**BARBARA FREI, PhD**

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**PERSONAL STATEMENT**



My primary goal as a researcher is to do high quality science geared towards conservation and management issues relevant in a rapidly changing world. I currently work as a Quantitative Wildlife Biologist in the Migratory Bird and Wildlife Health section of Canadian Wildlife Service.

My research has focused on managed or at-risk bird species, including their conservation, habitat use, community and population ecology, as well as the macroecology, biodiversity, and ecosystem services of working landscapes. My involvement beyond academia includes applied conservation work, scientific communication, education, and outreach with a variety of stakeholders. Being grounded in the realities and the challenges facing conservation in today’s changing world has inspired some of my best work as a scientist and granted me an enlightened perspective beyond the ivory tower of academia.

**RESEARCH INTERESTS**



Conservation biology, ornithology, species-at-risk, landscape ecology, wildlife-human interactions, agroecosystems, social-ecological systems, ecosystem services, science communication and outreach

**EDUCATION**



2014 PhD, Natural Resource Sciences, McGill University

Thesis: Roles of maladaptive behavior and evolutionary traps in the decline of a threatened woodpecker (Supervisors: Drs. James Fyles and Joe Nocera (Trent U.)

2008 MSc, Natural Resource Sciences, McGill University

Thesis: Ecology and management of Bobolinks in hayfields of Québec and Ontario (Supervisors: Drs. Rodger Titman and David Bird)

2005 BSc honors, Biology, Carleton University

Thesis: Vibrational communication in Hook-tip moth caterpillars

(Supervisor: Dr. Jayne Yack)

**ACADEMIC APPOINTMENTS**



06/2018 – 07/2018 Researcher, University of Ottawa

08/2017 – 06/2018 Postdoctoral Researcher, McGill University

06/2014 – 05/2017 Postdoctoral Fellow, University of Ottawa

***\* (On Maternity leave August 2015 – August 2016; and Sept. 2018 – Sept. 2019)***

**PUBLICATIONS**



**Peer-reviewed publications (published/in press/in review)**

[17] Morales A\*, **Frei B**, Mitchell GW, Begin Marchand C, Elliott KH. *In press*. Variation in stopover diurnal activity and migration speed associated with molt status in migrating Swainson's Thrushes. Journal of Ornithology.

[16] Bégin Marchand C, Desrochers A, Taylor P, Tremblay JA, Berrigan L, Elliott K, **Frei B**, Morales A, Mitchell GW. 2021. Spatial structure in migration routes despite regional convergence among eastern populations of Swainson’s Thrushes. Movement Ecology 9(1) DOI:10.1186/s40462-021-00263-9

[15] Brennan CL, Boulanger E, Duval S, **Frei B**, Gorbet A, Head J, Shieldcastle M, Jones AW.2021*.*Two cases of a previously undocumented New World warbler hybrid (*Setophaga magnolia x S. ruticilla*) in eastern North America. Wilson's Journal of Ornithology 132(3): 537-547.

[14] Morales A\*, **Frei B**, Leung C\*, Titman R, Elliott KH. 2020. Point-of-care blood analyzers measure the nutritional state of seventeen free-living bird species. Comparative Biochemistry and Physiology, Part A 240:110594.

[13] **Frei B**, Queiroz C, Chaplin-Kramer R, Andersson E, Renard D, Rhemtulla JM, Bennett EM. 2020*.*​A brighter future: Complementary goals of diversity and multifunctionality to build resilient agricultural landscapes. Global Food Security 26:100407.

[12] Garra J\*, Frei B, Bennett E.M 2019. Bright spots among lakes in the Rideau Valley Watershed, Ontario. Ecology and Society 24 (3):22. [online] URL: https://www.ecologyandsociety.org/vol24/iss3/art22/

[11] Nip EJ**\***, **Frei B**, Elliott KH. 2018 Temporal variation in body mass and fat stores in Black-capped Chickadees (*Poecile atricapillus*). Canadian Field-Naturalist 132: 368 – 377.

[10]**Frei B**, Renard D, Mitchell MGE, Seufert V, Chaplin-Kramer R, Rhemtulla JM, Bennett EM. 2018*.* Bright spots in agricultural landscapes: Identifying areas exceeding expectations for multifunctionality and biodiversity. Journal of Applied Ecology 55(6):2731-2743.

