

Bradley Evan Carlson, Ph.D.

Curriculum Vitae

Byron K. Trippet Assistant Professor of Biology
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Professional Experience

2014 - present Byron K. Trippet Assistant Professor of Biology, Wabash College

Education

2009-2014 PhD in Ecology, minor in Statistics, The Pennsylvania State University,
University Park, PA
Advisor: Dr. Tracy Langkilde
Dissertation: The evolutionary ecology of intraspecific trait variation in
larval amphibians

2008 B.S. in Biology, Bethel University, St. Paul, MN
Summa cum laude, Honors Graduate
Thesis: Temperature and desiccation effects on the antipredator behavior
of *Centruroides vittatus* (Scorpiones: Buthidae)

Research Experience

2009-2014 Dissertation research on evolutionary, behavioral, and community ecology of
larval amphibians. Focused on intraspecific trait variation, phenotypic plasticity,
and predator-prey interactions. The Pennsylvania State University.

2008 NSF-funded Research Experience for Undergraduates studying bark scorpion
thermal ecology. Sam Houston State University.

Research Interests

Evolutionary ecology – local adaptation, trait integration, genetic and phenotypic diversity

Behavioral ecology – phenotypic plasticity, predator-prey interactions, personality traits

Community ecology – trait-mediated indirect interactions, predation, trait-based ecology

Teaching Experience

At The Pennsylvania State University (as graduate student):

- 2014 Laboratory Teaching Assistant, *Mammalian Anatomy*.

 Guest Lecturer, *Reptiles and Amphibians*, Topic: “Ecology and Behavior of Larval Amphibians”.
- 2013 Guest Laboratory Coordinator, *Wildlife Behavior*, Topic: Evaluation of boldness as a personality trait in terrestrial isopods.

 Guest Lecturer (one week), *Wildlife Behavior*, Topic: “Sexual Selection and Mate Choice”.

 Guest Lecturer (3 times), *Reptiles and Amphibians*, Topics: “Ecology and Behavior of Larval Amphibians” and herpetological field trips to Rock Springs and Scotia Barrens.

 Guest Lecturer, *Structure and Function of Organisms*, Topic: "Bigfoot and Scientific Thinking".
- 2012 Guest Lecturer, *Experimental Field Biology*, Topic: "Ecological Statistics".
- 2010-2012 Graduate Teaching Assistant, *Biology: Basic Concepts and Biodiversity*. Taught total of 6 laboratory sections.

At Bethel University (as undergraduate):

- 2008 Grading Teaching Assistant, *Environment and Humanity* and *Biology of the Mind*.
- 2006-2008 Laboratory Teaching Assistant, *Introduction to Biodiversity, Ecology, and Adaptation* and *Introduction to Molecular and Cellular Biology*.

Additional teaching skills development:

- 2010-2013 Co-leader and developer of Langkilde Lab Undergraduate Discussion Group at Penn State, directed towards cultivating intellectual scientific abilities and professional development (up to ~30 students per semester)
- 2010-2012 BIOL 602 Supervised Experience in College Teaching, including instruction in pedagogy (3 semesters)

Student Mentorship

At The Pennsylvania State University:

Supervised (or co-supervised) 25 undergraduate research assistants at Penn State University

- 2 students funded by MURE (Minority Undergraduate Laboratory Research Experience)
- 1 student funded by WISER (Women in Science and Engineering Research)
- 10 students conducted independent projects:

Kelly Brossman - *Phenotypic plasticity and flexibility in newts* (2 published papers)

Matthew Ridgway - *Adaptive color change in tadpoles*

Dan Knapp - *Adaptive color change in tadpoles*

Shannen McGinley - *Sexually dimorphic aggression in scorpions* (1 published paper)

Alex Pianovich - *Population differences in susceptibility of scorpions to invasive fire ants*

Jett Peng - *Ontogeny of sexual dichromatism in wood frogs*

Jillian Newman - *Hunger and the response to alarm cues in tadpoles* (1 manuscript in review)

Danielle Rosenberg - *Size- and species-specific predation risk and behavioral responses in tadpoles* (Honors Thesis, 1 manuscript in preparation)

Jason Langshaw - *Responses of two plethodontid salamanders to conspecific and congeneric odor cues* (1 manuscript in revision)

Jared Moroskie - *First observations of courtship in Plethodon hoffmani*

- 15 additional students served as research assistants:
Brent Storm, Maria Utrecho, Edward Owen, Courtney Brenner, Justin Malloy, Lauren Moyer, Dayna Ukwuoma, Andrew Watts, Marie Noah, Jennie Williams, Drake McGregor, Aaron Jacobs, Hannah Herriott, Tommy Cerri, Dan Fricker

Publications

(*co-author was undergraduate)

Carlson, BE, Williams*, J, and Langshaw*, J. Is synchronized ecdysis in wild rat snakes (*Pantherophis alleghaniensis*) linked to humidity? Accepted at *Herpetology Notes*.

