surface-active arthropods in the metropolitan Chicago region. *Biological Conservation* 190: 154-166.

In review

Railsback, S., C. Gallagher, B. Harvey, **M.A. McCary**, and V. Grimm. Empirical ecology to support mechanistic modelling: new approaches and new rewards. *Methods in Ecology and Evolution*.

Book, K.R., A.R. McCormick, J.S. Phillips, J.C. Botsch, **M.A. McCary**, and A. Ives. Environment, trait, and phylogenetic interactions shape community assembly in a subarctic heathland. *New Phytologist*.

RESEARCH FUNDING AND EXTRAMURAL SUPPORT

Awarded

2025-2030 NSF (Population and Community Ecology, \$1,257,808). CAREER: The role of above-and-belowground traits in plant invasions: implications for community and ecosystem dynamics. **M.A. McCary**.

2022-2024 NSF (Biodiversity on a Changing Planet, \$517,312). Functional divergence between females and males: consequences of climate-induced shifts in composition of dioecious plant populations. T. X. Miller, A. Keiser, **M.A. McCary**, K. Crawford, J. H. Leebens-Mack.

2022-2024 Rice University's Creative Ventures Fund (\$50,000). Sustainable futures in a biodiversity hotspot: Assessing conservation values of traditional use forests in Madagascar. A. Dunham, C. Masiello, **M.A. McCary**, J. Blackburn, A. Pinn.

- 2022-2023 Texas Ecological Laboratory (\$5,421). Collateral damage: understanding how shrub encroachment into grasslands affects tick-borne disease dynamics. M. Celestin[#] and **M.A. McCary**. [#] Graduate student
- 2015-2016 Graduate Research Grant (\$10,000). Department of the Institute for Environmental Science and Policy. University of Illinois at Chicago. **M.A. McCary**.

INVITED PROFESSIONAL PRESENTATIONS

Invited keynote address:

- 2025 Ecology in the Anthropocene: Mapping the Hidden Links Between Soil, Plants, and Planet. Houston Ecology and Evolution Symposium, Houston, TX.
- 2024 Environmental Biology for a Sustainable and Equitable 21st Century: The Need for Diversity to Secure Ecosystem and Human Health. Inaugural Distinguished Science Lecture, D.R. Semmes School of Science, Trinity University.

Invited research seminars:

- 2025 Eawag, Swiss Federal Institute of Aquatic Science and Technology, Dübendorf, Switzerland (virtual).
- 2024 Ecology Center, University of Utah State, Logan, UT.
- 2024 Department of Biology, University of Texas, Arlington, TX.
- 2024 Department of Ecology and Evolutionary Biology, University of Michigan Biological Station, Pellston, MI.
- 2024 Ecology, Evolution, and Behavior Department, University of Minnesota, Minneapolis, MN.
- 2024 Ecology and Evolutionary Biology Program, University of Wyoming, Laramie, WY.
- 2023 Division of Biological Sciences. University of Missouri, Columbia, MO.
- 2023 Department of Earth and Environmental Sciences. Rutgers University at Newark, Newark, NJ.
- 2023 Department of Ecology and Evolutionary Biology. University of Michigan, Ann Arbor, MI.
- 2022 Department of Biology. Southwest University, Georgetown, TX.
- 2022 Department of Biology. University of North Carolina, Chapel Hill, NC (virtual).
- 2022 Goldschmidt Lecture Series. Sigma Xi, Houston, TX Chapter (virtual).
- 2022 Department of Ecology, Evolution, and Organismal Biology. Ohio State University, Columbus, OH (virtual).
- 2022 Department of Biology. North Central College, Naperville, IL (virtual).
- 2021 Department of Biology. Indiana University, Bloomington, IN.
- 2021 Department of Biological Sciences. University of Illinois, Chicago, IL.
- 2021 Department of Biology. Stanford University, Stanford, CA (virtual).
- 2021 Natural Sciences Seminar series. Washington State University at Vancouver, Vancouver, WA (virtual).
- 2021 Biological and Environmental Science Colloquium. University of Rhode Island, Kingston, RI (virtual).
- 2021 Department of Ecology and Evolution. Rutgers University, New Brunswick, NJ (virtual).
- 2021 Department of Ecology, Evolution, and Organismal Biology, Kennesaw State University, Marietta, GA (virtual).

