

ERIN F. BAERWALD, PhD

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Citizenship: Canadian

EDUCATION

PhD in Ecology September 2015

University of Calgary, Calgary, Alberta, Canada

- Dissertation project: Movement ecology and conservation of the migratory bats *Lasiurus cinereus* and *Lasionycteris noctivagans*.

MSc in Conservation Biology July 2008

University of Calgary, Calgary, Alberta, Canada

- Thesis project: Bat migration and the causes and consequence of fatalities at wind energy facilities.

BSc in Conservation Biology (with distinction) April 2005

University of Alberta, Edmonton, Alberta, Canada

- Honours project: An assessment of the diet of prairie long-eared bats (*Myotis evotis*) during a grasshopper outbreak.

ACADEMIC POSITIONS

Assistant Professor January 2020

University of Northern British Columbia, Prince George, BC

NSERC Post-doctoral Research Fellowship January 2018 – December 2019

University of Regina, Regina, SK.

Post-doctoral Fellowship

September 2015 – December 2017

American Wind Wildlife Institute, Washington D.C.

AWARDS

William T. Hornaday Award for outstanding contributions to the conservation of mammals and their habitats. American Society of Mammalogists. 2014

PUBLICATIONS

Baerwald, E. F., T. J. Weller, D. M. Green, and R. A. Holland. Coming Home to Roost:

Randomness in Bat Homing, Revisited. In Press. In B. K. Lim, editor. 50 Years of Bat Research. Foundations and New Frontiers: Fascinating Life Sciences. Springer Science Press.

Allison, T. D., J. E. Diffendorfer, **E. F. Baerwald**, J.A. Beston, D. Drake, A.Hale, C. D. Hein, M. M. Huso, S. R. Loss, J. E. Lovich, M. D. Strickland, K. Williams, V. L. Winder. 2019. Impacts to wildlife of wind energy siting and operation in the United States. Issues in Ecology. Report No. 21.

Reimer, J. P., **E. F. Baerwald**, and R. M. R. Barclay. 2018. Echolocation activity of migratory bats at a wind energy facility: testing the feeding-attraction hypothesis to explain fatalities. Journal of Mammalogy. <https://doi.org/10.1093/jmammal/gyy143>

Frick, W. F., **E. F. Baerwald**, J. F. Pollock, R. M. R. Barclay, J. A. Szymanski, T. J. Weller, A. L. Russell, S. C. Loeb, R. A. Medellin, and L. P. McGuire. 2017. Fatalities at wind turbines may threaten population viability of a migratory bat. Biological Conservation 209:172-177.

Barclay R. M. R., **E. F. Baerwald**, and J. Rydell. 2017. Bats. Pages 191 - 221 in M. Perrow, editor. Wildlife and Wind Farms: Onshore Effects. Volume One. Pelagic Publishing.

Baerwald, E. F. and R. M. R. Barclay. 2016. Are migratory behaviours of bats socially transmitted? Royal Society Open Science 3:150658.

Baerwald, E. F., R. R. Beasley, S. L. Lance, K. L. Jones, and R. M. R. Barclay. 2016. Development of novel polymorphic microsatellite markers for two bat species affected by wind turbines, hoary bats (*Lasiurus cinereus*) and silver-haired bats (*Lasionycteris noctivagans*). Conservation Genetics Resources 1:43-81.

