



# Megan Barkdull

ASSISTANT CURATOR OF ENTOMOLOGY

Natural History Museum of Los Angeles County

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## Professional appointments

### Assistant Curator of Entomology

Natural History Museum of Los Angeles County

January 2025–present

## Education

### Ph.D., Department of Ecology and Evolutionary Biology

ADVISOR: DR. CORRIE MOREAU

Cornell University

August 2019–December 2024

### Bachelor of Arts in Biology

ADVISOR: DR. EMILY HEFFERNAN

New College of Florida

August 2014–May 2018

- Honors Thesis: Population Genetics of the Threatened Florida Duskywing Skipper

## Publications

Double dagger (‡) indicates co-first authors. Dagger (†) indicates mentored undergraduate co-author.

### Published:

1. Donaldson, M.†, **Barkdull, M.**, & C. S. Moreau. Variation in aggression across ants (Hymenoptera: Formicidae) is linked to natural selection on neurotransmitter receptor and cuticular hydrocarbon synthesis genes. *Invited submission to Annals of the Entomological Society of America*.
2. Heffernan, E. V.‡, **Barkdull, M.**‡, N. K. Brady. 2023. Microsatellites for butterfly conservation: historical challenges, current relevance, and a guide to implementation. *Frontiers in Ecology and Evolution*. <https://doi.org/10.3389/fevo.2024.1344065>
3. **Barkdull, M.**‡, C. R. Miller‡, M. A. Pipkin, & C. S. Moreau. 2023. Natural history collections: What are they and why do we need them?. *Frontiers for Young Minds*. <https://kids.frontiersin.org/articles/10.3389/frym.2023.1048608>
4. **Barkdull, M.**, & C. S. Moreau. 2023. Worker reproduction and caste polymorphism impact genome evolution and social genes across the ants. *Genome Biology and Evolution*. <https://doi.org/10.1093/gbe/evad095>
5. Heffernan, E., A. Markee,, M. R. Truglio, **M. Barkdull**, S. Steele Cabrera, J. Daniels. 2023. Population Genetic Structure of a Rare Butterfly in a Fragmented South Florida Ecosystem. *Insects* <https://doi.org/10.3390/insects14040321>
6. Williams, K.M., **M. Barkdull**, M. Fahmy, E. Hekkala, M. E. Siddall, S. Kvist. 2020. Caught red handed: iDNA points to wild source for CITES-protected contraband leeches. *Eur J Wildl Res*. <https://doi.org/10.1007/s10344-020-01419-5>
7. Siddall, M. E., **M. Barkdull**, M. Tessler, M. R. Brugler, E. Borda,, & E. Hekkala. 2019. Ideating iDNA: Lessons and limitations from leeches in legacy collections. *PloS one* <https://doi.org/10.1371/journal.pone.0212226>

### Accepted:

1. **Barkdull, M.**, & C. S. Moreau. Phenotypic plasticity in turtle ants has opposing evolutionary consequences for genes and regulatory loci. Accepted at *Evolution*.

## Grants, Fellowships & Awards

### Research grants

(Amount directly awarded: \$96,240; Additional amount managed: \$935,025)

- National Science Foundation— Collaborative Research: Digitization TCN: DBI-2102006: Extending Anthophila research through image and trait digitisation (Big-Bee). *Subaward with lead PI Dr. Katja Seltmann. Assumed management of grant upon joining NHMLAC (\$236,048)*
- California Institute for Biodiversity— California Insect Barcoding grant. *Assumed management of grant upon joining NHMLAC (\$698,977); additional \$78,740 awarded to PI Barkdull in 2025.*
- Society for the Study of Evolution— Rosemary Grant Advanced Award (\$3,500)
- Cornell University— Andrew W. Mellon Student Research Grant (\$1,000)
- Sigma Xi, Cornell Chapter— Research Grant (\$1,000)
- American Society of Naturalists— Student Research Award (\$2,000)
- Society for Integrative and Comparative Biology— Grant-in-aid of research (\$1,000)
- Cornell University Graduate School— Research Travel Grant (\$2,000)
- Cornell University— Graduate Student Research Fund (\$4,000)
- Cornell University— Richard G. Harrison Fund (\$3,000)

## Conference travel grants

(Total amount: \$1,250)

- Cornell University— Graduate School Conference Travel Grant (\$600)
- Cornell University— Graduate School Conference Travel Grant (\$500)
- Cornell University— Orenstein Fund (\$750)

## Fellowships

(Total amount: \$244,487)

- Cornell University Insect Collection— Summer Stipend Award (\$10,832)
- National Science Foundation— Graduate Research Fellowship (\$138,000)
- Cornell Fellowship (\$33,241)
- National Merit Scholar (\$62,414)

## Awards

- Book Award for Best First-Year Symposium Presentation

## Talks

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Dagger (†) indicates presenter.

