

# Derek R. McFarland, Jr.

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## Education

**Ph.D. Candidate in Ecology, Evolution, and Conservation Biology**, University of Illinois Urbana-Champaign, Urbana, IL, *start: May 15, 2020*, \*expected year of degree conferral **2026\***

**B.Sc. in Biology**, *summa cum laude*, Honors College, Harris-Stowe State University, St. Louis, MO, *start: August 21, 2017* **2020**

## Publications | [Google Scholar](#)

- **McFarland Jr, Derek**; Rajagopalan, Shreyas; Zhang, Junhe; Allan, Brian. High variance in prevalence estimates of Bourbon and Heartland viruses in field-collected *Amblyomma americanum* ticks depending on sample size: A brief review. *In Preparation for Emerging Infectious Diseases*
- **McFarland Jr, D.**, Wallace, K., Blocher, B. H., Nicholson, W. L., Soares, L., & Adalsteinsson, S. A. (2025). High burdens of *Ixodes scapularis* ticks and surveillance for *Babesia* spp. in Carolina Wrens (*Thryothorus ludovicianus*) in Missouri, USA. *Journal of Medical Entomology*, tjaf076.
- **McFarland Jr, D.**, Fredericks, L. P., Hedlund, T., Jones, S., Keesing, F., Mutinda, M., & Allan, B. F. (2024). A suite of pathogens detected in ticks sampled from wildlife hosts in central Kenya. *African Journal of Ecology*, 62(3).
- Aziati, I. D., **McFarland Jnr, D.**, Antia, A., Joshi, A., Aviles-Gamboa, A., Lee, P., Adalsteinsson, S.A. & Boon, A.C. (2022). Prevalence of Bourbon and Heartland viruses in field collected ticks at an environmental field station in St. Louis County, Missouri, USA. *Ticks and Tick-borne Diseases*, 102080.

## Research Experience

**PROJECT #1:** Effects of Human-Mediated Landscape Change on Tick-Borne Disease Risk in St. Louis, MO

*Mentor/Ph.D. Advisor: Brian Allan, Ph.D.*

**2020–present**

**Ph.D. Student, Program in Ecology, Evolution, and Conservation Biology, University of Illinois UC**

- Sampled and taxonomically identified ticks from 31 sites across the St. Louis, MO metropolitan area using carbon-dioxide trapping protocol and estimated wildlife host activity using dung surveys
- Conducted pathogen analyses and sequencing using DNA-based RT-PCR methods for detecting bacterial pathogens (*Ehrlichia* spp.) in 1,492 lone star tick samples
- Employed methods in ArcGIS to map and quantify landscape metrics (i.e., composition, connectivity, change over time, tick-borne disease risk, etc.) throughout the study region
- Investigated effects of plant invasion and urbanization on tick survival using experimental field assays and analyzed effects using Cox proportional hazards regression among other methods
- Supervised, trained, and organized 7 undergraduate research assistants in field and lab protocols

**PROJECT #2:** Prevalence of Bourbon Virus in Field-Collected Ticks in Saint Louis County, Missouri

*Mentors: Adrianus Boon, Ph.D. & Solny Adalsteinsson, Ph.D.*

**2019–2020**

**STEP-UP Research Fellow, National Institutes of Health – NIDDK**

**Research Intern, Division of Infectious Diseases, Washington University School of Medicine**

- Analyzed samples for presence of virus using quantitative RT-PCR and plaque assays
- Performed RNA extraction, cDNA synthesis, gel electrophoresis, and quantitative RT-PCR

**Tyson Fellow, Tyson Research Center, Washington University in St. Louis**

- Optimized lab protocol for extraction and detection of novel, tickborne RNA viruses from ticks
- Sampled and taxonomically identified ticks using drag sampling

**PROJECT #3:** Absence of *Babesia* spp. Parasites in a Population of Carolina Wrens, despite high tick burdens

*Mentors: Leticia Soares, Ph.D. & Solny Adalsteinsson, Ph.D.*

**2018–2019**

**Tyson Fellow, Tyson Research Center, Washington University in St. Louis**

- Mist-netted, banded, and blood-sampled 75 songbirds
- Prepared, stained, and analyzed blood slides using Giemsa staining and microscopy techniques to determine the prevalence of avian blood parasites
- Sampled and taxonomically identified nymphal and larval ticks from avian hosts