[9]**Frei B**, Bennett EM, Kerr JT. 2018. Agricultural land-use intensity strongest predictor of avian biodiversity loss in agroecosystems with a long history of agriculture. Regional Environmental Change. https://doi.org/10.1007/s10113-018-1343-5

[8] Jarjour C**\***, **Frei B**, Elliott KH. 2017.Associations between sex, age and species-specific climate sensitivity in migration. Animal Migration. https://doi.org/10.1515/ami-2017-0004  
  
[7]**Frei B,** Fyles J, Berl JL, Edwards JW, Nocera JJ. 2015. Low fecundity of Red-headed Woodpeckers at the northern edge of the range. Wilson Journal of Ornithology 127: 639-645.  
  
[6]**Frei B**, Smith KG, Withgott JH, Rodewald PG. 2015. Red-headed Woodpecker (*Melanerpeserythrocephalus*), The Birds of North America Online (A. Poole, Ed.). Ithaca, Cornell Lab of Ornithology.  
  
[5]**Frei B**, Nocera JJ, Fyles J. 2015. Interference competition and nest survival of the  threatened Red-headed Woodpecker. Journal of Ornithology 156:743–753.  
  
[4]**Frei B**, Fyles J, Nocera JJ. 2013. Maladaptive habitat use of a North American  woodpecker in population decline. Ethology 119: 377-388.

[3] Guedes RNC, Matheson SM,**Frei B**, Smith ML, Yack JE. 2012. Vibrational detection  and discrimination in the masked birch caterpillar (*Drepana arcuata*). Journal of Comparative Physiology A 198: 325-335.  
  
[2]**Frei B**, Bird DM, Titman RD. 2010. Bobolink egg mass variability and nestling growth patterns. Wilson Journal of Ornithology 122: 432-438.  
  
[1] Hudson MA, Gahbauer M, Leckie S, **Frei B**. 2008. Unusually Extensive Preformative Molt in Hatching-year Song Sparrows. North American Bird Bander 33: 1-6.

**Peer-reviewed publications (in prep)**

[2] Lalla KM\*, Fraser KC, **Frei B**, Fischer JD, Siegrist J, Ray JD, Cohn-Haft M, Elliott KH. Central place foraging poses variable constraints year-round in a neotropical migrant. Biology Letters.

[1] **Frei B**, Cox A, Roy C. Delayed fall migration of waterfowl and spatio-temporal effects of climate. Global Change Biology.

***\* Supervised student***

**Technical Reports and Other Publications**

[11] **Frei B.** 2018. COSEWIC Assessment and Update Status Report on the Red-headed Woodpecker (*Melanerpes erythrocephalus*). Committee on the Status of Endangered Wildlife in Canada, Ottawa

[10] **Frei B.** 2014. Have you seen the Redhead? Ontario Nature.

[9] Howes L-A, **Frei B**. 2013. North American Banding Council Manual to Banding at Nest Boxes. North American Banding Council. 35 pp.

[8] McCracken JD, Reid RA, Renfrew RB, **Frei B**, Jalava JV, Cowie A, Couturier AR. 2013. DRAFT Recovery Strategy for the Bobolink (*Dolichonyx oryzivorus*) and Eastern Meadowlark (*Sturnella magna*) in Ontario. Ontario Recovery Strategy Series. Prepared for the Ontario Ministry of Natural Resources, Peterborough, Ontario. viii + 86 pp.

[7] **Frei B.** 2014. Roles of maladaptive behaviour and evolutionary traps in the decline of a threatened woodpecker. Ph.D. Dissertation, McGill University, Montréal, QC. 170 pp.

[6] **Frei B.** 2011. Ontario’s Threatened Bobolink. Ontario Field Ornithologists 29(3): 9-10.

[5] **Frei B**. 2011. Researching Ontario’s Red-headed Woodpeckers. Ontario Field Ornithologists 29(1): 8-9.

[4] **Frei B,** Hudson M-A R**.** 2008. McGill Bird Observatory Fall Migration Monitoring Program 2007 Report. McGill Bird Observatory, Montreal, Quebec. Available at: http://www.migrationresearch.org/documents/fmmp2008.pdf

[3] Hudson M-A R, **Frei B.** 2007. McGill Bird Observatory Spring Migration Monitoring Program 2007 Report. McGill Bird Observatory, Montreal, Quebec. Available at: http://www.migrationresearch.org/mbo/reports/fmmp2007.pdf

[2] **Frei B.** 2009. Environmental review report for the Wolfe Island wind project. www.waterkeepers.ca/documents/2009-03\_FREI.pdf