Carlson, BE. *Notophthalmus viridescens*: diet. Accepted at *Herpetological Review*.

Carlson, BE. *Lithobates sylvaticus*: egg predation. Accepted at *Herpetological Review*.

Carlson, BE. *Lithobates catesbeianus*: habitat. *Herpetological Review* 45:304-305.

Carlson, BE, and T Langkilde. 2014. Predation risk in tadpole populations shapes behavioural responses of prey but not strength of trait-mediated indirect interactions. In press at *Oikos*.

Carlson, BE, McGinley*, S, and MP Rowe. 2014. Meek males and fighting females: sexually-dimorphic antipredator behavior and locomotor performance is explained by morphology in bark scorpions. *PLOS ONE* 9: e97648.

Media coverage: LiveScience.com, ScienceNews.org

Brossman*, K, Carlson, BE, Stokes, A, and T Langkilde. 2014. Eastern newt (*Notophthalmus viridescens*) larvae alter morphological but not chemical defenses in response to predator cues. *Canadian Journal of Zoology* 92:279-283.

Carlson, BE, and T Langkilde. 2014. No evidence of selection by predators on tadpole boldness. *Behaviour* 151:23-45.

Thawley, CJ and BE Carlson. 2013. Geographic distribution: *Hyla versicolor* (gray treefrog). *Herpetological Review*. 44: 621.

Carlson, BE, and T Langkilde. 2013. Personality traits are expressed in Bullfrog tadpoles during open-field trials. *Journal of Herpetology* 47: 378-383.

Brossman*, KH, Carlson, BE, Swierk, LN, and T Langkilde. 2013. Aquatic tail size carries over to the terrestrial phase without impairing locomotion in eastern red-spotted newts (*Notophthalmus v. viridescens*). *Canadian Journal of Zoology* 91:7-12.

Carlson, BE, and T Langkilde. 2013. A common marking technique affects tadpole behavior and predation risk. *Ethology* 119:167-177.

Carlson, BE and MP Rowe. 2009. Temperature and desiccation effects on the antipredator behavior of *Centruroides vittatus* (Scorpiones: Buthidae). *Journal of Arachnology* 37:321-330.

In review:

Carlson, BE, Newman*, J, and T Langkilde. Food or fear: the response of tadpoles to injured conspecifics depends on hunger. In revision at *Hydrobiologia*.

In preparation:

Carlson, BE, and T Langkilde. Pervasive and context-dependent community effects of intrapopulation size variation in consumers. In preparation for *Ecology Letters*.

Carlson, BE, and T Langkilde. The role of resources in microgeographic variation in Red-spotted Newt (*Notophthalmus v. viridescens*) morphology. In preparation for *Journal of Herpetology*.

Carlson, BE, and T Langkilde. Competition but not predation determines cohort size variation in natural tadpole populations. In preparation for *Oecologia*.

Carlson, BE, and T Langkilde. Personality across ontogeny in wood frogs. In preparation for *Animal Behaviour*.

Graham, SP, Carlson, BE, Thawley, CJ, Moroskie*, JM, and T Langkilde. Aspects of the natural history of the Valley and Ridge Salamander (*Plethodon hoffmanni*). In preparation for *Herpetological Conservation and Biology*.

Presentations

Oral presentations:

Carlson, BE, and T Langkilde. 2014. "Pervasive effects of size variation in tadpoles on pond communities." Society for Integrative and Comparative Biology Annual Meeting. Austin, TX.

Carlson, BE, and T Langkilde. 2013. "Ecological causes and consequences of variation in tadpole behavior." Ecological Society of America Annual Meeting. Minneapolis, MN.

Carlson, BE, and T Langkilde. 2013. "Behavioral variation among tadpole populations: ecological causes and consequences." Society for Integrative and Comparative Biology Annual Meeting. San Francisco, CA.

* Best Student Paper - Oral Presentation, Division of Animal Behavior

BE Carlson and T Langkilde. 2012. "Personality across ontogeny in an amphibian." Society for Integrative and Comparative Biology Annual Meeting. Charleston, SC.