**McNair Scholar, McNair Summer Research Program, St. Louis University**

- Wrote research proposal and secured funding through the McNair Summer Research Program
- Presented research findings at 13 national and regional conferences, earning 4 awards for effective research presentations and 2 prestigious travel awards

**Teaching Experience**

\* - Rated “Outstanding”, List of Teachers Ranked as Excellent by Their Students, ICES

**Teaching Assistant, Advanced GIS in Natural Resources Management (NRES 455)**

*Department of Natural Resources, University of Illinois*

**(future) Spring 2025**

- TBD

**Teaching Assistant, Evolution and Human Health (IB 360)**

*School of Integrative Biology, University of Illinois*

**(current) Fall 2025**

- Led discussion sections for 100 students on the evolutionary perspectives of health to inform the treatment of disease and to guide public health policy
- Curated and led lecture on the association of evolutionary life history traits and disease risks

**Teaching Assistant, Ecology and Human Health (IB 361)**

*School of Integrative Biology, University of Illinois*

**Spring 2024\*/2025\***

- Delivered guest lecture to 150 students on the impact of the landscape change on infectious diseases, emphasizing the impact of human intervention on environmental and public health outcomes
- Provided support to the instructor and students during lectures, fostering a conducive learning environment, a deep understanding of public health concerns, and data interpretation skills
- Conducted personalized sessions with students to address academic queries and learning deficits
- Maintained fairness and consistency in grading exams and assignments, adhering to deadlines

**Teaching Assistant, Introduction to GIS in Natural Resources Management (NRES 454)**

*Department of Natural Resources, University of Illinois*

**Fall 2023\*/2024\***

- Led lab sessions for 100 students, guiding them through complex analyses in ArcGIS Pro software
- Provided individualized assistance to students, troubleshooting issues and enhancing their proficiency in ArcGIS Pro during lab sessions and office hours.
- Ensured fairness and consistency in grading exams and weekly assignments, meeting deadlines with punctuality, precision, and personalized feedback

**Teaching Assistant/Tutor, General Physics I | General Physics II | College Algebra**

*Office of Academic Support, Harris-Stowe State University*

**2018–2020**

- Led group and individual tutoring sessions for 20-30 students
- Assisted teaching by providing supplemental lectures and study materials for students

**Leadership and Work Experience**

**Graduate Mentor & Recruiting Assistant, McNair Postbaccalaureate Achievement Program**

*Center for Access and Academic Success, University of Illinois*

**2022–present**

- Designed and implemented the UIUC McNair Ambassadors Program, enhancing recruitment efforts by fostering peer-to-peer mentoring relationships and increasing recruitment by 30%
- Provided academic mentoring, monitoring, and advocacy to 20 demographically underrepresented scholars for retention and matriculation to graduate school
- Guided students in developing effective science communication strategies, especially regarding accessible presentations of research findings to non-scientists and diverse audiences

**Search Committee Member, Hiring the Assistant Director for the federal TRIO McNair Program**

*Office for Access and Equity, University of Illinois*

**2025**

- Collaborated with university leadership to equitably identify, interview, and evaluate candidates
- Provided in-depth insight into the needs of underrepresented students, advocating for alignment with the program mission of advancing diversity in undergraduate and graduate education

**Student Working Group Member, Fall 2024 Campus Climate Survey**

*Student Success, Inclusion and Belonging, University of Illinois*

**2024**

- Nominated by faculty to collaborate with a diverse group of undergraduate, professional, and graduate students to facilitate engagement with the fall 2024 Campus Climate Survey
- Developed strategies to encourage student participation and provide feedback and analysis on survey findings and proposed recommendations
- Identified opportunities for student involvement in the campus climate assessment process, including the development of an implementation plan

**Graduate Mentor & Program Ambassador, McNair Postbaccalaureate Achievement Program**

*Office of Pre-College Access & TRIO Programs, St. Louis University*

**2018–2022**

- Assisted recruitment efforts as a McNair Ambassador at Harris-Stowe State University through live speech and video format during outreach events
- Advised 3 undergraduate students in resumé building and graduate school preparation for their successful application and transition to graduate school

