

MATTHEW R. WILKINS

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RESEARCH INTERESTS

Complex signal evolution; sexual selection; multimodal signals; geographic variation in birdsong; female signaling; speciation; phenotype networks; phenotypic integration

OUTREACH MISSION STATEMENT

My aims are to: 1) communicate science to K-12 students, undergrads, and the general public through creative digital multimedia and 2) stimulate collaboration and synergy within the community of researchers striving to improve public engagement in science.

EDUCATION

PhD (2014) University of Colorado (CU): Ecology and Evolutionary Biology
Advisor: Dr. Rebecca J. Safran
Dissertation: Evolutionary divergence in sexual signals: Insights from within and among barn swallow populations

BA (2006) Vanderbilt University: Double major in Ecology, Evolution, and Organismal Biology & Spanish Linguistics; GPA 3.50, *magna cum laude*

ACADEMIC APPOINTMENTS

Aug 2017- Postdoctoral Fellow: Center for Science Outreach, Vanderbilt University
2016-2017 Postdoctoral Research Fellow: School of Biological Sciences, University of Nebraska-Lincoln (Advisor: Dr. Dai Shizuka)
2014-2016 School of Biological Sciences Program of Excellence Postdoctoral Fellow, University of Nebraska-Lincoln (Advisors: Drs. Dai Shizuka & Eileen Hebets)

PUBLICATIONS

9. JK Hubbard, AK Hund, II Levin, KJ McGraw, **MR Wilkins**, RJ Safran (2017) The importance of cross-validation, accuracy, and precision for measuring plumage color: a comment on Vaquero-Alba et al. *The Auk* 134 (1): 34-38
8. **MR Wilkins**, H Karaardıç, Y Vortman, TL Parchman, T Albrecht, A Petrzekova, L Özkan, P Pap, JK Hubbard, A Hund, RJ Safran (2016) Phenotypic differentiation is associated with divergent sexual selection among closely related barn swallow populations. *Journal of Evolutionary Biology* 29 (12): 2410-2421
7. RJ Safran, Y Vortman, BR Jenkins, JK Hubbard, **MR Wilkins**, RJ Bradley, A Lotem (2016) The maintenance of phenotypic divergence through sexual selection: an experimental study in barn swallows *Hirundo rustica*. *Evolution* 70 (9): 2074-2084 (cited 1x)
6. RJ Safran, ESC Scordato, **MR Wilkins**, JK Hubbard, BR Jenkins, T Albrecht, SM Flaxman, H Karaardıç, Y Vortman, A Lotem, P Nosil, P Pap, S Shen, S-F Chan, T Parchman, NC Kane (2016) Genome-wide differentiation in closely related populations: the roles of selection and geographic isolation. *Molecular Ecology* 25 (16): 3769-4090 (Cover; cited 2x)

5. MN Vitousek, O Tomášek, T Albrecht, **MR Wilkins**, RJ Safran (2016) Signal traits and oxidative stress: a comparative study across populations with divergent signals. *Frontiers in Ecology & Evolution* 4 (56) (cited 1x)
4. **MR Wilkins**, D Shizuka, MB Joseph, JK Hubbard, RJ Safran (2015) Multimodal signalling in the North American barn swallow: a phenotype network approach. *Proceedings of the Royal Society B: Biological Sciences* 282 (20151574) (cited 9x)
3. RL Rodríguez, M Araya-Salas, DA Gray, M Reichert, L Symes, **MR Wilkins**, RJ Safran, G Höbel (2015) How acoustic signals scale with body size: common trends in static allometry across diverse taxa. *Behavioral Ecology* 26 (1): 168-177 (cited 9x)
2. **MR Wilkins**, N Seddon, RJ Safran (2013) Evolutionary divergence in acoustic signals: causes and consequences. *Trends in Ecology and Evolution* 28 (3): 156-166 (Cover; cited 109x)
1. RJ Safran, KJ McGraw, **MR Wilkins**, JK Hubbard, J Marling (2010) Positive carotenoid balance correlates with greater reproductive performance in a wild bird. *PLoS ONE* 5 (2): e9420 (cited 24x)

