Zachary L.T. Bunch

Email: Zachbunch2002@gmail.com, ZacharyBunch@psu.edu, Mobile: (336)-536-2365

EDUCATION

In progress - Ph.D. Ecology, The Pennsylvania State University

- In progress: Ph.D. Ecology
- Advisor: Christina Grozinger

Completed - M.S. Biology, University of North Carolina, Greensboro

- Completed: M.S. Biology
  - Defended: 4/16/2024
- Advisor: Kimberly Komatsu
- Committee: Jim Coleman, Sally Koerner

Completed - B.S. Biology, University of North Carolina, Greensboro

- Completed: B.S. Biology, Graduated Spring 2022
- Llyod International Honors College – International Honors Program

Completed - A.A. & A.S. - Guilford Technical Community College

- Completed: A.A., Graduated Spring 2020
- Completed A.S., Graduated Fall 2019

RESEARCH EXPERIENCE

Graduate Research Assistant

- August 2025 - Current
- Department of Entomology, The Pennsylvania State University
- InsectNET Trainee
  - Interdisciplinary Studies in Entomology, Computer Science and Technology Network
  - https://insectnet.psu.edu/
- Supervisor: Dr. Christina Grozinger
- PhD Student in Intercollege Graduate Degree Program in Ecology (The Pennsylvania State University)

Research Technician

- May 2025 - August 2025
- Department of Entomology, The Pennsylvania State University
- Supervisor: Dr. Christina Grozinger
- Assisting with lab operations/research

Research Scientist

- May 2024 - August 2024
- Department of Biology, University of North Carolina at Greensboro

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- Supervisor: Dr. Kimberly Komatsu
- Project title: Continuing work on "*Impacts of Patch Burn Grazing on the Invertebrate Communities of Kansas Rangelands*"
    - Description: In this role, I continued to conduct research on fire management and invertebrate communities. This project was the basis of my thesis and took place at Konza Biological Research Station in Manhattan, KS. During this role, I worked to move this project towards publication.

Graduate Research Assistant

- January 2023 - May 2024
- Department of Biology, University of North Carolina at Greensboro
- Supervisor: Dr. Kimberly Komatsu
- Project title: "*Impacts of Patch Burn Grazing on the Invertebrate Communities of Kansas Rangelands*"
    - Description: This project is the basis of my thesis and takes place at Konza Biological Research Station in Manhattan, KS. We are seeking to investigate the use of patch burn grazing, a novel burn management technique, to promote positive invertebrate community health in tall-grass prairie ecosystems.

Research Technician

- May 2022 - August 2022
- Department of Biology, University of North Carolina at Greensboro
- Supervisor: Dr. Kaira Wagoner
- Projects: Worked on several projects revolving around honeybee research. These include hygienic behavior, pollinator preferences and Varroa destructor virus levels.

Undergraduate Research Assistant

- November 2020 - May 2022
- Department of Biology, University of North Carolina at Greensboro
- Advisor: Dr. Sally E. Koerner
- Project: Worked on meta-analysis to understand the global effects of drought on plant invasions

Undergraduate Research and Creativity Award Researcher

- August 2021- December 2021
- Advisor: Dr. Sally E. Koerner (with Morgan Frost as graduate student mentor)
- Project title: "*Impacts of invasion on the insect communities of Montanan rangelands"*
    - Description: This project was basis for my monetary research award. I investigated the impacts of the invasive *Bromus Arvensis* on the invertebrate communities of Montanan rangelands using samples collected as Fort Keogh Livestock and Range Research Laboratory

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PEER-REVIEWD PAPERS

- **Bunch, Z. L. T.,** M. L. Avolio, S. E. Koerner, K. R. Wilcox, L. Zeglin, K. Komatsu. 2026. Understanding the effects of patch-burn grazing management on aboveground grassland invertebrate biodiversity. **Oikos** e11935**.** DOI
- Bloodworth KJ, Trimas Frost MD, Young AL, Allred GA, Araya D, **Bunch Z. L. T.,** Ford JM, Glass EA, Gora SL, Green CE, Johnson AL, Mann WT, Mota S, Numan M, *et al*. 2025. Heatwaves leave a legacy on a dominant understory grass in longleaf pine savanna. **Ecosphere** 16(12):e70481. DOI.
- Frost, M. D. T., G. E. Trimas, K. A. Johnston, **Z. L. T. Bunch,** A. D. Jolin, and S. E. Koerner. 2025. Native plant species exhibit consistent drought advantage over introduced species until additional global change drivers are included: A grassland meta-analysis. Journal of Ecology 113:2698–2711. DOI.
- **Bunch, Z. L.T.**, M. L. Avolio, S. E. Koerner, K. R. Wilcox, L. H. Zeglin, and K. J. Komatsu. 2025. Patch-Burn Grazing is Similar to Annual Burning in Effects on Belowground Invertebrates in Tallgrass Prairie. Rangeland Ecology & Management 101:140–146**.** DOI.
- Frost, M. D. T., K. J. Komatsu, L. M. Porensky, K. O. Reinhart, K. R. Wilcox, **Z. L. T. Bunch**, A. D. Jolin, K. A. Johnston, G. E. Trimas, and S. E. Koerner, 2024, Plant, insect, and soil microbial communities vary across brome invasion gradients in northern mixed-grass prairies. Oikos, Volume 2024, Issue 6, e10515. DOI.