**Mentorship Experience**

- 2024 Andrea Gallo Salinas, Allan Lab Undergraduate Researcher, 3<sup>rd</sup> year, University of Illinois, Urbana-Champaign
- 2023 Matt Beard, Allan Lab Undergraduate Researcher, 2<sup>nd</sup> year, School of Integrative Biology Honors, University of Illinois, Urbana-Champaign
- 2023 D.J. Thomas, Access and Achievement Program Summer Research Fellowship (AAPSRF) & Allan Lab Undergraduate Researcher, 3<sup>rd</sup> year, University of Illinois, Urbana-Champaign
- 2022 Shreyas Rajagopalan, Allan Lab Undergraduate Researcher, 4<sup>th</sup> year, University of Illinois, Urbana-Champaign; **Senior Thesis:** Prevalence of Heartland & Bourbon Virus in *A. americanum*
- 2022 Natalie Sinjaradze, Allan Lab Undergraduate Researcher, 1<sup>st</sup> year, University of Illinois, Urbana-Champaign
- 2022 Ashleigh Cox, AAPSRF Summer Research Fellowship & Allan Lab Undergraduate Researcher, 4<sup>th</sup> year, University of Illinois, Urbana-Champaign
- 2021 Randy Hartmann, Allan Lab - Undergraduate Research Assistant, 3<sup>rd</sup> year, Washington University in St. Louis
- 2019 Elora Robeck, Tyson Environmental Research Fellow, 2019, Hazelwood W. High School, MO
- 2018 Kayla Wallace, Tyson Environmental Research Fellow 2018, Webster Groves High School, MO
- 2018 Julia Berndt, Tyson Environmental Research Fellow 2018, Webster Groves High School, MO

### **Honors and Awards**

- 2025 Urban Biodiversity Futures Workshop, Urban Wildlife Network, Lincoln Park Zoo, Chicago, IL
- 2025 Program Enhancement Fund, Entomological Society of America (\$500)
- 2025 Rated “Outstanding”, Spring 2025 List of Teachers Ranked as Excellent by Their Students, ICES
- 2025 NASA-MSU Professional Enhancement Award, NASA and Michigan State University (\$800)
- 2024 Rated “Outstanding”, Fall 2024 List of Teachers Ranked as Excellent by Their Students, ICES
- 2024 Francis M. and Harlie M. Clark Research Support Grant, SIB (\$1,000)
- 2024 Rated “Outstanding”, Spring 2024 List of Teachers Ranked as Excellent by Their Students, ICES
- 2024 Travel Grant, Program in Ecology Evolution, and Conservation Biology (\$700)
- 2024 Conference Presentation Award, UIUC Graduate College (\$233)
- 2023 Rated “Outstanding”, Fall 2023 List of Teachers Ranked as Excellent by Their Students, ICES
- 2023 Field Inclusive Research Grant, Field Inclusive Incorporated (\$500)
- 2023 The Harvey J. Van Cleave Research Award, School of Integrative Biology (SIB; \$1,500)
- 2023 Program in Ecology, Evolution, and Conservation Biology Summer Research Grant (\$1,500)
- 2023 Honorable Mention, Predoctoral Fellowship, Ford Foundation
- 2022 Graduate College Nominee, HHMI Gilliam Fellowship - University Level Competition
- 2022 Departmental Nominee, HHMI Gilliam Fellowship - Department Level Competition
- 2022 Graduate College Dissertation Travel Grant, UIUC Graduate College (\$4,834)
- 2022 Tick University Fellowship, S.E. Center of Excellence in Vector Borne Diseases (\$500; declined)
- 2022 Summer Research Grant, Program in Ecology, Evolution, and Conservation Biology (\$1,500)
- 2022 The Harvey J. Van Cleave Research Award, SIB (\$1,000)
- 2022 Honorable Mention, Graduate Research Fellowship Program, National Science Foundation
- 2022 Honorable Mention, Predoctoral Fellowship, Ford Foundation
- 2021 Illinois Mosquito & Vector Control Association Meeting (Oral), 3<sup>rd</sup> Place Award (\$100)
- 2021 Research Assistantship, Natural Resources & Environmental Sciences, Support Award (\$2,500)
- 2021 The Francis M. and Harlie M. Clark Research Support Grant, SIB (\$1,000)
- 2021 Summer Research Award, Program in Ecology, Evolution, and Conservation Biology (\$1,000)
- 2021 Graduate Mentor Award, SLU McNair Scholars Program
- 2020 Summer Predoctoral Institute Certificate of Achievement, UIUC Graduate College
- 2020 ASPIRE Fellowship, UIUC Graduate College, (full tuition and stipend, ~\$75,000)
- 2020 Alumni Engagement Program Appreciation Award, SLU McNair Scholars Program
- 2020 Emerging Researchers National Conference (Oral), 1<sup>st</sup> Place Award (\$300)
- 2019 MO-Louis Stokes Alliance Minority for Participation Summer Scholars REU Award (\$4,000)
- 2019 NIH-NIDDK STEP-UP Research Program Fellowship (\$5,000)
- 2019 Missouri Louis Stokes Alliance for Minority Participation Conference, Travel Award
- 2019 Emerging Researchers National Conference, Travel Award
- 2018 Louis Stokes Alliance for Minority Participation Conference (Oral), 2<sup>nd</sup> Place Award (\$250)
- 2018 Minority Access 19th Annual Role Models Conference (Oral), 1<sup>st</sup> Place Award (\$1,000)
- 2018 Washington University in St. Louis, Tyson Research Fellowship (\$2,500)
- 2018 McNair Summer Research Scholarship (\$2,500)

