

Mario Zuliani, M.Sc., PhD

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Research Profile

Quantitative ecologist integrating field-based research, long-term ecological datasets, hydrologic and spatial data, and predictive modeling to understand how environmental variability, species interactions, habitat structure, and landscape change shape species distributions, community assembly, resilience, and biodiversity dynamics across ecosystems. Research strengths include community ecology, invasion ecology, species–environment relationships, conservation and restoration, avian and herpetofaunal ecology, reproducible workflows, and data-intensive ecological modeling.

Education

Ph.D. Biology - York University September 2020 - May 2024

- Main focus in Ecology, restoration, Plant-Animal interactions and data science

M.Sc. Biology - York University September 2018 - August 2020

- Main focus in Ecology, Restoration and Plant-Animal interactions

B.Sc. Life Sciences (Honours) - McMaster University September 2014 - April 2018

- Main focus in Life Science with a broad range of science-based courses including Chemistry, Biology, Genetics, Ecology, Environmental Studies, Health, and Nutrition

Postdoctoral Experience

Postdoctoral Associate, Department of Wildlife Ecology and Conservation, University of Florida (January 2025 – Present)

- Hydrology-Avian Dynamics: Investigating links between water management, hydrologic variability, and wading-bird dynamics to inform ecosystem management in the Greater Everglades.
- Submerged Aquatic Vegetation (SAV) Modeling: Developing predictive models of SAV response to hydrologic conditions to support restoration and water management decision-making.
- Collaborative Research: Partnering with the South Florida Water Management District (SFWMD) on both projects to integrate long-term ecological and hydrological data.
- Mentorship: Co-supervising an undergraduate researcher comparing EDDMapS and iNaturalist records for introduced herpetofauna in Florida, and guiding a Master's student conducting wading-bird surveys on Lake Okeechobee.

Peer-Reviewed Publications

Citation Metrics (Google Scholar, updated September 2026)

Total citations: 279 | h-index: 10 | i10-index:11

- 26) **Zuliani, M.**, Hitchcock, C., Francis, J. S., Mason, B. M., & Callaghan, C. T. (2026). iNaturalist as research infrastructure for teaching ecology: Moving from observation to inference in hypothesis-driven classrooms. **Manuscript submitted for publication in *Ecology and Evolution*.**
- 25) Callaghan, C. T., Mason, B., Bowler, D., Hochmair, H., Mesaglio, T., Owuor, I., Pernat, N., & **Zuliani, M.** (2026). Looking for the little things: Experience shapes the biodiversity people observe. **Manuscript submitted for publication in *Current Biology*.**
- 24) Nix, E., Gaudenti, N., Weaver, S., Axsom, I., Ghazian, N., Owen, M., **Zuliani, M.**, Westphal, M. F., Lortie, C. J., Taylor, E., & Todd, B. D. (2026). The influence of naturally occurring drought and habitat variation on space use in an endangered desert lizard. **Manuscript submitted for publication in *Animal Conservation*.**
- 23) Gallivan L, **Zuliani M**, Mason BM, Callaghan CT. 2026 iNaturalist and Early Detection & Distribution Mapping System provide complementary data for monitoring non-native herpetofauna in Florida. R. Soc. Open Sci. 13: 251218. <https://doi.org/10.1098/rsos.251218>
- 22) Hoskins, L. P., Mason, B. M., Heitmann, J. B., Alvarez-Abreu, O., Bearhs, K., Carnevale, S., Fussell, C. A., Lilkendey, T., Marquis, M., Sellers, B. A., Song, J., Swigris, A., **Zuliani, M.**, & Callaghan, C. T. (2026). Bioblitzes Provide Valuable Biodiversity Data. Natural Areas Journal, 46(2). <https://doi.org/10.3375/2162-4399-46.2.4>

