

## KRISTA J. PATRIQUIN, PHD

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### EDUCATION

**Ph.D.** Department of Biology, Dalhousie University, Halifax, Nova Scotia. 2004 – 2012

Thesis: The Causes and Consequences of Fission-Fusion Dynamics in Female Northern Long-eared Bats, *Myotis septentrionalis*.

Supervisors: Dr. M. Leonard and Dr. H.G. Broders

**M.Sc.** University of Calgary, Calgary, AB. 1998 –2001

Thesis: Ecology of a Bat Community in Harvested Boreal Forest in Northwestern Alberta.

Supervisor: Dr. R.M.R. Barclay

**B.Sc. Honours.** Mount Allison University, Sackville, NB. 1992 – 1997.

Thesis: Do Female Three-spined Sticklebacks (*Gasterosteus aculeatus*) Copy the Mate Choice of Others?

Supervisor: Dr. J.-G. Godin

### RESEARCH INTERESTS

Research interests include behavioural ecology and conservation biology. To understand the evolution of behaviour and to conserve animal populations and their habitat, I integrate an array of biological concepts to explore how current animal populations are shaped by the interplay among mating behaviour, foraging behaviour, social behaviour, functional ecology, genetic relatedness, and, more recently, human activity. I explore these relationships using a combination of field observations, experimental studies, genetic analyses, and quantitative analyses. Below is a summary of my research and professional experience. Detailed research statement available upon request.

### RESEARCH & PROFESSIONAL EXPERIENCE

2015 – present	Postdoctoral Fellow	Biology, University of Toronto Mississauga, Ontario
2015 – present	Visiting Fellow	Smithsonian Tropical Research Institute, Panama
2014 – 2015	Research Scientist	Dillon Consulting Limited, Ontario
Fall 2012	Wildlife Biologist	Dillon Consulting Limited, Nova Scotia
2004 – 2012	PhD	Biology, Dalhousie University, Nova Scotia
Fall 2003 & 2004	Wildlife Biologist	AMEC Earth & Environmental Ltd., Alberta
Fall 2003 & 2004	Wildlife Biologist	Golder Associates Ltd., Alberta
Summer 2003	Field Coordinator	Biology, University of Calgary, Alberta
Spring 2003	Consultant	Alberta Research Council, Alberta

2001 – 2002	Level 2 Wildlife Biologist	Golder Associates Ltd., Alberta
1999 – 2001	MSc	Biology, University of Calgary, Alberta
1997 – 1998	Research Associate	Biology, Mount Allison University, New Brunswick
1992 – 1997	BSc Honours	Biology, Mount Allison University, New Brunswick

#### **FELLOWSHIPS, SCHOLARSHIPS, AND GRANTS (in CAD)**

2015 – 2017	Natural Science and Engineering Research Council, PDF	45,000/year
2007	Nova Scotia Department of Natural Resources Species at Risk Conservation Fund	5,000
2007	Nova Scotia Department of Natural Resources Habitat Conservation Fund	4,000
2004 – 2006	Natural Science and Engineering Research Council, CGS D	35,000/year
2000	University of Calgary Thesis Research Grant	1,000
1999-2001	Natural Science and Engineering Research Council, PGS A	17,500/year
1999	Alberta Conservation Association Challenge Grant in Biodiversity	10,300
1999	Bat Conservation International Scholar	3,700
1999	Canadian Circumpolar Institute Circumpolar/ Boreal Arctic Research Grant	3,000

#### **ACCOLADES**

**Biology TA Award.** Dalhousie University, 2010. (Behavioural Ecology).

**Best Student Talk.** North American Symposium on Bat Research, 2009.

**Poster Presentation Award.** Atlantic Universities Undergraduate Biological Conference, 1997.

#### **PUBLICATIONS**

##### **Book Chapters**

**Patriquin, KJ** and JM Ratcliffe. 2016. Should I stay or should I go? Fission-fusion dynamics in bats. In: Sociality In Bats, J Ortega (ed).

##### **Invited Contributions**

**Patriquin, KJ.** And JM Ratcliffe. Invited Review. Evolution of social learning in bats. Animal Behaviour Special Edition, Fall 2018

##### **Refereed Research Papers**

Wilkinson, GS, G Carter, KM Bohn, B Caspers, G Chaverri, D Farine, L Günther, G Kerth, M Knörnschild, F Mayer, M Nagy, J Ortega, and **KJ Patriquin.** In Revision. Kinship, association, and social complexity in bats. Behavioral Ecology and Sociobiology.

