

Tracy Langkilde

Professor and Head
Department of Biology
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Education and training

- 2002 - 2005 **Ph.D.** School of Biological Sciences, University of Sydney, Australia.
Supervisor: Prof. Richard Shine.
- 1995 - 1999 **B.Sc.** (1st Class Honors), School of Tropical Biology, James Cook University, Australia. Prof. Lin Schwarzkopf and Ross Alford.

Employment History

- 2016 - present **Head.** Department of Biology, The Pennsylvania State University.
- 2016 - present **Professor.** Department of Biology, The Pennsylvania State University.
- 2012 - 2016 **Associate Professor.** Department of Biology, The Pennsylvania State University.
- 2014 **Tombros Fellow for Undergraduate Research,** Eberly College of Science. The Pennsylvania State University.
- 2007 - 2012 **Assistant Professor.** Department of Biology, The Pennsylvania State University.
- 2005 - 2007 **Gaylord Donnelley Environmental Postdoctoral Fellow.** Forestry and Environmental Studies, Yale University.

Honors and Awards

- 2016 **Campbell Biology Textbook** featured researcher.
- 2011 **George Mercer Award** for an outstanding ecological research paper published by a young researcher. Ecological Society of America.
Edward D. Bellis Award in Ecology for outstanding contribution and dedication to educating and training graduate students in the Intercollegiate Graduate Degree Program in Ecology. Penn State University.
- 2006 **Jabez King Memorial Prize** for the most meritorious Ph.D. thesis. School of Biological Sciences, University of Sydney.
- 2005 **New South Wales Young Tall Poppy Science Award** for scientific and intellectual excellence in science. Australian Institute of Political Sciences.
Postgraduate Excellence Prize in Biological Sciences, University of Sydney.
Peter Rawlinson Prize for Postgraduate Research. Joint Meeting of the Australian, New Zealand and Fijian Societies of Herpetologists.

Peer-Reviewed Publications †undergraduate or §graduate student author

- 97) Blackburn D.G., Lestz L., Barnes M.S., Powers K.G. and **Langkilde T.** 2018. Morphological features of the yolk processing pattern in the Eastern Fence Lizard, *Sceloporus undulatus* (Phrynosomatidae). *Journal of Morphology* In Press
DOI:10.1002/jmor.20892
- 96) Ensminger D., **Langkilde T.**, Owen D. MacLeod K. and Sheriff M. 2018. Maternal stress alters the phenotype of the mother, her eggs, and her offspring in a wild caught lizard. **Journal of Animal Ecology** Early View doi.org/10.1111/1365-2656.12891
- 95) MacLeod K.J., Sheriff M.J., Ensminger D.C.⁴, Owen D.A.S. and **Langkilde T.** 2018. Survival and reproductive costs of repeated acute glucocorticoid elevations in a captive, wild animal. **General and Comparative Endocrinology** 268: 1-6
- 94) Trevelline B.K., MacLeod K.J., Knutie S.A., **Langkilde T.** and Kohl K.D. 2018. *In ovo* microbial communities: a potential mechanism for the initial acquisition of gut microbiota among oviparous birds and lizards. **Biology Letters** 14: 20180225
- 93) Assis B.A., Swierk L. and **Langkilde T.** 2018. Performance, behavior, and offspring morphology may offset reproductive costs of male-typical ornamentation for female lizards. **Journal of Zoology** Early View doi:10.1111/jzo.12599
- 92) Owen, D.A.S., Sheriff, M.J., Engler, H.I. and **Langkilde, T.** 2018. Sex-dependent effects of maternal stress: stressed moms invest less in sons than daughters. **Journal of Experimental Zoology-A** Early View doi:10.1002/jez.2192
- 91) Anton A.J., **Langkilde T.**, Graham S. and Fawcett J.D. 2018. Effects of chronic corticosterone increases on the maternal behaviour of the Prairie Skink, *Plestiodon septentrionalis*. **Herpetological Journal** 28: 123-126.
- 90) Swierk L. and **Langkilde T.** 2018. Does repeated human handling of study animals during the mating season affect their offspring? **Journal of Experimental Zoology-A** 329: 80-86.
- 89) Mina O., Gall H.E., Elliott H.A., Watson J.E., Mashtare M.L., **Langkilde T.**, Harper J.P. and Boyer E.W. 2018. Estrogen occurrence and persistence in vernal pools impacted by wastewater irrigation practices. *Agriculture, Ecosystems and Environment* 257: 103-112.
- 88) Owen D.A.S., Robbins T.R. and **Langkilde T.** 2018. Trans-generational but not early-life exposure to stressors influences offspring morphology and survival. **Oecologia** 186: 347-355
- 87) Tylan C. and **Langkilde T.** 2017. Local and systemic immune responses to different types of phytohemagglutinin in the green anole: Lessons for field ecoimmunologists. **Journal of Experimental Zoology A** 327: 322-332
- 86) Carlson B.E. and **Langkilde T.** 2017. Body size variation in aquatic consumers causes pervasive community effects, independent of mean body size. **Ecology and Evolution** 7: 9978-9990
- 85) **Langkilde T.**, Thawley C.J. and Robbins T. 2017. Behavioral Adaptations to Invasive Species: Benefits, Costs, and Mechanisms of Change. In M. Naguib, J. Podos, L. W. Simmons, L. Barrett, S. Healy, & M. Zuk (Eds.), **Advances in the Study of Behavior** (pp. 199-235)

