

DR. ERIN R. SIRACUSA

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**EDUCATION

Ph.D. – Integrative Biology, University of Guelph, Ontario (CAN) 2013-2018

Supervisor: Dr. Andrew McAdam

Dissertation: Effects of the social environment on the behaviour and fitness of a territorial squirrel

B.Sc. (honors) – Biology and English, St. Lawrence University, NY (USA) 2008-2012

Overall GPA: 4.0/4.0 (*Summa cum laude*)

Supervisor: Dr. Erika Barthelmess

Honors thesis: Assessing the impact of North American porcupine (*Erethizon dorsatum*) foraging on forest composition and structure in northern New York.

**PROFESSIONAL APPOINTMENTS

Postdoctoral Research Fellow University of Exeter, UK Apr 2022 – present

Conducted a novel experimental manipulation of food resources on Cayo Santiago to explore how changing competition levels affect the formation of social relationships and structure of social networks. Part of the FriendOrigins Project: <https://www.friendorigins.com/>

Postdoctoral Research Associate University of Exeter, UK Jan 2020 – Apr 2022

Studied the causes and consequences of age-based changes in sociality. Coordinated the collection and curation of behavioural data in a free-living population of rhesus macaques on Cayo Santiago.

Postdoctoral Researcher University of Guelph, CA Mar – Dec 2019

& Kluane Red Squirrel Project Coordinator

Studied the effects of the social environment on behaviour and fitness in a “solitary” species.

Trained and coordinated 15-20 field technicians in a remote field camp to collect life history and behavioural data on a free-living population of red squirrels.

**PUBLICATIONS

PEER-REVIEWED ARTICLES

Published

12. Siracusa E.R., Pereira A.S, Bohr Brask J., Negron-Del Valle J.E., Phillips D., Platt M.L., Higham J.P., Snyder-Mackler N., Brent L.J.N. Ageing in a collective: The impact of ageing individuals on social network structure. *Philosophical Transactions of the Royal Society B*, 378: 20220061. <https://doi.org/10.1098/rstb.2022.0061>