- 21) Ghazian, N., **Zuliani, M.**, MacDonald, S. E., & Lortie, C. J. (2026). Artificial shelters provide microclimatic refuges from increasing desertification for resident vertebrates. *Ecological Solutions and Evidence*, 7(1), e70188. <https://doi.org/10.1002/2688-8319.70188>
- 20) **Zuliani, M.**, Chen, S., Braun, J., Owen, E., Lortie, C. J. (2025). The Effects of Conspecific *Cylindropuntia Ramosissima* Density on Morphology and Animal Associations in the Mojave Desert, California. *The Southwestern Naturalist*, 70(1), 1-7. <https://doi.org/10.1894/0038-4909-70.1.3>
- 19) **Zuliani, M.**, Ghazian, N., MacDonald, S. E., & Lortie, C. J. (2025). The shrub density effect: Unraveling vertebrate community dynamics along an aridity gradient in Southern California. *Frontiers in Ecology and Evolution*, 13, 1648121. <https://doi.org/10.3389/fevo.2025.1648121>
- 18) **Zuliani, M.**, & Lortie, C. J. (2025). Using Open Science Tools to Teach Environmental Sciences. *Ecology and Evolution*, 15(7). <https://doi.org/10.1002/ece3.71837>
- 17) Hillier-Weltman, Z., Lortie, C., & **Zuliani, M.** (2025). The influence of native shrub density on bird communities in the southern drylands of California, USA. *BMC Ecology and Evolution*, 25(1), 63. <https://doi.org/10.1186/s12862-025-02410-x>
- 16) **Zuliani, M.**, Haas-Desmarais, S., Brussa, L., Cunsolo, J., Zuliani, A., Lortie, C.J. (2025). Controlled temperature contrasts of three native and one highly invasive annual plant species in California. *PeerJ* 13:e18794 <https://doi.org/10.7717/peerj.18794>
- 15) **Zuliani, M.**, Ghazian, N., MacDonald, S., & Lortie, C. J. (2024). The relative effects of artificial shrubs on animal community assembly. *Restoration Ecology*, e14121. <https://doi.org/10.1111/rec.14121>
- 14) **Zuliani, M.**, Ghazian, N., Owen, M., Westphal, M. F., Butterfield, H. S., & Lortie, C. J. (2023). Shrub density effects on the presence of an endangered lizard of the Carrizo Plain National Monument, California. *Ecology and Evolution*, 13(5), e10128. <https://doi.org/10.1002/ece3.10128>
- 13) **Zuliani, M.**, Ghazian, N., & Lortie, C. J. (2023). A meta-analysis of shrub density as a predictor of animal abundance. *Wildlife Biology*. <https://doi.org/10.1002/wlb3.01042>
- 12) Owen, E., **Zuliani, M.**, Goldgisser, M., & Lortie, C. (2024). The importance of native shrubs on the distribution and diversity of reptiles and amphibians in the central drylands of Southwestern USA. *Biodiversity and Conservation*. <https://doi.org/10.1007/s10531-024-02851-8>
- 11) Owen, E., Lortie, C. J., & **Zuliani, M.** (2024). Native shrub densities predict burrow co-occurrence patterns in Central California Drylands. *BMC Ecology and Evolution*, 24(1), 68. <https://doi.org/10.1186/s12862-024-02259-6>
- 10) Ghazian, N., King, R., **Zuliani, M.**, & Lortie, C. J. (2024). The microclimatic effects of the native shrub *Ephedra californica* (Mormon tea) in California drylands. *Frontiers in Plant Science*, 15, 1396004. <https://doi.org/10.3389/fpls.2024.1396004>
- 9) Lucero, J. E., Filazzola, A., Callaway, R. M., Braun, J., Ghazian, N., Haas, S., Miguel, M. F., Owen, M., Seifan, M., **Zuliani, M.**, & Lortie, C. J. (2022). Increasing global aridity destabilizes shrub facilitation of exotic but not native plant species. *Global Ecology and Conservation*, 40, e02345. <https://doi.org/10.1016/j.gecco.2022.e02345>
- 8) Ivey, Kathleen N, Margaret B Cornwall, Nicole Gaudenti, Paul H Maier, Nargol Ghazian, Malory Owen, Emmeleia Nix, **et al.** 2022. "Temperature-Based Activity Estimation Accurately Predicts Surface Activity, but Not Microhabitat Use, in the Endangered Heliothermic Lizard *Gambelia Sila*." *Amphib. Reptile Conserv.* 16 (1): 10.
- 7) **Zuliani, M.**, Ghazian, N., & Lortie, C.J. 2021. "Shrub Density Effects on the Community Structure and Composition of a Desert Animal Community." *Wildlife Biology* 2021 (2). <https://doi.org/10.2981/wlb.00774>.
- 6) Lortie, C. J., Ghazian, N., & **Zuliani, M.** (2022). A workflow for selecting seeding density in desert species experiments. *Journal of Arid Environments*, 198, 104701. <https://doi.org/10.1016/j.jaridenv.2021.104701>