### Invited seminars:

1. University of California, Los Angeles (2025). One genotype, many phenotypes: Evolutionary insights from complex traits in ants.
2. Natural History Museum of Los Angeles County (2024). Evolutionary insights from complex traits in ants.
3. Essig Brunch Seminar Series, University of Berkeley, Berkeley, CA. (2023). Genomic causes and consequences of worker caste polymorphism in the ants.

### Oral presentations:

1. Entomology, Portland, OR. (2025). A. Baker†, B. Brown, **M. Barkdull**, M. Guzman. The California Insect Barcoding Initiative: a million specimens and counting.
2. Entomology, Portland, OR. (2025). T. McGlynn†, Y. Kamal, **M. Barkdull**, C. Bennett, M. Angel, A. Shultz. Insects demonstrate unparalleled capacity to reflect infrared solar radiation.
3. Entomology, Portland, OR. (2025). Y. Kamal†, M. Barrett, **M. Barkdull**, A. Shultz, T. McGlynn. Shining a light on ant thermoregulation: near-infrared reflectivity across latitudes.
4. Evolution, Athens, GA. (2025) **Barkdull, M†**. Turtle ant soldiers evolve by repurposing ancient genes.
5. Evolution, Montreal, QB. (2024) **Barkdull, M†**. and Moreau, C. One genotype, many phenotypes: Evolutionary insights from complex traits in ants.
6. Evolution, Albuquerque, NM. (2023) **Barkdull, M†**. and Moreau, C. Social traits modulate genome evolution in ants.
7. Cornell Department of Ecology and Evolutionary Biology Winter Symposium, Ithaca, NY. (2022). **Barkdull, M†**. and Moreau, C. Social traits shape genome evolution in ants.
8. Social Insects in the Northeast Region meeting, Brooklyn, NY. (2020). **Barkdull, M.†** and Moreau, C. Formicidae caste determination: single cell and functional genomic techniques. \*\*Cancelled due to COVID19.

### Posters:

1. Entomology, Portland, OR. (2025). C. Bennett†, T. McGlynn, M. Barrett, A. Shultz, **M. Barkdull**, C. Penick. Ant near-infrared reflectivity responds to climatic conditions.
2. Biology of Genomes meeting, Cold Spring Harbor Laboratory, NY. (2022). **Barkdull, M†**. and Moreau, C. Social traits modulate genome evolution in ants.
3. International Symposium on Molecular Insect Science, Barcelona, Spain. (2019). E.V Heffernan†, **M. Barkdull**, and A. Markee. The role of gene flow in connecting populations of endangered skipper butterflies in the United States: using genetic data to inform management strategies.
4. Entomological Society of America meeting, St. Louis, MO. (2019). Markee, A.N†., Saarinen, E. V., **Barkdull, M.** Conservation genetics of the Florida duskywing skipper (*Ephyriades brunnea*): a multi-population assessment of a rare South Florida butterfly.
5. Imperiled Butterflies Working Group meeting, Miami, FL. (2017). Ash, M†., **Barkdull, M†**., Elmir, G.† Are endangered Dakota Skipper populations infected with Wolbachia?

## Research Positions

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### Ph.D. researcher

MOREAU LAB

- Investigated the genetic basis and consequences of worker caste polymorphisms using genome sequencing, comparative genomic methods, and transcriptomics.
- Conducted multiple field excursions to collect ant specimens to support research program.

Cornell University

August 2018–December 2024

## **Post-baccalaureate intern**

ZAMUDIO LAB

- Conducted conservation genetics research on a number of reptile and amphibian species.
- Responsible for assisting all lab members with wet lab work, including DNA extractions, microsatellite sequencing, Sanger sequencing, and library prep for MiSeq.
- Collaborated with Dr. Fábio de Sá to describe the genetic mating system of the saxicolous Brazilian frog \*Cycloramphus boraceiensis\*.

