

James Reilly

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EDUCATION

2009 Ph.D., Entomology, Cornell University, Ithaca, NY
2002 B.S., Biology, College of William & Mary, Williamsburg, VA

RESEARCH ANALYST

2014-Present Dept of Ecology, Evolution, & Natural Resources, Rutgers University, New Brunswick, NJ
2012-2013 Dept of Entomology, Rutgers University, New Brunswick, NJ

POSTDOCTORAL RESEARCHER

2009-2011 Dept of Biological Sciences, Louisiana State University, Baton Rouge, LA

CONSULTANT

2012-2013 Ecological consulting/data analysis, Cornell University, Ithaca, NY
2009-2011 GIS mapping/databases, Capital Region Land Conservancy, Richmond, VA
2021-Present Agriculture and Forest Districts Outreach Committee, Powhatan County, VA

PUBLICATIONS

Genung M, **Reilly JR**, Williams N, Buderer A, Gardener J, Winfree R (2022) Rare and declining bee species are key to consistent pollination of wildflowers and crops across large spatial scales. *Ecology* (in press).

Allen-Perkins A, Magrach A, Dainese M, Garibaldi L, Kleijn D, Rader R, **Reilly JR**, Winfree R, ..., Bartomeus I (2021) CropPol: a dynamic, open and global database on crop pollination. *Ecology* 103(3): e3614.

Reilly JR, Artz DR, Biddinger D, Bobiwash K, Boyle NK, Brittain C, Brokaw J, Campbell JW, Daniels J, Elle E, Ellis JD, Fleischer SJ, Gibbs J, Gillespie RL, Gundersen KB, Gut L, Hoffman G, Joshi N, Lundin O, Mason K, McGrady CM, Peterson SS, Pitts-Singer TL, Rao S, Rothwell N, Rowe L, Ward KL, Williams NM, Wilson JK, Isaacs R, Winfree R (2020) Crop production in the USA is frequently limited by a lack of pollinators. *Proceedings of the Royal Society B* 287: 20200922.

MacLeod M, **Reilly JR**, Cariveau D, Genung M, Roswell M, Gibbs J, Winfree R (2020) How much do rare and crop-pollinating bees overlap in identity and flower preferences? *Journal of Applied Ecology* 57(2): 413-423.

Winfree R, **Reilly JR**, Bartomeus I, Cariveau DP, Williams N, Gibbs J (2018) Species turnover promotes the importance of bee diversity for crop pollination at regional scales. *Science* 359: 791-793. Also featured by *Science* as a perspective.

Winfree R, Fox J, Williams N, **Reilly JR**, Cariveau D (2015) Abundance of common species, not species richness, drives delivery of a real-world ecosystem service. *Ecology Letters* 18: 626-635. Also featured by *Nature* as a research highlight.

Reilly JR, Elderd BD (2014) Effects of biological control on long-term population dynamics: Identifying unexpected outcomes. *Journal of Applied Ecology* 51(1): 90-101.

Elderd BD, **Reilly JR** (2014) Warmer temperatures increase disease transmission and outbreak intensity in a host-pathogen system. *Journal of Animal Ecology* 83 (4): 838-849.

Benjamin F, **Reilly JR**, Winfree R (2014) Pollinator body size mediates the scale at which land use drives crop pollination services. *Journal of Applied Ecology* 51(2): 440-449.

Reilly JR, Liebhold A, Hajek AE, Plymale R (2014) The impact of *Entomophaga maimaiga* on outbreak gypsy moth populations: the role of weather. *Environmental Entomology* 43(3): 632-641.

Rader R, **Reilly JR**, Bartomeus I, Winfree R (2013) Predicting climate change impacts on pollination services. *Global Change Biology* 19 (10): 3103-3110.

Reilly JR, Hajek AE (2012) Prey processing by avian predators enhances virus transmission in the gypsy moth. *Oikos* 121: 1311-1316.