MANUSCRIPTS IN PREPARATION

- Geng J., Zhuang S., **Bunch Z.L.T.**, Patch H.M., Grozinger C.M. **(in prep)**. *InsectEye: Insect-centered design of real-time automated monitoring system for insect biodiversity.*
- Amoah E.I., **Bunch Z.L.T.**, Patch H.M., Grozinger C.M. **(in prep)**. *EcoMorph: A prompt-based visual foundation system for automated morphological trait quantification and biomass estimation in ecological research.*

ADDITIONAL NON-PEER-REVIEWED PAPERS

- **Bunch, Z.,** M. Frost and S.E. Koerner. Impact of Invasion on the Insect Communities of Montana Rangelands. Y Ddraig Goch; An Interdisciplinary Honors Journal. **Published 3/31/2023.**

SCHOLARSHIPS AND AWARDS

Simons Graduate Fellowships in Ecology and Evolution (Simon Foundation), 2025, $265.800 (Fellowship/stipend)

- Finalist with anticipated reception in 2026 (all finalists will receive an award pending confirmation of certain criteria)
- "The purpose of these awards is to provide support for students entering U.S.-based Ph.D. programs with a plan to perform research in ecology and evolution. While we will

consider all projects in ecology and evolution, we are particularly interested in interdisciplinary research that jointly considers processes on both ecological and evolutionary timescales, or that links studies of ecology and evolution to other STEM fields, including physics, computer science, mathematics, chemistry and other areas of biology, especially genetics."

University Graduate Fellowship (Penn State), 2025, $10,000 (Fellowship/stipend)

- "The UGF is the most prestigious and competitive graduate fellowship awarded by the Graduate School. It is given to a select group of the best incoming graduate students across all Penn State graduate programs."

Biology Graduate Student Support Grant (UNC Greensboro), 2023, $370 (research funds)

- *Competitive departmental research funds award*

Excellence in Research Award (UNC Greensboro), 2022, (nonmonetary)

- *Awarded to students who complete rigorous criteria indicting they have excelled in research during their undergraduate career.*

Honorable Mention, 2022 (UNC Greensboro), (nonmonetary)

- *Awarded to student with notable presentations at the 16th annual Carolyn and Norwood Thomas Undergraduate Research and Creativity Expo*

Biology Undergraduate Research Award (UNC Greensboro), 2022, $105 (Research funds)

- *Awarded to students seeking to fund undergraduate research projects.*

Biology Undergraduate Research Award (UNC Greensboro), 2021, $190 (Research funds)

- *Awarded to students seeking to fund undergraduate research projects.*

Undergraduate Research and Creativity Award (UNC Greensboro), 2021, $1250 (Stipend)

- *Award stipend through the Undergraduate Research, Scholarship, and Creativity Office*

Chancellor's Scholarship Award (UNC Greensboro), 2019, *$4500 (Scholarship)*

- *Awarded to a select number of students who show academic merit*
- *Repeatable for four years*

PRESENTATIONS

Z Bunch, H. Patch and C. Grozinger. March 27th, 2026. *Monitoring insect diversity with AI-enabled devices.* The Pennsylvania State University 2026 Graduate Research Expo. **(Poster)**

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Z Bunch, H. Patch and C. Grozinger. March 26th, 2026. *Monitoring insect diversity with AI-enabled devices.* The Pennsylvania State University 2026 Gamma Sigma Delta Research Expo. **(Poster)**

Z Bunch, J. Geng, H. Patch and C. Grozinger. November 11th, 2025. *Monitoring insect diversity with AI-enabled devices.* Presented at the symposium Advancing Digital Pest Monitoring: Technologies, Challenges, and Opportunities, Entomological Society of America Annual Meeting, Oregon Convention Center, Portland, OR. **(Talk)**

Z. Bunch, April 16th, 2024, *Impacts of patch burn grazing on the invertebrate communities of Kansas rangelands.* UNC Greensboro's Department of Biology **(Thesis defense)**

Z. Bunch and K. Komatsu 2024, March 24th, *Impacts of patch burn grazing on the invertebrate communities of Kansas rangelands*. Entomological Society of America - 2024 North Central Branch Meeting **(Talk)**

Z. Bunch and K. Komatsu 2023, November 2nd*, Impacts of patch burn grazing on the invertebrate communities of Kansas rangelands.* UNC Greensboro's 3 Minute Thesis Finalist **(Talk)**

Z. Bunch and K. Komatsu 2023, May 31st, *Impacts of patch burn grazing on the invertebrate communities of Kansas rangelands.* Konza LTER NSF Site Review. **(Poster)**