11. **Siracusa E.R.**, Negron-Del Valle J.E., Phillips D., Platt M.L., Higham J.P., Snyder-Mackler N., Brent L.J.N. 2022. Within-individual changes reveal increasing social selectivity with age in rhesus macaques. *Proceedings of the National Academy of Sciences*, 119 (49) e2209180119. <https://doi.org/10.1073/pnas.2209180119>
10. Pavez-Fox M.A., Kimock, C.M., Rivera-Barreto N., Negron-Del Valle J.E., Phillips D., Ruiz-Lambides A., Snyder-Mackler N, Higham J.P., Brent L.J.N.*, **Siracusa E.R.*** (2022) Reduced injury risk links sociality to survival in a group-living primate. *iScience*, 25 (11): 105454. <https://doi.org/10.1016/j.isci.2022.105454>
*equal contribution
9. **Siracusa E.R.** (2022) Social senescence in red deer. *Nature Ecology and Evolution, News & Views*, 6: 1062-1063. <https://doi.org/10.1038/s41559-022-01766-3>
8. Martinig, A.R., Karst H.J, **Siracusa E.R.**, Studd E.K., McAdam A.G., Dantzer B., Delaney D.M., Lane J.E., Pokharel P., Boutin S. (2022) Animal personality: a comparison of standardized assays and focal observations in North American red squirrels. *Animal Behaviour*, 190: 221-232. <https://doi.org/10.1016/j.anbehav.2022.05.012>
7. **Siracusa E.R.**, Higham J.P., Snyder-Mackler N., Brent L. J. N. (2022) Social ageing: Exploring the drivers of late-life changes in social behaviour in mammals. *Biology Letters*, 18: 20210643. <https://doi.org/10.1098/rsbl.2021.0643>
6. Fisher D.N., Kilgour R.J., **Siracusa E.R.**, Foote J.R., Hobson E.A., Montiglio P.O., Saltz J.B., Wey T., Wice E.W. (2021) Anticipated effects of abiotic environmental change on intraspecific social interactions. *Biological Reviews*, 96: 2661-2693. <https://doi.org/10.1111/brv.12772>
5. **Siracusa E.R.**, Boutin S., Dantzer B., Lane J.E., Coltman D.W., McAdam A.G. (2021) Familiar neighbors, but not relatives, enhance fitness in a territorial mammal. *Current Biology* 31: 438-445. <https://doi.org/10.1016/j.cub.2020.10.072>
4. Studd E.K., Menzies A.K., **Siracusa E.R.**, Dantzer B., Lane J.E., McAdam A.G., Boutin S., Humphries M.M. (2020) Optimization of energetic and reproductive gains explains behavioural responses to environmental variation across seasons and years, *Ecology Letters* 23: 841-850. <https://doi.org/10.1111/ele.13494>
3. **Siracusa E.R.**, Wilson D.R., Studd E.K., Boutin S., Humphries M.M., Dantzer B., Lane J.E., McAdam A.G. (2019) Red squirrels mitigate costs of territory defence through social plasticity, *Animal Behaviour* 151: 29-42. <https://doi.org/10.1016/j.anbehav.2019.02.014>
2. **Siracusa E.**, Morandini M., Boutin S., Humphries M.M., Dantzer B., Lane J.E., & McAdam A.G. (2017) Red squirrel territorial vocalizations deter intrusions by conspecific rivals, *Behaviour* 154: 1259-1273. [10.1163/1568539X-00003467](https://doi.org/10.1163/1568539X-00003467)
1. **Siracusa E.**, Boutin S., Humphries M.M., Gorrell J.C., Coltman D.W., Dantzer B., Lane J.E., & McAdam A.G. (2017) Familiarity with neighbours affects intrusion risk in territorial red squirrels, *Animal Behaviour* 133: 11-20. <https://doi.org/10.1016/j.anbehav.2017.08.024>

SCIENCE OUTREACH

4. **Siracusa, E.**, Snyder-Mackler, N. Macaque monkeys shrink their social networks as they age- new research suggests evolutionary roots of a pattern seen in elderly people, too. The Conversation, US. April 2023. <https://theconversation.com/macaque-monkeys-shrink-their-social-networks-as-they-age-new-research-suggests-evolutionary-roots-of-a-pattern-seen-in-elderly-people-too-196862>
3. Hooper B., DeMoor D., **Siracusa, E.** Animal friendships are surprisingly like our own. The Conversation, UK. October 2022. <https://theconversation.com/animal-friendships-are-surprisingly-like-our-own-188120>
2. **Siracusa, E.** Red squirrels, socially distant by nature, teach us the value of good neighbours. The Conversation, Canada. March 2021. <https://theconversation.com/red-squirrels-socially-distant-by-nature-teach-us-the-value-of-good-neighbours-152210>
1. **Siracusa, E.** A narwhal frolics with the belugas: Why interspecies adoptions happen. The Conversation, Canada. November 2018. <https://theconversation.com/a-narwhal-frolics-with-the-belugas-why-interspecies-adoptions-happen-105776>

****RESEARCH TALKS**

INVITED EXTERNAL SEMINARS

5. Social aging: Toward a deeper understanding of the intersection between sociality and the aging process. Kennesaw State University. March 2022.
4. Lessons in social distancing from red squirrels: The importance of social relationships for behaviour and fitness in a solitary species. St. Lawrence University. March 2021
3. Lessons in social distancing from red squirrels: The importance of social relationships for behaviour and fitness in a solitary species. University of Northern British Columbia. March 2021
2. Lessons in social distancing from red squirrels: The importance of social relationships for behaviour and fitness in a solitary species. University of Saskatchewan. February 2021
1. Lessons in social distancing from red squirrels: The importance of social relationships for behaviour and fitness in a solitary species. University of Washington. June 2020.