- Arnett, E. B., **E. F. Baerwald**, F. Mathews, L. Rodrigues, A. Rodriguez-Duran, J. Rydell, R. Villegas-Patracca, and C. C. Voigt. 2016. Impacts of wind energy development on bats: a global perspective. Chapter 11 in C. C. Voigt and T. Kingston, editors. *Bats in the Anthropocene: conservation of bats in a changing world*. Springer Science Press.
- Baerwald, E. F.**, W. P. Patterson, and R. M. R. Barclay. 2014. Origins and migratory patterns of bats killed by wind turbines in southern Alberta: evidence from stable isotopes. *Ecosphere* 5: art118.
- Arnett, E. A., **E. F. Baerwald**. 2013. Impacts of wind energy development on bats: implications for conservation. Pages 435 - 456 in R. Adams and S. Pedersen, editors. *Bat Evolution, Ecology, & Conservation*. Springer Science Press.
- Cryan, P. M., J. W. Jameson, **E. F. Baerwald**, C. K. R. Willis, R. M. R. Barclay, E. A. Snider, and E. G. Crichton. 2012. Evidence of late-summer mating readiness and early sexual maturation in migratory tree-roosting bats found dead at wind turbines. *PLoS One* 7: e47586.
doi:10.1371/journal.pone.0047586
- Baerwald, E. F.** and R. M. R. Barclay. 2011. Patterns of activity and fatality of migratory bats at a wind energy facility in Alberta, Canada. *Journal of Wildlife Management* 75:1103-1114.
- Klüg, B. J., A. S. Turmelle, J. A. Ellison, **E. F. Baerwald**, and R. M. R. Barclay. 2011. Rabies prevalence in migratory tree-bats in Alberta and the influence of roosting ecology and sampling method on reported prevalence of rabies in bats. *Journal of Wildlife Diseases* 47: 64-77.
- Reimer, J. P., **E. F. Baerwald**, and R. M. R. Barclay. 2010. Diet of hoary (*Lasiurus cinereus*) and silver-haired (*Lasionycteris noctivagans*) bats while migrating through southwestern Alberta in late summer and autumn. *American Midland Naturalist* 164:230-237
- Klüg, B. J. and **E. F. Baerwald**. 2010. Incidence and management of live and injured bats at wind energy facilities. *Journal of Wildlife Rehabilitation* 30: 11-16.
- Baerwald, E. F.** and R. M. R. Barclay. 2009. Geographic variation in activity and fatality of migratory bats at wind energy facilities. *Journal of Mammalogy* 90: 1341-1349.
- Baerwald, E. F.**, J. Edworthy, M. Holder, and R. M. R. Barclay. 2009. A large-scale mitigation experiment to reduce bat fatalities at wind energy facilities. *Journal of Wildlife Management* 73: 1077-1081

Baerwald, E. F., G.H. D'Amours, B. J. Klüg, and R. M. R. Barclay. 2008. Barotrauma is a significant cause of bat fatalities at wind turbines. *Current Biology* 18: R695-R696.

Barclay, R. M. R., **E. F. Baerwald**, and J. C. Gruver. 2007. Variation in bat and bird fatalities at wind energy facilities: assessing the effects of rotor size and tower height. *Canadian Journal of Zoology* 85: 1-7.

SCHOLARSHIPS, GRANTS, AND FELLOWSHIPS

NSERC Postdoctoral Fellowship. 2018 – 2020	\$90,000
AWWI Postdoctoral Fellowship. 2015 – 2017	\$100,000 USD
Dr. Chen Fong Chancellor's Club Doctoral Scholarship. University of Calgary. 2014	\$20,000
Dean's Graduate Performance Award. University of Calgary. 2012	\$1,000
Alberta Innovates-Technology Futures. Alberta Research Council. 2010 – 2012	\$43,500
Alberta Conservation Association Biodiversity Grant. 2010 – 2012	\$18,000
Dean's Research Excellence Award. University of Calgary. 2009	\$1,500
NSERC Alexander Graham Bell Canada Graduate Scholarship. 2009 – 2011	\$70,000
Alberta Conservation Association Biodiversity Grant. 2007 – 2008	\$7,500
North American Bat Conservation Partnership Grant. 2006 – 2007	\$5,000 USD
Bat Conservation International Scholarship. 2006 – 2007	\$5,000 USD
Industrial NSERC. 2006 – 2008	\$42,000
Margo Fraser Memorial Scholarship. University of Alberta. 2004 – 2005	\$4,500
World Petroleum Congress Scholarship. University of Alberta. 2004	\$3,000
Total received (USD not converted)	\$411,000