- 2021 Department of Biology and Biochemistry, University of Houston, Houston, TX.
- 2020 Department of Ecology, Evolution, and Marine Biology, University of California, Santa Barbara, CA.
- 2020 Department of Entomology, Kansas State University, Manhattan, KS.
- 2020 School of the Environment, Yale University, New Haven, CT.
- 2019 Department of BioSciences, Rice University, Houston, TX.
- 2019 Department of Botany, University of Wisconsin, Madison, WI.
- 2019 Department of Biology, Pittsburgh University, Pittsburgh, PA.
- 2019 Department of Biology, Lawrence University, Appleton, WI.
- 2019 Center for Limnology, University of Wisconsin, Madison, WI.
- 2018 Department of Entomology, Purdue University, West Lafayette, IN.
- 2018 Department of Natural and Applied Sciences, University of Wisconsin, Green Bay, WI.
- 2018 Department of Entomology, University of Wisconsin, Madison, WI.
- 2015 Elmer Hadley Research Fund. University of Illinois, Chicago, IL.

Invited symposium presentations

- 2023 Making ecology more diverse, inclusive, and equitable through the efforts of Black ecologists within ESA. Ecological Society of America Meeting, Portland, Oregon.
- 2023 Using individual-based modeling to understand the causes and consequences of plant invasions, Ecological Society of America Meeting, Portland, OR.
- 2022 Do resource subsidies alter energy flows through soil food webs? Implications for C and N cycling in subarctic Iceland. The Next “Black Box”: The Role of Soil Invertebrates in Plant-Soil Interactions, Ecological Society of America Meeting, Montreal, Canada.
- 2019 Aquatic insects alter terrestrial ecosystems: lessons from subarctic Iceland. Recent Approaches to Studying Invertebrate Responses to Rapid Environmental Change, Entomological Society of America Meeting, St. Louis, MO.
- 2018 Emergent aquatic insects alter plant composition and litter decomposition: lessons from subarctic Iceland. Wisconsin Ecology Fall Symposium, University of Wisconsin, Madison, WI.
- 2017 A mechanistic model to explain how plant-mycorrhizal disruptions can lead to invasion success: implications for biodiversity conservation and management. Linking Management, Biodiversity, and Ecosystem Services Via Mechanistic Models, Ecological Society of America Meeting, Portland, OR.
2016. Consequences of invasion: evaluating how invasive alien plants alter the structure of food webs in woodland ecosystems. Invaders in Food Webs: Using Trophic Structure to Predict Invasibility and Invader Impact, Ecological Society of America Meeting, Fort Lauderdale, FL.
- 2015 The cascading effects of invasive alien plants on the structure of belowground food webs in woodland ecosystems. Invasive Plant Symposium: Biotic Interactions with Invasive Species, Annual North Weed Science Society, Indianapolis, IN.

ORGANIZED SYMPOSIUM, SPECIAL SESSIONS, AND WORKSHOPS

- 2024 **Session organizer**, “Creating Safe and Inclusive Spaces to Support Early Career Scientists: Lessons From Diverse Communities Within ESA.” Ecological Society of America Meeting (ESA), Long Beach, CA. **M.A. McCary** and K. Bailey (co-organizer).

- 2023 **Field trip host**, SEEDS (Strategies for Ecology Education, Diversity, and Sustainability) National Field Trip for underrepresented minority undergraduates, Rice University, Houston, TX. **M.A. McCary**, F. Abbott, K. Bailey, C. Nilon.
- 2023 **Symposium co-organizer**, “Yes Ecologists Can: Models and Field Studies for 21st Century Problems.” Ecological Society of America Meeting (ESA), Portland, OR. S. Railsback and **M.A. McCary**.
- 2022 **Symposium organizer**, “Applied ecology for 21st-century environmental solutions requires the need for diverse perspectives.” Ecological Society of America Meeting (ESA), Montreal, Canada

TEACHING EXPERIENCE

- 2024 **Co-Instructor**, Climate Change, Economics, and the Wine Industry (EEPS 234), Department of Earth and Planetary Sciences, Rice University.
- 2023-present **Instructor**, Insect Biology (BIOS 326), Department of Biosciences, Rice University.
- 2022 **Instructor**, Topics in Ecology (BIOS 563), Department of Biosciences, Rice University.
- 2018 **Co-Instructor**, Basic and Applied Insect Ecology Lab (ENTO 451), Department of Entomology, University of Wisconsin at Madison.
- 2014-2016 **Teaching Assistantship**, General Ecology Lab (BIOS 331), Department of Biological Sciences, University of Illinois at Chicago.
- 2012-2013 **Teaching Assistantship**, Biology of Populations and Communities (BIOS 101), Department of Biological Sciences, University of Illinois at Chicago.
- 2010-2011 **Teaching Assistantship**, Biology of Cells and Organisms (BIOS 100), Department of Biological Sciences, University of Illinois at Chicago.