[Total Citations= 156](#)

In Review

- ESC Scordato, **MR Wilkins**, G Semenov, A Rubtsov, N Kane, RJ Safran. Phenotypic and genomic variation in two avian hybrid zones. *Molecular Ecology*
- MF Rosenthal, **MR Wilkins**, D Shizuka, EA Hebets. A systems approach to animal communication reveals dynamic changes to display architecture and function across signaling environments. *Evolution*
- CD Francis CD*, **MR Wilkins*** Testing the strength and direction of selection using metabolic theory of ecology: a case study in vocal communication. *American Naturalist*

In Preparation

- **MR Wilkins**, S-F Chan, H Karaardıç, PL Pap, A Rubtsov, ESC Scordato, G Semenov, S-F Shen, Y Vortman, and RJ Safran. Song Divergence Across the Barn Swallow Species Complex. Target: *Evolution*, May
- **MR Wilkins**, D Shizuka, RJ Safran. Comparing barn swallow phenotype networks: sexual selection and phenotypic integration. Target: *Evolution*, July
- **MR Wilkins**, MD Merz[‡], RJ Safran. Signal honesty and sexual selection: The role of trill rate in barn swallow communication. Target: *Proc B*, September
- **MR Wilkins**, D Shizuka, A Knaub[‡], EA Hebets. The architecture of multimodal signaling across competitive and mating contexts in the wolf spider *Schizocosa floridana*. Target: *Animal Behavior*, November

*-shared first author; [‡]-mentored student

FUNDING

Fellowships

2014-2017	University of Nebraska-Lincoln: Population Biology Program of Excellence Postdoctoral Fellowship (\$159,660)
2013	NSF NESCent Graduate Student Semester Fellowship (\$15,500)
2010-2013	NSF Graduate Research Fellowship Award (\$90,000)

Research and Travel Grants

2017	UNL UCARE Grant for undergraduate mentee, Arich Knaub (\$2,400)
2016	UNL UCARE Grant for undergraduate mentee, Arich Knaub (\$2,400)

- UNL Postdoctoral Travel Grant (\$750)
- 2015 UNL UCARE Grant for undergraduate mentee, Allen Overholtzer (\$2,400)
- 2013 CU EBIO Graduate Student Research Grant (\$1,103)
- Beverly Sears Graduate Student Grant Award (\$1,000)
- 2012 Society for the Study of Evolution Travel Award (\$500)
- CU Graduate School Travel Grant (\$300)
- CU EBIO Graduate Student Research Grant (\$2,000)
- CU UGGS Travel Grant (\$300)
- CU UROP Grant for undergraduate assistant, Courtney van der Linden (\$800)
- CU UROP Grant for undergraduate assistant, Martin Merz (\$800)
- CU UROP Grant for undergraduate assistant, Matt Aberle (\$800)
- Beverly Sears Graduate Student Grant Award (\$1,000)
- 2011 Animal Behavior Society Student Research Grant (\$1,500)
- CU BURST Grant for undergraduate assistant, Martin Merz (\$2,450)
- CU EBIO Graduate Student Research Grant (\$1,500)
- Wilson Ornithological Society: Paul A. Stewart Grant (\$500)
- CU Graduate School Travel Grant (\$300)
- 2010 CU EBIO Graduate Student Research Grant (\$2,500)
- 2009 Beverly Sears Graduate Student Grant Award (\$1,000)
- CU EBIO Graduate Student Research Grant (\$2,500)
- Cooper Ornithological Society: Joseph Grinnell Award (\$1,000)
- American Ornithologists' Union: Alexander Wetmore Award (\$1,500)

Outreach Grants

NASA Nebraska Space Grant in support of SciComm 2016 (\$2,000)

