

Natalie M. Allen

Department of Forestry and Natural Resources, Purdue University
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EDUCATION

Purdue University, West Lafayette, Indiana USA January 2023 — Present
Ph.D. Candidate in Evolutionary Biology and Conservation Genomics
Marquette University, Milwaukee, Wisconsin USA August 2019 — December 2022
B.S. in Biological Sciences with Comprehensive Honors, *magna cum laude*
Minor in Environmental Studies

RESEARCH EXPERIENCE

Department of Forestry and Natural Resources, Purdue University West Lafayette, Indiana USA
Ph.D. Candidate, DeWoody Lab January 2023 - Present

- Lead investigator on multiple whole-genome resequencing projects examining demographic history and conservation genomics in vertebrates.
- Directed population genomic study of the western chicken turtle, identifying cryptic structure relevant to conservation unit designation.
- Led genome-wide analysis of Pacific gray whale demographic history, inferring historical gene flow and contemporary population dynamics using low-coverage resequencing data.
- Developed and implemented reproducible bioinformatic pipelines for variant calling, demographic inference, pangenome construction, and structural variant analysis.
- Contributed to development and evaluation of short-read pangenome frameworks for conservation applications.
- Assembled a novel vertebrate reference genome and constructed long-read pangenomes.
- Mentors undergraduate researchers in genomic analysis and scientific communication.

Department of Biological Sciences, Marquette University Milwaukee, Wisconsin USA
Undergraduate Researcher, Gamble Evolutionary Biology Lab September 2019 – December 2022

- Led an independent project to study the evolution of visual opsin genes across geckos using phylogenetic trees, selection tests, and molecular clock analysis (August 2020 – December 2022).
- Completed DNA extraction, PCR, gel electrophoresis, multi-sequence alignment, and phylogenetic analysis to identify hybrid geckos (September 2019 – March 2020).

SKILLS

- **Bioinformatics:** Pre-processing, variant calling, and population genomic analysis of whole genome resequencing data; genome assembly; phylogenomics and comparative genomics; pangenomics using PGGB and Minigraph-Cactus; Nextflow pipeline construction; R; Python; shell scripting; ArcGIS Pro; R and Python for GIS.
- **Laboratory Genetics:** High molecular weight DNA extraction; cDNA synthesis; PCR; gel electrophoresis; DNA cloning; RT-qPCR; quality control (Qubit, TapeStation).
- **Field Work:** Field identification of North American vertebrates (especially herpetofauna); freshwater turtle trapping and tissue sampling.
- **Climate & Spatial Analysis:** Integration of genomic and environmental datasets; time-series modeling; SLiM simulations, ArcGIS Pro; spatial visualization.
- **Leadership & Communication:** Undergraduate mentorship; graduate teaching including lecturing (statistics for natural resources); science communication training; peer review for international journals; public writing.

SCIENTIFIC PUBLICATIONS

Andrew N. Black, Jong Yoon Jeon, Andrew M. Mularo, **Natalie M. Allen**, Erangi Heenkenda, Julia C. Buchanan-Schwanke, John W. Bickham, Zachary E. Lowe, J. Andrew DeWoody. (2024) Thematic layers of genomic susceptibility for conservation assessments: introgressive hybridization as an example. *Molecular Ecology* e17582. <https://doi.org/10.1111/mec.17582>

Jong Yoon Jeon, **Natalie M. Allen**, Andrew N. Black, J. Andrew DeWoody. (2025) Short-Read Pangenomes and Their Potential Utility in Population and Conservation Genomics. *Molecular Ecology Resources* e70060. <https://doi.org/10.1111/1755-0998.70060>

Natalie M. Allen, Andrew J. Mularo, Jong Yoon Jeon, Alvaro G. Hernandez, Ethan S. Streckfuss, Wade A. Ryberg, Toby J. Hibbitts, Brandon C. Bowers, Paul Crump, and J. Andrew DeWoody. (2026) Whole genome resequencing data provide high-resolution conservation insights into population structure and life history. *Conservation Genetics* 27, 61. <https://doi.org/10.1007/s10592-026-01777-8>

Jong Yoon Jeon, Andrew M. Mularo, **Natalie M. Allen**, Erangi Heenkenda, John W. Bickham, Andrew N. Black, J. Andrew DeWoody. (2026) Genomic metrics can inform formal listing processes associated with the conservation of threatened and endangered species. *Trends in Ecology and Evolution*. *In revision*.

