

Tara E. Stewart Merrill

Ecology & Evolutionary Biology – University of Colorado Boulder – Boulder, CO 80309

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EDUCATION

Ph.D. in Ecology and Evolution, August 2019, *University of Illinois at Urbana-Champaign*

B.A. in Biology, June 2011, *University of California, Santa Barbara*

B.F.A. in Dance, June 2008, *University of California, Santa Barbara*

PROFESSIONAL APPOINTMENTS

Lecturer, Ecology and Evolutionary Biology, University of Colorado Boulder (Jan 2020-May 2020)

Life Sciences Research Foundation Postdoctoral Fellow (August 2019 – July 2022)

Research: Host competence and its role in diversity-disease relationships: testing the effects of among- and within-species variation on parasite transmission

University of Colorado Boulder (Advisor: Pieter Johnson)

National Science Foundation Graduate Research Fellow (August 2014 – July 2019)

Dissertation: Variable immunity and its consequences for parasite dynamics

University of Illinois at Urbana-Champaign (Advisor: Carla Cáceres)

Laboratory Assistant (January 2014 – August 2014)

Research: Aquatic population, community and evolutionary ecology

University of Illinois at Urbana Champaign (Advisor: Carla Cáceres)

Laboratory Assistant (June 2011 – August 2013)

Research: Parasite and infectious disease ecology

University of California Santa Barbara (Advisors: Kevin Lafferty, Armand Kuris, Ryan Hechinger)

PEER-REVIEWED PUBLICATIONS

- (13) **Stewart Merrill, T.E.**, S.R. Hall & C.E. Cáceres. 2020. Parasite exposure and host susceptibility jointly drive the emergence of epidemics. *Ecology*: doi: 10.1002/ecy.3245
- (12) **Stewart Merrill, T.E.** & P.T.J. Johnson. 2020. Towards a mechanistic understanding of competence: a missing link in diversity-disease research. *Parasitology* 147:1159-1170.
- (11) Rapti, Z., **T.E. Stewart Merrill**, B. Mueller-Brennan, J.H. Kavouras & C.E. Cáceres. 2019. Indirect effects in a planktonic disease system. *Theoretical Population Biology* 130:132-142.

- (10) **Stewart Merrill, T.E.**, S.R. Hall, L. Merrill & C.E. Cáceres. 2019. Variation in immune defense shapes disease outcomes in laboratory and wild *Daphnia*. ***Integrative & Comparative Biology*** 59:1203-1219.
- (9) Merrill, L., **T.E. Stewart Merrill**, A. Barger & T.J. Benson. 2019. Avian health across the landscape: nestling immunity covaries with changing landcover. ***Integrative & Comparative Biology*** 59:1150-1164.
- (8) **Stewart Merrill, T.E.** & C.E. Cáceres. 2018. Within-host complexity of a plankton-parasite interaction. ***Ecology*** 99:2864-2867.
- (7) Rosencranz, J.A., K.D. Lafferty, K.M. Thorne, K.J. Buffington, J. Takekawa, R.F. Hechinger, **T.E. Stewart**, R.F. Ambrose, G.M. MacDonald, M. Holmgren, J. Crooks & R. Patton. 2018. Sea-level rise, habitat loss, and potential extirpation of a salt marsh specialist bird in urbanized landscapes. ***Ecology and Evolution*** 8:8115-8125.
- (6) **Stewart, T.E.**, M.I. Torchin & C.E. Cáceres. 2018. Invisible parasites and their implications for coexisting water fleas. ***Journal of Parasitology*** 104:101-105.
- (5) Merrill, L., M. Naylor, M. Dalimonte, S. McLaughlin, **T. Stewart** & J. Grindstaff. 2017. Early life immune activation increases song complexity and alters phenotypic associations between sexual ornaments. ***Functional Ecology*** 31:2263-2273.
- (4) Buck, J.C., R.F. Hechinger, A.C. Wood, **T.E. Stewart**, A.M. Kuris & K.D. Lafferty. 2017. Host density increases parasite recruitment but decreases host risk in a snail-trematode system. ***Ecology*** 98:2029-2038.
- (3) **Stewart, T.E.** and S.A. Schnitzer. 2017. Blurred lines between competition and parasitism. ***Biotropica*** 49:433-438.
- (2) **Stewart, T.E.** and L. Merrill. 2015. Host sex and parasitism in Red-winged Blackbirds (*Agelaius phoeniceus*): examining potential causes of infection biases in a sexually dimorphic species. ***Canadian Journal of Zoology*** 93:21-29.
- (1) Merrill, L., **T.E. Stewart**, P.L. Gonzalez-Gomez, A.L. O'Loughlen, J.C. Wingfield, V.A. Ellis and S.I. Rothstein. 2014. Epaulet size and current condition in Red-winged Blackbirds: examining a semi-static signal, testosterone, immune function, and parasites. ***Physiological and Biochemical Zoology*** 88:11-21.

