

## EVIN CARTER

Postdoctoral Scholar  
Department of Ecology & Evolutionary Biology  
University of Tennessee  
Knoxville, Tennessee 37996

### EDUCATION

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- 2012–2018** **Ph.D., Ecology and Evolutionary Biology**, *Life History and Contemporary Evolution: Implications for managing a salamander hybrid invasion*. Advisor: Benjamin M Fitzpatrick
- 2010–2012** **M.S., Biology**, Purdue University Fort Wayne, *Impacts of Invasive plants on Resource Selection and Thermoregulation by the Copperhead*. Advisor: Bruce A Kingsbury
- 2006–2009** **B.S., Biology** (and A.A., Chemistry) with High Distinction, Indiana University Southeast

### PROFESSIONAL EXPERIENCE

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- 2018–present** **POSTDOCTORAL SCHOLAR**, Ecology and Evolutionary Biology, University of Tennessee
- Focal project: Snake fungal disease management and life history interactions between *Ophidiomyces* and *Sistrurus catenatus* (massasauga rattlesnakes) at the landscape level
- 2018\*–present** **RESEARCH ASSOCIATE**, Environmental Resources Center, Purdue University Fort Wayne
- Mentor M.S. students, research design, analysis, manuscript prep (\*unofficial 2012-2018)
- 2014** **WILDLIFE CONTRACTOR**, Environmental Services, Inc. / US Army. Faunal surveys
- 2010–2012** **RESEARCH TECH**, Center for Reptile and Amphibian Conservation and Management, Purdue University Fort Wayne (PFW) (endangered species conservation and outreach)
- 2007–2009** **BIOLOGICAL SCIENCE AID**, USFWS, Muscatatuck National Wildlife Refuge, Indiana
- assisted with development of national invasive plant mapping protocols
  - coordinated >50 individuals during mark-recapture and telemetry of endangered wildlife
- 2007** **BIOLOGICAL INTERN**, USFWS, Muscatatuck National Wildlife Refuge, Indiana
- wetland and wildlife management, endangered species surveys
  - assisted in developing protocols for passive monitoring and mark-recapture of a federally-listed distinct population segment of *Nerodia erythrogaster*

### SELECTED FUNDING AND AWARDS (~\$200,000 in external funding)

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- 2018** **\$117,925**, U.S. National Guard Bureau. Spatiotemporal environmental associations between imperiled massasaugas (*Sistrurus catenatus*) and *Ophidiomyces ophiodiicola* using a novel environmental DNA approach: Implications for snake fungal disease management.
- 2016** **\$18,493**, National Science Foundation (NSF DDIG). Does transgressive segregation in physiological niche explain the rapid spread of invasive genes into a native population?
- 2015** **Outstanding Graduate Researcher**. The University of Tennessee Knoxville.
- 2013–2015** **\$15,000** (\$7,500 + \$7,500 increment), Chancellor's Research Fund. University of Tennessee
- 2014** **Chuck Haugen Conservation Award**, City of Marina, California. (\$350)
- 2012** **\$5,000**, University of Tennessee Knoxville EEB Graduate Recruitment Research Fund. To study conservation genomics of California tiger salamanders.
- 2010–2011** **\$12,740**, ORES Research Fellowship, Purdue University. Impacts of nonnative invasive plants on resource selection and thermoregulation (*Agkistrodon contortrix*).
- 2009** **\$2,000**, Indiana Academy of Science Senior Research Grant. Impacts of invasive plants on copperhead (*Agkistrodon contortrix*) habitat use in southern Indiana forests.

**PEER-REVIEWED ARTICLES** (underline = co-lead author, \* undergraduate mentee, \*\* M.S. mentee)***Pending, Submitted, or In Review***

17. **Carter, ET**, BC Eads, & BM Fitzpatrick. Environmental fluctuations reduce success of a hybrid invader despite a highly plastic life history. Target journal: *BMC Biology*.
16. **Carter, ET**, EA Riddell, HB Shaffer, MW Sears & BM Fitzpatrick. Bounded hybrid superiority may limit the scope of a hybrid invasion via bioenergetic tradeoffs. Target journal: *Ecological Monographs*.
15. **Carter, ET** & BM Fitzpatrick. Life history strategy and evolutionary dynamics in finite populations. Target journal: *Conservation Genetics*.

**2018**

14. Wessels, JL\*, **ET Carter**, C Hively, LE Hayter, & BM Fitzpatrick. Population viability of nonnative Mediterranean house geckos (*Hemidactylus turcicus*) at an urban site near the northern invasion front. *Journal of Herpetology* 52(2): 215-222.
13. Gladstone, NS\*, **ET Carter**, ML McKinney, & ML Niemiller. Status and conservation of the cave-obligate snails in the Appalachians and Interior Low Plateau of the Eastern United States. *American Malacological Bulletin* 36(1): 62-78.