[1] **Frei B.** 2008. Étude Sur l’Écologie du Goglu des Prés: Ecological Study of Bobolinks. Canadian Wildlife Service Technical Report, Environment Canada. 25 pgs

**AWARDS (*selected*)**



2020 Early Career Researcher Award, Society of Canadian Ornithologist

2013 Canadian Society for Ecology and Evolution Best Talk Award

2013 Featured top reviewer for [Peerage of Science](https://www.peerageofscience.org/review/review-examples/) (PEQ=4.9/5)

2005 Gold medal, Department of Biology, Carleton University

2002 Entomological Society of Canada Best Talk Award

**PRESENTATIONS (selection)**



**Conference Talks**

* Roy C, Frei B, Thurber BG, Morales A, Cox A, Guenette J-S, Zimmerling JR. Changes in the autumn migration phenology of waterfowl in Eastern Canada. The Wildlife Society, virtual conference.
* Frei B, Bennett E. 2020. Bright spots of biodiversity and multifunctionality in agricultural landscapes. World Biodiversity Forum, Davos, Switzerland.
* Frei B, Bennett E. 2019. Learning from bright spots of multifunctionality in agricultural landscapes. Leverages Conferences, Lüneburg, Germany.
* Frei B, Bennett E, Kerr J. 2015. Conserving biodiversity in Canada’s agroecosystems: are we forest-focused and forgetting farmland. Canadian Society of Ecology and Evolution, Saskatoon, SK, Canada.
* Frei B, Bennett E, Kerr J. 2015. Conserving biodiversity in Canada’s agroecosystems: are we forest-focused and forgetting farmland. Canadian Society of Ecology and Evolution, Saskatoon, SK, Canada.
* Frei B, Fyles J, Cardille J, Nocera JJ**.** 2014. Missing the small picture: What is a global model hiding in the story of the Red-headed Woodpecker’s decline? AOU/COS/SCO Joint Meeting, Estes Park, CO, USA.
* Frei B, Nocera JJ,Fyles J. 2013. The early bird gets the competition: Invasive species lowers breeding success of a threatened woodpecker. Canadian Society for Ecology and Evolution, Kelowna, BC, Canada.(***Best Talk Award***)
* Frei B, Fyles J, Nocera JJ**.** 2012. Red-headed Woodpeckers exhibit non-ideal habitat selection in a human- modified landscape. North American Ornithological Conference V, Vancouver, BC, Canada.
* Frei B, Fyles J, Nocera JJ. 2012. A threatened woodpecker makes bad choices in a rapidly changing world. Symposium on Biodiversity Science. Québec Centre for Biodiversity Science. Montréal, Coeur de science, QC, Canada.
* Frei B, Fyles J, Nocera JJ. 2012. Red-­headed Woodpecker maladaptive habitat use and competition at the northern edge of their range. Société Québecoise pour l’étude Biologique du Comportement. Université de Montréal, Montréal, QC, Canada.
* Frei B, Bird DM, Titman RD. 2007. Nest success, microhabitat selection, and management of Bobolinks (Dolichonyx oryzivorus) in farmlands of Québec and Ontario. Society of Canadian Ornithologists, Lake Opinicon, ON, Canada

**Community Meetings and Workshops (*invited*)**

* Frei B. 2016. The Messenger: special screening with questions answered by ornithology experts. Cinema du Parc, Montréal, QC.
* Frei B, Nocera JJ, Fyles J. 2010. Biodiversity in Your Backyard: The story of the Red-headed Woodpecker in central Ontario. Nature Conservancy Canada and Rice Lake Plains Bird Conservation Workshop, Alderville, ON.
* Frei B. 2010. Where are the Red-headed Woodpeckers in Southern Ontario and how can we help them. Joint meeting of the Richmond Hill and West Humber Naturalist, Toronto, ON.
* Frei B. 2010. Where have all the Red-headed Woodpeckers gone? Peterborough Field Naturalists, Peterborough, ON.
* Frei, B. 2008. The plight of Bobolinks and other grassland birds in Québec. Bird Protection Québec conservation lecture series. Montréal, QC.
* Frei B. 2007. Conservation of Bobolinks in managed hayfields. Hemmingford Municipal Centre, Hemmingford, QC.
* Frei B. 2007. Bobolink – Wildlife Lecture Series. Frontenac Stewardship Council, Wolfe Island, ON.

