

## ADRIAN L. CARPER

Postdoctoral Associate and Lecturer  
Department of Ecology and Evolutionary Biology, University of Colorado  
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### EDUCATION

- 2008-2013 Ph.D., Ecology and Evolutionary Biology  
Dept. of Biological Sciences, Dartmouth College, Hanover, NH  
Advisor: Dr. Rebecca Irwin
- 1999-2003 Bachelor of Science, Fisheries and Wildlife Sciences  
North Carolina State University, Raleigh, NC  
Minor in Environmental Science, Magna Cum Laude

### ACADEMIC APPOINTMENTS

- 2013-present *Postdoctoral Associate and Lecturer*  
Dept. Ecology and Evolutionary Biology (2013-present)  
University of Colorado, Boulder, CO, 80309
- Senior Research Assistant*, Dept. Biological Sciences (2016)  
Oakland University, Rochester, MI, 48309
- Postdoctoral Associate*, Dept. Entomology (2013-2015)  
University of Wisconsin, Madison, WI, 53706

### PEER-REVIEWED PUBLICATIONS

- Carper, A. L.**, R. E. Irwin, L. S. Adler, and P. S. Warren. 2020. Pollination in suburban environments: implications for pollen limitation of native plant reproduction\*. *Oikos: submitted*.
- Birdshire, K. R., **Carper, A. L.**, & C. E. Briles. 2020. Bee community response to local and landscape factors along an urban-rural gradient. *Urban Ecosystems*: 1-14.
- Carper, A. L.**, Enger, M., & M.D. Bowers. 2019. Host plant effects on immune response across development of a specialist caterpillar. *Frontiers in Ecology and Evolution*: 7: 1 – 11.
- Jamieson, M. A, **Carper, A. L.**, Wilson, C. J., Scott, V. L., & J. Gibbs. 2019. Geographic biases in bee research limits understanding of species distribution and response to anthropogenic disturbance. *Frontiers in Ecology and Evolution*: 7: 1 – 8.
- Carper, A. L.**, Schwantes, C. J., & M. A. Jamieson. 2019. A new state record of the rare bee, *Cemolobus ipomoeae* (Hymenoptera, Apidae), from Colorado, USA. *Journal of the Kansas Entomological Society*: 91(2): 171 – 175.
- Schwantes, C. J., **Carper, A. L.**, & M.D. Bowers. 2018. Solitary floral specialists do not respond to cryptic flower-occupying predators. *Journal of Insect Behavior*: 31(6):642 – 655.
- Carper, A. L.** & R. E. Irwin. 2016. Effects of florivory on plant-pollinator interactions:

implications for male and female components of plant reproduction. *American Journal of Botany*: 103(6): 1061 – 1070.

**Carper, A. L.**, L. S. Adler, P. S. Warren, & R. E. Irwin. 2014. Effects of suburbanization on forest bee communities. *Environmental Entomology* 43(2):253 – 262.

Irwin, R., P. Warren, **A. Carper**, & L. Adler. 2013. Plant–animal interactions in suburban environments: implications for floral evolution. *Oecologia* 174(3): 803 – 815.

#### MANUSCRIPTS IN PREPARATION

\* manuscript available on request

Muchoney, N.D., M.D. Bowers, **A.L. Carper**, P.A. Mason, M.B. Teglas, & A.M. Smilanich. 2020. A tale of two host-plants: Phytochemical sequestration mediates shift in herbivore defenses following host-range expansion. *in prep.*

Morphew, A.M., **Carper, A.L.**, Bowers, M.D. & M.A. Jamieson. Grassland conservation plantings support more abundant cavity-nesting bee communities than rangelands in agroecosystems. for *Journal of Insect Conservation* (2020)

**Carper, A. L.**, Richardson, L. L., and M. D. Bowers. Seasonal variation in hostplant chemistry drives sequestration in a specialist herbivore\*. for *Journal of Chemical Ecology* (2020)

**Carper, A. L.**, Schwantes, C. J., Norton, A.P., Bowers, M.D., and M. A. Jamieson. Ecological efficacy of three different capture techniques for wild bee inventories\*. for *Insect Conservation and Diversity* (2021).