Cornell University

September 2018–August 2019

## **Hawkmoth Sensory Behavior volunteer**

RAGUSO LAB

- Participated in weekly hawkmoth colony care tasks (feeding, plant care, pupae counts etc.).
- Ran experiments testing the role of floral humidity in hawkmoth feeding choice.

Cornell University

September 2018–December 2018

## **Birdsong Evolution, research assistant**

DRS. ARAYA-SALAS AND ODOM

- Coded individual song elements in birdsong spectrograms for downstream data analysis.
- Created analysis protocol and generate graphics for future researchers on the project.

Cornell Lab of Ornithology

May 2018–May 2019

## **Florida Duskywing Genetics Project, research assistant**

HEFFERNAN LAB

- Carried out a population genetics analysis of the threatened Florida Duskywing skipper butterfly to inform conservation policy.
- Performed next-generation sequencing in order to develop novel microsatellite markers

New College of Florida

August 2017–May 2018

## **NSF Research Experiences for Undergraduates Intern**

DEPARTMENT OF INVERTEBRATE ZOOLOGY

- Used genetic techniques (Sanger sequencing etc.) to identify the hosts of terrestrial bloodfeeding leeches.
- Conducted fieldwork to collect invertebrate (leeches, crayfish) for related lab projects.

American Museum of Natural History

May 2017–August 2017

## **Dakota Skipper Wolbachia Status, research assistant**

HEFFERNAN LAB

- Conducted DNA extractions and PCR amplifications of Wolbachia pathogen genes from the endangered Dakota Skipper butterfly to identify pathogen strains.

New College of Florida

January 2017–May 2017

# **Curatorial Skills & Experiences**

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## **From Nabokov's Net exhibit contributor**

CORNELL UNIVERSITY INSECT COLLECTION AND MANN LIBRARY

September 2023–March 2024

- Collaborated with CUIC and Mann library staff to design an exhibit featuring the butterfly specimens collected by Vladimir Nabokov during his time at Cornell.
- Designed visuals and wrote content for exhibit component focused on butterfly conservation and the role of natural history collections in conservation research.

## **Six-Legged Science: Unlocking the Secrets of the Insect World exhibit contributor**

CORNELL UNIVERSITY INSECT COLLECTION AND MUSEUM OF THE EARTH

January 2022–March 2022

- Helped design components of public-facing museum exhibit, including pulling specimens, databasing, and design work
- This exhibit reached 18,592 in-person visitors.

## **Social Media co-manager**

CORNELL UNIVERSITY INSECT COLLECTION

January 2022–December 2024

- Co-managed the CUIC's Instagram and Twitter pages, designing and posting content to engage the broader community with the work of the CUIC.

## **Collections Management Workshop, participant**

CORNELL UNIVERSITY INSECT COLLECTION

January 2021–May 2021

- Participant in a semester-long workshop series, led by Drs. Jason Dombroskie and Corrie Moreau, which focused on practical discussion of topics related to the care and management of natural history collections, including museum mission statements, managing loans, permits, managing volunteers and students, databasing, and outreach.

## **Collection Databasing, graduate supervisor**

CORNELL UNIVERSITY INSECT COLLECTION

August 2020–December 2024

- Responsible for databasing specimens in the CUIC's Formicidae collection, from data entry to interfacing with Specify.
- Hired, trained, and supervised undergraduate and graduate students on how to conduct databasing in the collection.
- Designed training materials for other databasing workers.

## **Entomological Collections Network annual meeting, attendee**

November 2020–NA

- Virtually attended conferences sessions on a wide range of entomological collections management topics.

## **Teaching**

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### **Introduction to Evolution and Diversity teaching assistant**

BIOEE1780

Cornell University

January 2020–December 2024

- Taught three weekly discussion/lab sections.
- Assisted with course transition to an online format in 2020 due to COVID-19.

### **Introduction to Evolution and Diversity Writing in the Major guest lecturer**

BIOEE 1780

Cornell University

October 2023–NA

- Invited to give a guest lecture on my dissertation research and path to graduate school in Jasmine Peters' Writing in the Majors course.

### **Conservation Biology guest lecturer**

BISC 4575

Forham University

April 2023–NA

- Invited to give a guest lecture on conservation genetics and my research to Dr. Evon Hekkala's conservation biology seminar course.

### **Introduction to Evolution and Diversity grader**

BIOEE 1781

Cornell University

August 2022–December 2023

- Responsible for grading weekly assignments for online evolution and diversity course.