CONFERENCE PRESENTATIONS

13. **Siracusa E.R.**, Negrón-Del Valle J.E., Phillips D, Platt, M.L., Higham J.P., Snyder-Mackler N., Brent L.J.N. Within-individual changes reveal increasing social selectivity with age in rhesus macaques. International Society for Behavioural Ecology. Stockholm, Sweden. July 28 - Aug 2, 2022. Oral presentation.
12. **Siracusa E.R.**, Negrón-Del Valle J.E., Phillips D, Platt M.L., Higham J.P., Snyder-Mackler N., Brent L.J.N. Within-individual changes reveal increasing social selectivity with age in rhesus

macaques. Joint Conference of the European Federation for Primatology and the Gesellschaft für Primatologie. Arnhem, Netherlands. June 1-3, 2022. Oral presentation

11. **Siracusa E.R.**, Negron-Del Valle J.E., Phillips D, Platt M.L., Higham J.P., Snyder-Mackler N., Brent L.J.N. Age-Based Changes in Social Behaviour in Rhesus Macaques: Evidence for Social Selectivity. Animal Behavior Society. Virtual Conference. August 3-6, 2021. Oral presentation.
10. **Siracusa E.R.**, Higham J.P., Snyder-Mackler N., Brent L.J.N. From interactions to relationships to social structure: Understanding how aging shapes the social landscape. American Society of Mammalogists. Virtual Conference. June 14-18, 2021. Oral presentation.
9. **Siracusa E.**, Boutin S., Humphries M.M., Dantzer B., Lane J., Coltman D.W, McAdam A.G. The lasting effects of ‘dear enemies’: stable social relationships have fitness benefits for a territorial squirrel. European Conference on Behavioural Biology. Liverpool, UK. August 9-12, 2018. Oral presentation.
8. **Siracusa E.**, Boutin S., Humphries M.M., Dantzer B., Lane J., Coltman D.W, McAdam A.G. Long-term social relationships affect reproductive success and survival in a territorial squirrel. Animal Behavior Society. Milwaukee, WI. August 2-6, 2018. Oral presentation. (***Winner of the W.C. Allee competition for best student paper and presentation***)
7. **Siracusa E.**, Boutin S., Humphries M.M., Dantzer B., Lane J., Coltman D.W, McAdam A.G. Does the social environment matter to solitary animals? Fitness benefits of familiarity in red squirrels. Canadian Society for Ecology and Evolution. Guelph, ON. July 19-21, 2018. Oral presentation.
6. **Siracusa E.**, Boutin S., Humphries M.M., Dantzer B., Lane J., Coltman D.W, McAdam A.G. Does the social environment matter to solitary animals? Fitness benefits of familiarity in red squirrels. American Society of Mammalogists. Manhattan, KS. June 25-29, 2018. Oral presentation. (***Plenary speaker***)
5. **Siracusa E.**, Wilson D.R., Boutin S., Humphries M.M., Gorrell J.C., Coltman D.W., Dantzer B., Lane J., McAdam A.G. Neighbor familiarity affects intrusion risk and behavioral plasticity in a territorial squirrel (*Tamiasciurus hudsonicus*). American Society of Mammalogists. Moscow, ID. June 20-24, 2017. Oral presentation.
4. **Siracusa E.**, Wilson D.R., Boutin S., Humphries M.M., Gorrell J.C., Coltman D.W., Dantzer B., Lane J., McAdam A.G. Effects of Neighbor Familiarity on Intrusion Risk and Behavioral Plasticity in the North American Red Squirrel. Animal Behavior Society. Toronto, ON. June 12-16, 2017. Oral presentation.
3. **Siracusa E.**, Wilson D.R., Boutin S., Humphries M.M., Gorrell J.C., Coltman D.W., Dantzer B., Lane J., McAdam A.G. Effects of Neighbour Familiarity on Intrusion Risk and Behavioural Time Budgets in a Territorial Squirrel (*Tamiasciurus hudsonicus*). Canadian Society for Ecology and Evolution. Victoria, BC. May 7-11, 2017. Oral presentation.
2. **Siracusa E.** & Barthelmess E. Assessing the impact of North American porcupine (*Erethizon dorsatum*) foraging on forest composition and structure in northern New York. Adirondack Research Consortium, 20th Annual Conference on the Adirondacks. Lake Placid, NY. May 15-16,