Conference papers:

Mina, O, Gall, HE, Carlson, BE, and T Langkilde. 2014. "A preliminary assessment of endocrine disrupting compounds in vernal ponds in central Pennsylvania." 2014 ASABE and CSBE/SCGAB Annual International Meeting. Paper no. 141910944. doi: 10.13031/aim.20141910944

Poster presentations:

Carlson, BE, McGinley, S, and MP Rowe. 2013. "Morphological and behavioral sexual dimorphism in scorpions as compensation for locomotor costs of reproduction." Society for Integrative and Comparative Biology Annual Meeting. San Francisco, CA. **Poster.**

BE Carlson, K Brossman, LN Swierk, and T Langkilde. 2011. "A tail of two newts: Aquatic tail size carries over but does not impair terrestrial locomotion in eastern newts (*Notophthalmus v. viridescens*)." Ecological Society of America Annual Meeting. Austin, TX. **Poster.**

BE Carlson and T Langkilde. 2011. "Does spatial variation in prey resources influence morphological variation among subpopulations of eastern newts?" Ecological Society of America Mid-Atlantic Chapter Annual Meeting. Montclair, NJ. **Poster.**

BE Carlson and MP Rowe. 2008. "Antipredator behaviors and thermal relations in *Centruroides vittatus* (Scorpiones: Buthidae)." Sigma Xi Research Conference. Washington, D.C. **Poster.**

Grants

2013 NSF Doctoral Dissertation Improvement Grant - \$19,370

Penn State Ecology Program Travel Award - \$200

- PSU Biology Student Travel Grant - \$250
- 2012 PSU Biology Student Travel Grant - \$250
- 2011 Animal Behavior Society Student Research Award - \$981
 ASIH Gaige Award - \$500
- 2010 Sigma Xi Grant-in-Aid - \$400

Grants Awarded to Supervised Undergraduates:

- 2012 Eberly College of Science Undergraduate Research Award to Jett Peng - \$333
 Eberly College of Science Undergraduate Research Award to Danielle Rosenberg - \$333
- 2011 Eberly College of Science Undergraduate Research Award to Alex Pianovich - \$540
 Eberly College of Science Undergraduate Research Award to Dan Knapp - \$540
 Penn State Discovery Grant to Kelly Brossman - \$2500
- 2010 Eberly College of Science Undergraduate Research Award to Kelly Brossman - \$400
 Eberly College of Science Undergraduate Research Award to Matt Ridgway - \$302

Honors, Awards, and Fellowships

- 2013 Research Assistantship - Intercollege Graduate Degree Program in Ecology, The Pennsylvania State University. \$19,000.
 Best Student Paper - Oral Presentation, Division of Animal Behavior, SICB 2013 Annual Meeting. \$250
- 2012 Honorable Mention - American Society of Naturalists Student Research Award
 Huck Institutes of the Life Sciences Fellowship. The Pennsylvania State University. \$19,000
- 2010, 2011 Honorable Mention – NSF Graduate Research Fellowship
- 2009-2010 Herbert J. Bailey Endowed Graduate Fellowship. The Pennsylvania State University. \$5,000
 University Graduate Fellowship. The Pennsylvania State University. \$38,000.
 Ecology Graduate Award. The Pennsylvania State University. \$5,000.
 Funds for Excellence in Graduate Recruitment. The Pennsylvania State University. \$2,500.

- 2009 NSF Graduate Fellowship Incentive Award. The Pennsylvania State University. \$1,000.
- 2009 Paul J. Christian Award for Excellence in Scholarship. Bethel University, \$150.
- 2007-2008 Biology Scholarship. Bethel University. St. Paul, MN.
- 2005-2008 President's Scholarship. Bethel University. St. Paul, MN.

Program Service

- 2013-2014 Ecology Spring Seminar Series organizing committee (planning series, inviting speakers, managing speaker schedules)
- 2012, 2013 Curriculum Committee Representative for Ecology Graduate Student Organization

Outreach Activities

- 2013 Gave presentation on arthropod ecology and behavior to inmates at Centre County Correctional Facility
Assisted with SEECoS research experience for high school students
Judge at Penn State Undergraduate Exhibition
- 2012 Gave presentation on arthropod behavior to inmates at Centre County Correctional Facility
Children's science outreach at Discovery Space
- 2011 Children's science outreach hosted by WPSU studio
Presentation on Pennsylvania herpetofauna at Bellefonte Children's Garden Club
Judge at Pennsylvania Junior Academy of Sciences
Sharing research with visiting high school science students
Video-chatting with middle school science students in St. Louis, MO

Peer-reviewer

Nature Education (1), *Herpetologica* (2), *The Herpetological Journal* (1), *Journal of the Arkansas Academy of Science* (1)

Professional Memberships

American Society of Ichthyologists and Herpetologists

Ecological Society of America

Society for Integrative and Comparative Biology

Tri-Beta Biological Society

References

Dr. Tracy Langkilde

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The Pennsylvania State University

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Dr. Matthew P. Rowe

Undergraduate Mentor and Current Collaborator

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