**2017**

12. Tetzlaff, SJ\*\*, **ET Carter**, MJ Ravesi, BA DeGregorio, & BA Kingsbury. To forage, mate, or thermoregulate: Influence of resource manipulation on male rattlesnake behavior. *Ecology and Evolution* 7(16): 6606-6613.
11. Pierson, TW, SJ Arnold, MK Hamed, W Lattea, & **ET Carter**. Courtship behavior of the Yonahlossee Salamander (*Plethodon yonahlossee*): Observations in the field and laboratory. *Herpetological Conservation & Biology* 12(1): 1-15.
10. Tetzlaff, SJ, MJ Ravesi, MC Allender, **ET Carter**, BA DeGregorio, JM Josimovich & BA Kingsbury. Snake fungal disease affects behavior of free-ranging massasauga rattlesnakes (*Sistrurus catenatus*). *Herpetological Conservation & Biology* 12(3): 624-634.
9. Niemiller, ML, KS Zigler, KA Ober, **ET Carter**, AS Engel, G Moni, & CDR Stephen. Rediscovery and conservation status of six short-range endemic *Pseudanophthalmus* cave beetles (Carabidae: Trechini). *Insect Conservation and Diversity* 10(6): 495-501.

**2016**

8. **Carter, ET**, MJ Ravesi, BC Eads, & BA Kingsbury. Invasive plant management creates ecological traps for snakes. *Biological Invasions* 19(1): 443-453.
7. Attum, O, J Lowry, BA Kingsbury, & **ET Carter**. The distribution of amur honeysuckle and box turtle habitat use in an urban forest. *Urban Naturalist* 12: 1-16.
6. Niemiller, ML, K Zigler, C Stephen, **ET Carter**, A Paterson, SL Taylor, & AS Engel. Vertebrate fauna in caves of eastern Tennessee within the Appalachians karst region. *Journal of Cave and Karst Studies* 78: 1-24.

**2015**

5. **Carter, ET**, BC Eads, & BA Kingsbury. Exotic invasive plants alter thermal regimes: Implications for management using a case study of a native ectotherm. *Functional Ecology* 29(5): 683-693.
4. Jordan, MA, N Perrine-Ripplinger, & **ET Carter**. An independent observation of facultative parthenogenesis in the copperhead (*Agkistrodon contortrix*). *Journal of Herpetology* 49:118-121.
3. Fitzpatrick, BM, JR Johnson, ME Ryan, J Corush, & **ET Carter**. Hybridization and the species problem in conservation. *Current Zoology* 61(1): 206-215.

**2014**

2. Owen, Dustin\*, **ET Carter**, ML Holding, IT Moore, & K Islam. Roads are associated with a blunted stress response in a North American pit-viper. *General and Comparative Endocrinology* 202:87-92.
1. **Carter, ET**, O Attum, BC Eads, AS Hoffman, & BA Kingsbury. Reducing the potential for human-snake encounters in a recreational park. *Human-Wildlife Interactions* 8(2): 158-167. (cover article)

## BOOKS, CHAPTERS, AND PROCEEDINGS

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- contracted** Kingsbury, BA & **ET Carter**. *A Field Guide to the Reptiles and Amphibians of Indiana*. Indiana University Press, Bloomington, Indiana.
- in press** Niemiller ML, **ET Carter**, DB Fenolio, AG Gluesenkamp, & JG Phillips. (in press). Drivers of subterranean colonization and diversification in cave-dwelling salamanders. In: *Cave Life - Drivers of Diversity and Diversification*, Wynne JJ (ed.). NOVA Science Publishers.
- 2017** Engel AS, Niemiller ML, Zigler KS, Stephen CDR, **Carter ET**, Paterson AT, Keenan SW, & Taylor SJ. Invertebrate and vertebrate cave fauna records for the Appalachian Valley and Ridge. *Proceedings of the 17th International Conference of Speleology* 17: 82–86.

## SHORT COMMUNICATIONS

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- pending** **Carter, ET**, MJ Ravesi, SJ Tetzlaff, BA DeGregorio, JM Josimovich, MC Allender, & BA Kingsbury. Anomalous late-season surface activity is correlated with snake fungal disease infection status in a Michigan population of massasauga rattlesnakes (*Sistrurus catenatus*). Target journal: *Journal of Wildlife Diseases*.
- 2018** Gladstone, NS, **ET Carter**, KD Kendall-Niemiller, LE Hayter, & ML Niemiller. A new maximum body size record for the Berry Cave Salamander (*Gyrinophilus gulolineatus*) and genus *Gyrinophilus* (Caudata: Plethodontidae) with a comment on body size in plethodontid salamanders. *Subterranean Biology*.