2013. Oral presentation.

1. **Siracusa E.** & Barthelmess E. Assessing the impact of North American porcupine (*Erethizon dorsatum*) foraging on forest composition and structure in northern New York. Adirondack Research Consortium, Student Research Symposium. Paul Smith's College, Paul Smiths, NY. April 13, 2013. Oral presentation.

SYMPOSIA ORGANIZED

Conference	Symposium Name	Co-organizers	Date
Canadian Society for Ecology and Evolution	Ecology and evolution in a social context	D.Fisher & R.Kilgour	May 2017
Joint Conference of the European Federation for Primatology and the Gesellschaft für Primatologie	The hows and whys of social relationships: applying Tinbergen's four questions to the study of primate social behaviour	D. De Moor & C. Testard	June 2022
Animal Behaviour Society	The social domains of aging: Integrating sociality into our broader understanding of the aging process	M. Watowich	July 2023

****RESEARCH FUNDING**

SCHOLARSHIPS

Award	Granting Agency	Amount	Year
Elgin Card Scholarship	University of Guelph	\$4,000	2017
Ontario Trillium Scholarship	Ontario Government	\$160,000	2013
Fulbright Canada STEM award	Fulbright Canada	\$60,000 (declined)	2013
Graduate Research Fellowship	National Science Foundation	Honorable mention	2013
Sesquicentennial Scholarship	St. Lawrence University	\$80,000	2012

RESEARCH GRANTS

Award	Granting Agency	Amount	Year
Does conditional reciprocity drive cooperative interactions in the territorial squirrel <i>Tamiasciurus hudsonicus</i>	American Society of Mammalogists	\$1,500	2016

Adaptive behavioral plasticity in response to the composition of the social neighborhood in a highly territorial squirrel (<i>Tamiasciurus hudsonicus</i>)	Arctic Institute of North America	\$1,000	2015
Adaptive behavioral plasticity in response to the composition of the social neighborhood in a highly territorial squirrel (<i>Tamiasciurus hudsonicus</i>)	American Society of Mammalogists	\$1,500	2014

TRAVEL GRANTS & HONORARIA

Award	Granting Agency	Amount	Year
Travel Grant	American Society of Mammalogists	\$1,500	2023
Travel Grant	International Society for Behavioural Ecology	\$400	2022
Anna M. Jackson Award	American Society of Mammalogists	\$2,000	2018
Travel Grant	Animal Behaviour Society	\$500	2018
Travel Grant	American Society of Mammalogists	\$400	2017

****RESEARCH EXPERIENCE & ASSOCIATED SKILLS**

Postdoctoral Research – fieldwork with rhesus macaques on Cayo Santiago, Puerto Rico

- Learned how to individually ID monkeys and collect behavioural data
- Coordinated the implementation of new software for collecting behavioural data (Animal Observer App)
- Trained and supervised research team on use of new behavioural software from in-field data collection through to data processing and storage
- Collected non-invasive biological samples (urine and feces)
- Coordinated, trained, and supervised multiple volunteers in the collection of biological samples
- Worked long hours in tropical field conditions

Ph.D. Research – fieldwork with red squirrels in a remote field camp in southwest Yukon, Canada

- Trapped and handled red squirrels including ear tagging, radio collaring, collaring with accelerometers, blood sampling
- Used radio telemetry for individual tracking
- Extensive experience observing & recording animal behavior in the field (3000+ hours)
- Recorded red squirrel vocalizations
- Deployed camera traps
- Trained, coordinated and supervised multiple field assistants
- Lived and worked in isolated conditions, including long hours alone in bear country