- 84) Kelehear C. Graham S.P. and **Langkilde T.** 2017. Defensive strategies of Puerto Rican Dwarf Geckos (*Sphaerodactylus macrolepis*) against Invasive Fire Ants. **Herpetologica** 73: 48-54
- 83) McCormick G.L., Robbins T.R., Cavigelli S.A. and **Langkilde T.** 2017 Ancestry trumps experience: Transgenerational but not early life stress affects the adult physiological stress response. **Hormones and Behavior** 87: 115-121
- 82) †Herr M.W., Graham S.P. and **Langkilde T.** 2017. Stressed snakes strike first: Hormone levels and defensive behavior in free ranging Cottonmouths (*Agkistrodon piscivorus*). **General and Comparative Endocrinology** 243: 89-95
- 81) Thawley, C.J. and **Langkilde T.** 2017. Attracting unwanted attention: generalization of behavioural adaptation to an invasive predator carries costs. **Animal Behaviour** 123: 285-291
- 80) Graham S.P., Freidenfelds N.A., §Thawley C.J., Robbins T.R. and **Langkilde T.** 2017. Are invasive species stressful? The glucocorticoid profile of native lizards exposed to invasive fire ants depends on the context. **Physiological and Biochemical Zoology** 90: 328-337
- 79) Tennessen, J.B., Parks, S.E., **Langkilde, T.** 2016. Anthropogenic noise and physiological stress in wildlife. In: **The Effects of Noise on Aquatic Life II, Advances in Experimental Medicine and Biology**, Popper, A.N., Hawkins, A. eds., Springer, 1145-1148.
- 78) Schrey A.W., Robbins T.R., †Lee J., †Dukes D. W. Jr., †Ragsdale A.K., §Thawley C. and **Langkilde T.** 2016. Epigenetic response to environmental change: DNA methylation varies with invasion status. **Environmental Epigenetics** 2016 2: dvw008
- 77) §Tennessen J.B., Parks S.E., Tennessen T.P. and **Langkilde T.** 2016. Raising a racket: invasive species compete acoustically with native treefrogs. **Animal Behaviour** 114: 53-61.
- 76) †Herr M., Robbins T.R., †Centi A., §Thawley C.J. and **Langkilde T.** 2016. Irresistible ants: Exposure to novel toxic prey increases consumption over multiple temporal scales. **Oecologia** 181: 749-756.
- ** Cover article
- 75) §Carlson B.E. and **Langkilde T.** 2016. The role of prey in microgeographic variation in Red-spotted Newt (*Notophthalmus v. viridescens*) head width. **Journal of Herpetology** 50: 442-448.
- 74) §Thawley C.J. and **Langkilde T.** 2016. Invasive fire ant (*Solenopsis invicta*) predation of eastern fence lizard (*Sceloporus undulatus*) eggs. **Journal of Herpetology** 50: 284-288.
- 73) §McCormick G.L., Shea K. and **Langkilde T.** 2015. How do duration, frequency, and intensity of exogenous CORT elevation affect immune outcomes of stress? **General and Comparative Endocrinology** 222:81-87.
- 72) §Swierk L.S., §Tennessen J.B. and **Langkilde T.** 2015. Sperm depletion may not limit male reproduction in a capital breeder. **Biological Journal of the Linnean Society** 116: 684-690.
- 71) Graham S.P., Steen D.A., Bailey M.A., Godwin J.C., Stiles J., Stiles S., Langkilde T. and Guyer C. 2015. The amphibians and reptiles of Conecuh National Forest, Escambia and Covington Counties, Alabama. **Alabama Museum of Natural History Bulletin** 32: 1-112.

**** Cover article**

- 70) §Carlson B.E., †Newman J.C. and **Langkilde T.** 2015. Food or fear: hunger modifies responses to alarm cues in tadpoles. **Hydrobiologia** 743: 299-308.
- 69) §Swierk L.N., Graham S.P. and **Langkilde T.** 2014. The stress of scramble: Sex differences in behavior and physiological stress response in a time-constrained mating system. **Behavioral Ecology and Sociobiology** 68: 1761-1768.
- 68) §Tennesen J.B., Parks S.E. and **Langkilde T.** 2014. Traffic noise causes physiological stress and impairs breeding migration behavior in frogs. **Conservation Physiology** 2: cou032 doi:10.1093/conphys/cou032.