Fundraising

UNL SciComm 2015 support from Nebraska EPSCoR, Nebraska STEM, and the following UNL divisions: Materials Research Science and Engineering Center, Office of Research and Economic Development, and the School of Biological Sciences (\$5,800)

SciComm 2016 support from Nebraska EPSCoR, Doane University, and the following UNL divisions: Materials Research Science and Engineering Center, Office of Research and Economic Development, the Libraries, College of Arts and Sciences, Central Administration, Nebraska Science Program of Excellence, Student Government Association, and the departments of Physics, Biology, and Sociology (\$13,850)

Awards

Short-listed for the European Society for the Study of Evolution [2016 Stearns Graduate Student Prize](#)

PRESENTATIONS (First Author)

Invited presentations

- 2017 "Sexual selection and the evolution of complex signals in barn swallows" Center for Evolution and Genomics, Uppsala University, Sweden
- 2016 "Comparing phenotype networks across barn swallow populations: phenotypic integration and sexual selection" Network Theory in Ornithology Symposium, North American Ornithological Conference in Washington, DC

- 2015 “Multimodal signaling in the North American barn swallow: a phenotype network approach” (talk) Warder Clyde Allee Symposium, Animal Behavior Society Meeting in Anchorage, AK.
Invited to present in the symposium “Multimodal Signaling, Is It Special?” at the 34th International Ethological Conference in Cairns, Australia (Declined)
- 2013 “The evolution of complex sexual signals and their role in reproductive isolation” (talk), California Polytechnic State University, San Luis Obispo, CA
- 2010 “The effects of complex mate choice on population divergence” (talk) Akdeniz University, Department of Biology, Antalya, Turkey

Contributed presentations

- 2016 “Comparing phenotype networks across barn swallow populations: sexual selection and phenotypic integration” (talk) Evolution Conference, Austin, TX
“Divergent sexual selection explains phenotypic differentiation among closely related barn swallow populations” (talk) American Society of Naturalists Meeting, Asilomar, CA
- 2014 “Multimodal signaling in the North American barn swallow: influences of intra- and intersexual selection on signal evolution” (talk) AOU/COS/SCO Joint Ornithological Meeting, Estes Park, CO
“Multimodal signaling in the North American barn swallow: influences of intra- and intersexual selection on signal evolution” (talk) Evolution Conference, Raleigh, NC
- 2013 “Multimodal sexual signaling in the North American barn swallow” (talk) Animal Behavior Society Meeting, Boulder, CO
“Multimodal sexual signaling in the North American barn swallow” (talk) Front Range Student Ecology Symposium, Ft. Collins, CO
- 2012 “An experimental test of the role of trill rate in sexual signaling in the barn swallow” (poster) North American Ornithological Conference, Vancouver, CA
“Divergence in multimodal sexual signals across the Holarctic range of the barn swallow *Hirundo rustica*” (poster) First Joint Congress on Evolutionary Biology, Ottawa, Canada
- 2011 “The role of trills in communication and population divergence: A case study in the barn swallow *Hirundo rustica*” (talk) Guild of Rocky Mountain Ecologists and Evolutionary Biologists, CU Boulder Mountain Research Station, CO
“Geographic variation in the song of the barn swallow, *Hirundo rustica*” (talk) AFO/COS/WOS Joint Ornithological Meeting, Kearney, NE
- 2010 “Geographic variation in the song of the barn swallow, *Hirundo rustica*” (poster) Animal Behavior Society, Williamsburg, VA

TEACHING

Lead Instructor

- 2016 Field Animal Behavior (UNL: BIOS 468/868)
2015 Graduate Seminar: Understanding Biological Complexity (UNL: BIOS 998)

Teaching Assistant

- 2014 General Biology Lab 2 (CU: EBIO 1240)
2010 General Biology Lab 2 (CU: EBIO 1240)

- 2009 General Biology Lab 1 (CU: EBIO 1230)
General Biology Lab 2 (CU: EBIO 1240)
2008 General Biology Lab 1 (CU: EBIO 1230)