Erangi Heenkenda, Andrew N. Black, Craig Stockwell, **Natalie M. Allen**, J. Andrew DeWoody. (2026) Temporal population genomics reveals evidence of purging genetic load in small, isolated populations of conservation concern. *Proceedings B*. *In revision*.

Natalie M. Allen, Anna Brüniche-Olsen, Jong Yoon Jeon, Andrew J. Mularo, John W. Bickham; Jorge Urbán Ramírez; J. Andrew DeWoody. (2026) The contemporary Pacific gray whale (*Eschrichtius robustus*) gene pool includes ancestry from a potential ghost population: inferences from population genomics. *Journal of Heredity*. *In review*.

Jong Yoon Jeon, **Natalie M. Allen**, Audrey J. Heckel, Alberto Macias-Duarte, René Jesús Toscano-Meléndrez, Jesús Raúl Martínez-Sandoval, Angel Montoya, John McLaughlin, J. Andrew DeWoody. (2026) A landscape level pangenomic framework reveals adaptation based on structural variants and climate-driven vulnerability in a sedentary bird. *Science*. *In review*.

CONFERENCE AND SEMINAR TALKS

- The contemporary Pacific gray whale (*Eschrichtius robustus*) gene pool includes ancestry from a potential ghost population: inferences from population genomics. *International Whaling Commission Scientific Committee* 2026, Bled, Slovenia.
- Whole genome resequencing data provide high-resolution conservation insights into population structure and life history. *Evolution 2025*, Athens, Georgia, USA.
- Conservation insights from population genomics in an elusive turtle. Department of Biological Sciences *Ecolunch* 2025, Purdue University.
- Population genomics of the Pacific gray whale. *Evolution 2024*, Montreal, Canada.
- Population genomics of the gray whale. *Midwest Population Genetics* 2023, University of Michigan.

POSTER PRESENTATIONS

- Population genomics can inform conservation efforts in an elusive turtle. *Midwest Population Genetics* 2024, Indiana University.
- Conservation genomics of the western chicken turtle. Department of Forestry and Natural Resources 2023 poster symposium, Purdue University.
- The evolution of gecko vision. Department of Biological Sciences 2022 Summer Research Symposium, Marquette University.
- The evolution of gecko vision. *Evolution* 2022, Cleveland, Ohio, USA.

- Evidence of molecular convergence and positive selection on visual opsin proteins in geckos. Department of Biological Sciences 2022 Undergraduate Research Day, Marquette University.
- Testing for molecular convergence and selection on gecko opsin genes. Honors Undergraduate Research Fair 2021, Marquette University.
- The evolution of gecko vision: Molecular convergence in visual opsin proteins. Department of Biological Sciences 2021 Undergraduate Research Day, Marquette University.

MONETARY AWARDS

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| • Kirkpatrick Memorial Graduate Student Award, 2026 | \$3,000 |
| • Welder Wildlife Foundation Research Fellowship, 2026 | \$26,400 |
| • D. Woods Thomas Memorial International Support Fund, 2025 | \$1,500 |
| • Purdue Institute for a Sustainable Future Travel Award, 2024 | \$650 |
| • Marquette Biological Sciences Conference Travel Award, 2022 | \$1,500 |
| • Marquette Biological Sciences Summer Research Program, 2022 | \$4,000 |
| • Marquette Honors Summer Research Fellowship, 2021 | \$3,500 |