TEACHING EXPERIENCE

Course Instructor — Conservation Biology. University of Northern British Columbia. 2020

Guest Lecturer (Animal Migration) – Animal Behaviour. University of Regina. 2018

Guest Lecturer (Animal Behaviour) – Introductory Biology. University of Regina. 2016

Guest Lecturer (Bats and Wind Energy) – Current Environmental Issues. Mount Royal University. 2014

Guest Lecturer (Two Lectures: Communication in Bats and Migratory Behaviour) – Animal Behaviour. University of Calgary. 2013

Guest Lecturer (Migration in Mammals) – Mammalogy. University of Calgary. 2013

Teaching Assistant/Lab-coordinator – Animal Behaviour. University of Calgary. 2009 & 2013

Guest Lecturer (Bats and Wind Energy) – Conservation Biology. University of Calgary. 2006 & 2008

Teaching Assistant – Conservation Biology. University of Calgary. 2006

Teaching Assistant – Introduction to Ecology and Evolution. University of Calgary. 2005 & 2008

Teaching Assistant – Introduction to Animal Diversity. University of Alberta. 2004

MENTORING

Co-supervising a PhD project by Dana Green on migratory behaviour and ecology of silver-haired bats (*Lasionycteris noctivagans*). University of Regina. September 2018 - present

Co-supervising a MSc project by Erin Swerdfeger on landscape use by migrating bats in relation to wind energy development. University of Regina. June 2017 - present

Co-supervised an independent research project by undergraduate Simon Fense entitled “A comparison of fatality rates of bats and Common Nighthawks (*Chordeiles minor*) at wind turbines in Canada and the United States”. University of Regina. 2016.

CONSERVATION POLICY

I have been actively engaged in helping create science-based policy around the bats and wind issue at multiple levels of government since 2006. Highlights include:

- Working with the government of Peru to draft the proposal to list four species of Lasiurine bats under Appendix II of the UN’s Convention on the Conservation of Migratory Species of Wild Animals (CMS). This work included a trip to the 12th Conference of the Parties CMS in Manila, Philippines and presentations at two separate side events (25 and 26 October 2017).
- Co-authoring the post-construction survey protocols for bats and wind energy in Alberta. Barclay, R., and E. Baerwald, E. 2015. Post-Construction Wind Energy Protocol for Bats. Calgary, AB. <http://aep.alberta.ca/fish-wildlife/wildlife-management/documents/PostCostructionBatProtocol-Jul-2015.pdf>

- Co-authoring the pre-siting and pre-construction survey protocols for bats and wind energy in Alberta. Lausen, C., E. Baerwald, J. Gruver, and R. Barclay. 2008. Bats and Wind Turbines: Pre-Siting and Pre-Construction Survey Protocols. *Handbook of Inventory Methods and Standard Protocols for Surveying Bats in Alberta, Appendix, 5*. <http://www.srd.gov.ab.ca/fishwildlife/wildlifeinalberta/batsalberta/abat.aspx>

SEMINARS AND CONFERENCE PRESENTATIONS

I have given numerous conference presentations and seminars, for example:

- I have presented at nearly every annual meeting of The North American Society for Bat Research since 2005 (16/19 meetings)
- I have presented at every annual meeting of the American Society of Mammalogists since 2015 (4/4)

For the sake of brevity, I have only provided detail for **invited talks**:

Invited Departmental Lecture – Bats and Wind Energy: a crash course. University of Guelph. September 2018.

The 98th Annual Meeting of the American Society of Mammalogists. In Manhattan, Kansas, 25-29 June 2018. **Symposium organizer and speaker**

The Annual Meeting of the Canadian Society of Zoologists. In St. John's, NFLD, 7-11 May 2018.

The 12th Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals (CMS). In Manila, Philippines, 25 October 2017. **CMS sponsored side event speaker**

The 12th Conference of the Parties to the Convention on the Conservation of Migratory Species of Wild Animals. In Manila, Philippines, 26 October 2017. **CMS sponsored side event speaker**

The 1st Annual Saskatchewan Chapter of the Wildlife Society Research Expo. In Regina, Saskatchewan, 31 August 2017. **Keynote Speaker.**

The 102nd Annual Meeting of the Ecological Society of America. In Portland, Oregon, 6-11 August 2017.

