

# Matteo Rizzuto

POSTDOCTORAL ASSOCIATE · SCHOOL OF THE ENVIRONMENT, YALE UNIVERSITY

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Pronouns: he/him/his

## 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, UK

### 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

- Building mathematical models to investigate and quantify animal influences on ecosystem carbon cycling
- Developing theoretical frameworks to support and expand nature-based climate change solutions, with a focus on trophic rewilding

### 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—Silwood Park

Jan.–Mar. 2016

Ascot, UK

- Collected and managed data for a meta-analysis of published studies of plant thermal responses

### RESEARCH ASSISTANT

Tsaobis Baboon Project, Zoological Society of London

Jun.–Oct. 2015

London, UK

- Field-based placement to collect behavioral, dietary, and population data from wild *Chacma* baboons in the Namib Desert

### RESEARCH ASSISTANT

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

Jun.–Sept. 2013

Trento, Italy

- Field-based placement to collect data on roe deer movement data, plant phenology, and pellet decay rate in the Eastern Alps

### 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 an individual's contribution to their family group song among *Indri* lemurs

## Publications

† marks equal contributions; for publications where I am fourth author or later, I contributed to ideas, data collection, and writing.

Peer reviewed.

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>, Lohring, 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

#### In progress

- Rizzuto, M., Leroux, S. J., Schmitz, O. J., Vander Wal, E., Wiersma, Y. F., Heckford, T. R. 2023. Animal-vectored nutrient flows across resource gradients influence the nature of local and meta-ecosystem functioning. In review, *Ecological Modelling*, manuscript id: ECOMOD-23-431. *bioRxiv preprint*.
- McLeod, A.M., Leroux, S.J., Rizzuto, M., Leibold, M.A., Schiesari, L. 2023. Integrating ecosystem and contaminant models to predict the effects of ecosystem fluxes on contaminant dynamics. In review, *Ecosphere*, manuscript id: ECS23-0188. *bioRxiv preprint*.
- Rizzuto, M., Leroux, S. J., Schmitz, O. J. 2023 Rewiring the carbon cycle: a theoretical framework for animal-driven ecosystem carbon sequestration. In review, *Journal of Geophysical Research: Biogeosciences*, manuscript id: 2023JG007714. *bioRxiv preprint*.

#### 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. *Modeling the zoogeochemical effects of herbivores on ecosystem carbon cycles*. 6<sup>th</sup> Yale Postdoc Association Annual Symposium, New Haven, CT, USA. 25 May 2023
- [Rizzuto, M.](#), Leroux, S.J., Schmitz, O.J., Vander Wal, E., Wiersma, Y.F., Heckford, T.R. *Movers and shakers: Animal-vectored nutrient flows across resource gradients influence local and meta-ecosystem functioning*. “Ecological Models for Tomorrow’s Solutions” The International Society for Ecological Modelling Global Conference 2023, Toronto, ON, Canada. 2–6 May 2023
- [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 Graphics: 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

### Outreach

- [Rizzuto, M.](#) *Skype-a-Scientist*, Hope Township Elementary School. 22 Mar. 2023

## Honors & Awards

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

**Hanski Prize**, Oecologia 2021

Awarded by the journal’s Editorial Board to the best student-authored paper in animal ecology

**Mitacs Research Training Award**, Mitacs, St. John’s, Canada 2020

Awarded to graduate students to conduct research during the COVID-19 pandemic

**First Place–H5P Maker Session**, Memorial University, St. John’s, Canada 2019

Awarded by the Centre for Innovation in Teaching & Learning to the creator of the best HTML5 interactive learning object

**Mitacs Globalink Research Award**, 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 Awarded to Ph.D. students based on academic excellence and research potential	2016–2020
<b>Graduated with Distinction</b> , Imperial College London, London, UK Awarded to the top 5% of all Master's students in a cohort	2014
<b>Erasmus-LLP Scholarship</b> , University of Turin, Turin, Italy Awarded to students to take part in the Erasmus exchange program of the European Union	2010