WORK AND TEACHING

Purdue University

<i>Graduate Research Fellow</i> , Welder Wildlife Foundation	January 2026 - Present
<i>Graduate Teaching Assistant</i> , Statistics for Natural Resources	Spring 2026
<i>Graduate Research Assistant</i> , DeWoody Lab	January 2023 - December 2025

Marquette University

<i>Teaching Assistant</i> , Principals of Biological Investigation	Fall 2022
<i>Teaching Assistant</i> , Evolutionary Biology	Spring 2022
<i>Teaching Assistant</i> , Cellular Biology	Fall 2021
<i>Squamate Animal Caretaker</i> , Gamble Lab	Aug. 2020 - Dec. 2022
• <i>Manager</i> (May 2022 - Dec. 2022)	

Varsity Tutors

<i>Tutor</i> , ACT, SAT, Algebra, Precalculus, Calculus 1	July 2019 - Dec. 2022
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Independent Tutoring

<i>Tutor</i> , English for ESL students, Algebra	Feb. 2016 - Dec. 2022
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UNDERGRADUATE MENTEES

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| • Ethan Streckfuss | August 2024 - May 2025 |
| • Poster presentation: Genomic insights into the conservation of the western chicken turtle, Spring Undergraduate Research Expo 2025, Purdue University, USA | |
| • Brady Kahner (co-mentored) | August 2024 - Present |
| • Megan Johnson | January 2023 - May 2024 |
| • Poster presentation: Nuclear copies of Mitochondrial DNA fragments (NUMTs) in the Gray Whale Genome, Fall Undergraduate Research Expo 2023, Purdue University, USA | |
| • Poster presentation: Nuclear copies of Mitochondrial DNA fragments (NUMTs) in the Gray Whale Genome, Society for Molecular Biology and Evolution "Molecular Evolution in Small Populations" 2023, Princeton University, USA | |
| • Rafaela Besse | January 2023 - December 2023 |
| • Poster presentation: Nuclear copies of Mitochondrial DNA fragments (NUMTs) in the Gray Whale Genome, Fall Undergraduate Research Expo 2023, Purdue University, USA | |

- Poster presentation: Nuclear copies of Mitochondrial DNA fragments (NUMTs) in the Gray Whale Genome, Society for Molecular Biology and Evolution "Molecular Evolution in Small Populations" 2023, Princeton University, USA

ATTENDED TRAININGS

- Workshop: Communicating Science to Diverse Audiences, Evolution Meeting June 2025
- Workshop: GIS and Data Science, Purdue University October 2024
- Workshop: Designing Nextflow pipelines, Purdue University January - May 2024
- Course: Analysis of high throughput data for population genomics, University of Copenhagen (virtual) August 2023
- Workshop: SLiM forward evolutionary simulation software, Albuquerque, New Mexico June 2023
- Training: RT-qPCR, Purdue FNR Genetics Lab May 2023

ARTICLES

- **Allen, N.** (2020, July 30). *Allen: MU must offer remote learning, teaching options for Fall Semester*. Marquette Wire. <https://marquettewire.org/4034276/featured/allen-mu-must-offer-remote-learning-teaching-options-for-fall-semester/>

PEER REVIEW CONTRIBUTIONS

- Science (co-reviewer)
- Molecular Ecology
- Molecular Ecology Resources

SERVICE AND LEADERSHIP

- *College of Agriculture Representative*, FNR Graduate Student Council May 2025 - Present
- *Judge*, Fall Undergraduate Research Expo 2024
- *Organizer*, Lab Bioinformatics Coffee Hours Jan. 2024 - Present
- *Volunteer*, Wisconsin Humane Society 2022
- *Founder*, Biology Research Achievement Mentorship Program (RAMP) 2022
- *Interviewer*, Building DEI in Marquette Honors Admissions 2022
- *Vice President*, Marquette Waterski Team 2022
- *Women's Captain*, Marquette Waterski Team 2021
- *Volunteer*, River Revitalization Foundation 2020 - 2021
- *Volunteer*, Milwaukee Public Museum 2019 - 2020