
Austin R. Spence, Ph.D. Ecology and Evolutionary Biology

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Research Interests:

Ecology in a changing world, with a particular emphasis on how climate change, agriculture, and urbanization affect wildlife across individual, species, and ecological scales

Education and Professional Experience:

University of California, Davis, Postdoctoral Fellow

Dept. of Wildlife, Fish, and Conservation Biology, 2022–Present

Advisor: Daniel Karp

University of Connecticut, Ph.D.

Dept. of Ecology and Evolutionary Biology, 2015–2021

Dissertation: Physiological mechanisms and biotic interactions structuring hummingbird range limits along an elevational gradient

Committee: Morgan Tingley (advisor), Robert Colwell, Margaret Rubega, Carlos García-Robledo, Eric Schultz

Utah State University, B.A.

Dept. of Biology, *Summa cum laude*. 2015.

Dissertation: Detrimental effects of zinc oxide nanoparticles on amphibian life stages

Dissertation advisor: Susannah French

Peer Reviewed Publications:

Spence, A.R., E.E. Wilson Rankin, and M.W. Tingley. DNA reveals broadly overlapping diets in three sympatric hummingbirds. *Ornithology*. 139(1), ukab074.

Spence, A.R. and M.W. Tingley. 2021. Body size and environment influence both intraspecific and interspecific variation in torpor use across hummingbirds. *Functional Ecology*. 35(4), 870-883.

Herder, E.A., **A.R. Spence**, M.W. Tingley, and S.M. Hird. 2021. Elevation correlates with significant changes in relative abundance in hummingbird fecal microbiota, but composition changes little. *Frontiers in Ecology and Evolution*. 8, p. 534.

Spence, A.R., S.S. French, G.R. Hopkins, A.M. Durso, S.B. Hudson, G.S. Smith, and L.A. Neuman-Lee. 2020. Long-term monitoring of two snake species reveals immune-endocrine interactions and importance of ecological context. *Journal of Experimental Zoology Part A*, 333(10), pp. 744-755.

Spence, A.R. and MW Tingley. 2020. The challenge of novel abiotic conditions for species undergoing climate-induced range shifts. *Ecography*, 43(11), pp. 1571-1590.

Tell, L.A., J. Hazlehurst, J. Brown, R. Bandivadekar, **A.R. Spence**, D.R. Powers, L.W. Woods, and A. Engilist Jr. 2021. Hummingbird (Family Trochilidae) Research: Welfare conscious handling and

sampling techniques for live hummingbirds. *Texas Tech University Natural Science Research Laboratory Special Publications*.

Spence, A.R., A.M. Durso, G.D. Smith, H.M. Skinner, and S.S. French. 2017. Physiological correlates of multiple parasitic infections in side-blotched lizards. *Physiological and Biochemical Zoology*, 90(3), pp.321-327.

Spence A.R., G.R. Hopkins, L.A. Neuman-Lee, G.D. Smith, E.D. Brodie Jr., and S.S. French. 2016. Detrimental effects of zinc oxide nanoparticles on amphibian life stages. *Journal of Experimental Zoology Part A: Ecological Genetics and Physiology*, 325(7), pp.415-424.

Neuman-Lee, L.A., H.B. Fokidis, **A.R. Spence**, M. Van der Walt, G.D. Smith, S. Durham, and S.S. French. 2015. Food restriction and chronic stress alter energy use and affect immunity in an infrequent feeder. *Functional Ecology*, 29(11), pp.1453-1462.

Publications in Review:

Pollock, H.S., D. Lamont, S.E. MacDonald, **A.R. Spence**, J.D. Brawn, and Z.A. Cheviron. Widespread torpor use in hummingbirds from the thermally stable lowland tropics. *Physiological and Biochemical Zoology*. In Review.

Smith, G.D., T.E. Wilcoxon, S.B. Hudson, E.E. Virgin, A.M. Durso, P.A. Terletzky, M. Van der Walt, **A.R. Spence**, L.A. Neuman-Lee, A.C. Webb, and S.S. French. Anthropogenic and climatic factors interact to influence reproductive timing and effort. *Journal of Animal Ecology*. In Review.

Spence, A.R., H. LeWinter, and M.W. Tingley. Hummingbird physiological response to novel thermal and hypoxic exposure at high elevations. *Journal of Experimental Biology*. In Review.

Spence, A.R., J.B. Socolar, A.N. Stillman, and M.W. Tingley. Late-summer temperature anomalies drive population change at avian range margins. In Review.

Fellowships and Grants:

2019 – Ecology and Evolutionary Biology Research Grant, University of Connecticut (\$1,500)

2018 – American Ornithological Society Research Grant (\$2,500)

2018 – White Mountain Research Center Research Grant (\$1,500)

2018 – Fellowship of Graduate Student Travel, Society for Integrative and Comparative Biology (\$2,000)

2017 – Ecology and Evolutionary Biology Research Grant, University of Connecticut (\$1,000)

2016 – National Science Foundation Graduate Student Research Fellowship (\$96,000)

Selected Talks:

2021 – **Spence, A.R.** Hummingbird diets: Exploring what our backyard pollinators are eating and how we can help. *Brentwood Garden Club* (invited seminar).