- 5) Lortie, C. J., Filazzola, A., Brown, C., Lucero, J., **Zuliani, M.**, Ghazian, N., Haas, S., Owen, M., Butterfield, H. S., Nix, E., & Westphal, M. (2021). Facilitation promotes plant invasions and indirect negative interactions. *Oikos*, 130(7), 1056–1061. <https://doi.org/10.1111/oik.08443>
- 4) Lortie, C. J., **Zuliani, M.**, Ghazian, N., Haas, S., Braun, J., Owen, M., Miguel, F., Seifan, M., Filazzola, A., & Lucero, J. (2021). Too much of a good thing: Shrub benefactors are less important in higher diversity arid ecosystems. *Journal of Ecology*, 109(5), 2047–2053. <https://doi.org/10.1111/1365-2745.13596>
- 3) Ghazian, N., **Zuliani, M.**, & Lortie, C. (2020). Micro-Climatic Amelioration in a California Desert: Artificial Shelter Versus Shrub Canopy. *Journal of Ecological Engineering*, 21(8), 216–228. <https://doi.org/10.12911/22998993/126875>
- 2) Ivey, K. N., Cornwall, M., Crowell, H., Ghazian, N., Nix, E., Owen, M., **Zuliani, M.**, Lortie, C. J., Westphal, M., & Taylor, E. (2020). Thermal ecology of the federally endangered blunt-nosed leopard lizard (*Gambelia sila*). *Conservation Physiology*, 8(1), coaa014. <https://doi.org/10.1093/conphys/coaa014>
- 1) Lortie, C. J., Braun, J., Westphal, M., Noble, T., **Zuliani, M.**, Nix, E., Ghazian, N., Owen, M., & Scott Butterfield, H. (2020). Shrub and vegetation cover predict resource selection use by an endangered species of desert lizard. *Scientific Reports*, 10(1), 4884. <https://doi.org/10.1038/s41598-020-61880-9>

Teaching and Experiential Learning Experience

Course Instructor Bio 4700: Current Topics in Environmental Biology - York University: Department of Biology (July 2023 - May 2024)

- Responsible for designing an upper level Undergraduate course including weekly topics, assignments and marking schemes.
- Created and conducted in person lectures for multiple upper year Undergraduate students for the duration of the course.
- Responsible for grading and providing feedback on student assignments and presentations.

Course Instructor Bio 4265: Environmental Management - York University: Department of Biology (September 2023 - December 2023)

- Responsible for designing an upper level Undergraduate course including weekly topics, assignments, marking schemes, and presentations.
- Created and conducted in-person lectures for over 30 upper year Undergraduate students.
- Responsible for grading and providing feedback on student assignments and presentations.

Guest Lecturer Bio 4265 - York University: Department of Biology (November 2022)

- In charge of conducting a comprehensive lecture on the differences between systematic reviews and meta-analyses.
- Explained how to properly search for relevant peer-reviewed journals for literature reviews.
- Illustrated how to collect and analyze data to conduct a meta-analysis.
- Answered questions related to student specific systematic review and meta-analysis designs.

Teaching Assistant Bio 3250 - York University: Department of Biology (September 2019 - December 2022)

- Conduction of labs with Undergraduate students
- Instructing Undergraduate students on proper experimental design
- Instructed students on how to run proper statistical analysis and how to conduct systematic reviews
- Aided students in designing and conducting their own projects for course
- Head grader and organizer for labs

Teaching Assistant Bio 2080 - York University: Department of Biology (September 2022 - December 2023)

- Conduction of Ecological labs with 2nd year Undergraduate students including species identification (both plant and animal), plant census, seed identification, and analysis of predator-prey interactions.
- Responsible for invigilating of course midterms and exams
- Tasked with grading all lab reports, midterms, and exams.
- Responsible for managing and organizing 25 Undergraduate students while conducting both field and indoor labs.