PUBLICATIONS IN REVIEW OR IN ADVANCED STAGES OF PREPARATION

Stewart Merrill, T.E., Z. Rapti & C.E. Cáceres. Host controls of within-host disease dynamics: insight from an invertebrate system. In review: ***American Naturalist***

Rogalski, M.A., **T.E. Stewart Merrill**, C.D. Growler, C.E. Cáceres & M.A. Duffy. Ecological context drives a shift from parasitism to mutualism. In revision: ***American Naturalist***

Hopkins, S., C. Wood, S. Olson, J. Buck, M. Childs, G. de Leo, J. Fornberg, A. Garchitorena, M. Howard, I. Jones, A. Kuris, L. Kwong, C. LeBoa, A. Leon, A. Lund, A. MacDonald, D. Metz, N. Nova, A. Peel, J. Remais, S. Sokolow, **T. Stewart Merrill**, M. Wilson, M. Bonds, A. Dobson, K. Fiorella, L. Mandle, H. Tallis & K. Lafferty. Viable win-win solutions for conservation and human health are ready for adaptive implementation. In review: **PNAS**

Rivera-Quiñones, V., **T.E. Stewart Merrill**, C.E. Cáceres & Z. Rapti. Host immunity suppresses epidemic size and stabilizes host-parasite interactions in an invertebrate disease model. In review: **American Naturalist**.

Hobart, B.K. W.E. Moss, T. McDevitt-Galles, **T.E. Stewart Merrill** & P.T.J. Johnson. Trait-mediated predation on parasites alters predator population size and host infection prevalence in natural wetlands. Submitted: **Ecology**

PUBLISHED DATASETS

Hechinger, R.F., Wood, A., **Stewart, T.E.**, Ashford, J., Kuris, A.M. & Lafferty, K.D. 2016. Monthly trematode infections of the snail *Cerithidiopsis (Cerithidea) californica* at Carpinteria Salt Marsh, California, USA, February 2012 to January 2014: U.S. Geological Survey data release, <http://doi.org/10.5066/F7348HJB>

Lafferty, K.D., **T.E. Stewart** & R.F. Hechinger. 2016. Bird distribution surveys at Carpinteria Salt Marsh, California USA, January 2012 to March 2013: U.S. Geological Survey data release, <http://dx.doi.org/10.5066/F7F47M95>

Lafferty, K.D., Wood, A.C., **Stewart, T.E.**, Lubar, A.A., Arbon, J., Birnir, E., Hong, R., and Hechinger, R.F. 2017. Distribution and mapping of the snail *Cerithideopsis (Cerithidea) californica* at Carpinteria Salt Marsh, California USA, June to August 2012: U.S. Geological Survey data release, <https://doi.org/10.5066/F7PG1PWZ>

Lafferty, K.D., Dunham, E.J., Mancini, F.T., **Stewart, T.E.**, and Hechinger, R.F. Carpinteria salt marsh habitat polygons: U.S. Geological Survey data release, <https://doi.org/10.5066/F7T72FMP>

GRANTS AND AWARDS

2019 Life Sciences Research Foundation (sponsored by the Simons Foundation) **\$156,000** salary plus **\$30,000** research funds distributed over three years
Schmidt Science Fellows finalist (*final interview declined in lieu of LSRF*)

2017 NSF Doctoral Dissertation Improvement Grant **\$20,539**
Lebus Fund Award, University of Illinois **\$990**
Summer Research Grant, University of Illinois **\$1000**

2016 Dresden Student Travel Award, American Society of Parasitologists **\$600**
Clark Research Award, University of Illinois **\$1000**
IGERT research grant, University of Illinois **\$5,000**