B.Sc. Research – fieldwork on North American porcupines in northern New York, USA

- Trapped, anesthetized, and handled North American porcupines
- Used GPS technology to collect spatial data

- Gained proficiency in identifying common tree species of northeastern North America both in summer and winter

Computer & Statistical Software –

- R, RStudio (primary statistical software used) – mixed effects modeling, survival modeling, network analysis
- MS Word, Excel, PowerPoint
- Animal Observer for behavioural data collection
- Sequel Pro for database management
- Kaleidoscope and Audacity for acoustic analysis

Trainings & Certifications –

- Wilderness & Remote First Aid & CPR/AED Level C
- Mental Health First Aid
- Allyship Training
- Leave No Trace Trainer

**TEACHING AND MENTORING

TEACHING AND ENVIRONMENTAL EDUCATION EXPERIENCE

Mammalogy Sessional Lecturer University of Guelph, CA Jan-April 2017

Developed curriculum and course materials for a lab-based Mammalogy course, lectured on course content, advised students on course assignments and supervised teaching assistants.

Teaching Assistant University of Guelph, CA 2013-2016

Ecology, Mammalogy, Animal Behaviour, Evolution

Advised undergraduate students, graded and provided feedback on papers, projects, and exams, led hour-long tutorial sessions and invigilated exams.

Nature Up North Project Manager St. Lawrence University, USA 2012-2013

Launched a new project designed to further place-based and environmental education in the rural, underserved region of northern New York. Worked with community members and local public schools to promote environmental stewardship and increase involvement in the outdoors.

Summer Naturalist Adirondack Mountain Club, USA May-Sept 2012

Developed and provided interpretive nature walks and night hikes that educated park visitors about the ecology and natural history of the Adirondacks and Leave No Trace techniques.

ENVIRONMENTAL EDUCATION GRANTS

Grant	Granting Agency	Amount	Year
Nature Up North	Alcoa Foundation	\$45,000	2013
Nature Up North	Henry David Thoreau Foundation	\$18,644	2013
Nature Up North: Using the Internet and citizen-based science to understand and protect the St.	St. Lawrence River Research Education Fund New York Power Authority	\$20,000	2013

Lawrence River watershed in northern New York

MENTORING EXPERIENCE

M.Sc. Student Supervisor –

Z. Cheng – “Strength and stability of non-kin bonds in female rhesus macaques.”

M. Skelton – “Age related changes in the production of and responsiveness to social information.”

B.Sc. Student Supervisor –

N. Fukushima - “The presence of North American red squirrel territory owners deters intrusion by unfamiliar neighbours.”

Field Assistant Supervisor –

J. Robertson, Y. Sun, M. Thorpe

Trained field assistants in trapping & handling red squirrels, conducting focal observations, radio telemetry, deploying audio recorders & camera traps.

Work-Study Supervisor –

N. Fukushima, C. Garrido Cortes, A. Egan, A. Hudson

Supervised paid work-study students. Developed protocols and trained students how to identify individual squirrels from camera trap photos & extract red squirrel rattles from audio data.

Lab Volunteer Supervisor –

A. Picyk, M. Piczak, B. Angel, W. Michelin, A. Harte, L. Gee, R. Fisk, I. Deutsch, C. Moir, M. Fanti-Cocco, A. Warman, M. Mervyn, A. Ahmed

Supervised unpaid lab volunteers. Developed protocols and trained students how to identify individual squirrels from camera trap photos, extract red squirrel rattles from audio data, and complete cone counts.

