

MATTEO RIZZUTO

Ecosystem Ecology Lab
Department of Biology
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EDUCATION

Ph.D., *Biology*

2016–2022

Memorial University of Newfoundland and Labrador, St. John's, NL, Canada

- Thesis: From elements to landscapes: the role of terrestrial consumers in ecosystem functioning
- Supervisor: Dr. Shawn J. Leroux

Master of Research (Distinction), *Ecology, Evolution, and Conservation*

2013–2014

Imperial College London-Silwood Park, Ascot, UK

- Research Projects:
 - The scaling of activity budgets in carnivores; Supervisors: Dr. Samraat Pawar and Dr. Chris Carbone
 - Comparison of two commonly used methods to estimate species diversity: dung counts and camera trapping; Supervisors: Prof. Mick Crawley and Prof. Joris Cromsigt

Master of Science, *Evolution of Animal and Human Behaviour*

2009–2012

University of Turin, Turin, Italy

- Thesis: Predator-prey interactions: feeding ecology of the Wolf (*Canis lupus*) and anti-predator behaviour of the Chamois (*Rupicapra rupicapra*) in the Western Alps
- Supervisor: Dr. Francesca Marucco

Bachelor of Science (Honours), *Biology*

2004–2009

University of Turin, Turin, Italy

- Thesis: Individual characteristics of vocalisations emitted during the song of *Indri indri*
- Supervisors: Prof. Cristina Giacoma and Dr. Marco Gamba

PUBLICATIONS

Note: for papers where I am first author, I led study design, data collection, analysis, and writing. For papers where I am fourth author or later, I contributed to ideas, data collection, and writing. An asterisk (*) stands for equal contribution.

Peer Reviewed

- Little, C.J.^{*}, **Rizzuto, M.^{*}**, Luhring, T.M., Monk, J.D., Nowicki, R.J., Paseka, R.E., Stegen, J.C., Symons, C.C., Taub, F.B., Yan, J.D.L. (2022) Movement with Meaning: Integrating Information into Meta-Ecology. *Oikos*. DOI: [10.1111/oik.08892](https://doi.org/10.1111/oik.08892)
- Balluffi-Fry, J., Leroux, S.J., Wiersma, Y.F., Richmond, I.C., Heckford, T.R., **Rizzuto, M.**, Kennah, J.L., Vander Wal, E. (2021) Integrating plant stoichiometry and feeding experiments: state-dependent forage choice and its implications on body mass. *Oecologia*. DOI: [10.1007/s00442-021-05069-5](https://doi.org/10.1007/s00442-021-05069-5) *Highlighted Student Paper*

- Richmond, I.C., Balluffi-Fry, J., Vander Wal, E., Leroux, S.J., **Rizzuto, M.**, Heckford, T.R., Kennah, J.L., Riefesel, G.R., Wiersma, Y.F. (2021) Individual snowshoe hares manage risk differently: Integrating stoichiometric distribution models and foraging ecology. *Journal of Mammalogy*. DOI: [10.1093/jmammal/gyab130](https://doi.org/10.1093/jmammal/gyab130)
- Heckford, T.R., Leroux, S.J., Vander Wal, E., **Rizzuto, M.**, Balluffi-Fry, J., Richmond, I.C., Wiersma, Y.F. (2021) Spatially explicit correlates of plant functional traits inform landscape patterns of resource quality. *Landscape Ecology*. DOI: [10.1007/s10980-021-01334-3](https://doi.org/10.1007/s10980-021-01334-3)
- **Rizzuto, M.**, Leroux, S.J., Vander Wal, E., Richmond, I.C., Heckford, T.R., Balluffi-Fry, J., Wiersma, Y.F. (2021) Forage stoichiometry predicts the home range size of a small terrestrial herbivore. *Oecologia* 197(2), 327–338. DOI: [10.1101/2020.08.13.248831](https://doi.org/10.1101/2020.08.13.248831) *Highlighted Student Paper*
- Ellis-Soto, D.^{*}, Ferraro, K.M.^{*}, **Rizzuto, M.**, Briggs, E., Monk, J.D., and Schmitz, O.J. (2021) A methodological roadmap to quantify animal-vectored spatial ecosystem subsidies. *Journal of Animal Ecology* 90(7), 1605–1622. DOI: [10.1111/1365-2656.13538](https://doi.org/10.1111/1365-2656.13538)
- Richmond, I.C., Leroux, S.J., Vander Wal, E., Heckford, T.R., **Rizzuto, M.**, Balluffi-Fry, J., Kennah, J., Wiersma, Y.F. (2020) Temporal variation and its drivers in the elemental traits of four boreal plant species. *Journal of Plant Ecology* 14(3), 398–413. DOI: [10.1093/jpe/rtaa103](https://doi.org/10.1093/jpe/rtaa103)
- Balluffi-Fry, J., Leroux, S.J., Wiersma, Y.F., Heckford, T.R., **Rizzuto, M.**, Richmond, I.C., Vander Wal, E. (2020) Quantity-quality trade-offs revealed using a multiscale test of herbivore resource selection on elemental landscapes. *Ecology and Evolution* 10(24), 13847–13859. DOI: [10.1002/ece3.6975](https://doi.org/10.1002/ece3.6975)
- **Rizzuto, M.**, Leroux, S.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R., Balluffi-Fry, J. (2019) Patterns and potential drivers of intraspecific variability in the body C, N, and P composition of a terrestrial vertebrate, the snowshoe hare (*Lepus americanus*). *Ecology and Evolution* 9(24), 14453–14464. DOI: [10.1002/ece3.5880](https://doi.org/10.1002/ece3.5880)
- **Rizzuto, M.**, Carbone, C., and Pawar, S. (2018) Foraging constraints reverse the scaling of activity time in carnivores. *Nature Ecology and Evolution* 2(2), 247–253. DOI: [10.1038/s41559-017-0386-1](https://doi.org/10.1038/s41559-017-0386-1) *Cover story*