2021 – **Spence, A.R.** Hummingbird fuel: how to get it and how to save it. *Seattle Audubon Society* (invited seminar).

2020 – **Spence, A.R.**, E.E. Wilson-Rankin, and M.W. Tingley. Investigating dietary niche partitioning in morphologically similar hummingbirds using metabarcoding. *North American Ornithological Conference*.

2020 – **Spence, A.R.**, J.B. Socolar, A.N. Stillman, and M.W. Tingley. 2020. Population Response to Temperature and Precipitation across 156 North American Passerine Distributions. *Ecological Society of America*.

2019 – **Spence, A.R.** LG-EEB-TQ – A history of LGBTQ scientists in ecology and evolutionary biology. *University of Connecticut Seminar*.

2019 – **Spence, A.R.**, J.B. Socolar, A.N. Stillman, and M.W. Tingley. 2019. Population Response to Temperature and Precipitation across 156 North American Passerine Distributions. *Wilson Ornithological Society*.

2019 – **Spence, A.R.** and M.W. Tingley. Will low oxygen slow range shifts? Response to novel high elevation environments from populations across a hummingbird range. *American Ornithological Society*.

2019 – **Spence, A.R.** and M.W. Tingley. Response to novel thermal and hypoxic challenges from populations across a hummingbird's elevational range. *Society for Integrative and Comparative Biology*.

2018 – **Spence, A.R.** and M.W. Tingley. Overcoming thermal and hypoxic challenges of high elevations in two hummingbird species. *American Ornithological Society*.

2014 – **Spence, A.R.**, G.R. Hopkins, L.A. Neuman-Lee, G.D. Smith, E.D. Brodie Jr., and S.S. French. Detrimental effects of zinc oxide nanoparticles on amphibian life stages. *Society for Integrative and Comparative Biology*.

Awards and Honors:

2020 – *Ecography* Award for Excellence in Ecology and Evolutionary Biology

2020 E4 Winning Manuscript

Title: *The challenge of novel abiotic conditions for species undergoing climate-induced range shifts.*

2019 – American Ornithological Society Student Travel Award

2019 – Honorable Mention for American Ornithological Society Best Student Oral Presentation

Title: *Will low oxygen slow range shifts? Response to novel high elevation environments from populations across a hummingbird range*

2018 – American Ornithological Society Student Travel Award

2009 – Kennedy-Lugar Youth Exchange and Study Abroad Scholarship

Mumbai, India, Inaugural Class of American Ambassadors sponsored through the United States Department of State

Teaching Appointments:

Guest Lecturer – **Behavioral Endocrinology**, Loyola Marymount University, 2020.

Primary Instructor – **Reading and Communicating Ecology and Evolutionary Biology**, University of Connecticut, 2018.

Graduate Teaching Assistant – **Human Evolution and Diversity**, University of Connecticut, 2017.

Guest Lecturer – **Physiological Ecology**, University of Connecticut, 2016.

Graduate Teaching Assistant – **Introduction to Biology**, University of Connecticut, 2015–2016.

Undergraduate Teaching Assistant – **Introduction to Biology**, Utah State University, 2013–2015.

Reviewer:

Journal Peer-review: Wilson Journal of Ornithology, Ecography, Biotropica, PeerJ, Alytes, Science of Nature, Journal of Animal Health, Ecosphere, Ecology and Evolution

Diversity and Volunteer Experience:

American Field Service volunteer (2010-present)

Participation in candidate selection and training for future YES-Abroad scholars.

oSTEM Representative

oSTEM is a collaborative conference for out LGBTQ professionals in science, technology, engineering, and mathematics.

University of Connecticut Safezone Training

Active training to make academic and classroom communities safer and more inclusive for members of the LGBTQIA+ community

Ecology and Evolutionary Biology Graduate Student Association Treasurer (2016–2019)

Affiliations:

American Ornithological Society, Wilson Ornithological Society, Ecological Society of America, NOGLSTP

Popular Media:

The Science Pawdcast (2022)

Spaces Unleashed Bonus Content. *Dr. Austin Spence Hummingbird Expert*

Ecography Interviews and Visualizations (2020)

Ecography podcast interview (https://soundcloud.com/user-224236556/the-moran-effect-revisited-spatial-population-synchrony-under-global-warming?utm_source=clipboard&utm_medium=text&utm_campaign=social_sharing)

Ecography video (https://www.youtube.com/watch?v=5qyLd_7Zg4I)

The Science Pawdcast (2020)

Season 2, Episode 35. *“SUPER COOL”ed particles, snake bites, and hummingbirds with Austin Spence*

International Education:

2013 – Research in Science and Engineering (RISE)

Internship with the Senckenburg Naturmuseum in Frankfurt, Germany facilitated through the German Academic Exchange Service (DAAD). Investigating population ecology and genetics of European hamsters at danger of local extirpation.

2009/2010 – Kennedy Lugar Youth Exchange and Study Abroad (YES Abroad) Scholar

Participated as a student ambassador in Mumbai, India. I lived with host families, completed my 11th grade of high school at the Dhirubhai Ambani International School, and participated in US Department of State outreach functions.