**Carper, A. L.**, Schwantes, C. J., Endriss, S. B., Norton, A.P., Bowers, M.D., and M. A. Jamieson. Local and landscape factors driving wild bee community dynamics across Colorado agroecosystems \*. for *Journal of Insect Conservation* (2021).

#### EXTERNAL GRANTS

2016 Boulder County Parks & Open Space: \$10,000. The conservation value of woody debris for cavity-nesting bees on Boulder County open space. PI. D. Bowers co-PI

2015 Boulder County Parks and Open Space: \$11,452. Agricultural Practices on Boulder County Open Space: implications for pollinator conservation. Co-PI with C. Kearns and D. Oliveras.

2012 National Science Foundation: Doctoral Dissertation Improvement Grant: \$13,560. DISSERTATION RESEARCH: Effects of suburbanization on multispecies plant-animal interactions. PI.

#### INTERNAL GRANTS AND FELLOWSHIPS

2016 Undergraduate Research Opportunity Program Team Grant: \$3,000. Exploring Patterns of Cavity-Nesting Bee Community Dynamics across Colorado. PI.

2015 Undergraduate Research Opportunity Program Team Grant: \$3,000. The Bees' Needs: Integrating Ecological Research with Citizen Science. PI.

Biological Undergraduate Research Skills & Training Grant: \$2,500. Pollen-host use and cavity-nesting bee performance in conservation grasslands of Colorado. PI. In collaboration with honors student, A. M. Morphew.

Undergraduate Research Opportunity Program Team Grant: \$3,000. Digital Curation of Colorado's Native Bees: Practical Applications. PI.

2014 Undergraduate Research Opportunity Program Team Grant: \$3,000. Growth and

Reproduction of Cavity Nesting Bees across an Agricultural Gradient. PI.

INTERNAL GRANTS AND FELLOWSHIPS, *continued*

- 2014 Undergraduate Research Opportunity Program Team Grant: \$3,000. Biological effects of extreme weather events: Response of native bees to the Colorado flood. PI.
- 2012 Dartmouth Graduate Studies Travel Award: \$1,000
- 2009 Graduate Assistance in Areas of National Need Fellowship. \$30,000

MENTORED STUDENT GRANTS

- 2020 Louis Webster Fund, Denver Audubon: \$4,853. The Impacts and Recovery Status of Wild Bee Communities following a Catastrophic Flood. CU-Boulder MS student J. Mullins.
- 2019 CU-Boulder Undergraduate Research Opportunity Program Individual Grant: \$3,000. St. Vrain Bee Surveys. Undergraduate Mr. J. Unger.
- 2018 The Garden Club of America Centennial Pollinator Fellowship: \$4,000. Changes in wild bee diversity and abundance along an urban to rural gradient. CU-Denver MS student K. Birdshire.
- 2016 CU-Boulder Undergraduate Research Opportunity Program Individual Grant: \$2,400. The impact of nest-site limitation on the population dynamics of native cavity-nesting bees. Undergraduate K. Bohanon.
- 2016 CU-Boulder Undergraduate Research Opportunity Program Individual Grant: \$2,400. Impacts of flood restoration efforts on riparian plant and pollinator communities. Undergraduate T. Streb.
- Eve Verderber Undergraduate Research Fellowship: \$1,500. Assessing wild bee growth and development across agroecosystems in Colorado: impacts of the Conservation Reserve Program. Honors Thesis undergraduate A. Morphew.
- CU-Boulder Undergraduate Research Opportunity Program Individual Grant: \$2,400. Factors driving competitive and host-parasite dynamics of native bees across the Front Range. Undergraduate researcher L. Mendoza.
- 2015 CU-Boulder Undergraduate Research Opportunity Program Individual Grant: \$1,200. The impacts of land-use on bees in agroecosystems: Does the Conservation Reserve Program promote cavity-nesting bee communities? Honors Thesis undergraduate A. Morphew.

COURSES TAUGHT

- 2019 *Insect Biology*, EBIO 4660, Department of Ecology and Evolutionary Biology, University of Colorado-Boulder. Instructor: Explored insect biology, ecology, systematics and evolution of insects through lectures, active learning activities, field trips, and laboratory.
- 2019 *Principles of Ecology*, EBIO 2040. Department of Ecology and Evolutionary Biology, University of Colorado-Boulder. Lecturer: developed and gave lectures on the major disciplines, theories, and classical hypotheses in the field of ecology.
- 2018 *Insect Biology*, EBIO 4660, Department of Ecology and Evolutionary Biology, University of Colorado-Boulder. Instructor: Explored insect biology, ecology,

systematics and evolution of insects through lectures, active learning activities, field trips, and laboratory.