In Progress

- **Rizzuto, M.**, Leroux, S.J., Schmitz, O.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R. Animal-vectored nutrient flow along different resource gradients influences the nature of local and meta-ecosystem functioning. In revision, *The American Naturalist*, manuscript id: 61130.
- McLeod, A.M., Leroux, S.J., **Rizzuto, M.**, Leibold, M.A., Schiesari, L. Integrating ecosystem and contaminant models to study the spatial dynamics of contaminants. In review, *The American Naturalist*, manuscript id: 60949.
- Heckford, T.R., Leroux, S.J., Vander Wal, E., **Rizzuto, M.**, Balluffi-Fry, J., Richmond, I.C., Wiersma, Y.F. Foliar elemental niche responses of balsam fir (*Abies*

balsamea) and white birch (*Betula papyrifera*) to differing community types across geographic scales. In review, *Ecology and Evolution*, manuscript id: ECE-2022-02-00239.

Outreach

- Wiersma, Y.F., Catto, N., Deal, C., Edinger, E., Evans, R., Geissinger, E., Hearn, C., Sun Lim, K., McCann, N., MacDonald, K., Meyer, A., Prosser, J., Quinn, D., Richmond, I.C., **Rizzuto, M.**, Roncal, J., Swain, M. (2020). The classroom goes virtual—experiences at Memorial University. *Blog post*, url: nllandscapeecology.com
- Cagnacci, F., Rocca, M., Nicoloso, S., Ossi, F., Peters, W., Mancinelli, S., Valent, M., **Rizzuto, M.**, Hebblewhite, M. (2013). Il progetto 2C2T. *Il Cacciatore Trentino*, 93, 4–15.

CONFERENCE PRESENTATIONS

Talks

- **Rizzuto, M.**, Leroux, S.J., Schmitz, O.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R. *Going against the flow: non-diffusive organismal movement influences local and meta-ecosystem functioning*. “Vital Connections in Ecology” Ecological Society of America Virtual Annual Meeting, Long Beach, CA, USA. 2–6 AUG. 2021
- **Rizzuto, M.**, Leroux, S.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R., Balluffi-Fry, J. *Ontogeny and Ecological Stoichiometry of Snowshoe hares (*Lepus americanus*) in the Boreal Forests of Newfoundland*. Canadian Society for Ecology and Evolution Annual General Meeting, Guelph, ON, Canada. 18–21 JUL. 2018
- **Rizzuto, M.**, Carbone, C., and Pawar, S. *Bio-mechanical constraints on foraging reverse the scaling of activity rate among carnivores*. Canadian Society for Ecology and Evolution Annual General Meeting, St. John’s, NL, Canada. 7–11 JUL. 2016

Posters

- **Rizzuto, M.**, Leroux, S.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R., Balluffi-Fry, J. *Beyond Diffusion: Animal-Mediated Nutrient Transport at Different Spatial Scales*. “Unifying Ecology Across Scales” Gordon Research Seminar and Conference, Biddeford, ME, USA. 21–27 JUL. 2018

