

# Matteo Rizzuto

POSTDOCTORAL ASSOCIATE · SCHOOL OF THE ENVIRONMENT, YALE UNIVERSITY

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## Education

### DOCTOR OF PHILOSOPHY, BIOLOGY

Memorial University of Newfoundland and Labrador

2016–2021

St. John's, NL, Canada

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

### MASTER OF RESEARCH (DISTINCTION), ECOLOGY, EVOLUTION, AND CONSERVATION

Imperial College London

2013–2014

London, United Kingdom

### MASTER OF SCIENCE, EVOLUTION OF ANIMAL AND HUMAN BEHAVIOUR

University of Turin

2009–2012

Turin, Italy

### BACHELOR OF SCIENCE (HONOURS), BIOLOGY

University of Turin

2004–2009

Turin, Italy

## Research Appointments

### POSTDOCTORAL ASSOCIATE

Schmitz Lab, School of the Environment, Yale University

Present

New Haven, USA

- Developing a mathematical model tracking animals influence on carbon budget and nutrient cycling in terrestrial ecosystems

### VISITING ASSISTANT IN RESEARCH

Schmitz Lab, School of the Environment, Yale University

Feb.–Apr. 2019

New Haven, USA

- Developed a meta-ecosystem model capturing the effects of animal-mediated nutrient transport across ecosystem boundaries

### RESEARCH ASSISTANT

Pawar Lab, Department of Life Sciences, Imperial College London

Jan.–Mar. 2016

Silwood Park, Ascot, United Kingdom

- Data collection, management, and cleanup for a meta-analysis of published studies of plant thermal responses

### RESEARCH ASSISTANT

Tsaobis Baboon Project, Zoological Society of London

Jun.–Oct. 2015

London, United Kingdom

- Field placement to collect behavioral and population data from wild, habituated *Chacma* baboons, and conduct plant phenology survey

### RESEARCH ASSISTANT

Roe & Red Deer in Trentino and Technology Project, Fondazione Edmund Mach

Jun.–Sept. 2013

Trento, Italy

- Field placement to collect roe deer radio-tracking data, as well as conduct plant phenology surveys and pellet decay rate analyses

### GRADUATE INTERN

Piedmont Wolf Project, Maritime Alps Nature Park

Jun.–Dec. 2011

Entracque (CN), Italy

- Designed and led a mixed laboratory and field-based study of wolves-chamois predator-prey interactions in the Western Alps

### UNDERGRADUATE INTERN

Ethology Lab, University of Turin

2008–2009

Turin, Italy

- Bio-acoustic study of the *Indri* lemur to isolate individual contributions to a family group song

## Publications

Peer reviewed. <sup>†</sup> stands for equal contribution.

11. Heckford, T.R., Leroux, S.J., Vander Wal, E., **Rizzuto, M.**, Balluffi-Fry, J., Richmond, I.C., Wiersma, Y.F. 2022. Ecoregion and community structure influences on the foliar elemental niche of balsam fir (*Abies balsamea* (L.) Mill.) and white birch (*Betula papyrifera* Marshall). *Ecology and Evolution* **12**, e9244.

10. Little, C.J.<sup>†</sup>, **Rizzuto, M.<sup>†</sup>**, 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* **8**, e08892. **Editor's Choice**
9. Balluffi-Fry, J., Leroux, S.J., Wiersma, Y.F., Richmond, I.C., Heckford, T.R., **Rizzuto, M.**, Kennah, J.L., Vander Wal, E. 2022. Integrating plant stoichiometry and feeding experiments: state-dependent forage choice and its implications on body mass. *Oecologia* **198**(3), 579–591.
8. 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. 2022. Individual snowshoe hares manage risk differently: integrating stoichiometric distribution models and foraging ecology. *Journal of Mammalogy* **103**(1), 196–208.
7. Heckford, T.R., Leroux, S.J., Vander Wal, E., **Rizzuto, M.**, Balluffi-Fry, J., Richmond, I.C., Wiersma, Y.F. 2022. Spatially explicit correlates of plant functional traits inform landscape patterns of resource quality. *Landscape Ecology* **37**, 59–80.
6. **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. **Winner, Hanski Prize 2021**
5. Ellis-Soto, D.<sup>†</sup>, Ferraro, K.M.<sup>†</sup>, **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. **Winner, Sidnie Manton Award 2021**
4. Richmond, I.C., Leroux, S.J., Vander Wal, E., Heckford, T.R., **Rizzuto, M.**, Balluffi-Fry, J., Kennah, J., Wiersma, Y.F. 2021. Temporal variation and its drivers in the elemental traits of four boreal plant species. *Journal of Plant Ecology* **14**(3), 398–413.
3. 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.
2. **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.
1. **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. **Cover Story**