- Patriquin, KJ**, JE Kohles, RA Page, and JM Ratcliffe. 2018. Bats without borders: predators learn novel prey cues from other predatory species. *Science Advances* 4: eaaq0579.
- Vrtilek, J, G Carter, **KJ Patriquin**, RA Page, and JM Ratcliffe. 2018. New method for rapid testing of social learning in vampire bats. *Royal Society Open Science* 5: 172483.
- Patriquin, KJ**, ML Leonard, HG Broders, WM Ford, ER Britzke, and A Silvis. 2016. Climatic and geographic influences on fission-fusion dynamics in northern long-eared bats. *Animal Behaviour*, 122: 47-57.
- Luszcz, TMJ, JMK Rip, **KJ Patriquin**, LM Hollis, JM Wilson, HDM Clarke, J Zinck, and RMR Barclay. 2016. A blind-test comparison of the reliability of using external morphology and echolocation-call structure to differentiate between the little brown bat, *Myotis lucifugus*, and Yuma myotis, *M. yumanensis*. *Northwestern Naturalist*, 97: 12-23.
- Patriquin, KJ**, F Palstra, ML Leonard, and HG Broders. 2013. Female northern myotis, *Myotis septentrionalis*, that roost together are related. *Behavioral Ecology*, 24: 949-954.
- Patriquin, KJ**, ML Leonard, HG Broders, and CJ Garroway. 2010. Do social networks of female northern long-eared bats vary with reproductive period and age? *Behavioral Ecology and Sociobiology*, 64: 899-913.
- Patriquin, KJ**. 2004. Red bat (*Lasiurus borealis*) captured in northeastern Alberta. *Northwestern Naturalist*, 85: 28-30
- Patriquin, KJ** and RMR Barclay. 2003. Foraging by bats in cleared, thinned and unharvested boreal forest. *Journal of Applied Ecology*, 40:646-657
- Patriquin, KJ**, LJ Hogberg, BJ Chruszcz, and RMR Barclay. 2003. The influence of habitat structure on the ability to detect ultrasound using bat detectors. *Wildlife Society Bulletin*, 31:475-481
- Hogberg, LJ, **KJ Patriquin**, and RMR Barclay. 2002. Use by bats of patches of residual trees in logged areas of the boreal forest. *American Midland Naturalist*, 148: 282-288
- Patriquin-Meldrum, KJ** and J-G J Godin. 1997. Do female three-spined sticklebacks copy the mate choice of others? *American Naturalist*, 151: 570-577

### **Technical Reports**

- Dillon Consulting Ltd. 2015. Predictors of Bat Fatality and Activity at the Talbot Wind Farm. Submitted to Enbridge
- Golder Associates Ltd. 2002. Suncor Firebag In-situ Project Supplemental Wildlife Surveys 2001. Submitted to Suncor Energy Inc.
- Golder Associates. 2001. Christina Lake Thermal Project, Phase 1 Wildlife Monitoring Program 2001. Submitted to PanCanadian Petroleum Limited

### **RESEARCH SEMINARS AND CONFERENCE PRESENTATIONS**

#### **Invited Seminars**

- All I need to know, I learned from bats. Natural History Museum, Berlin, February 2018
- Interspecific learning in bats. Tupper Seminar Series, Smithsonian Tropical Research Institute, Panama, April 2017

- The world of bats. Lincoln Park Zoo Seminar Series, October 2016
- Socioecology of bats: Insights from temperate forests, neotropics, and urban parks. Department of Biological Sciences, DePaul University, October 2016
- Should I Stay or Should I Go? Fission-fusion in bats. Behavioral Discussion Group Seminar Series, Smithsonian Tropical Institute, Panama, March 2015
- The causes and consequences of fission-fusion dynamics in bats. BAMBI Seminar Series, Smithsonian Tropical Institute, Panama, February 2015
- The evolution of sociality in bats. Biology Department, Queen's University, January 2015
- The causes and consequences of fission-fusion dynamics in female northern long-eared bats (*Myotis septentrionalis*). Biology Department, Mount Saint Vincent University, February 2013
- Bats gone wild. Department of Biology, Dalhousie University, March 2007
- Bats: A glimpse into the lives of one of our most misunderstood relatives. Biology Department, Mount Allison University, November 2005
- Bats: Flying primates? Can logging be good? Does size matter? Department of Biology, Dalhousie University, November 2004