HONORS & AWARDS

- Mitacs Research Training Award, Mitacs Canada 2020
- First Place, H5P Maker Session, Centre for Innovation in Teaching and Learning, Memorial University of Newfoundland and Labrador 2019
- Mitacs Globalink Research Award, Mitacs Canada 2018
- Dean’s Doctoral Award, Memorial University of Newfoundland and Labrador 2016–2018
- Graduated with Distinction, Imperial College London 2014
- Erasmus-LLP Scholarship, University of Turin 2010

RESEARCH EXPERIENCE

Visiting Assistant in Research, Schmitz Lab FEB.-APR. 2019
School of the Environment, Yale University, New Haven, CT

- Collaboration to develop a mathematical metaecosystem model describing animal-mediated nutrient transport across ecosystem boundaries
- Reviewed metaecosystem, metapopulation, and animal movement literature
- Performed simulations of ecosystem persistence over time under different animal movement and nutrient transport scenarios

Research Assistant, *Pawar Lab*

JAN.-MAR. 2016

Imperial College London-Silwood Park, Ascot, UK

- Digitized data from terrestrial plant thermal response from published studies
- Assisted with database management and cleanup, and formation of new team members

Research Assistant, *Tsaobis Baboon Project*

JUN.-OCT. 2015

Zoological Society of London, London, UK

- Assisted with collection of behavioural and population data from two troops of wild, habituated Chacma baboons, and with plant phenology surveys

Research Assistant, *Roe & Red deer in Trentino & Technology Project*

JUN.-SEPT. 2013

Trento, Italy

- Studied the migratory behaviour of roe deer using radio-tracking techniques (GPS, VHF), plant phenology surveys, and pellet decay rate analyses
- Intensive fieldwork in a physically demanding environment, under harsh weather conditions

Graduate Intern, *Piedmont Wolf Project*

JUN.-DEC. 2011

Maritime Alps Nature Park, Entraque (CN), Italy

- Designed and performed a study of the predator-prey interactions of wolves and chamois in the Maritime Alps Natural Park
- Managed all aspects of the project, from behavioural sampling to prey identification by hair analysis to scat specimen preparation for DNA analyses

Undergraduate Intern, *Ethology Lab*

JUN. 2008-MAR. 2009

University of Turin, Turin, Italy

- Bioacoustics study of the Indri lemur, testing for potential identification of lemurs from individuals' contributions to the family group song

**TEACHING
EXPERIENCE****Guest Lecturer, *Department of Biology***

Memorial University of Newfoundland and Labrador, St. John's, NL, Canada

Models in Biology

WINTER 2020

- Topics covered in lectures included classical models in Ecology, models of species interactions, meta-ecology models

Teaching Assistant, *Department of Biology*

Memorial University of Newfoundland and Labrador, St. John's, NL, Canada

Principles of Ecology

FALL 2018

- Managed the online learning section of the course, developing weekly new content introducing students to preeminent ecologists
- Provided administrative and academic support to students

Principles of Biology

WINTER 2017

- Supported students during practical laboratories
- Invigilated midterm and final exams, marked weekly lab reports

Undergraduate Teaching Assistant, Department of Life Sciences

Imperial College London, London, UK

Ecology

SPRING 2015

- Helped students collect data and plan analyses for final projects

Behavioral Ecology

WINTER 2015

- Assisted in laboratory setup for weekly practicals
- Helped student design analyses on data collected during practicals

Introduction to Biological Statistics

FALL 2014

- Helped students learn base and advanced R language

Graduate Teaching Assistant, Department of Life Sciences

Imperial College London-Silwood Park, Ascot, UK

Statistics

FALL 2014

- Assisted students with R coding and in developing statistical analyses

Macroecology and Climate Change

FALL 2014

- Assisted students using the species distribution software Maxent

SERVICE

Manuscript reviewer for *Biological Conservation*, *Science of the Total Environment*, and *Ecology and Evolution*.

PROFESSIONAL
DEVELOPMENT*Courses*

- **Becoming a More Equitable Educator: Mindsets and Practices,** MAR.-JUN. 2020
MIT Teaching Systems Lab
Attended online at edX.org
- **Teaching Skills Enhancement Program,** SEPT.-AUG. 2020
Centre for Innovation in Teaching and Learning
Memorial University of Newfoundland and Labrador, St. John's, NL, Canada

Workshops

- **Reproducible Research through Open Science,** 11 JUNE 2020
Canadian Institute for Ecology and Evolution & NSERC-CREATE "Living Data Project"
Attended online at osf.io
- **Teaching Inclusively & Equitably Online,** 21 MAY 2020
American Society for Engineering Education & NSF INCLUDES Aspire Alliance
Attended online through Blackboard Collaborate Ultra