****Editors Choice**

- 67) †Newman J.C., §Thawley C.J. and **Langkilde T.** 2014. Red imported fire ant predation on eggs of the eastern fence lizard. **Herpetology Notes** 7: 415-418.
- 66) §Carlson B.E. and **Langkilde T.** 2014. Predation risk in tadpole populations shapes behavioural responses of prey but not strength of trait-mediated indirect interactions. **Oikos** 123: 1519-1527.

**** Featured in Oikos Blog**

- 65) §McCormick G.L. and **Langkilde T.** 2014. Immune responses of Eastern fence lizards (*Sceloporus undulatus*) to repeated acute elevation of corticosterone. **General and Comparative Endocrinology** 204: 135-140.
- 64) Zuk M., Bastiaans E., **Langkilde T.** and §Swanger E. 2014. The role of behavior in the establishment of novel traits. **Animal Behavior** 92: 333-344.
- 63) †Brossman K.H., §Carlson B.E., Stokes A.N. and **Langkilde T.** 2014. Eastern newt (*Notophthalmus viridescens*) larvae alter morphological but not chemical defenses in response to predator cues. **Canadian Journal of Zoology** 92: 279-283.
- 62) §Carlson B.E. and **Langkilde T.** 2014. No evidence of selection by predators on tadpole boldness. **Behavior** 151: 23-45.
- 61) Du W., Warner D.A., Langkilde T., Robbins T.R., and Shine R. 2014. Latitudinal and seasonal variation in reproductive effort of the eastern fence lizard (*Sceloporus undulatus*). **Integrative Zoology** 9: 360-371.
- 60) §Swierk L.N. and **Langkilde, T.** 2013. Bearded ladies: Females suffer fitness consequences when bearing male traits. **Biology Letters** 9: 20130644.
**** Featured in National Geographic, LA Times, Christian Science Monitor, LiveScience, National Science Foundation**
- 59) §Swierk L.N. and **Langkilde, T.** 2013. Sizing-up the competition: Factors modulating male display behavior during mate competition. **Ethology** 119: 1-12.
- 58) §Rosier, R.L. and **Langkilde T.** 2013. Early activity rates do not predict growth and future body size of juvenile eastern fence lizards, *Sceloporus undulatus*. **Ethology** 119: 624-633.
- 57) §Swierk L.N., †Myers A. and **Langkilde, T.** 2013. Male mate preference is influenced by both female behaviour and morphology. **Animal Behaviour** 85: 1451-1457.
- 56) †Brossman K.H., §Carlson B.E., §Swierk, L.N. and **Langkilde T.** 2013. Aquatic tail size carries over to the terrestrial phase without impairing locomotion in adult eastern red-spotted newts (*Notophthalmus v. viridescens*). **Canadian Journal of Zoology** 91: 7-12.
- 55) §Carlson B.E. and **Langkilde T.** 2013. A common marking technique affects tadpole behavior and risk of predation. **Ethology** 119: 167-177.

- 54) Robbins, T.R., Freidenfelds, N. and **Langkilde T.** 2013. Native predator eats invasive toxic prey: evidence for increased incidence of consumption rather than aversion-learning. **Biological Invasions** 15: 407-415.
- 53) §Carlson B and **Langkilde T.** 2013. Personality traits are expressed in Bullfrog tadpoles during open-field trials. **Journal of Herpetology** 47: 378-383.
- 52) Robbins, T.R. and **Langkilde T.** 2012. The consequences of lifetime and evolutionary exposure to toxic prey: changes in avoidance behavior through ontogeny. **Journal of Evolutionary Biology** 25: 1937-1946.
 ** Cover article
 ** Editor's Choice
- 51) §Swierk L.N., †Ridgway M. and **Langkilde T.** 2012. Female lizards discriminate between potential reproductive partners using multiple male traits when territory cues are absent. **Behavioral Ecology and Sociobiology** 66: 1033-1043.
- 50) **Langkilde T.** and †Boronow K.E. 2012. Hot boys are blue: temperature-dependent color change in male Eastern Fence lizards. **Journal of Herpetology** 46: 461-465.
- 49) Du W., Warner D.A., **Langkilde T.**, Robbins T.R. and Shine R. 2012. The roles of pre-hatching and post-hatching growth rates in generating a latitudinal cline of body size in the eastern fence lizard (*Sceloporus undulatus*). **Biological Journal of the Linnean Society** 106: 202-209.
- 48) Freidenfelds N.A., Robbins T.R. and **Langkilde T.** 2012. Evading invaders: the effectiveness of a behavioral response acquired through lifetime exposure. **Behavioral Ecology** 23: 659-664.
- 47) Shine R., **Langkilde T.** and Mason R.T. 2012. Facultative pheromonal mimicry in snakes: "she-males" attract courtship only when it is useful. **Behavioral Ecology and Sociobiology** 66: 691-695.
- 46) §Rosier R.L. and **Langkilde T.** 2012. Absence of climbing-induced limb length plasticity in the eastern fence lizard, *Sceloporus undulatus*. **Journal of Herpetology** 46: 162-165.
- 45) Graham S.P., Freidenfelds N.A., §McCormick G.L. and **Langkilde T.** 2012. The impacts of invaders: Basal and acute stress glucocorticoid profiles and immune function in native lizards threatened by invasive ants. **General and Comparative Endocrinology** 176: 400-408.
- 44) §Rosier R.L. and **Langkilde T.** 2012. Behavior under risk: how animals avoid becoming dinner. **Nature Education Knowledge** 2:8.
- 43) §Rosier R.L. and **Langkilde T.** 2012. In response to the letter to the editor regarding the article: "Does environmental enrichment really matter? A case study using the eastern fence lizard, *Sceloporus undulatus*." **Applied Animal Behaviour Science** 135: 171-172.
- 42) †Trompeter, W.P. and **Langkilde T.** 2011. Invader danger: lizards faced with novel predators exhibit an altered behavioral response to stress. **Hormones and Behavior** 60: 152-158.
 ** Cover article
- 41) §Rosier, R.L. and **Langkilde, T.** 2011 Does environmental enrichment really matter? A case study using the eastern fence lizard, *Sceloporus undulatus*. **Applied Animal Behaviour Science** 131: 71-76.