**Invited Departmental Seminars and Guest Lectures**

* Community Ecology, McGill University (2011, ’12, ’13, ’14, ‘15)
* Frei B, Nocera JJ, Fyles J. 2011. Multi-scale habitat use by threatened Red-headed Woodpeckers in Ontario. National Wildlife Research Center research seminar series, Ottawa, ON.
* Natural History of Vertebrates, McGill University (2010, ’12, ’13)
* St. Lawrence Lowlands , McGill University (2010, ’12, ’13)
* Scientific Communication, McGill University (2010)
* Ornithology, McGill University (2007, ’08, ’09)
* Wildlife Conservation, McGill University (2016, ’17, ’18)
* Guest speaker for science honours program at Marianapolis College (2018)

**GRANTS & SCHOLARSHIPS**



2020-2023 Environmental Damages Fund (co-applicant) $390,000

2018-2019 Kenneth M. Molson, Research Grant $20,000

2016-2017 Kenneth M. Molson, Research Grant $50,000

2016-2017 Bird Protection Québec, Research Grant $44,000

2014-2017 FRQNT, Postdoctoral Fellowship $65,000

2013 McGill University, Graduate Excellence Fellowship $3,200

2012 McGill University, Graduate Student Travel Award $500

2012 McGill University, Graduate Excellence Fellowship $4,000

2012 Species at Risk Research Fund for Ontario, SARRFO $17,072

2010-2011 Species at Risk Stewardship Fund, SARSF $50,680

2011-2012 FRQNT, Graduate Scholarship $20,000

2009-2011 NSERC, Postgraduate Scholarship D2 $42,000

2009 McGill University Graduate Student Fellowship $5,000

2009 Trent University Dean’s PhD Scholarship, declined $33,000

2008 Bird Protection Quebec, Alfred B. Kelly Research Grant $3,000

2007-2008 Canadian Wildlife Service, Research Grant $10,000

2007 Bird Protection Quebec, Alfred B. Kelly Research Grant $3,000

2006-2007 Fondation de la Faune de Québec, Research Grant $10,000

2005-2007 NSERC, Canada Graduate Scholarship $35,000

2005 McGill University Graduate Student Fellowship $5,000

2005 FRQNT, Graduate Scholarship, declined $30,000

2003 NSERC USRA, Carleton University $4,500

2002 NSERC USRA, Carleton University $4,500

2000-2004 Carleton University, President’s Entrance Scholarship $10,000

**SCIENCE OUTREACH AND COMMUNICATION**



**Media Interviews and Guest Appearances**

2021 “Conserving birds in a changing world” Explore by the Seat of Your Pants

2021 “Little turkey, big city” CBC News

2018 “Wild turkeys run a-fowl in Rosemont: bird expert weighs in on what to do” *CBC News*

2017 “Wild turkey chases members, wreaks havoc at Île-Bizard golf course” *CBC News*

2017 Featured on an episode of Animal Migration on *Finding Stuff Out* on TVOKids

2016 “Snowy owl spotted soaring by Montreal traffic camera” *CBC News*

2016 “Montreal snowy owl caught of traffic cam goes viral” *Montreal Gazette*

2016 “Peregrine Falcons nesting in Montreal” *CBC News*

2016 “Why is that woodpecker knocking” *CBC Homerun*

2015 “Angry bird dive-bombing passersby at Maison Radio-Canada” *CBC News*

2009 “Birds and farming” Panel discussion on *CBC Farm Show*

**Invited Blog Posts**

2014 “Knock knock – Ten facts about Red-headed Woodpeckers” *Scilogs*

2013 “Birds as an Ecosystem Service – McGill Bird Observatory” *Montreal’s Ecosystems at Your Services*

2013 “Winter cultural service – cross-country skiing in Montreal” *Montreal’s Ecosystems at Your*

*Services*

**Scientific Communication Training**

2021 Science Made Simple, Environment and Climate Change Canada

2013 Liber Ero Fellowship in Science Communication & Policy Engagement, McGill University and COMPASS Online

2012 “Getting the message out: How to communicate your research effectively through the

media”, 4th North American Ornithological Conference, Vancouver,BC

**TEACHING**



**Courses taught/assisted**

2011 Instructor, Natural History of Vertebrates, McGill University

2010, ’12 Teaching Assistant, Natural History of Vertebrates, McGill University

2009 Teaching Assistant, Introduction to Cellular Biology, McGill University

2008 Teaching Assistant, Introduction to Physiology, McGill University

2007 Teaching Assistant, Mammology, McGill University

2006, ’07 Teaching Assistant, Ornithology, McGill University

2006 Teaching Assistant, Scientific Communication, McGill University

**Student supervision/committee**

2021E. Tranze-drabinia**,** McGill University (Honours) “*Energetics of molt migrants in relation to stopover habitat quality*” with Kyle Elliott