- **H5P Maker Session,** 24 OCT. 2019
Centre for Innovation in Teaching and Learning
 Memorial University of Newfoundland and Labrador, St. John's, NL, Canada
- **Community of Inquiry Coffee Break: Open Access,** 23 OCT. 2019
Centre for Innovation in Teaching and Learning
 Memorial University of Newfoundland and Labrador, St. John's, NL, Canada
- **Open Access and Scholarly Publishing,** 22 OCT. 2019
Centre for Innovation in Teaching and Learning
 Memorial University of Newfoundland and Labrador, St. John's, NL, Canada
- **Four Things to Consider for Graduate Student Teaching,** 8 NOV. 2018
Enhanced Development of the Graduate Experience
 Memorial University of Newfoundland and Labrador, St. John's, NL, Canada
- **AARMS CRG Software Carpentry Workshop,** 27 MAY 2017
The Carpentries
 Memorial University of Newfoundland and Labrador, St. John's, NL, Canada

**VOLUNTEER
EXPERIENCE**

- Communications Officer, Biology Graduate Student Association** 2019–2020
 Memorial University of Newfoundland and Labrador, St. John's, NL, Canada
- Managed the Association's weekly newsletter, website, and all of its social media presence
- Chair, Biology Graduate Student Association** 2018–2019
 Memorial University of Newfoundland and Labrador, St. John's, NL, Canada
- Designed, funded, and run "The Balanced Student: stress and work management for graduate students", a workshop series on graduate students mental health and wellness
 - Hosted a Student-Supervisor Relationship workshop during the Graduate Core Seminar course for new graduate students
 - Coordinated the activities of the Executive Committee, focusing on fundraising and community outreach
- Seminar Coordinator, Biology Graduate Student Association** 2017–2018
 Memorial University of Newfoundland and Labrador, St. John's, NL, Canada
- Organized and run the weekly Seminar series for the Department of Biology, in a team of three coordinators
 - Helped in organizing the annual Symposium showcasing the research produced by the Department's graduate students
 - Contributed to the Association's fundraising and outreach activities
- Youth Educator, OASI-Operazione Mato Grosso** 2000–2013
 Turin, Italy
- Volunteer work with children and teenagers in primary, secondary and high school, in Turin, Italy, and at the Hospital São Julião in Campo Grande, MS, Brazil

	Team Leader, XX Winter Olympic and IX Paralympic Games	2005–2006
	Turin, Italy	
	- Organized and supervised daily activities of a team of 10 volunteers in the Protocol Crew, International Relations and Services	
PROFESSIONAL AFFILIATIONS	Ecological Society of America	2021–2022
	Canadian Society of Ecology and Evolution	2016–2021
CONFERENCES ATTENDED	- “Vital Connections in Ecology”	2–6 AUG. 2021
	Ecological Society of America, Virtual Annual Meeting, Long Beach, CA, USA	
	- “Unifying Ecology Across Scales”	21–27 JUL. 2018
	Gordon Research Seminar and Conference, Biddeford, ME, USA	
	- Annual General Meeting	18–21 JUL. 2018
	Canadian Society for Ecology and Evolution, Guelph, ON, Canada	
	- Annual General Meeting	7–11 JUL. 2016
	Canadian Society for Ecology and Evolution, St. John’s, NL, Canada	
	- From Energetics to Macro Ecology: Carnivore Responses to Environmental Change	14–15 NOV. 2013
	Zoological Society of London, London, UK	
	- Euroscience Open Forum	2–7 JUL. 2010
	Turin, Italy	
	- XIX Congress of the Italian Primatological Society	1–3 APR. 2009
	Asti, Italy	
SOFTWARE PROFICIENCY	R, RStudio, Mathematica, Git, Unix shell, \LaTeX , Markdown, Inkscape, Quantum GIS, ArcGIS	
CERTIFICATES	- Wilderness and Remote First Aid	2016–2019
	Canadian Red Cross, St. John’s, NL, Canada	
	- WHMIS and Lab Safety	2017
	Memorial University of Newfoundland, St. John’s, NL, Canada	
	- Basic Outdoor First Aid	2014
	Marlin Training Ltd., London, UK	
	- International English Language Testing System, grade 8.5	2013
	British Council, Turin, Italy	
	- International Computer Driving Licence	2007
	University of Turin, Turin, Italy	
INTERESTS	Backpacking, Hiking, Photography, Yoga	