#### 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*.
- 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.

## Presentations

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#### Conference 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

#### Conference 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

#### Workshops

- **Rizzuto, M.** *Grammar of Graphic: ggplot2*. Part of SPRY: A Learning Community for Quantitative Skill-Sharing Yale University School of the Environment. 4 Nov. 2022
- **Rizzuto, M.** *(R)markdown: a brief tour*. Part of SPRY: A Learning Community for Quantitative Skill-Sharing Yale University School of the Environment. 14 Oct. 2022

## Honors & Awards

Note: *Memorial University* stands for Memorial University of Newfoundland and Labrador.

<b>Hanski Prize</b> , Oecologia	2021
Awarded by the journal's Editorial Board to the best student-authored paper in animal ecology	
<b>Mitacs Research Training Award</b> , Mitacs, St. John's, Canada	2020
Awarded to graduate students to conduct research during the COVID-19 pandemic	
<b>First Place–H5P Maker Session</b> , Centre for Innovation in Teaching & Learning, Memorial University, St. John's, Canada	2019
Awarded to the creator of the best HTML5 interactive learning object	
<b>Mitacs Globalink Research Award</b> , Mitacs, St. John's, Canada	2019
Awarded to senior graduate students to conduct research abroad	
<b>Dean's Doctoral Award</b> , Memorial University, St. John's, Canada	2016–2020
Awarded to Ph.D. students based on academic excellence and research potential	
<b>Graduated with Distinction</b> , Imperial College London, London, United Kingdom	2014
Awarded to the top 5% of all Master's students in a cohort	
<b>Erasmus-LLP Scholarship</b> , University of Turin, Turin, Italy	2010
Awarded to students to take part in the Erasmus exchange program of the European Union	

## Teaching

<b>YALE UNIVERSITY</b>	2022
Guest Lecturer	New Haven, USA
<b>INDUSTRIAL ECOLOGY</b> , Graduate course	Fall 2022
<ul style="list-style-type: none"> <li>• Crafted and delivered a lecture weaving the concept of metabolism from ecology into urban ecology</li> </ul>	
<b>MEMORIAL UNIVERSITY OF NEWFOUNDLAND AND LABRADOR</b>	2017–2020
Teaching Assistant and Guest Lecturer	St. John's, Canada
<b>MODELS IN BIOLOGY</b> , Graduate and Undergraduate course	Winter 2020
<ul style="list-style-type: none"> <li>• Designed and delivered lectures on classical models in Ecology, models of species interactions, and meta-ecology models</li> </ul>	
<b>PRINCIPLES OF ECOLOGY</b> , Undergraduate course	Fall 2018
<ul style="list-style-type: none"> <li>• Managed the online learning portion of the course, provided administrative and academic support to students</li> </ul>	
<b>PRINCIPLES OF BIOLOGY</b> , Undergraduate course	Winter 2017
<ul style="list-style-type: none"> <li>• Assisted during lab-based lectures, marked lab reports, midterms, and invigilated final exams</li> </ul>	

ECOLOGY, Undergraduate course	Spring 2015
• Demonstrator for the course's field trip, helped students design, collect data, and run analyses for their final projects	
BEHAVIORAL ECOLOGY, Undergraduate course	Winter 2015
• Assisted with lab-based lectures, from experiment setup to helping students with lab data analysis	
INTRODUCTION TO BIOLOGICAL STATISTICS, Undergraduate course	Fall 2014
• Helped students learn base and advanced R language, facilitated Q&A sessions ahead of final exams	
STATISTICS, Graduate course	Fall 2014
• Helped students in developing and coding statistical analyses in R	
MACROECOLOGY AND CLIMATE CHANGE, Graduate course	Fall 2014
• Assisted students using the species distribution software Maxent	

## Service

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**Manuscript Reviewer** *Biological Conservation, Science of the Total Environment, Ecology and Evolution*

## Professional Development

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### Courses

BECOMING A MORE EQUITABLE EDUCATOR: MINDSETS AND PRACTICES	Mar.–Jun. 2020
MIT Teaching Systems Lab	Attended online at <a href="https://edX.org">edX.org</a>
TEACHING SKILLS ENHANCEMENT PROGRAM	Sept. 2019–Aug. 2020
Centre for Innovation in Teaching and Learning	Memorial University