Z. Bunch and K. Komatsu 2023, April 4th, *Impacts of patch burn grazing on the invertebrate communities of Kansas rangelands.* 11th Annual Graduate Research and Creativity Showcase. **(Poster)**

Z. Bunch, M. Frost and S. Koerner. 2022, April 18th*. Impacts of invasion on the insect communities of Montanan Rangelands*. 16th annual Carolyn and Norwood Thomas Undergraduate Research and Creativity Expo **(Talk)**

Z. Bunch, M. Frost and S. Koerner. 2022, March 25th. *Impacts of invasion on the insect communities of Montanan Rangelands.* Lloyd International Honor's College 22nd Annual Honors Symposium. **(Talk)**

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Z. Bunch, M. Frost, and S. Koerner. 2021, November 13th. *Impacts of invasion on the insect communities of Montanan rangelands.* State of North Carolina Undergraduate Research and Creativity Symposium. **(Poster)**

LEADERSHIP EXPERIENCE

Social Chair – Ecological Graduate Student Association (Penn State)

- Social chair for the Intercollege Degree Program in Ecology
- January 2026 – present

Graduate Student Association Senator

- Representative for the Department of Biology
- January 2024 – May 2024

Graduate Student Association Alternative Senator

- Representative for the Department of Biology
- August 2023 – January 2024

WORK & TEACHING EXPERIENCE

Adjunct Lecturer of Biology

- March 2025 – July 2025
- Department of Life Sciences, Forsyth Technical Community College
- Supervisor: Dr. Holly Ramey
- Courses
    - BIO 112
        - Prerequisite for 300-level courses and above. This is a lab and lecture combination course that covers the fundamental principles of biology including botany, zoology, evolution, and ecology.
        - Taught both remote and hybrid

Adjunct Lecturer of Biology

- August 2024 – May 2025
- Department of Biology, High Point University
- Supervisor: Dr. Matthew Talbert
- Courses
    - ENV 1110L

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        - This laboratory course examines problems associated with the interaction of humans with their environment. Taken in conjunction with a lecture course.
    - BIO 1501L
        - This introductory lab course focused on the chemical, cellular, and metabolic levels of biological organization. The acquisition of basic scientific lab skills including data analysis are emphasized. Students learn to preform cell biology techniques, develop and interpret graphical representations of their data, and communicate scientific information in written and oral formats.

Graduate Teaching Assistant

- January 2023 – May 2024
- Department of Biology, University of North Carolina at Greensboro
- Supervisor: Dr. Malcolm Schug
- Courses
    - BIO 112L
        - Prerequisite for 300-level courses and above. Laboratory course covers the fundamental principles of biology including botany, zoology, evolution, and ecology.
    - BIO 111
        - Prerequisite for most other biology courses. Lecture covers the fundamental principles of biology including the molecular and cellular basis of life, genetics, and biotechnology.
    - BIO 111L
        - Served as both Graduate Teaching Assistant AND the Instructor of Record
        - Prerequisite for most other biology courses. Laboratory course covers the fundamental hands-on techniques associated with the principles of biology including the molecular and cellular basis of life, genetics, and biotechnology.

Administrative Assistant

- October 2022 – January 2023
- Advancement Services, North Carolina State University
- Supervisor: Jessi Fasola
- Member of the gifts team. Assisted in the management and upkeep of the Advance database. This requires donor communication, high attention to detail and close collaboration with colleagues.

Veterinary Assistant

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- January 2017 – May 2022
- King's Crossing Animal Hospital
- Supervisor: Dr. Angelique Fuller
- Assist and perform medical care for animals, run relevant laboratory tests and provide client communication.

Tutor

- 2020 Spring Semester
- UNC Greensboro
- Supervisor: Chris Dizon
- Tutored students enrolled in physics and economics classes at UNC Greensboro through the Academic Achievement Center

SKILLS AND CERTIFICATES

Computing and Laboratory Skills

- Invertebrate identification
- Invertebrate biomass collection
- Invertebrate pinning and pointing
- RStudio Statistical Software
- ArcGIS (introductory experience)
- Microsoft Office (Excel, Word, and PowerPoint)
- Cornerstone (Customer Relationship Management Software)
- Advance (Customer Relationship Management Software)

Field Skills

- Invertebrate sample collection (reverse leaf blower)
- Soil coring
- Soil moisture/temperature probe measurements
- Light meter measurements
- CO_2 respiration measurementss
- On sight pollinator identification
- General beekeeping

Certifications

- *CRLA Tutor Training Program Certification: Tutor, Level 1*
- *American Red Cross: Cat and Dog First Aid*

PRESS MENTIONS

- UNCG News: "Pet Walls Brighten UNCG Halls" https://www.uncg.edu/faculty-staff/pet-walls-brighten-uncg-halls/

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- UNCG Research Magazine: “Bee Business” https://researchmagazine.uncg.edu/spring-2023/part-of-the-hive/bee-business/