- 40) **Langkilde T.** and Freidenfelds N.A. 2010. Consequences of envenomation: Red imported fire ants have delayed effects on survival but not growth of native fence lizards. **Wildlife Research** 37: 566-573.
- 39) Du W., Warner D.A., **Langkilde T.**, Robbins T. and Shine R. 2010. The physiological basis of geographic variation in rates of embryonic development within a widespread lizard species. **American Naturalist** 176: 522-528.
** *Featured in the New York Times*
- 38) **Langkilde T.** and †Boronow K.E. 2010. Color as a signal: the relationship between coloration and morphology in male eastern fence lizards, *Sceloporus undulatus*. **Journal of Herpetology** 44: 261-271.
- 37) **Langkilde T.** 2010. Repeated exposure and handling effects on the escape response of fence lizards to encounters with invasive fire ants. **Animal Behaviour** 79: 291-298.
- 36) †Boronow K.E. and **Langkilde T.** 2010. Sublethal effects of invasive fire ant venom on a native lizard. **Journal of Experimental Zoology Part A** 313A: 17-23.
** *Cover article*
** *Feature Article*
- 35) Freidenfelds N.A. and **Langkilde T.** 2009. Natural history notes: *Sceloporus undulatus* (Eastern fence lizard). Diet. **Herpetological Review** 40: 439.
- 34) §Swierk L.N. and **Langkilde T.** 2009. Micronutrient input into a mangrove ecosystem in Jobos Bay, Puerto Rico, by the exotic green iguana, *Iguana iguana*. **Current Zoology** 55: 50-53.
- 33) Lance S.L., Hagen C., Glenn T.C., Freidenfelds N.A. and **Langkilde T.** 2009. Development and characterization of seventeen polymorphic microsatellite loci in the eastern fence lizard, *Sceloporus undulatus*. **Conservation Genetics Resources**. 1: 233-236.
- 32) **Langkilde T.** 2009. Holding ground in the face of invasion: native fence lizards (*Sceloporus undulatus*) do not alter their habitat use in response to introduced fire ants (*Solenopsis invicta*). **Canadian Journal of Zoology** 87: 626-634.
- 31) **Langkilde T.** 2009. Invasive fire ants alter behavior and morphology of native lizards. **Ecology** 90: 208-217.
** *Cover article in Ecological Bulletin*
** *Featured in Science, on Discovery News, MSNBC National Geographic, and CBC Radio.*
** *Received George Mercer Award from the Ecological Society of America*
- 30) Uller T., While G.M., Wapstra E., Warner D.A., Goodman B.A., Schwarzkopf L., **Langkilde T.**, Doughty P., Radder R.S., Rohr D.H., Bull C.M., Shine R. and Olsson M. 2009. Evaluation of offspring size-number invariants in twelve species of lizard. **Journal of Evolutionary Biology** 22: 143-151.
- 29) **Langkilde T.**, O'Connor D. and Shine R. 2007. The benefits of parental care: do juvenile lizards obtain better-quality habitat by remaining with their parents? **Austral Ecology** 32: 950-954.
** *Cover article*
- 28) **Langkilde T.** and Shine R. 2007. Interspecific conflict in lizards: social dominance depends upon an individual's species not its body size. **Austral Ecology** 32: 869-877.
** *Cover article*