2021 – 2023 V. Poirier, McGill University (M.Sc.) “*Habitat use and experimental relocation of molt*

*migrants during fall migration*” with Kyle Elliott

2018 - 2020 K. Lalla, McGill University (M.Sc.) “*Life-cycle survivorship and conservation of Purple Martins*” with Kyle Elliott

2018 M. Guiglimo, McGill University (Honours) “*Refining a radio receiver network for studying bird migration*” with Kyle Elliott

2017 - 2019 A. Morales, McGill University (M.Sc.) “*Passerine migration and stopover across an urban gradient*” with Kyle Elliott

2017 M. Philips, McGill University (Honours) “*Optimising a radio receiver network for studying bird migration*” with Kyle Elliott

2016 C. Leung, McGill University (Honours) “*Haematological health parameters of passerines* ” with Kyle Elliott

2016 C. Jarjour, McGill University (Honours) “*Changes in migration phenology in passerines over a 10-year period in southern Québec*” with Kyle Elliott

2016 E. Nip, McGill University (Independent Study) “*Variation in body mass of Black-capped Chickadees (Poecile atricapillus) at the McGill Bird Observatory*”

with Kyle Elliott

2014 A. Corriveau, McGill University (Honours) “*Cavity characteristics and occupancy of Collared Aracaris (Pteroglossus torquatus) in a fragmented landscape*” with Chris Buddle

**NON-ACADEMIC EMPLOYMENT**



2019 Quantitative Wildlife Biologist, Canadian Wildlife Service

2009 Biologist, Ontario Ministry of Natural Resources, Peawanuck, ON

2009 Biologist, Ontario Ministry of Natural Resources, Algonquin Park, ON

2009 Team lead, Jacques Whitford Environmental, Newfoundland and Labrador

2005 Biologist, Bird Studies Canada, Northern Ontario

2003 Research Technician, Gilmour Lab, Carleton University

2002 Research Technician, Yack Lab, Carleton University

2001 Research Technician, University of Western Ontario

**RESEARCH TRAINING**



* Introduction to Geostatistics with R: Variograms, interpolation, kriging (2014); Quebec Centre for Biodiversity Science Workshops
* Open Source GIS: Introduction to QGIS and Grass (2014); Centre for Forest Research
* R Introductory Course, Ordination Techniques in R (2010); Centre for Forest Research
* Introduction to Geographic Information System (GIS) analysis with ArcGIS software (2009); Centre for Forest Research Intensive GIS Course

**SERVICE**



**Professional/academic service**

2020 Reviewer for the Food for Thought Program, University of Guelph

2012- current Director, [McGill Bird Observatory](http://www.oommbo.org)

2012- current Board of Directors for the Migration Research Foundation, Inc.

2012- 2015 Member of Council, Society for Canadian Ornithologists

2016 Species Expert, Red-headed Woodpecker Recovery Team

2014 Organizer and Moderator for McGill University’s Women in Academia Symposium

2014 Organizing Committee for the Symposium for Women Entering Ecology and Evolution Today (SWEEET)

2010- 2015 Board of Directors for Bird Protection Québec; serving on Research and Conservation Committees

2010- 2013 Species Expert, Bobolink and Eastern Meadowlark Ontario Recovery Team

2006- 2011 Coordinator, [McGill Bird Observatory](http://www.oommbo.org)

2006 Reviewer for the Breeding Bird Atlas of Ontario

**Peer reviewer**

*Acta Oecologica; Agriculture, Ecosystems and Environment; Agroforestry Systems; Annales Zoologici Fennici; Animals; Animal Migration; Avian Conservation and Ecology; Canadian Field Naturalist; Current Zoology; Diversity; Ecology & Society; Ecoscience; Ecosphere; Ecosystem Services; Global Change Ecology; International Journal of Biometeorology; Journal of Animal Ecology; Journal Applied Ecology; Journal of Field Ornithology; Journal of Sustainability; Northeastern Naturalist; North-western Journal of Zoology; Ornithological Applications; Peerage of Science; Scientific Report; Southeastern Naturalist; Wilson Journal of Ornithology*

**Professional Memberships**

Bird Protection Québec, Canadian Society for Ecology and Evolution, Québec Centre for Biodiversity Studies, Society for Canadian Ornithologists