Guest Lecturer

- 2014 Graduate Seminar: Species Concepts and Speciation (UNL: BIOS 998)
Professionalism (UNL: BIOS 809)
2013 Evolution (CU: EBIO 3080)

Workshops and Training

- 2014 General Biology Weekly Teaching Workshop, Spring (22 hours)
Graduate Teaching Program Spring Workshop (5 hours)
Collaborative Preparing Future Faculty Network Forum (5 hours)
2011 CITI Responsible Conduct of Research Training (6 hours)
CU BURST Undergraduate Research Mentor Training (3 hours)
2010 General Biology Weekly Teaching Workshop, first half of Spring (11 hours)
2009 Graduate Teaching Program Fall Workshop (2 hours)
General Biology Weekly Teaching Workshop, Fall & Spring (44 hours)
2008 General Biology Weekly Teaching Workshop, Fall (22 hours)
Graduate Teaching Program Spring Workshop (6 hours)

Video consultation of teaching

- 2014 Reviewed and evaluated my teaching performance in Gen Bio lab with lead graduate teacher (CU)
2009 Assessed my teaching performance in Gen Bio lab with lead graduate teacher (CU)

Certifications

Certificate of College Teaching from the Graduate Teaching Program at CU Boulder

SERVICE

Professional Service

Ad Hoc Reviewer for: *Behavioral Ecology and Sociobiology, Bioacoustics, Biological Journal of the Linnean Society, Bird Conservation International, Current Opinion in Plant Biology, Ethology, Evolution, Journal of Ethology, Journal of Evolutionary Biology, Journal of Ornithology, Proceedings of the Royal Society B, Royal Society Open Science, The Auk: Ornithological Advances, Wilson Journal of Ornithology*

Member of: American Association for the Advancement of Science, American Ornithologists' Union, American Society of Naturalists, Animal Behavior Society, Society for the Study of Evolution

Other Activities

- 2016 -Judged undergrad presentations at the NAOC Ornithological Meeting in DC
-Reviewed fellowship proposals for Graduate Women in Science
-Judged grad student talks at the American Society of Naturalists meeting
2015 -Reviewed undergraduate research grant applications for UCARE at UNL
2009–2014 -Graduate Student Mentor at CU for Tim Szweczyk and David Zonana
2008–2014 -Member of the Evolution Outreach Committee at CU

- 2011–2012 -Member of the CU EBIO Colloquium Committee
 2010 -Judge for science fair at Adams Elementary School
 2008 -Judge for the EBIO Graduate Student Symposium at CU
 -Tutored ESL students from Boulder High School
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BROADER IMPACTS

Training

- 2016 Science Communication workshop at Evolution 2016 (run by Jory Weintraub)
- 2015 Organization for Tropical Studies 2-week course “Telling Stories about Science” on science communication in the digital age. Crash course instructors: Hillary Rosner, Michael Kodas (print journalism); Molly Webster, Pat Walters (radio/podcast production); Neil Losin and Morgan Heim (filmmaking). Produced stories in each format: [scientist profile](#), [podcast](#) & [film](#)

Innovations in Science Outreach

- Planned and ran [SciComm 2016 \(Sep 23-24\)](#), sequel to the 2015 event I organized. A 2-day meeting including a workshop coordinated with the National Alliance for Broader Impacts; a big science outreach event in downtown Lincoln; and a science communication symposium with 35 presentations and a keynote from TED speaker Melissa Marshall (180+ registrants from 12 states). [Storify Summary](#)
- In Feb 2016, founded [Numbat Media](#), a website and social media outlet showcasing science outreach projects and scientists’ stories from around the globe (4k+ page views; 700 [Twitter](#) followers; 91 on [Instagram](#); 106 likes on [Facebook](#))
- Organized [UNL SciComm 2015: A symposium on effective science communication](#). Recruited 14 speakers from 9 UNL departments, CU, & Doane College to present on science communication as well as social & psychological issues affecting science literacy, to forge collaborations and increase impact of these efforts. (120+ registrants: grad students, professors, administrators, & K-12 teachers) [Talk Links](#)