### **Invited Public Speaking**

- 2025 Presenter, Medical, Urban, and Veterinary Entomology Symposium, ESA, Portland, OR

- 2025 Speaker, Entomology Colloquium, Department of Entomology, UIUC, Urbana, IL
- 2025 Presenter/Panelist, Tyson Environmental Research Conference, Washington University, MO
- 2024 Presenter, College Success – Illinois TRIO Day, Eastern Illinois University, Charleston, IL
- 2024 Speaker, First-Generation Graduate Student Success, Geis School of Business, Champaign, IL
- 2024 Panelist, Grant Winner Spark Moment Webinar and Q&A, Field Inclusive Incorporated, Zoom
- 2023 Panelist, NIH-NIDDK STEP-UP Summer Enrichment Series, Zoom
- 2023 Guest Lecturer, IB361 Ecology & Human Health, Champaign, IL.
- 2023 Panelist, Plenary Panel, AAAS/NSF Emerging Researchers National Conference, D.C.
- 2022 Panelist, McNair Alumni & Career Panel, Summer Research Institute, University of Illinois, IL
- 2022 Panelist, Summer Research Internship Alumni Panel, St. Louis University, MO
- 2022 Guest Lecturer, IB361 Ecology & Human Health, Champaign, IL.
- 2021 Panelist, NIH-NIDDK STEP-UP Informational Webinar – Part 1 & 2, Zoom
- 2021 Panelist, TRIO-SSS McNair Info Session, Washington University, Zoom
- 2020 Panelist, Graduate Student Panel: Discussing the Value of REUs, Lee University, Zoom
- 2020 Panelist, Alumni Engagement Program Virtual Panel, SLU McNair, Zoom
- 2019 Panelist, McNair Welcome Event, St. Louis, MO
- 2019 Panelist, Gateway Regional Math Alliance, St. Louis, MO
- 2019 Panelist, Spark the Mind: Advancing the Agenda for African Americans in STEM, St. Louis, MO
- 2018 Speaker, McNair Scholars Program Luncheon, St. Louis, MO
- 2018 Master of Ceremonies, HSSU MSEIP Conference, Alton, IL

### **Research Presentations**

- 2025 McFarland, Derek; Allan, Brian. (Oral). **Illinois Mosquito & Vector Control Association**, Champaign, IL.
- 2025 McFarland, Derek; Allan Brian. (Oral). **Department of Entomology Colloquium Series**, Urbana, IL.
- 2025 McFarland, Derek; Allan Brian. (Oral). **Annual Tyson Environmental Research Conference**, Washington University in St. Louis, MO.
- 2025 McFarland, Derek; Allan Brian. (Oral). **Program in Ecology, Evolution, Conservation Biology Exit Seminar Series**, Urbana, IL.
- 2025 McFarland, Derek; Allan Brian. (Oral). **International Association for Landscape Ecology-North America Annual Meeting**, Raleigh, NC.
- 2024 McFarland, Derek; Allan Brian. (Oral). **Ecological Society of America**, Long Beach, CA.
- 2023 McFarland, Derek; Allan Brian. (Oral). **Graduates in Ecology and Evolutionary Biology Symposium**, Urbana, IL.
- 2023 McFarland, Derek; Allan, Brian. (Oral). **Infectious Genomics for One Health**, Urbana-Champaign, IL.
- 2022 McFarland, Derek; Allan, Brian. (Oral). **Illinois Mosquito & Vector Control Association**, Northbrook, IL.
- 2022 McFarland, Derek; Allan, Brian. (Poster). **Geo-Resolution: Geospatial Perspectives on Climate Change: Predicting and Mitigating Effects**, St. Louis, MO.
- 2021 McFarland, Derek; Allan, Brian. (Oral). **Illinois Mosquito & Vector Control Association**, Northbrook, IL.