****HONORS & AWARDS**

University of Guelph College of Biological Sciences Best Student Paper (\$500) <i>(selected for Siracusa et al. 2021 Current Biology paper)</i>	2021
Animal Behaviour Society W.C. Allee Competition Winner (\$1,000) <i>(selected top research paper and presentation at 2018 ABS meeting)</i>	2018
NSERC Science, Action! Finalist (\$2,500)	2018
Middleton Graduate Student Teaching Award , University of Guelph	2017
Pearsall Adirondack Foundation/International Paper Scholar <i>(selected top research paper at Adirondack Research Consortium)</i>	2013
Trustee Academic Achievement Award , St. Lawrence University <i>(given to the student with the highest GPA upon graduating)</i>	2012
Beta Beta Beta Outstanding Senior Biology Majors Award , St. Lawrence University	2012
Douglas and Sylvia Angus Creative Writing Award , St. Lawrence University	2012
Elected to Phi Beta Kappa, National Honor Society	2011
Elected to Sigma Tau Delta, English Honorary Society	2011
Elected to Beta Beta Beta, Biology Honorary Society <i>(President: Fall 2011, Spring 2012)</i>	2010
Elected to Omicron Delta Kappa, National Leadership Honor Society	2010
Carolyn Susan Conkey Scholarship , St. Lawrence University <i>(awarded to the woman with the highest GPA her freshman year)</i>	2010

****PROFESSIONAL SERVICE**

CRAB Seminar Series – helped to coordinate and organize the departmental seminar series for the Centre for Research in Animal Behaviour at the University of Exeter	2020- present
American Society of Mammalogists Informatics Committee	2017- present
American Society of Mammalogists Public Education Committee	2017- present
Grad Student Mental Health & Wellness Committee – Helped to organize and coordinate initiatives designed to increase awareness and reduce stigma around mental health issues in academia. Worked to improve departmental collegiality, provide students with appropriate resources and support, and increase mental health training for students, faculty, and staff.	2017-2019
University of Guelph R Users Group – Helped to establish and organize an R Users Group designed to provide a space for R users of all levels to gather to share R knowledge and improve coding skills. Assisted with leading and organizing weekly tutorials on various topics in R.	2015-2018

MEMBERSHIP IN PROFESSIONAL SOCIETIES

International Society for Behavioural Ecology (since 2022)
Association for the Study of Animal Behaviour (since 2021)
Animal Behavior Society (since 2017)
Canadian Society for Ecology and Evolution (2017-2019)
American Society of Mammalogists (since 2014)

PEER-REVIEWER CONTRIBUTIONS

Nature Ecology & Evolution (x1), Oecologia (x1), Trends in Ecology and Evolution (x1), Proceedings of the Royal Society B (x1), Journal of Animal Ecology (x1), Ecology Letters (x1), Scientific Reports (x1), Philosophical Transactions of the Royal Society B (x1), Animal Behaviour (x1), Behavioural Ecology (x2), Ecology and Evolution (x2), American Naturalist (x1), Behavioral Ecology & Sociobiology (x2), Behavioural Processes (x1), Frontiers in Ecology and Evolution (x1), Communications Biology (x2), Current Opinion in Behavioural Sciences (x1), GeroScience (x1), Neuroscience and Biobehavioral Reviews (x1)

****COMMUNITY OUTREACH**

Empire Public School Book Club – Discussed squirrel and porcupine ecology and behaviour with grades 1-6 at Empire Public School, Waterloo, ON.	2017-2018
Kluane Red Squirrel Project Outreach – Organized annual visits from grade school students at nearby schools to our research station in the Yukon. Students participated in hands-on field research and learned about the ecology and natural history of red squirrels & snowshoe hares.	2014-2016
Ecological Field Day – Organized an annual fall festival that included interactive exhibits focused on teaching individuals of all ages about vertebrate natural history, plant identification, and forest ecology in northern New York.	2011-2012
Brain Blast – Organized a day of hands-on and interactive exhibits for primary and secondary school students that highlighted neuroscience research and promoted awareness of brain function.	2010-2012

****REFERENCES**

Dr. Lauren Brent, Ph.D.
Associate Professor, University of Exeter
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Dr. Andrew McAdam, Ph.D.
Associate Professor, University of Colorado Boulder
andrew.mcadam@colorado.edu

Dr. Erika Barthelmess, Ph.D.
Professor, St. Lawrence University
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