2015 Summer Research Grant, University of Illinois **\$1000**

2014 NSF Graduate Research Fellowship, **\$102,000**
NSF IGERT Fellowship, **\$64,000**

INVITED PRESENTATIONS

2020 Cornell University, Ecology and Evolutionary Biology, Ithaca, NY: Chalk talk
Cornell University, Ecology and Evolutionary Biology, Ithaca, NY: Seminar
University of Michigan, Ecology and Evolutionary Biology, Ann Arbor, MI: Seminar
2019 Society for Integrative and Comparative Biology Symposium, Tampa, FL: Symposium
2018 University of Illinois Mathematical Biology, Urbana, IL: Seminar
2017 Biomathematics & Ecology: Education and Research, Bloomington, IL: Symposium

CONTRIBUTED PRESENTATIONS

**Denotes "Best talk" Award*

2020 Toward a mechanistic understanding of competence: investigating a missing link in diversity-disease theory. Ecological Society of America, Salt Lake City, UT (virtual talk during COVID-19)

2020 Building parasites into freshwater food webs: how a pathogenic chytrid fungus affects large-bodied *Daphnia* and their role in lake ecosystems (accepted abstract; conference cancelled due to COVID-19)

2019 Host competence: a missing link in biodiversity-disease research. Life Sciences Research Foundation Annual Meeting, Baltimore, MD (poster)

2018 Variable immunity and its consequences for parasite dynamics. UIUC Program in Ecology, Evolution & Conservation Biology seminar (talk)

Exposure and susceptibility jointly drive epidemic emergence. Ecological Society of America, New Orleans, LA (talk)

Exposure and susceptibility jointly drive epidemic emergence. UIUC Graduate Student Symposium, Urbana, IL (talk)**

2017 Plankton-parasite interactions: a window into the within-host dynamics. Ecology and Evolution of Infectious Disease, Santa Barbara, CA (talk)

Plankton-parasite interactions: a window into the within-host dynamics. Association for the Sciences of Limnology and Oceanography, Honolulu, HI (talk)

2016 A closer look reveals a role for parasites in *Ceriodaphnia* competition. Association for the Sciences of Limnology & Oceanography, Santa Fe, NM (talk)

Plankton-parasitoid interactions: a window into the within-host dynamics. American Society of Parasitologists, Edmonton, Alberta (talk)*

Diving into *Daphnia* defenses: how a waterflea kills its parasitic invaders. UIUC Graduate Student Symposium, Urbana, IL (talk)**

- 2015 What's parasitizing tropical zooplankton? A survey of Cladocerans and their parasites from the bays of Barro Colorado Island. Ecological Society of America, Baltimore, MD (poster)
- 2014 Disease resistance is influenced by intestinal morphology in *Daphnia dentifera*. Ecological Society of America, Sacramento, CA (poster)
- 2013 Where are the birds in Carpinteria Salt Marsh? Mapping the estuary's avifauna in space and time. UCSB Natural Reserve Symposium, Santa Barbara, CA (talk)
- Where are the birds in Carpinteria Salt Marsh? Mapping the estuary's avifauna in space and time. UCSB Graduate Student Symposium, Santa Barbara, CA (poster)
- 2010 Sex-biased variation in parasitism of breeding Red-winged Blackbirds. UCSB College of Creative Studies Science Week, Santa Barbara, CA (poster)

TEACHING EXPERIENCE AND TRAINING

- 2020 **Lecturer:** Parasitology, University of Colorado Boulder
- 2018 **Fellow:** Mobile Summer Institute on Scientific Teaching, University of Illinois
Guest lecturer: Marine Biology, University of Illinois
- 2016 **Instructor:** Epidemiology/Parasitology, University of Illinois
Teaching Assistant: Vertebrate Natural History, University of Illinois
Guest lecturer: Summer Illinois Mathematics Camp, University of Illinois
Guest lecturer: Ornithology, University of Illinois
- 2014 **Teaching Assistant:** Environmental Biology, University of Illinois
- 2009 **Instructor:** Physically Integrated Dance, Keshet Dance Company, Albuquerque, NM
Instructor: Dance, Title One Homeless Project, Albuquerque, NM
Instructor: Dance, Math, Language, and Conflict Resolution, Youth Diagnostic and Development Center, Albuquerque, NM
- 2008 **Instructor:** Dance, Title One Homeless Project, Albuquerque, NM
Instructor: Dance, Math, Language, and Conflict Resolution, Youth Diagnostic and Development Center, Albuquerque, NM

OUTREACH AND STUDENT-CENTERED ACTIVITIES

1) Diversity and Inclusion Seminar: Active participant in the CU Boulder Ecology and Evolutionary Biology "Diversity and Inclusion Seminar" which meets weekly to provide training and advance departmental diversity and inclusion efforts (2019-present)