- 2020 McFarland, Derek; Allan, Brian. (Oral). **Research and Action Plan – Summer Predoctoral Institute Symposium**, via Zoom.
- 2020 McFarland, Derek; Boon, Adrianus “Jacco”; Adalsteinsson, Solny. (Poster). **Emerging Researchers National Conference**, Washington, D.C.
- 2019 McFarland, Derek; Boon, Adrianus “Jacco”; Adalsteinsson, Solny. (Poster). **Annual Biomedical Research Conference for Minority Students**, Anaheim, CA.
- 2019 McFarland, Derek; Boon, Adrianus “Jacco”; Adalsteinsson, Solny. (Poster). **Washington University Undergraduate Research Symposium**, St. Louis, MO.
- 2019 McFarland, Derek; Soares, Leticia; Adalsteinsson, Solny. (Poster). **American Society of Parasitologists Meeting**. Rochester, MN.
- 2019 McFarland, Derek; Boon, Adrianus “Jacco”; Adalsteinsson, Solny. (Oral & Poster). **NIH/NIDDK STEP-UP Research Symposium**, Bethesda, MD.
- 2019 McFarland, Derek; Soares, Leticia; Adalsteinsson, Solny. (Oral). **MOLSAMP Conference**, Jefferson, MO.
- 2019 McFarland, Derek; Soares, Leticia; Adalsteinsson, Solny. (Oral). **Emerging Researchers National Conference**, Washington, D.C.
- 2018 McFarland, Derek. (Poster). **Minority Science Engineering Improving Program Conference**, Alton, IL.
- 2018 McFarland, Derek; Soares, Leticia; Adalsteinsson, Solny. (Oral). **Minority Access 19th Annual Role Models Conference**, Washington, D.C.
- 2018 McFarland, Derek; Soares, Leticia; Adalsteinsson, Solny. (Oral). **Heartland (MOKANNE) Conference**, Kansas City, MO.
- 2018 McFarland, Derek; Soares, Leticia; Adalsteinsson, Solny. (Poster). **Washington University Undergraduate Research Symposium**, St. Louis, MO.
- 2018 McFarland, Derek; Soares, Leticia; Adalsteinsson, Solny. (Oral). **Inland Bird Bander’s Association Meeting**, STL, MO.
- 2018 McFarland, Derek; Soares, Leticia; Adalsteinsson, Solny. (Oral). **McNair Summer Research Symposium**, St. Louis, MO.

### Analytical and Technical Skills

**Software:** Geographic Information Systems (ArcGIS Pro/ArcMap, Fragstats), R programming (RStudio)

**Wet Lab:** Quantitative reverse transcriptase-Polymerase Chain Reaction, cDNA synthesis, DNA-/RNA-extraction, Gel-electrophoresis, Geimsa staining

**Field:** Taxonomic tick identification, Tick sampling (carbon-dioxide trapping, tick dragging and flagging), Mist-netting (bird capture and banding), Woodland bird identification (Midwestern-Eastern US), Avian phlebotomy (blood extraction), Avian blood smear preparation and analysis

### Relevant Graduate Coursework

#### Statistical Analysis

**IB 496** *Analysis of Biological Data in R*

**NRES 421** *Quantitative Methods in Statistics*

**NRES 454** *GIS Natural Resources Management*

**NRES 455** *Advanced GIS for Natural Resources Management*

#### Biological Sciences

**CB 540** *Wildlife Ecosystem Health*

**IB 453** *Community Ecology*

**IB 461** *Ornithology*

### **Professional Memberships**

Entomological Society of America (ESA)

International Association for Landscape Ecology, North America (IALE-North America)

Ecological Society of America (ESA)

Field Inclusive (FI) Inc.

American Ornithological Society (AOS)

Kappa Mu Epsilon (KME), Missouri Mu Chapter

American Society of Parasitologists (ASP)