## RECENT PEER-REVIEWED NOTES

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- in press** Nelson, S, **ET Carter**, & LE Hayter (*in press*) Nesting behavior of *Necturus maculosus* (Common Mudpuppy) in Tennessee. *Tennessee Journal of Herpetology*.
- 2018** Pierson, TW, **ET Carter**, & A Funk. *Gyrinophilus porphyriticus* (Spring Salamander). Courtship. *Tennessee Journal of Herpetology* 2018(1): 24.
- 2017** **Carter, ET**, TW Pierson & LE Hayter. Geographic Distribution: *Plestiodon anthracinus* (Coal Skink). *Herpetological Review* 47(2): 259.
- 2017** Pierson, TW, W Lattea, **ET Carter**, & LE Hayter. *Plethodon yonahlossee* (Yonahlossee Salamander) Arboreal behavior. *Herpetological Review* 48(3): 601.
- 2016** Lattea, W, TW Pierson, & **ET Carter**. *Desmognathus organi* (Northern Pygmy Salamander) nest. *Herpetological Review* 47(1): 100-101.

## SELECTED TECHNICAL/GOVERNMENT REPORTS

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- 2018** Niemiller, ML, **ET Carter**, LE Hayter, & NS Gladstone. New surveys and reassessment of the conservation status of the berry cave salamander (*Gyrinophilus gulolineatus*). Technical report provided to the U.S. Fish and Wildlife Service. 58p.
- 2015** Niemiller, ML & **ET Carter**. The Subterranean Fauna of Stamps Cave (TCS No. PU55), Putnam County, Tennessee, USA. Technical report provided to the Tennessee Wildlife Resources Agency and Tennessee Parks and Greenways Foundation. 9p.
- 2013** **Carter, ET** & BA Kingsbury. Copperhead (*Agkistrodon contortrix*) habitat use and invasive plant management impacts in southern Indiana forests. Technical report provided to the Indiana Department of Natural Resources. 87p.
- 2012** **Carter, ET** & BA Kingsbury. Recommended management guidelines for copperheads in Indiana State Parks. Management guidelines provided to the IN Department of Natural Resources. 5p.

## REPRESENTATIVE PRESENTATIONS

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- 2017** **Carter, ET**, E Riddell, HB Shaffer, MW Sears, & BM Fitzpatrick. Bounded hybrid superiority may limit the scope of a hybrid invasion. Joint Meeting of Ichthyologists and Herpetologists, Austin, TX, 12–16 July.
- 2017** Corush, J, **ET Carter**, & BM Fitzpatrick. Effects of diadromous life histories on genetic diversity and population structure in fishes. Joint Meeting of Ichthyologists and Herpetologists, Austin, TX, 12–16 July.
- 2017** Gladstone, NS\*, AG Slater, **ET Carter**, ML McKinney, DA Freshour, & ML Niemiller. Malacology underground: a review of gastropod diversity in caves of North America and their ecological significance. 83<sup>rd</sup> American Malacological Society Meeting, Newark, DE, 16–21 July [poster].
- 2016** Ravesi, MJ\*\*, **ET Carter**, SJ Tetzlaff, BA DeGregorio, & BA Kingsbury. Response of massasaugas (*Sistrurus catenatus*) to habitat alteration from timber harvest and fire near their northern range limit. Midwest Fish and Wildlife Conference, Grand Rapids, MI, 24–27 January.
- 2016** Gladstone, NS\*, **Carter ET**, McKinney M, & Niemiller ML. Troglolobiotic snails of the Interior Low Plateau and Appalachian karst regions. 23<sup>rd</sup> International Conference on Subterranean Biology, Fayetteville, Arkansas, USA, 13–17 June [poster].
- 2015** Tetzlaff, SJ\*\*, **ET Carter**, MJ Ravesi, BA DeGregorio, & BA Kingsbury. Influence of supplemental feeding on spatial ecology and habitat use of male massasaugas (*Sistrurus catenatus*). Society for the Study of Amphibians and Reptiles, Lawrence, KS, 30 July–3 Aug.
- 2014** **Carter, ET**, BC Eads, M Farmer, & BA Kingsbury. Modelling road avoidance by wetland snakes using a modified random walk: The case of the copperbelly. Joint Meeting of Ichthyologists and Herpetologists, Chattanooga, TN, 30 July–3 Aug.
- 2014** **Carter, ET** & BM Fitzpatrick. Reproductive strategy and the efficiency of selection in small populations. Evolution, Raleigh, NC. 20–24 June.
- 2012** **Carter, ET** (invited) Copperhead habitat use in Southern Indiana forests: Implications and management strategies. Workshop for Fire and Forest Management Impacts on Timber Rattlesnakes and Their Surrogates, Ohio State University, Columbus, OH. 8 March.
- 2011** **Carter, ET** (invited) Status of copperhead populations on southern Indiana management lands. Indiana DNR State Wildlife Management Meeting, Charlestown, IN.