- 27) Shine R., **Langkilde T.**, Wall M. and Mason R.T. 2006. Temporal dynamics of emergence and dispersal of garter snakes from a communal den in Manitoba. **Wildlife Research** 33: 103-111.
** Cover article
- 26) Allsop D.J., Warner D., **Langkilde T.**, Du W. and Shine R. 2006. Do operational sex ratios influence sex allocation in viviparous lizards with temperature-dependent sex determination? **Journal of Evolutionary Biology** 19: 1175-1182.
- 25) **Langkilde T.** and Shine R. 2006. How much stress do researchers inflict on their study animals? A case study using a scincid lizard, *Eulamprus heatwolei*. **Journal of Experimental Biology** 209: 1035-1043.
- 24) **Langkilde T.** and Shine R. 2005. Different optimal offspring sizes for sons and daughters may favor the evolution of temperature-dependent sex determination in viviparous lizards. **Evolution** 59: 2275-2280.
- 23) **Langkilde T.**, Alford R.A. and Schwartzkopf L. 2005. No behavioural compensation for fitness costs of autotomy in a lizard. **Austral Ecology** 30: 713-718.
- 22) Shine R., Wall M., **Langkilde T.** and Mason R.T. 2005. Do female garter snakes evade males to avoid harassment or to enhance mate quality? **American Naturalist** 165: 660-668.
- 21) Shine R., Wall M., **Langkilde T.** and Mason R.T. 2005. Battle of the sexes: forcibly-inseminating male garter snakes target courtship to more vulnerable females. **Animal Behaviour** 70: 1133-1140.
- 20) Shine R., Wall M., **Langkilde T.** and Mason R.T. 2005. Scaling the heights: thermally-driven arboreality in garter snakes. **Journal of Thermal Biology** 30: 179-185.
- 19) Shine R., **Langkilde T.**, Wall M. and Mason R.T. 2005. The fitness correlates of scalation asymmetry in garter snakes *Thamnophis sirtalis parietalis*. **Functional Ecology** 19: 306-314.
- 18) Shine R., **Langkilde T.**, Wall M. and Mason R.T. 2005. Alternative male mating tactics in garter snakes, *Thamnophis sirtalis parietalis*. **Animal Behaviour** 70: 387-396.
- 17) **Langkilde T.**, Lance V.A. and Shine R. 2005. Ecological consequences of agonistic interactions in lizards. **Ecology** 86: 1650-1659.
- 16) Shine R., O'Donnell R., **Langkilde T.**, Wall M.D. and Mason R.T. 2005. Snakes in search of sex: the relationship between mate-locating ability and mating success in male garter snakes. **Animal Behaviour** 69: 1251-1258.
- 15) **Langkilde T.** and Shine R. 2005. How do water skinks avoid shelters already occupied by other lizards? **Behaviour** 142: 203-216.
- 14) **Langkilde T.**, Schwartzkopf L. and Alford R.A. 2004. The function of tail displays in male rainbow skinks, *Carlia jarnoldae*. **Journal of Herpetology** 39: 325-328.
- 13) **Langkilde T.**, Shine R. and Mason R.T. 2004. Predatory attacks to the head versus body modify behavioural responses of garter snakes. **Ethology** 110: 937-947.
- 12) **Langkilde T.** and Shine R. 2004. Competing for crevices: interspecific conflict influences retreat-site selection in montane lizards. **Oecologia** 140: 684-691.
- 11) Shine R., Lemaster M., Wall M., **Langkilde T.** and Mason R. 2004. Why did the snake cross the road? Effects of roads on movement and location of mates by garter snakes (*Thamnophis sirtalis parietalis*). **Ecology and Society** 9: 9. [online] URL: <http://www.ecologyandsociety.org/vol9/iss1/art9>

- 10) Shine R., Phillips B., **Langkilde T.**, Lutterschmidt D., Wayne H. and Mason R.T. 2004. Mechanisms and consequences of sexual conflict in garter snakes (*Thamnophis sirtalis*, Colubridae). **Behavioral Ecology** 15: 654-660.
- 9) Shine R., **Langkilde T.** and Mason R.T. 2004. Courtship tactics in garter snakes: how does a male's morphology and behavior influence his mating success? **Animal Behaviour** 67: 477-483.
- 8) Shine R., **Langkilde T.** and Mason R.T. 2003. The opportunistic serpent: male garter snakes adjust courtship tactics to mating opportunities. **Behavior** 140: 1509-1526.
- 7) Shine R., **Langkilde T.** and Mason R.T. 2003. Cryptic forcible insemination: male snakes exploit female physiology, anatomy and behavior to obtain coercive matings. **American Naturalist** 162: 653-667.
- 6) Shine R., **Langkilde T.** and Mason R.T. 2003. Confusion within "mating balls" of garter snakes (*Thamnophis sirtalis*) - does misdirected courtship to other males impose significant selection on male tactics? **Animal Behaviour** 66: 1011-1017.
- 5) **Langkilde T.**, Schwarzkopf L. and Alford R. 2003. An ethogram for adult male rainbow skinks, *Carlia jarnoldae*. **Herpetological Journal** 13: 141-148.
- 4) **Langkilde T.** and Schwarzkopf L. 2003. Observations of mating behaviour and reproduction in a small tropical scincid lizard *Carlia jarnoldae*. **Herpetological Review** 34:325-326.
- 3) **Langkilde T.**, O'Connor D. and Shine R. 2003. Shelter-site use by five species of montane scincid lizards in south-eastern Australia. **Australian Journal of Zoology** 51:175-186.
- 2) **Langkilde T.**, †Smith V., Phillips S., Barrott E. and Shine R. 2003. Ornamental plant traps lizard. **Herpetofauna** 32:131.
- 1) **Langkilde T.** and Alford R. 2002. The tail wags the frog: attached transponders affect movement behaviour in *Litoria lesueuri*. **Journal of Herpetology** 36:711-715.