### **Comparative Physiology teaching assistant**

BIOG1440

Cornell University

August 2019–December 2020

- Taught three weekly discussion/lab sections, leading hands-on investigations of physiological concepts covered in lectures.
- Created extensive, novel course review materials; available on my GitHub.

### **Foundations of Biology teaching assistant**

BIOL2100

New College of Florida

August 2017–December 2017

- Led review sessions prior to tests and quizzes.
- Met individually with students to address performance questions.

### **Cellular Biology teaching assistant**

BIOL3500

New College of Florida

August 2016–December 2016

- Led content-delivery and problem-solving review sessions once per week.
- Assisted in exam grading and clerical tasks.

## **Mentoring Experiences**

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### **Yume Kamal**

NHM/CSU Dominguez Hills

March 2025–NA

MASTER'S STUDENT

- With Dr. Terry McGlynn, co-mentored on a master's project to understand how variation in ants' infrared reflectivity is associated with thermal environment.

### **Eduardo Guzman**

Cornell University

June 2024–NA

HIGH SCHOOL SUMMER INTERN

- Co-mentored Eduardo as he gained exposure to a variety of entomological and collections-based research approaches, including field collecting, ant specimen curation, databasing, DNA extraction, PCR, and scientific communication.

### **Mahalia Donaldson**

Cornell University

August 2022–May 2023

PAID RESEARCH INTERN

- Conducted a research project to the evolution of genes related to aggression in ants spanning a range of aggression phenotypes.
- Learning scientific programming skills including Bash and R scripting, Git and Github version control
- Results of this project were published as an invited submission to Annals of the Entomological Society of America.

### **Seyde Delgado**

Cornell University

May 2022–Present

PAID RESEARCH INTERN; BIOLOGY 2990 INDEPENDENT RESEARCH EXPERIENCE STUDENT

- Conducted a research project to understand the relationship between herbivory and molecular evolution in ants.
- Learning scientific programming skills including Bash and R scripting, Git and Github version control

# Service

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## SSE Lewontin Early Award reviewer

SOCIETY FOR THE STUDY OF EVOLUTION

March 2025–NA

## Professional Development panelist

DEPT. OF ENTOMOLOGY

- Answered questions from first-year graduate students about strategies for success in graduate school.

Cornell University

October 2024–NA

## EvoAlly

SAFE EVOLUTION INITIATIVE

- Trained to use active bystander techniques and serve as a point of contact for conference attendees to increase participant safety as part of the Safe Evolution initiative.

Evolution Conference

July 2024–Present

## Graduate Student Association treasurer

DEPT. OF ECOLOGY & EVOLUTIONARY BIOLOGY

Cornell University

August 2022–August 2023

- Managed funding from the university for graduate student and some department events.

Cornell University

July 2020–August 2022

## Graduate Student Association co-president

DEPT. OF ECOLOGY & EVOLUTIONARY BIOLOGY

- Liased between graduate student body and faculty leadership to communicate and address graduate student concerns
- Participated in the formation of working groups focused on assessing and improving diversity, equity and inclusion in the department.

## Cornell Diversity Preview Weekend volunteer

DEPT. OF ECOLOGY & EVOLUTIONARY BIOLOGY

Cornell University

September 2020 and summer 2021–NA

- Volunteered for the workshops “Crafting a CV” and “Fellowships and Personal Statements” providing peer review to participants for the 2020 DPW event.
- Served as a peer mentor to a DPW participant during the Fall 2020 semester.
- Answered participant questions as a panelist for the workshop “Crafting a CV” for the 2021 DPW event.

Cornell University

Spring 2020–NA

## EvoDay Planning Committee

\* POSTPONED TO SPRING 2022 DUE TO COVID19

- Identify and invite speakers for a day-long symposium on the theme of “Evolution in Deep Time”.

## Department Seminar Series Committee

DEPT. OF ECOLOGY & EVOLUTIONARY BIOLOGY

Cornell University

August 2019–August 2020

- This committee plans and coordinates the department’s weekly seminar series
- Responsible for soliciting speaker nominations, constructing schedule of speakers, and assisting host labs with managing their speaker visits.
- While on this committee, I initiated a push to increase the diversity of our invited speakers, based on the best practices identified by Hagan et al. (2020).