## Teaching

<b>YALE UNIVERSITY</b> Guest Lecturer	2022 New Haven, USA
INDUSTRIAL ECOLOGY, Graduate course • Crafted and delivered a lecture introducing ideas and theories from metabolic ecology to urban ecology	Fall 2022
<b>MEMORIAL UNIVERSITY OF NEWFOUNDLAND AND LABRADOR</b> Teaching Assistant and Guest Lecturer	2017–2020 St. John's, Canada
MODELS IN BIOLOGY, Graduate and Undergraduate course • Designed and delivered lectures on classical models in Ecology, models of species interactions, and meta-ecology models	Winter 2020
PRINCIPLES OF ECOLOGY, Undergraduate course • Managed the online learning part of the course, provided administrative and academic support to students	Fall 2018
GRADUATE CORE SEMINAR, Graduate course • Developed and delivered a seminar on Student-Supervisor Communications	Fall 2018
PRINCIPLES OF BIOLOGY, Undergraduate course • Assisted during lab-based lectures, marked lab reports, midterms, and invigilated final exams	Winter 2017
<b>IMPERIAL COLLEGE LONDON</b> Teaching Assistant	2014–2015 London, UK
ECOLOGY, Undergraduate course • Demonstrator for the course's field trip, helped students design, collect data, and run analyses for their final projects	Spring 2015
BEHAVIORAL ECOLOGY, Undergraduate course • Assisted with lab-based lectures, from experiment setup to helping students with lab data analysis	Winter 2015
INTRODUCTION TO BIOLOGICAL STATISTICS, Undergraduate course • Helped students learn base and advanced R language, facilitated Q&A sessions ahead of final exams	Fall 2014
STATISTICS, Graduate course • Helped students in developing and coding statistical analyses in R	Fall 2014
MACROECOLOGY AND CLIMATE CHANGE, Graduate course • Assisted students using the species distribution software Maxent	Fall 2014

## Service

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

## Professional Development

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### Courses

<b>MENTORSHIP TRAINING PROGRAM FOR YALE POSTDOCS</b> Office for Postdoctoral Affairs	March 2023 Yale University
<b>CAREER DEVELOPMENT LEADERS PROGRAM</b> Office of Career Strategy	Jan.–Mar. 2023 Yale University
<b>BECOMING A MORE EQUITABLE EDUCATOR: MINDSETS AND PRACTICES</b> MIT Teaching Systems Lab	Mar.–Jun. 2020 Attended online at <a href="https://edX.org">edX.org</a>

## Workshops

<b>BYSTANDER INTERVENTION TRAINING</b> Yale Postdoc Association	13 Jun. 2023 Yale University
<b>HOW TO HELP: TIPS FROM MENTAL HEALTH FIRST AID</b> Being Well at Yale	1 Mar. 2023 Yale University
<b>ALT-ACADEMIC CAREER Q&amp;A I</b> Early Career Section	8-9 Feb. 2023 Ecological Society of America
<b>HOW TO WRITE AN EFFECTIVE DIVERSITY STATEMENT</b> Graduate Writing Lab	11 Oct. 2022 Yale University
<b>BUILDING YOUR BRAND WORKSHOP</b> Beyond the PhD	8 Sept. 2022 Attended online
<b>REPRODUCIBLE RESEARCH THROUGH OPEN SCIENCE</b> Canadian Institute for Ecology and Evolution & NSERC-CREATE “Living Data Project”	11 Jun. 2020 Attended online at <a href="https://osf.io">osf.io</a>
<b>TEACHING INCLUSIVELY &amp; EQUITABLY ONLINE</b> American Society for Engineering Education & NSF INCLUDES Aspire Alliance	21 May 2020 Attended online
<b>H5P MAKER SESSION</b> Centre for Innovation in Teaching and Learning	24 Oct. 2019 Memorial University
<b>COMMUNITY OF INQUIRY COFFEE BREAK: OPEN ACCESS</b> Centre for Innovation in Teaching and Learning	23 Oct. 2019 Memorial University
<b>OPEN ACCESS AND SCHOLARLY PUBLISHING</b> Centre for Innovation in Teaching and Learning	22 Oct. 2019 Memorial University
<b>FOUR THINGS TO CONSIDER FOR GRADUATE STUDENT TEACHING</b> Enhanced Development of the Graduate Experience	8 Nov. 2018 Memorial University
<b>AARMS CRG SOFTWARE CARPENTRY WORKSHOP</b> The Carpentries	27 May 2017 Memorial University