Other Scientific Publications and Book Chapters

- Mina O., Gall H.E., Carlson B. and **Langkilde T.** 2014. A preliminary assessment of endocrine disrupting compounds in vernal ponds in central Pennsylvania. 2014 **American Society of Agricultural and Biological Engineers (ASABE)** Annual International Meeting Paper. DIO: 10.13031/aim.20141910944
- Clemenn N., **Langkilde T.** and Wapstra E. 2007. Position Statement No. 1. Toe clipping of lizards. **Australian Society of Herpetologists Inc.** [online]
http://www.australiansocietyofherpetologists.org/position_statements.html

Grants and Fellowships

- 2016-2018 **Pennsylvania Department of Conservation and Natural Resources, Bureau of Forestry.** Effects of prescribed burning in Pennsylvania's Mixed Oak Forest on Wildlife Taxa of Concern. C. Howey Co-PI. \$275,159.

- 2015-2019 **National Science Foundation**. The adaptive potential of maternal stress as a driver of variation in offspring fitness in a free-living animal. PI. \$618,535.
- 2014-2016 **Pennsylvania Department of Conservation and Natural Resources**, Bureau of Forestry. Effects of prescribed burning in Pennsylvania's Mixed Oak Forest on Wildlife Taxa of Concern. C. Howey Co-PI. \$286,829.
- 2011-2015 **National Science Foundation**. LiT - Sublethal impacts of non-native species invasion. IOS-1051367. S. Cavigelli Co-PI. \$500,548.
- 2014 **United States Department of Agriculture**, Forest Service Northern Research Station. Effects of prescribed burning in Pennsylvania's Mixed Oak Forest on Wildlife Taxa of Concern. C. Howey Co-PI. \$10,995.
- 2013-2014 **PSIEE Seed Grant**, Penn State Institute of Energy and Environment. *Emerging contaminants in vernal ponds across a human impact gradient*. Co-PI with E. Boyer, A. Miller; H. Gall PI. \$24,725.
- National Science Foundation**. Dissertation Research: Ecological causes and consequences of intraspecific trait variation in an aquatic consumer. Carlson Co-PI. \$19,370.
- Research Collaborations Fellowship Program**, Pennsylvania State University. Mechanisms underlying the relationship between stress, glucocorticoids, and the brain. L. Ladage PI. \$10,000.
- 2012-2014 **Social Science Research Institute and the Center for Brain, Behavior and Cognition**, Level 2 funding. Penn State University. *Does glucocorticoid programming allow animals to fine-tune their brain and behavior to current environmental conditions?* S. Cavigelli, P. Bartell Co-PIs. \$10,941.
- 2010-2014 **National Science Foundation**. LiT - Ecology and evolution of adaptive responses to rapid global change. DEB 0949483. \$489,600. Plus \$13,720 in REU supplements.
- 2012-2013 **National Science Foundation**. Dissertation Research: The impact of novel sound on native acoustic communities. \$14,886.
- 2009-2010 **Social Science Research Institute**, Level 2 funding. Penn State University. The role of stress in facilitating adaptive responses to novel threats. S. Cavigelli, E. Susman Co-PIs. \$14,000.
- 2006 – 2008 **National Geographic Society**. Committee for Research and Exploration. Rapid evolution in response to invasive species. \$20,180
- Eppley Foundation for Research**. Rapid evolution in response to invasive species. PI, D. Skelly Co-PI. Support for Advanced Scientific Research. \$25,200.
- 2006 – 2007 **American Museum of Natural History**, Collection Study Grant. Evolution of limb-length in response to invasive species. \$500.
- 2005 – 2007 **Yale Institute of Biospheric Studies**, Gaylord Donnelley Environmental Postdoctoral Fellowship. Incorporating evolutionary theory into biodiversity conservation: how rapidly and effectively can native communities evolve to minimize the impact of invasive species? \$84,000.
- 2004 **Australian Society of Herpetologists**, Student Research Grant. 2004. Effects of research procedures on stress levels of reptiles. \$750.

- James King of Irrawang Travelling Scholarship.** University of Sydney. \$3,485.
- Ethel Mary Read Research Grant.** Royal Zoological Society of New South Wales. \$750.
- Student Scholarship.** Australian and New Zealand Council for the Care of Animals in Research and Training. \$165.
- Student Travel Award.** Australasian Society for the Study of Animal Behaviour. \$155.
- 2003 **Student Travel Award.** Society for Research on Amphibians and Reptiles in New Zealand. \$50.
- Student Travel Award.** Australasian Society for the Study of Animal Behaviour. \$270.
- 2002 - 2005 **Australian Postgraduate Award,** University of Sydney. 2002-2005. Factors shaping habitat use in a guild of montane skinks. \$83,478.
- Postgraduate Research Support Scheme** research funding. University of Sydney. \$2,440.