Invited Departmental Lecture – Bats and Wind Energy: global and local perspectives. University of Regina. February 2017.

Invited Departmental Lecture – Bats and Wind Energy: global and local perspectives. University of Saskatchewan. November 2016.

The 95th Annual Meeting of the American Society of Mammalogists. In Jacksonville, Florida, 12-16 June 2015.

The 43rd Annual North American Symposium on Bat Research in conjunction with the 16th International Bat Research Conference. In San Jose, Costa Rica, 11-15 August 2013.

The 22nd Annual Alberta Chapter of the Wildlife Society General meeting. In Medicine Hat, Alberta. 16-18 March 2012.

Western Bat Working Group 2011 Biennial Meeting in conjunction with the 2nd Bats and Wind Energy Workshop. In Las Vegas, Nevada 3-8 April 2011. (on workshop organizing committee)

Western Bat Working Group 2009 Biennial Meeting in conjunction with the 1st Bats and Wind Energy Workshop. In Austin, Texas, 13-18 April 2009. (on workshop organizing committee)

The Western Bat Working Group 2007 Biennial Meeting. In Tucson, Arizona, 11-14 April 2007.

The National Wind Coordinating Committee's Wildlife Research Meeting VI. In San Antonio, Texas, 14-15 November 2006.

The 16th Annual Alberta Chapter of the Wildlife Society General Meeting. In Lethbridge, Alberta, 9-11 March 2006.

WEBINARS

I have presented in numerous webinars (~ 3 a year) to diverse audiences that include colleagues within academia, industry representatives, environmental consultants, and government employees and officials. Highlights of the last two years include:

- Is co-existence of bats and wind energy possible? November 2018. Hosted by The National Renewable Energy Laboratory (NREL) and Defenders of Wildlife. Approximately 40 invited people in attendance.
- A research needs discussion: Barotrauma as a cause of bat fatalities at wind facilities. October 2018. A WREN (Working Together to Resolve Environmental Effects of Wind Energy) expert forum hosted by NREL. Approximately 25 attendees
- Are migratory tree-roosting bat declining? May 2018. A presentation to the Bats and Wind Energy Cooperative (BWEC) science advisory board. Approximately 20 people in attendance
- Population level impacts of wind energy facilities on hoary bats: a discussion of recent population modelling efforts. February 2017. Hosted by The American Wind and Wildlife Institute (AWWI). Approximately 100 people in attendance.

PROFESSIONAL ORGANIZATIONS AND COMMITTEES

American Society of Mammologists

- Conservation Awards committee (Chair since 2015)
- Conservation committee

North American Society for Bat Research

The Western Bat Working Group

The Wildlife Society

Canadian Society for Ecology and Evolution

IUCN Bat Specialist Group

UN's Convention on the Conservation of Migratory Species of Wild Animals, Bat Specialist

JOURNALS REVIEWED FOR

Journal of Wildlife Management (3 manuscripts)

PLoS One (3 manuscripts)

Journal of Mammalogy (2 manuscripts)

Acta Chiropterologica (2 manuscripts)

Frontiers in Ecology and the Environment (1 manuscript)

Animal Behaviour (1 manuscript)

Wildlife Society Bulletin (1 manuscript)

Biological Conservation (1 manuscript)

Endangered Species Research (1 manuscript)

Scientific Reports (1 manuscript)

MEDIA HIGHLIGHTS

CBC Radio – Blue Sky Edition (call-in show), August 2017

CBC Radio – Quirks and Quarks, September 2008

RTE Radio One – Mooney Goes Wild, September 2008

Nature - Research Highlights, August 2008

National Geographic News – August 2008

ScienceDaily – August 2008

BBC News – August 2008

The Discovery Channel - The Daily Planet, October 2006

CBC Television – The National, September 2006