## Extracurricular Activity

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

<b>SYMPOSIUM COMMITTEE CO-COORDINATOR</b> Yale Postdoctoral Association	Present Yale University
<ul style="list-style-type: none"><li>Co-coordinated the activities of the YPA Symposium Committee and organized the Annual Yale Postdoc Symposium</li><li>Member of the Yale Postdoctoral Association Executive Board, participating in monthly meetings to steer the Association's activities</li></ul>	
<b>SYMPOSIUM COMMITTEE MEMBER</b> Yale Postdoctoral Association	2022–2023 Yale University
<ul style="list-style-type: none"><li>Leader of the Scheduling subcommittee</li><li>Developed the Symposium's schedule, planned and organized outreach and social activities, coordinated the search for the keynote speaker and panelists</li></ul>	
<b>COMMUNICATIONS OFFICER</b> Biology Graduate Student Association	2019–2020 Memorial University
<ul style="list-style-type: none"><li>Managed the Association's weekly newsletter, website, event advertisement campaigns, and social media presence</li></ul>	
<b>CHAIRPERSON</b> Biology Graduate Student Association	2018–2019 Memorial University
<ul style="list-style-type: none"><li>Coordinated the activities of the Executive Committee, focusing on fundraising, the welfare and mental health of graduate students, and community outreach</li><li>Liaised with the Head of the Department of Biology to coordinate activities and events</li></ul>	

## SEMINAR CO-COORDINATOR

2017–2018

### Biology Graduate Student Association

Memorial University

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

## 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

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### INTERNATIONAL SOCIETY FOR ECOLOGICAL MODELLING

2023–2025

### ECOLOGICAL SOCIETY OF AMERICA

2021–2023

### CANADIAN SOCIETY FOR ECOLOGY AND EVOLUTION

2016–2021

## Conferences

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### Organized

#### YALE POSTDOC ASSOCIATION

25 May 2023

#### 6<sup>th</sup> Annual Symposium

New Haven, CT, USA

### Attended

#### ECOLOGICAL MODELS FOR TOMORROW'S SOLUTIONS

2–6 May 2023

#### The International Society for Ecological Modelling Global Conference 2023

Toronto, ON, Canada

#### 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

#### ESOF—EUROSCIENCE OPEN FORUM

2–7 Jul. 2010

#### Euroscience

Turin, Italy

#### XIX CONGRESS

1–3 Apr. 2009

#### Italian Primatological Society

Asti, Italy

## Skills

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### Programming

R, Wolfram Mathematica, LaTeX, Bash, HTML

### Software

Version Control (Git, GitHub), RStudio, Atom, Sublime Text, QGIS, Inkscape

### Platforms

macOS, Windows

### Languages

Italian (Native), English (Fluent), French (Basic), Spanish (Basic), Polish (Basic)

## Certificates

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**WILDERNESS AND REMOTE FIRST AID**

Canadian Red Cross

2016–2019

St. John's, NL, Canada

**WHMIS AND LAB SAFETY**

Memorial University of Newfoundland and Labrador

2017

St. John's, NL, Canada

**BASIC OUTDOOR FIRST AID**

Marlin Training Ltd.

2014

London, UK

**INTERNATIONAL ENGLISH LANGUAGE TESTING SYSTEM**

British Council

2013

Turin, Italy

Grade: 8.5

**INTERNATIONAL COMPUTER DRIVING LICENCE**

University of Turin

2007

Turin, Italy

## Interests

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Hiking, Photography, Yoga, Watercolor painting

## References

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**DR. OSWALD J. SCHMITZ**

School of the Environment

Yale University

 New Haven, CT, USA [OSWALD.SCHMITZ@YALE.EDU](mailto:OSWALD.SCHMITZ@YALE.EDU)**DR. SHAWN J. LEROUX**

Department of Biology

Memorial University of Newfoundland

 St. John's, NL, Canada [SLEROUX@MUN.CA](mailto:SLEROUX@MUN.CA)**DR. YOLANDA F. WIERSMA**


Department of Biology

Memorial University of Newfoundland

 St. John's, NL, Canada [YWIERSMA@MUN.CA](mailto:YWIERSMA@MUN.CA)**DR. SAMRAAT PAWAR**

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