Invited Talks

- 2018 **Gordon Research Conference on Predator-Prey Interactions,** Ventura CA. Impacts of transgenerational versus early-life stress on lizard physiology (January).
- 2017 **Natural Science Convocation,** Lock Haven University, Lock Haven, PA. Convocation Speaker. How animals deal with environmental challenges: road noise and invasive species (November).
- Society for Behavioral Neuroendocrinology,** Long Beach CA. Presidential Symposium. Adaptive responses to environmental change: road noise and invasive species (June).
- EEB Spring Symposium,** Iowa State, Ames IA. Keynote Speaker. What doesn't kill you...Adaptive responses to environmental change (February).
- 2016 **Ecological Morphology Symposium, International Congress of Vertebrate Morphology,** Washington, D.C. The role of behavior in the ecomorphological paradigm. (June).
- John G. Ostrom Program Series, Yale Peabody Museum,** New Haven, CT. Adapting to a changing world. (March)
- 2015 **Duquesne University,** Pittsburg, PA. What doesn't kill you... Stress caused by invaders may actually benefit native species. (October)
- Southern Illinois University Carbondale,** Carbondale, IL. Responses of native lizards to invasive predatory fire ants: Adaptation at what cost? (April)
- University of Alabama at Birmingham,** AL. Responses of native lizards to invasive predatory fire ants: Adaptation at what cost? (March)
- 2014 **University of California, Santa Cruz,** CA. Responses of native lizards to invasive predatory fire ants: Adaptation at what cost? (January)
- 2013 **Archbold Biological Station,** Venus, FL. Invasive species management viewed through an evolutionary lens: Lessons from fire ants. (May)

- 2012 **World Congress of Herpetology**, Vancouver, Canada. Invasive species management viewed through an evolutionary lens: lessons from Fire Ants. (August)
University of Tennessee, Knoxville, TN. Mechanisms and consequences of adaptive responses to invasive species. (August)
Cornell University, Ithaca, NY. Fitness consequences of invader-induced stress. (April)
- 2011 **Harvard University**, Boston, MA. Multimodal impacts of invaders: complex responses to novel selective pressures. (September).
Yale University, New Haven, CT. Keynote speaker at the Forestry and Environmental Studies Doctoral Conference. Changes in selective pressure across ontogeny mediate tradeoffs in survival strategies. (October).
Yale Institute of Biospheric Studies, New Haven, CT. Keynote speaker at the Advisory Board Meeting. Mechanisms and consequences of adaptive responses to invasive species. (October).
University of Pittsburg, Pittsburg, PA. Fitness consequences of invader-induced stress. (October).
North American Society for Comparative Endocrinology. Ann Arbor, MI. Stress and invasion: elevated levels of corticosterone may facilitate survival-enhancing behavior of native lizards. (July).
International Symposium on Amphibian and Reptilian Endocrinology and Neurobiology. Ann Arbor, MI. Avoiding invaders: lizards exhibit altered behavioral stress responses following invasion by a novel predator. (July).
- 2010 **Bryn Mawr College**, Bryn Mawr, PA. Stress and invasion: Factors influencing the escape behavior of native fenced lizards in response to introduced fire ants. (October).
- 2009 **Texas Tech University**, Lubbock, TX. Boogie or die: native lizards adapt to survive invasion by fire ants. (December).
Penn State University, Altoona, PA. Boogie or die: native lizards adapt to survive invasion by fire ants. (November).
University of Western Ontario, London, Ontario, Canada. Boogie or die: adaptive responses of native lizards to fire ant invasion. (October).
University of Pittsburg, Pittsburg, PA. Boogie or die: adaptive responses of native lizards to fire ant invasion. (October).
Fordham University, Bronx, NY. Surviving invasion: native lizards alter their behavior and morphology in response to deadly fire ants. (October).
Rutgers University, New Brunswick, NY. Surviving invasion: native lizards alter their behavior and morphology in response to deadly fire ants. (September).
Villanova University, Villanova, PA. (2 talks) Invasive fire ants and the evolution of escape behavior and Competing for crevices: the nature and consequences of interference competition in montane lizards? (March).
University of South Florida, Tampa, FL. (Declined due to scheduling conflict).
- 2008 **James Madison University**, Harrisonburg, VA. Invasive fire ants and the evolution of escape behavior. (October).
Sixth World Congress of Herpetology, Manaus, Brazil. Defensive behaviour of lizards. (August).

- University of Mississippi**, Oxford, MS. Competition, invasion and the ghost of competition past. (May).
- Iowa State University**, Ames, IA. Competition, invasion and the ghost of competition past. (March).
- 2007 **University of California, Irvine**, CA. Competition, invasion and the ghost of competition past. (January).
- 2006 **University of Pennsylvania**, PA. Competition, invasion and the ghost of competition past. (January).
- 2005 **Marine Biological Laboratory**, Woods Hole, MA. Habitat use in montane skinks: do social interactions affect shelter site choice? (April).
- 2004 **Washington University**, St. Louis, MO. The ecological consequences of interspecific aggression in montane skinks. (May).