Hajek AE, Plymale R, **Reilly JR** (2012) Comparing Two Methods for Quantifying Soil-Borne *Entomophaga maimaiga* Resting Spores. *Journal of Invertebrate Pathology* 111: 193-195.

Reilly JR, Reilly RJ (2009) Bet-hedging and the orientation of juvenile passerines in fall migration. *Journal of Animal Ecology* 78: 990-1001.

Reilly JR, Hajek AE (2008) Density-dependent resistance of the gypsy moth *Lymantria dispar* to its nucleopolyhedrovirus, and the consequences for population dynamics. *Oecologia* 154: 691-701.

Henson SM, **Reilly JR**, Robertson SL, Schu MC, Rozier ED, Cushing JM (2003) Predicting irregularities in population cycles. *SIAM Journal on Applied Dynamical Systems* 2(2): 238-253.

NATURAL HISTORY NOTES

Reilly JR, Reilly SJ (2020) Range extension of *Hyla cinerea* (Green Treefrog) into the Virginia Piedmont. *Journal of the Virginia Herpetological Society: Catesbeiana* 42(2): 132.

Reilly JR, Reilly SJ (2020) County record for *Regina septemvittata* (Queensnake): Powhatan County, VA. *Journal of the Virginia Herpetological Society: Catesbeiana* 42(2): 147.

Reilly SJ, **Reilly JR** (2020) County record for *Thamnophis saurita saurita* (Common Ribbonsnake): Powhatan County, VA. *Journal of the Virginia Herpetological Society: Catesbeiana* 42(2): 148.

PRESENTATIONS

Reilly JR (2019) Ecological impact of a proposed utility-scale solar project on priority conservation areas and wildlife corridors in Powhatan County, VA. Invited oral presentation at the Powhatan County Board of Supervisors public meeting, Powhatan, VA.

Reilly JR, Winfree R (2016) The economic contributions of wild bees to specialty crops. Invited oral presentation in the "Integrated crop pollination in theory and practice" symposium at the International Congress of Entomology meeting, Orlando, FL.

- Reilly JR, Winfree R (2015) Getting from pollinator visitation to yield: a synthesis across multiple crop types. Invited oral presentation in the “Landscape simplification: effects on arthropods, ecosystem services and agricultural production” symposium at the Entomological Society of America meeting, Minneapolis, MN.
- Reilly JR, Bartomeus I, Cariveau DP, Benjamin F, Winfree R (2014) More pollinator species are required for pollination function at larger spatial scales, but high regional dominance can suppress this effect. Oral presentation at the Ecological Society of America meeting, Sacramento, CA.
- Reilly JR (2013) Predatory birds facilitate disease transmission in the gypsy moth. Invited seminar in the Biology seminar series at Virginia Commonwealth University, Richmond, VA.
- Reilly JR, Liebhold A, Plymale R, Hajek AE (2013) The impact of *Entomophaga maimaiga* on outbreak gypsy moth populations: the role of weather. Invited oral presentation at the USDA Research Forum on Invasive Species, Annapolis, MD.
- Reilly JR, Elderd BE (2010) Modeling viral and bacterial biological control in the gypsy moth. Oral presentation at the Ecological Society of America meeting, Pittsburg, PA.
- Reilly JR (2009) The link between bird predation and disease outbreaks in forest-defoliating insects. Invited seminar in the Systematics, Ecology, & Evolution seminar series at Louisiana State University, Baton Rouge, LA.
- Reilly JR (2008) The ecology of nucleopolyhedrovirus transmission in the gypsy moth, *Lymantria dispar*. Dissertation seminar in the Jugatae Seminar Series at Cornell, Ithaca, NY.
- Reilly JR, Hajek AE (2007) Variation in the prey-processing behavior of insectivorous birds affects NPV transmission in the gypsy moth. Oral presentation at the Society for Invertebrate Pathology meeting, Quebec City, QC, Canada.
- Reilly JR, Hajek AE (2007) Density-dependent resistance of the gypsy moth, *Lymantria dispar*, to its nucleopolyhedrovirus. Poster presentation and Pitch at the Ecology and Evolution of Infectious Disease meeting, Ithaca, NY.
- Reilly JR, Hajek AE (2006) Density-dependent resistance of the gypsy moth, *Lymantria dispar*, to its nucleopolyhedrovirus. Poster presentation at the USDA Research Forum on the Gypsy Moth and other Invasive Species, Annapolis, MD.
- Reilly JR, Hajek AE (2005) Density-dependent resistance of the gypsy moth to its nucleopolyhedrovirus (NPV). Oral presentation at the Entomological Society of America meeting, Ft Lauderdale, FL.
- Reilly JR, Reilly RJ (2004) Bet-hedging and the orientation of juvenile passerines in fall migration. Oral presentation at the Ecological Society of America meeting, Portland OR.