## TEACHING EXPERIENCE

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- 2012–2018** **GRADUATE TEACHING ASSISTANT**, Department of Ecology and Evolutionary Biology, University of Tennessee, Knoxville, TN
- Herpetology (lab)
  - Comparative Vertebrate Biology (lab)
  - Human Anatomy (lab)
  - Introductory Biology (Instructor)
- 2016** **LEAD INSTRUCTOR**, Field-based Ecology, Division of Biology, University of Tennessee, Knoxville, TN
- Taught two sections and coordinated four TAs and eight lab sections
  - Developed field and classroom curriculum, including R-based statistics modules
- 2011–2012** **GRADUATE TEACHING ASSISTANT**, Department of Biology, Purdue University Fort Wayne, Fort Wayne, IN
- Intermediate Ecology
  - Anatomy and Physiology

## STUDENT RESEARCH MENTORING

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- 2012–present**      **RESEARCH MENTOR** to master’s students
- Sasha J. Tetzlaff (Purdue Fort Wayne), now a PhD student at University of Illinois
  - Michael J. Ravesi (Purdue Fort Wayne), now an ecologist for MI DMVA
- 2010–present**      **RESEARCH MENTOR** to undergraduates
- five student-led or co-led publications
  - All students are now PhD or MS students:  
     E.g., Nicholas Gladstone (MS student at University of Tennessee), Jacob Wessels (MS student at Arkansas State), Jonathan Cox (MS student at University of Tennessee), Dustin Owen (PhD student at Penn State).

## SELECTED VOLUNTEER SERVICE AND OUTREACH

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- 2017-2018**      **GUEST INSTRUCTOR**, Tate’s Academy, Knoxville, TN (grade 6-8), Organismal Biology / Field Biology
- 2014–present**      **TRIP CO-LEADER**, ‘Salamanders of the Smokys,’ Great Smoky Mountains Annual Spring Wildflower Pilgrimage, Gatlinburg, TN
- 2014–2016**      **LEAD INSTRUCTOR**, ‘Kids U: Snakes Alive!’ Herpetology summer camp for children, grades 4-7
- 2015**              **TRIP CO-LEADER**, ‘Salamander Evolution in the Smokys,’ Educational hike for Darwin Day Tennessee
- 2015**              **TEAM LEADER**, Invasive plant mapping in Knoxville’s Urban Wilderness
- 2013**              **TRIP CO-LEADER**, 15th Annual Discover Life in America Conference, Great Smoky Mountains, Educational hikes covering elevational changes in salamander communities.
- 2008–2011**      **HERPETOLOGICAL SPEAKER AND INTERPRETER**, (periodic), Clifty Falls State Park, IN

## SELECTED PROFESSIONAL SERVICE

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- 2018**              **REPORT REVIEWER**, Berry Cave Salamander Species Status Assessment, U.S. Endangered Species Act
- 2018**              **TECHNICAL SESSION CO-ORGANIZER**, Linkages Among Subterranean Ecosystems and Geological Events in the Eastern United States, 67<sup>th</sup> Geological Society of America Meeting, Southeastern Section, Knoxville, TN
- 2012–2018**      **MANUSCRIPT REVIEWER**, e.g., *Biological Invasions*, *Biological Journal of the Linnean Society*, *Herpetological Conservation & Biology*, *Human-Wildlife Interactions*
- 2016**              **GRANT REVIEWER**, ‘Research and Development’ Proposals, KY Science and Engineering Foundation
- 2012–2013**      **CONSULTANT and REPORT REVIEWER**, Habitat management guidelines for the U.S. Fish and Wildlife Service (Muscatatuck National Wildlife Refuge, Seymour Indiana)
- 2010–2012**      **CONSULTANT** (and participant), Glade restoration and invasive plant control, multiple state parks and nature preserves in southern Indiana and Kentucky

## PROFESSIONAL MEMBERSHIPS

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- American Society of Ichthyologists & Herpetologists
- National Speleological Society
- Society for Conservation Biology
- Society for the Study of Amphibians & Reptiles
- Society for the Study of Evolution
- The Wildlife Society