### Workshops

REPRODUCIBLE RESEARCH THROUGH OPEN SCIENCE	11 Jun. 2020
Canadian Institute for Ecology and Evolution & NSERC-CREATE “Living Data Project”	Attended online at <a href="https://osf.io">osf.io</a>
TEACHING INCLUSIVELY & EQUITABLY ONLINE	21 May 2020
American Society for Engineering Education & NSF INCLUDES Aspire Alliance	Attended online
H5P MAKER SESSION	24 Oct. 2019
Centre for Innovation in Teaching and Learning	Memorial University
COMMUNITY OF INQUIRY COFFEE BREAK: OPEN ACCESS	23 Oct. 2019
Centre for Innovation in Teaching and Learning	Memorial University
OPEN ACCESS AND SCHOLARLY PUBLISHING	22 Oct. 2019
Centre for Innovation in Teaching and Learning	Memorial University
FOUR THINGS TO CONSIDER FOR GRADUATE STUDENT TEACHING	8 Nov. 2018
Enhanced Development of the Graduate Experience	Memorial University
AARMS CRG SOFTWARE CARPENTRY WORKSHOP	27 May 2017
The Carpentries	Memorial University

## Extracurricular Activity

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SYMPOSIUM COMMITTEE MEMBER	Present
Yale Postdoctoral Association	Yale University
• Led the Scheduling subcommittee, in charge of planning and organizing the annual YPA symposium	
COMMUNICATIONS OFFICER	2019–2020
Biology Graduate Student Association	Memorial University
• Managed the Association's weekly newsletter, website, event advertisement campaigns, and social media presence	

## CHAIRPERSON

2018–2019

### Biology Graduate Student Association

Memorial University

- Coordinated the activities of the Executive Committee, focusing on fundraising, graduate students' welfare and mental health, and community outreach
- Liaised with the Head of the Department of Biology to coordinate activities and events

## SEMINAR COORDINATOR

2017–2018

### Biology Graduate Student Association

Memorial University

- One-third of the Seminar team, in charge of approaching, scheduling, and managing internal and external speakers for the weekly seminar series of the Biology Department

## YOUTH EDUCATOR

2000–2013

### Associazione O.A.S.I.—Operazione Mato Grosso di Torino

Turin, Italy

- Designed, scheduled, and run educational activities and community outreach events with and for children, teenagers, and young adults in Turin, Italy, and at the Hospital São Julião in Campo Grande, Mato Grosso do Sul, Brazil

## TEAM LEADER

2005–2006

### XX Winter Olympic and IX Paralympic Games

Turin, Italy

- Led, scheduled, and supervised the daily activities of a ten-strong team of volunteers within the International Relations and Services Protocol Crew at the Ice Hockey, Curling, and Ceremonies Olympic venues

## Professional Affiliations

### ECOLOGICAL SOCIETY OF AMERICA

2021–2022

### CANADIAN SOCIETY FOR 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

### CANADIAN SOCIETY FOR ECOLOGY AND EVOLUTION

18–21 Jul. 2018

#### Annual General Meeting

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, United Kingdom

### ESOF—EUROSCIENCE OPEN FORUM

2–7 Jul. 2010

#### Euroscience

Turin, Italy

### XIX CONGRESS

1–3 Apr. 2009

#### Italian Primatological Society

Asti, Italy

## Skills

### Programming

R, Bash, Wolfram Mathematica, LaTeX, HTML

### Software

VCS (Git, GitHub), RStudio, Atom, Sublime Text, QGIS, Inkscape

### Platform

macOS, Windows

### Languages

Italian, English

## Certificates

### WILDERNESS AND REMOTE FIRST AID

2016–2019

#### Canadian Red Cross

St. John's, NL, Canada

<b>WHMIS AND LAB SAFETY</b>	2017
Memorial University of Newfoundland and Labrador	<i>St. John's, NL, Canada</i>
<b>BASIC OUTDOOR FIRST AID</b>	2014
Marlin Training Ltd.	<i>London, United Kingdom</i>
<b>INTERNATIONAL ENGLISH LANGUAGE TESTING SYSTEM</b>	2013
British Council	<i>Turin, Italy</i>
Grade: 8.5	
<b>INTERNATIONAL COMPUTER DRIVING LICENCE</b>	2007
University of Turin	<i>Turin, Italy</i>