LAB PERSONNEL

Graduate students

- 2024-present Ann Finneran, PhD Candidate (Formerly advised by Dr. Lydia Beaudrot [2022-2024], 2024 NSF GFRP Fellow)
- 2023-present Ruddy Alexandra Bradley Jiménez-Martin (Co-Advised with Dr. Tom Miller)
- 2021-present Modeline Celestin, PhD Candidate (2022 Ford Foundation Predoctoral Fellow)
- 2021-present Amoi Campbell, PhD Candidate

Technicians and post-baccalaureate students

- 2023-present Reginald Johnson, Research technician
- 2023-present Da’Janae Pearson, Post-baccalaureate student (Co-Advised with Dr. Tom Miller)
- 2023-present Christopher Oxley, Research technician (Co-Advised with Dr. Tom Miller)
- 2023 Jeremy Pustilnik, Research technician

Undergraduate students

- 2024-present Anna Evans, Undergraduate research assistant
- 2024-present Anoushka Mahendra-Rajah, BIOS 310 student
- 2023-present Caroline Leung, Senior Thesis student
- 2023-present Nicole Imming, BIOS 310 student
- 2022-present Lily Burdett, Undergraduate research assistant

2023-present Alondra Franco, Undergraduate research assistant
 2023 Arman Hassan, Summer research assistant
 2023 Nicholas Arrendodo, Summer Undergraduate Research Fellow
 2023 Brendan Oloughlin, Summer research assistant
 2023 Annie Huddleston, REU student (Co-Advised with Dr. Jocelyn Holt)
 2022-2023 Ling DeBellis, Senior Thesis student
 2021-2022 Ashley Fitzpatrick, BIOS 310 student

GRADUATE THESIS COMMITTEES

2023-present Tess Peterson, University of Houston (Advisor: Dr. Martin A. Nuñez)
 2023-present Julieanne Montaquila, Rice University (Advisor: Dr. Amy Dunham)
 2023-present Annie Finneran, Rice University (Advisor: Dr. Lydia Beaudrot)
 2022-present Clark Hamor, Rice University (Advisor: Dr. Yizhi Jane Gao)
 2022-present Sean Trainor, Rice University (Advisor: Dr. Kory Evans)
 2022-present Joyah Watkins, Rice University (Advisor: Dr. Kory Evans)
 2022-present Eric Wuesthoff, Rice University (Advisor: Dr. Amy Dunham)
 2022-present Camille Carey, Texas A&M University (Advisor: Dr. Doug Tolleson)
 2021-present Ali Campbell, Rice University (Advisor: Dr. Tom Miller)

Completed

2023 Sydney Allen, Doctor of Philosophy, Rice University (Advisor: Dr. Cin-ty Lee)
 2023 Kristin Brandon, Master's degree, Rice University (Advisor: Amy Dunham)
 2022 Sang-Ho Yoo, Master's degree, University of New Brunswick (Advisor: Dr. Jeff Houlan)

PROFESSIONAL SERVICE

Societal Service

2024-present **Associate Editor**, *Individual-Based Ecology*
 2023-present **Member**, ESA's Mercer Award Committee to determine best research paper by early career researcher
 2023-present **Associate Editor**, *Journal of Animal Ecology*
 2021-present **Co-Chair**, Black Ecologist Section of the Ecological Society of America
 2020-present **Associate Editor**, *Biological Invasions*

University Service

2022-present **Member**, Environmental Initiative Advisory Committee
 2022-present **Faculty Advisor**, Black Graduate Student Association, Rice University

Departmental Service

2024-2025 **Member**, Committee for Biosciences Evolutionary Biology Faculty Search
 2023-2024 **Member**, Committee for BioSciences Faculty Search
 2021-2022 **Member**, Committee for EEB Faculty Search
 2021-present **Member**, Committee for EEB Graduate Recruitment and Evaluation