**Oral & Poster Presentations (presenting author unless specified by an \*)**

2018	<i>The Boys of Summer: The role of municipal parks in the urban ecology of bats in Canada's largest urban centre.</i> Canadian Society for Ecology & Evolution	National	Invited Symposium Talk
2017	<i>Interspecific information transfer among neotropical gleaning bats.</i> Animal Behavior Society	International	Talk
	<i>The Boys of Summer: sex-specific patterns of urban habitat use by big brown bats.*</i> Animal Behavior Society	International	Poster
	<i>The Boys of Summer: The role of municipal parks in the urban ecology of bats in Canada's largest urban centre.</i> New Phytologist Workshop: Synthesis in the City - Urban Evolutionary Ecology	International	Poster
2015	<i>Use of an urban park by big brown bats.</i> North American Symposium on Bat Research (NASBR)	International	Poster
	<i>The cultural potential of bats.</i> Ontario Ecology, Ethology, and Evolution Colloquium	Regional	Poster
	<i>The causes and consequences of fission-fusion dynamics in bats.</i> Atwood Colloquium in Ecology & Evolution (University of Toronto)	Institutional	Talk
2014	<i>The cultural potential of bats.</i> NASBR	International	Talk
2012	<i>Female northern myotis (Myotis septentrionalis) that roost together are related.</i> 1 <sup>st</sup> Joint Congress on Evolutionary Biology	International	Talk
2010	<i>Do social networks of female northern long-eared bats (Myotis septentrionalis) vary with reproductive period</i>	Institutional	Talk

	<i>and age?</i> Patrick Lett Symposium (Dalhousie University)		
2009	<i>Social networks of female northern long-eared bats (Myotis septentrionalis) vary with reproductive period and age.</i>	International	Talk
	<b>NASBR – Best Student Talk</b>		
	<i>The influence of reproductive condition, age and annual cycles on the social networks of female northern long-eared bats (Myotis septentrionalis).</i> Northeastern Biology Graduate Student Conference (NBGSC)	Regional	Talk
2008	<i>Social structure of female northern long-eared bats (Myotis septentrionalis).</i> International Society of Behavioral Ecology	International	Talk
2007	<i>Social behaviour of northern long-eared bats (Myotis septentrionalis).</i> International Ethological Conference	International	Talk
	<i>Roosting ecology of northern long-eared bats in mature Acadian forest.</i> Acadian Forests Conference	Regional	Talk
	<i>Social structure of northern long-eared bats (Myotis septentrionalis).</i> NBGSC	Regional	Talk
2005	<i>Little brown (Myotis lucifugus) and northern long-eared bat (M. septentrionalis) roost selection at different spatial scales.</i> Ecological Society of America	International	Talk
	<i>Mating behaviour of little brown bats (Myotis lucifugus).</i> NASBR	International	Poster
	<i>Sexual selection on little brown bats (Myotis lucifugus).</i> NBGSC	Regional	Talk
2004	<i>Foraging behaviour of a bat community in harvested boreal forest in northwestern Alberta.</i> Canadian Society of Zoologists Annual Conference	National	Talk
2003	<i>Comparison of morphology, echolocation call structure, and genetics of Myotis lucifugus and Myotis yumanensis.</i> NASBR	International	Poster
	<i>Use by bats of patches of residual trees in logged boreal forest in northwestern Alberta.*</i> Alberta Chapter Wildlife Society Annual Conference	Regional	Talk
2002	<i>Listed species?</i> Alberta Chapter Wildlife Society Annual Conference	Regional	Talk
2001	<i>The influence of habitat type on the ability to detect ultrasound using bat detectors.</i> NASBR	International	Talk
	<i>Habitat use by bats in logged forest in northern Alberta.</i> Alberta Chapter Wildlife Society Annual Conference	Regional	Talk

	<i>Habitat use by bats in logged forests in northern Alberta.</i> Alberta Conservation Association Biodiversity Conference	Regional	Poster
2000	<i>Habitat use by bats in logged forests in northern Alberta.</i> NASBR	International	Talk
	<i>Influence of habitat type on the ability to detect bats with AnabatII detectors.</i> NASBR	International	Poster
	<i>The influence of forest harvesting on habitat use by foraging bats.</i> Prairie Universities Biological Symposium	Regional	Talk
1999	<i>The effects of fire and logging on forest-dwelling bats.</i> NASBR	International	Talk
1997	<i>Do female three-spined sticklebacks copy the mate choice of others?</i> Atlantic Universities Undergraduate Biological Conference – <b>Poster Award</b>	Regional	Poster