Teaching Assistant Bio 1000 - York University: Department of Biology (September 2018 - April 2023)

- Conduction of first year Undergraduate labs including analysis of respiration, DNA extraction and analysis, and investigation of Plasmolysis

- Responsible for the safety of 60 Undergraduate students during lab conduction
- In charge of marking all pre and post lab reports, quizzes and assignments

Teaching Assistant Bio 2050 - York University: Department of Biology (September 2018 - December 2021)

- Conduction of Ecological labs with Undergraduate students including species identification, plant census, seed identification and electronic simulations
- Invigilation of course quizzes, midterms and exams
- Head grader and organizer for labs
- Responsible for 25 Undergraduate students in lab

Teaching Assistant Bio 1001 - York University: Department of Biology (June 2019 - August 2022)

- Conduction of first year Biology labs including Animal identification, and Computer simulations
- Invigilation of course Midterms and Final Exam
- Head grader for submitted assignments, Midterms, and Exams

Supervisory Experience

Supervisor of Honours Undergraduate Students - University of Florida (January 2025 - Present)

- Supervise 1 Undergraduate student with their research thesis focusing on how community science tools can be used to monitor the spread of invasive herpetofauna. Work has resulted in a publication.
- Mentored Masters student thesis focusing on how citizen science can be used to enhance formal research by government agencies.

Supervisor of Honours Undergraduate Students - York University (September 2021 - August 2024)

- Supervised 4 honours Undergraduate students with their thesis studies focusing on an array of topics including; Rewilding of Ecosystems, Herptile resource association, and Urban tree damage. Work has resulted in 2 publications.
- Mentored Masters student thesis focusing on how shrub density influences avian observations and presence across dryland ecosystems. Work has resulted in a publication.
- Mentored students in experimental design, statistical analysis, and manuscript production.
- Facilitated regular meetings to track progress and provide guidance.

Review Experience

- Ecological Engineering (2026)
- Springer Nature Scientific Reports (2026)
- Sustainable Environment (2026)
- Journal of Arid Environments (2025, 2026)
- Ecology and Evolution (2022, 2024, 2025)
- Rangeland Ecology (2023)
- Zoologic Research (2023)
- Journal of Herpetology (2023)
- Nature Ecology & Evolution (2024)
- PLOS ONE (2024)
- Discover Ecology (2025)
- Ecological Applications (2025)

Other Extension Experience

Audio Podcast for Wildlife Biology - Soundcloud (May 26, 2021)

- Interviewed for my most recent publication in the ecological journal, Wildlife Biology, for the publication, "Shrub Density Effects on the Community Structure and Composition of a Desert Animal Community."
- <https://soundcloud.com/user-340086209-186066255/wildlife-biology-shrub-density-effects-on-desert-animal-communities-mario-zuliani>

Lab and Research Experience

Arid Ecosystem Research Assistant - York University (June 2022 - September 2022)

- Responsible for collecting shrub density data via Global Positioning Systems.
- Tasked with tidying-up and preparing it for statistical analysis.
- Conducted statistical analysis and visualization of collected shrub density data.

Arid Ecosystem Density Analysis - Carrizo Plain National Monument (May 2019 - June 2019)

- In charge of conducting ecological surveys in Desert ecosystems including: deployment of camera traps, running 100 meter transects, and conducting 1 hour focal observations
- Responsible for collecting data and further analyzing
- Generate statistics for collected data

Head Telemetry Technician - Carrizo Plain National Monument (April 2018 - June 2018)

- In charge of conducting radio telemetry tracking on lizards in the Carrizo desert
- Responsible for proper data recording, analysis and input
- Tasked with set up and proper maintenance of master data sheet
- Responsible for supervising others during radio tracking
- In charge of teaching others how to properly use electronic tracking equipment in field

Honours, Grants, and Awards

- Academic Excellence Research Fund - York University (2020 - 2024)
- MITACS Award Recipient - York University/University of California Santa Barbara (2019)
- Dean's List - McMaster University (2018)
- Honours Life Science Program - McMaster University (2015/2016)