Other Outreach/ Engagement

2017

- Talked about birdsong with families at [Sunday with a Scientist](#), Nebraska State Museum (182 attendees)

2016

- In late October, began working to reinvigorate [Condor Watch](#)’s flagging participation in their citizen science project. Produced a [video](#), leaderboard of top contributors, and a social media campaign
- Tweeted for “rotating curator” account [@RealScientists](#) Sep 4-10, discussing my research, science communication and issues in Academia with 36.2k followers
- Founded [Lincoln Chapter](#) of Nerd Nite—an organization that puts on a monthly talk series in 100+ cities around the world to grow community around curiosity, science, and creativity! (200+ members)
- Tweeted for [@IAmSciComm](#) Jan 18-24, spurring numerous discussions about science communication & outreach with 3k followers
- Volunteered for “[SciPop Interactive](#)” through the UNL Libraries. Spoke about arachnid diversity to kids and their parents. (55 attendees)
- Volunteered for “[Investigate](#),” Nebraska State Museum. Described mating and competitive behavior of Amblypygids to parents & their kids. (245 attendees)

2015

- Presented “[Humor as a Learning Tool](#),” at UNL SciComm 2015, where I suggested that humor should be used more in “serious” science communication efforts.
- Presented “The Nightmares of Spiders,” UNL Libraries SciPop series: described numerous predators and parasitoids to students and the public. (~40 attendees)

2014

- Volunteered at “Eight-Legged Encounters”, part of NSF-funded program on “Informal Education with Arachnids” (CRPA – 1241482), hosted at the Denver Museum of Science and Nature (~3,500 attendees)
- Worked at “Family Day—Evolution: Fit in Your World,” CU Museum of Natural History, organized by CU Evolution Outreach Committee (EOC) (~100 attendees)

2013

- Moderated panel on challenges of teaching controversial topics at the annual Teaching Evolution Workshop hosted by the CU EOC (~50 K-12 teachers attended)
- Volunteered for the day at “8-Legged Encounters,” hosted in Westminster, CO (~500 attendees)
- Maintained a blog (with Dr. Liz Scordato) describing our field efforts during a barn swallow sampling expedition across Russia at barnswallowproject.com
- Presented my research to four 7th grade science classes at Centennial Middle in Boulder (~70 students)

2012

- Presented “Words as Genes 2.0: Using parallels with linguistics to teach concepts in biological evolution” at the CU EOC Teaching Evolution Workshop

2011

- Presented at opening of “Birding on the Bus”: a program to make riders of a Metro Denver bus route aware of the birds living along a rural/urban transect
- Organized our lab’s second Site Owner Appreciation Day, where we met with landowners of our study sites to discuss the research of our lab group
- Gave a module at the annual EOC Teaching Evolution Workshop titled: “Words as Genes: Natural Selection Applied to Language”
- Presented research to 1st graders at Horizons K-8 Charter School, Boulder, CO
- Moderator for the EOC undergraduate symposium, “Biodiversity: From Evolution to Application”

2010

- Served as a judge at the Adams Elementary Science Fair, Boulder, CO
- Presented a [module on sexual selection](#) at EOC Teaching Evolution Workshop

2009

- Started blog transparentsci.blogspot.com: provides a narrative and photos about my work to inform and excite a broad audience about biological research
- Featured in an article covering my collaboration with PhD student Hakan Karaardıç in the Turkish *Serik Postası* newspaper
- Helped organize our lab’s first Site Owner Appreciation Day

Mentorship

Field and Lab Assistants Trained:

Lori Fraser, Connor Fitzhugh[‡], Andrew Flynn[‡] (2008, CU); Alex Oesterle, Rachel Wildrick[‡] (2009, CU); Özgün Eker[‡], Leyla Kaplan[‡] (2010, Akdeniz University, Turkey); Martin Merz[‡], Ian Harold, Stephen Alderfer[‡], Audrey Tobin (2011, CU); Caroline Glidden[‡], Lauren Brooks, Abdul Hussein, Courtney Van Der Linden, Matt Aberle[‡], Michelle Foreman, Allison Mitchell (2012, CU); Kate Zator[‡] (2013 CU); Sean Maguire, Taylor Bequette, Allen Overholtzer[‡], Jake Eastman, Andrew Ehresman, Hanna Anderson, and Alex Hansen[‡] (2014-2015, UNL); Arich Knaub[‡] (2015-17, UNL)

Total: 27 trained, 12 mentored (denoted by ‡)

LANGUAGE SKILLS

English (native), Spanish (fluent), Portuguese (elementary), Catalan (elementary), some knowledge of Russian and Turkish

PUBLISHED MULTIMEDIA

Photos in Scientific Journals

- [Cover](#) photo for *Molecular Ecology* Vol 25, Issue 16, p. 3769–4090
- Fig 1 in Hebets EA, et al. A systems approach to animal communication. *Proc. R. Soc. B* 2016 Mar 16 (Vol. 283, No. 1826, p. 20152889)
- Fig. 1 B and C in Levin II, et al. Performance of Encounternet Tags: Field Tests of Miniaturized Proximity Loggers for Use on Small Birds. *PLoS one*. 2015 Sep 8;10(9):e0137242
- Fig. 2 in Scordato ES and Safran RJ. Geographic variation in sexual selection and implications for speciation in the Barn Swallow. *Avian Research*. 2014 Dec 24;5(1):1
- Inset on [Cover](#) of Special Issue on Speciation in *Journal of Heredity*. 2014 105 (S1)
- Box 1 in Vitousek MN et al. An integrative view of the signaling phenotype: Dynamic links between signals, physiology, behavior and social context. *Current Zoology*. 2014 Dec 1;60(6)

Awards

- Best Film for “[Pygids](#)” at the 6th Annual Evolution Film Festival at the 2016 Evolution Meeting
 - Best Film for “[Pygids](#)” at the 20th International Conference on Arachnology in 2016
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COLLABORATORS WITHIN LAST 48 MONTHS

Albrecht, Tomáš	Institute of Vertebrate Biology, Academy of Sciences of the Czech Republic
Francis, Clinton	Biological Sciences Department, Cal Poly, San Luis Obispo, CA
Hebets, Eileen	School of Biological Sciences, University of Nebraska-Lincoln
Hubbard, Joanna	School of Biological Sciences, University of Nebraska-Lincoln
Hund, Amanda	Department of Ecology & Evolutionary Biology (CU)
Joseph, Maxwell	Department of Ecology & Evolutionary Biology (CU)
Karaardıç, Hakan	Elementary Science Education Department, Alaaddin Keykubat University, Alanya, Turkey
Pap, Peter	Dept. of Taxonomy & Ecology, Babeş-Bolyai University, Cluj-Napoca, Romania
Parchman, Thomas	Department of Biology, University of Nevada, Reno
Rodríguez, Rafael	Department of Biological Sciences, University of Wisconsin—Milwaukee
Rosenthal, Malcolm	Department of Environmental Science, Policy & Management, UC Berkeley
Safran, Rebecca	Department of Ecology & Evolutionary Biology (CU)
Scordato, Elizabeth	Department of Ecology & Evolutionary Biology (CU)
Seddon, Nathalie	Edward Grey Institute, Department of Zoology, Oxford University
Semenov, Georgy	GG Simpson Postdoctoral Research Fellow, University of Arizona
Shizuka, Daizaburo	School of Biological Sciences, University of Nebraska-Lincoln
Vitousek, Maren	Department of Ecology & Evolutionary Biology, Cornell University
Vortman, Yoni	Hula Research Center, Dep. of Animal Sciences, Tel-Hai Academic College

Updated: Mar 6, 2017