## **MEDIA COVERAGE**

- Post-doctoral work on learning in bats covered internationally by >20 sites, most notably: CBC Quirks & Quarks, Toronto Star, Washington Post, Science Daily, Science Friday, IFL Science, Wildlife Society
- Post-doctoral work with urban bats covered by Inside Toronto Bloor West Villager, CBC Metro Morning, Dispatches from the Field
- PhD work covered by Halifax Chronicle Herald, CBC

## **PEER REVIEW**

Reviewed manuscripts submitted to the following journals:

- Animal Behaviour
- Behaviour
- Behavioral Ecology and Sociobiology
- Bioacoustics
- Canadian Journal of Zoology
- Ecology
- Journal of Mammalogy
- Journal of Thermal Biology
- Journal of Wildlife Management
- Methods in Ecology and Evolution
- PLoS ONE
- The Northwest Naturalist

## **SERVICE AND ADMINISTRATION**

### **University Level**

- 2012 Lett Symposium Judge, Department of Biology, Dalhousie University
- 2006 – 2009 Dalhousie University Biology Ad-hoc Environmental Committee
- 2006 – 2007 Dalhousie University Biology Organization of Graduate Students (BOGS), President
- 2005 – 2006 Dalhousie University Advisory Committee on Faculty of Graduate Studies Scholarship Allocations, Student Representative
- 2005 – 2006 BOGS, Friday Informal Seminar Hour Coordinator

### **Conference Organization**

- 2009 Canadian Society for Ecology and Evolution (CSEE) Organizing Committee, Volunteer
- 2007 International Ethological Conference (IEC) Organizing Committee, Volunteer
- 2006 – 2007 Northeast Biological Graduate Student Conference (NBGSC) Organizing Committee, Co-chair & Treasurer

### **Conservation**

- 2017 – present Ontario Bat Network
- 2001 – 2003 Western Canada Bat Working Group (WCBWG), Newsletter editor/ contributing member
- 2000 – 2003 Alberta Bat Action Team (ABAT)
- 2000 – 2003 Alberta Chapter Wildlife Society

### **Community Outreach**

- 1998 - present Developed and delivered more than 20 interactive presentations for schools, parks, science centres, and nature centres. Through these, I dispel myths about bats and introduce scientific research and conservation biology.
- 2009 Science Fair Judge, St. Agnes Junior High, Halifax, Nova Scotia
- 2008 Public Education Volunteer, BioBlitz, Halifax, Nova Scotia
- 2006 – 2008 Ecology Action Centre (EAC) Biomass Issues Subcommittee, Standing Tall Subcommittee, Halifax, Nova Scotia

## **TEACHING**

Helped students gain an appreciation for principles of biology and an in depth understanding of ecology and evolution, including: plant and animal diversity, anatomy and physiology, metabolism, natural and sexual selection, sexual reproduction, chromosomes and chromosome mapping, DNA replication, gene transcription, translation, and expression, population ecology, competition, community dynamics, territorial behaviour, parenting and mating behaviour, social organization and behaviour, ecosystem dynamics, and conservation biology. Engaged students



Developed and presented over 20 interactive writing seminars and workshops on scientific writing and academic integrity. Created and maintained online learning resources.

**Curriculum Mapping, Department of Biology, Dalhousie University, Halifax, NS. August 2012 – June 2013.** Facilitated department-wide discussion about student learning outcomes to unify terminology across the curriculum. Using the mapping software Daedalus, entered student learning outcomes for all courses taught in the Department of Biology to identify potential gaps in content and skills offered to students.

#### **TEACHING SKILLS DEVELOPMENT**

**University Learning and Teaching Certificate, Dalhousie University, Halifax, NS.** Completed a full term course (CNLT 5000, Learning and Teaching in Higher Education) providing theory and hands-on experience for creating more enriching and engaging learning experiences at the university level. Also completed 20 hours of teaching workshops.

**Dalhousie Conference on University Teaching and Learning, Dalhousie University, Halifax, NS. 2005-2011.** Attended the conference each year and participated in a variety of workshops pertaining to teaching and assessment tools.