## Journal referee:

- Integrative and Comparative Biology, editorial reviewer
- Environmental DNA, ad hoc reviewer
- Wellcome Open Research, ad hoc reviewer
- Molecular Biology and Evolution, ad hoc reviewer
- Ecology and Evolution, ad hoc reviewer
- PCI EvolBio, ad hoc reviewer
- Molecular Ecology, ad hoc reviewer
- Genome Biology and Evolution, ad hoc reviewer
- Evolution, ad hoc reviewer
- Insects Sociaux, ad hoc reviewer

## Society membership:

- Society for the Study of Evolution (SSE), 2023- present.
- Society for Open, Reliable, and Transparent Ecology and Evolutionary Biology (SORTEE), 2023- present.
- Society for Integrative and Comparative Biology (SICB), 2022- 2023.
- Entomological Society of America (ESA), 2024- present.

# Outreach

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## Haunted Museum

NHMLAC

September 2025–NA

- Manned a table on insect diversity, bringing our collection to members of the public.

## **Descanso After Dark**

*Descanso Gardens*

September 2025–NA

- Displayed live insects and presented on insect diversity to guests at the Descanso After Dark event.

## **Tours, NHMLAC Entomology**

*NHMLAC*

*Ongoing–NA*

- Gave tours of the NHMLAC Entomology collection to groups including the NSF RaMP UNLAB mentees, and in partnership with the Advancement team.

## **Tabling, NHMLAC Bug Fair**

EVENT VOLUNTEER

*NHMLAC*

May 2025–NA

- Manned a table on insect diversity, bringing our collection to members of the public.

## **Tabling, NHMLAC Earth Day Festival**

EVENT VOLUNTEER

*NHMLAC*

April 2025–NA

- Manned a table on insect diversity, bringing our collection to members of the public.

## **Tabling, NHMLAC Green Screens showing of the film Nocturnes**

EVENT VOLUNTEER

*NHMLAC*

April 2025–NA

- Manned a table on moth diversity, bringing our collection to members of the public.

## **Interview, KTLA**

March 2025–NA

- Discussed the NHMLAC Butterfly Pavilion and butterfly conservation with KTLA's Gayle Anderson.

## **Tabling, NHMLAC First Fridays**

EVENT VOLUNTEER

*NHMLAC*

March 2025–NA

- Manned a table on insects and sound, bringing our collection to members of the public.

## **Guest presenter for second grade class unit on arthropods**

VOLUNTEER

*Ferndale Elementary School*

January 2024–NA

- Presented ant fun facts to 60 second grade students, and answered student questions about ants.

## **Volunteer instructor for Ithaca Children's Garden summer camp**

EVENT VOLUNTEER

*Ithaca Children's Garden*

July 2023–NA

- Led 6-10 year old campers through hands-on activity focused on the ant life cycle and on insect collecting.

## **Panelist for "Women in Entomology: Meet the Superheroes of Insect Science"**

*WSKG/PBS*

PUBLIC TALK

October 2022–NA

- Discussed research and insect conservation.
- Panel can be viewed at <https://www.youtube.com/watch?v=HZ0WdZk84wM>

## **Guest blogger for the Paleontological Research Institute/Museum of the Earth**

*Paleontological Research Institute/Museum of the Earth*

July 2022–NA

- Guest blogged for the Paleontological Research Institute and Museum of the Earth. \*\*Barkdull, M.\*\* (2022). Insects under threat: the role of natural history collections in biodiversity conservation. <https://bit.ly/3ph2lsm>

## **"Meet an Entomologist" volunteer**

*Six-legged Science Exhibit, Museum of the Earth*

July 2022–NA

EVENT VOLUNTEER

- Answered questions from visitors to the Musuem of the Earth's Six-legged Science exhibit.

## **Panelist for "Exploring Insect Evolution: A Panel on New Research"**

*Darwin Days Week, Museum of the Earth*

February 2022–NA

PUBLIC TALK

- Gave a research talk for the event \*Exploring Insect Evolution: A Panel on New Research\* as part of the Museum of the Earth's Darwin Days events.
- Talk can be viewed at <https://bit.ly/3s4jOGB>

## **Cornell Insectapalooza volunteer**

*Dept. of Entomology, Cornell University*

October 2019, 2022, 2023, 2024–NA

EVENT VOLUNTEER

- Manned a table on ant diversity and discussed all things ant with members of the public, including young children, teens and adults.