2) Undergraduate Research Mentor: Participated in a university sponsored mentoring workshop to develop mentoring skills and closely mentored 22 undergraduates in science. Students received interdisciplinary training in aquatic ecology, parasitology, and statistics, and contributed to laboratory projects, developed independent research, and completed honors theses. (2010-2020)

3) Illinois STEM Mentor Matching Engine: Virtually mentored ten students from high schools across the state of Illinois working to complete group and independent projects (2015-18)

4) Mobile Summer Institute Fellow: Participated in a week-long training intensive, the *Summer Institute on Scientific Teaching*, which covered evidence-based teaching strategies, student diversity, and how to maintain equity in the classroom. As part of the intensive, I co-developed a 30-minute hands-on learning activity that will be made available for educators on the institute's website (<https://www.summerinstitutes.org/teachable-tidbits>) (2018)

5) Girls Explore Biology Instructor: Volunteer instructor for the *Girls Explore Biology* summer camp for kindergarten to fourth grade girls in Champaign-Urbana, IL. I co-designed and implemented three hour-long teachable units in avian biology, including species identification, feeding strategies and morphology, and birdsong (2014; 2015; 2018)

6) Mathematics Camp Instructor: Volunteer instructor at the *Summer Illinois Mathematics Camp*, a free camp for middle to high school students exploring math and biology in Champaign-Urbana, IL. I presented a lecture on my collaborative research with mathematicians and facilitated a discussion on the nature and power of interdisciplinary research (2016)

UNDERGRADUATE MENTORING

Delvecchio Wilson, NSF REU, CU Boulder, 2020-present

Fox Freeman, Undergraduate Research, CU Boulder, 2020-present

Jackson McKinney, Undergraduate Research, CU Boulder, 2020-present

Margaret Paige Paulson, Undergraduate Research, CU Boulder, 2019-2020

Madelyn McLaughlin, Undergraduate Research, CU Boulder, 2019-2020

Sarah Von Hoene, Undergraduate Honors Thesis, CU Boulder, 2019

Cecily Negri, Undergraduate Research, U of Illinois, 2018-2019

Samantha Gray, Undergraduate Research, U of Illinois, 2018-2019

Veronika Laird Undergraduate Research, U of Illinois, 2018-2019

Diana Oleksyn Undergraduate Research, U of Illinois, 2018-2019

Anna Osborn Undergraduate Research, U of Illinois, 2018-2019

Zoe Schnitzler Undergraduate Research, U of Illinois, 2018-2019

Krti Tallam, Udall Scholar, U of Illinois, 2016-2018

Gargi Sundaram, Undergraduate Honors Thesis, U of Illinois, 2015-2017

Kaileen Dinnon, Undergraduate Research, U of Illinois, 2015-2016

Peter Schmucker, Undergraduate Research, U of Illinois, 2015-2016

Samantha Kopec, Undergraduate Honors Thesis, U of Illinois, 2014-2016

Mariah Matthews, Undergraduate Research, U of Illinois, 2014

Jelena Verkler, Undergraduate Research, U of Illinois, 2014

Jessica Arbon, Science Horizons Research Fellow, UC Santa Barbara, 2012

Anushika Ganegoda, Undergraduate Research, UC Santa Barbara, 2010

Erin O'Leary, Undergraduate Research, UC Santa Barbara, 2010

PROFESSIONAL SERVICE AND ACTIVITIES

National and International Conferences

Session co-organizer/moderator: Uniting predator-prey and parasite-host theory under a general consumer-resource framework. Ecological Society of America, New Orleans, LA, 2018

Society Affiliations

American Ornithological Society, American Society of Parasitologists, Association for the Sciences of Limnology and Oceanography, Ecological Society of America, Society for Integrative and Comparative Biology

Journal Reviews

American Naturalist (2), Ecology (2), Ecology and Evolution (1), Hydrobiologia (1), International Journal for Parasitology (2), Journal of Animal Ecology (1), Nature Scientific Reports (1), Parasitology Research (1), PLOS Computational Biology (1)

Institutional and Departmental Service

Graduate Admissions Committee for the Program in Ecology, Evolution & Conservation Biology at University of Illinois (2018), Organizer for the Graduate Student Symposium at University Illinois (2017), Events Coordinator for the Graduates in Ecology and Evolutionary Biology (2015-2016), Graduate Panelist at the Illini Wildlife and Conservation Club (2016)