TEACHING

- 2009-2010 Principles of Ecology (BIO 4253), Louisiana State University, Guest lecturer
- 2006 Introductory Biology (BIO 103) + Lab, Cornell University, Teaching Assistant
- 2003 Ecology and the Environment (BIOEE 261), Cornell University, Teaching Assistant
- 2001 Entomology (BIO 428), College of William and Mary, Teaching Assistant

GRANTS & FELLOWSHIPS

- Louisiana Board of Regents Support Fund, 2012-2014: Climate change and disease transmission: Shifts in host-pathogen ranges, Co-PI with Bret Elderd, Amount: \$133,012
- National Science Foundation Graduate Research Fellowship, 2002-2007
- W. Arthur and Alma D. Rawlins Graduate Student Endowment Grant, 2005-2007
- Grace Griswold Endowment Grant, 2003-2008
- Monroe Scholar Grant, College of William and Mary, 1999-2002
- Howard Hughes Medical Institute Grant, College of William and Mary, 2001
- Charles Center U.S. Domestic Research Grant, College of William and Mary, 2001
- Valedictorian, Trinity High School, Richmond, VA, 1999

OTHER SKILLS & EXPERIENCE

Programming and data analysis: I write programs for mathematical modeling in the R programming language. I am also skilled with html, php, javascript, sql/web databases, and Matlab. I have extensive experience using R to manipulate and statistically analyze large ecological datasets and have worked as an independent consultant doing data analysis.

GIS Mapping: I have a long-standing interest in GIS mapping, and make extensive use of ArcGIS and other software. I worked as an independent GIS contractor for the Capital Region Land Conservancy in Richmond, VA, creating maps that introduce ecological criteria into land use planning. I also used fine-scale land cover digitization and GIS mapping to design a system of conservation zones for my home county (Powhatan, VA) that were incorporated into the county comprehensive plan and are now protected with minimum 10 acre zoning. I am also part of the Agriculture and Forest Districts (AFD) Outreach Committee for Powhatan County, which involves using GIS to identify groups of parcels with high conservation value as targets for county and state-level protection.

Lepidoptera sampling/ specimen curation: I worked in the Cornell University Insect Collection to identify and curate the Franklemont Geometrid collection (several hundred thousand specimens), and incorporate it into the main collection. I can identify over 1000 species of moths from Eastern North America on sight, and have extensive experience sampling and photographing moths. I organized the Lepidoptera part of the Belmead BioBlitz in Virginia and also ran a series of moth nights open to the public.

Birding: My specialty is birding by ear, and I have worked conducting bird surveys (point counts) in VA for several agencies. I also band birds as part of my research and for outreach, and hold federal and state permits.

Laboratory skills: I am experienced with DNA extraction and analysis, including the use of real-time quantitative PCR. I also have experience rearing insects and maintaining Lepidoptera colonies, working with insect diseases, identifying insect pathogens using phase-contrast microscopy, and preparing samples for the scanning electron microscope.

I have reviewed numerous manuscripts for scientific journals including Science, Ecology, Proceedings B, Journal of Applied Ecology, Environmental Entomology, and Fungal Ecology