Professional Service

- Associate Editor**, Evolutionary Ecology (2015-present)
- Associate Editor**, Integrative and Comparative Biology (2016-present)
- Advisory Editorial Board Member**, Journal of Experimental Zoology – A (2014-2017)
- Awards Committee**, Ecological Society of America. Member (2013-2016)
- Nominations Committee**, Society for Integrative and Comparative Biology, Division of Ecology and Evolution. Member (2012-2013)
- Affiliate Editor** for ESL authors, Herpetologica.

Journal Peer Review

Allergy, Asthma and Clinical Immunology, Amphibia-Reptilia, American Naturalist, Animal Behaviour, Animal Conservation, Annales Zoologici Fennici, Austral Ecology, Australian Journal of Zoology, Behavioral Ecology, Behavioral Ecology and Sociobiology, Behaviour, Biological Conservation, Biological Invasions, Biological Journal of the Linnean Society, Biology Letters, Canadian Journal of Zoology, Central European Journal of Biology, Comparative Biochemistry and Physiology, Copeia, Current Zoology, Ecology, Ecoscience, Environmental Management, Ethology, Evolutionary Ecology, Functional Ecology, General and Comparative Endocrinology, Global Change Biology, Herpetologica, Herpetological Conservation and Biology, Herpetological Journal, Herpetological Review, Hormones and Behavior, Ibis, Journal of Applied Ecology, Journal of Experimental Biology, Journal of Experimental Zoology A, Journal of Herpetology, Journal of North American Herpetology, Journal of Thermal Biology, Journal of Zoology, Molecular Ecology, Nature Education, Oecologia, Oikos, PLOS ONE, Proceedings of the Royal Society B, Physiology and Behavior, Western North American Naturalist, Wildlife Research (52 journals, 157 manuscripts)

Granting Bodies Peer Review

National Geographic Society (2 proposals), National Science Foundation (3 panels, 5 ad-hoc reviews)

Book Reviews

Oxford University Press (3 books), University of Chicago Press (1 book)

Society Membership

American Association for the Advancement of Science, American Society of Naturalists, Animal Behavior Society, Australian Society of Herpetologists, Ecological Society of America, Sigma Xi, Society for Integrative and Comparative Biology, Society for the Study of Amphibians and Reptiles

Students and Trainees Advised**Postdoctoral Advisees**

Kirsty MacLeod (2016-present)
Christopher Howey (2014-2017; Assistant Professor, University of Scranton)
Gail McCormick (2016; Communications Analyst, Penn State University)
Lindsey Swierk (2014; Donnelley Postdoctoral Fellow, Yale)
Sean Graham (2011-2013; Assistant Professor, Sul Ross State University)
Travis Robbins (2010-2013; Instructor, University of Nebraska Omaha)
Renee Rosier (2012; Assistant Professor, PSU Wilkes Barre)

Ph.D. Students

Catherine Pritchard (Wildlife and Fisheries Science; 2017-2018)
David Ensminger (Wildlife and Fisheries Science; 2017-present)
Cameron Venable (Biology; 2016-present)
Dustin Owen (Ecology; 2015-present)
Braulio Assis (Ecology; 2015-present)
Catherine Tylan (Biology; 2015-present)
Christopher Thawley (Ecology; 2011-2016; postdoc at University of Rhode Island)
Gail McCormick (Ecology; 2011-2016; Communications Analyst, Penn State University)
Jennifer Tennesen (Ecology; 2011-2015; postdoc at NOAA)
Bradley Carlson (Ecology; 2009-2014; Assistant Professor, Wabash College)
Lindsey Swierk (Ecology; 2009-2013; Donnelley Postdoctoral Fellow, Yale)
Renee L. Rosier (Biology; 2008-2012; Assistant Professor, PSU Wilkes Barre)

M.Sc. Students

Kelly Brossman (Biology; 2012-2013; PA Fish and Boat Commission Biologist)
Michaleia Mead (Biology; 2016-present)

Undergraduate Students

I have mentored >60 Undergraduate Research Assistants or Independent Studies Students.

Lab Managers

Nicole Freidenfelds (2007-2011)

Research Associates

Tom Adams (2016-2018)

Media Coverage of Research

Print : Science Magazine, The Weekend Australian, The Townsville Sun, The Quitman County Democrat, Helix Magazine, “Yes” Magazine, the award winning book “Why the Cheetah Cheats: And Other Mysteries of the Natural World” by Lewis Smith;

Television: Totally Wild, Discovery Channel Canada, CBS “Brink”; ***Podcast and Radio***: Ecological Society of America, National Geographic, Quirks and Quarks; World Wide

Online: National Geographic, LATimes, MSNBC, Discovery Channel, Christian Science Monitor, Guardian Express, Headlines & Global News, The Scientist, Science Live, Science Illustrated, Scientific American, Science News.