- 2015 *Principles of Ecology*, EBIO 2040-20. Department of Ecology and Evolutionary Biology, University of Colorado-Boulder. Lecturer: developed and gave lectures on the major disciplines, theories, and classical hypotheses in the field of ecology.

#### GUEST LECTURES

- 2020 *Beeography*, GEOG 5500, Geography and Environmental Sciences, University of Colorado-Denver. Guest lectured on wild pollinator taxonomy and ecology in relation to local, landscape, continental, and global scales of biodiversity. Explored factors driving large-scale patterns of bee biodiversity.
- Biogeography*, GEOG 3351, Geography, University of Colorado-Boulder. Guest lectured on wild pollinator ecology in relation to local, landscape, continental, and global scales of biodiversity. Explored current knowledge, areas in need of research, and theoretical drivers of large-scale patterns of biodiversity.
- 2019 *Landscape Architecture*, ENVD 3200 Praxis, Program in Environmental Design, University of Colorado-Boulder. Guest lectured on wild pollinator ecology in relation to urban pollinator habitat design and gave tours of the Entomology Collection.
- 2018 *Principles of Ecology*, EBIO 2040. Department of Ecology and Evolutionary Biology, University of Colorado-Boulder. Lectured on pollinator conservation and lead a field research trip to Red Wagon Farm where students surveyed pollinators to aid Boulder Co. Parks and Open Space in restoration efforts.
- 2018 *Landscape Architecture*, ENVD 3200 Praxis, Program in Environmental Design, University of Colorado-Boulder. Guest lectured on wild pollinator ecology in relation to urban pollinator habitat design, gave tours of the Entomology Collection, and served as a research advisor for course research projects.
- 2018 *Biogeography*, GEOG 3351, Geography, University of Colorado-Boulder. Guest lectured on wild pollinator ecology in relation to local, landscape, continental, and global scales of biodiversity. Explored current knowledge, areas in need of research, and theoretical drivers of large-scale patterns of biodiversity.
- 2017 *Insect Biology*, EBIO 4460. Department of Ecology and Evolutionary Biology, University of Colorado-Boulder. Guest lecturer for pollination biology.
- 2016 *Insect Biology*, EBIO 4460. Department of Ecology and Evolutionary Biology, University of Colorado-Boulder. Guest lecturer for pollination biology.
- 2013 *Insect Biology*, EBIO 4460. Department of Ecology and Evolutionary Biology, University of Colorado-Boulder. Guest lecturer for pollination biology.

#### TEACHING ASSISTANTSHIPS

- 2012 *Statistics and Experimental Design I*, BIO 128. Dept. of Biological Sciences, Dartmouth College, Hanover, NH. Taught graduate laboratory session, introducing students to R programming, experimental design and analysis.
- 2011 *Animal Behavior*, BIO 27. Dept. of Biological Sciences, Dartmouth College, Hanover, NH. Cooperated in the development and teaching of observational and experimental laboratory exercises to explore and test hypotheses about animal behavior.

- 2009 *Ecology*, BIO 16. Dept. of Biological Sciences, Dartmouth College, Hanover, NH. Teaching Assistant: organized and led review sessions for lecture exams and graded lecture assignments.
- 2009 *Animal Behavior*, BIO 27. Dept. of Biological Sciences, Dartmouth College, Hanover, NH. Teaching Assistant: cooperated in the development and teaching of observational and experimental laboratory exercises to explore and test hypotheses about animal behavior.

#### OTHER TEACHING EXPERIENCE

- 2019 *Intro to Colorado's Wild Bees: Their Taxonomy and Ecology*, Boulder County Nature Association, Boulder, CO. Instructor: developed evening adult course for BCNA on bee ecology, natural history, and identification. Organized and led a field trip to explore bees on Open Spaces.
- 2019 *Prairie Perambulations: A Pawnee Grasslands Immersion Weekend*, Boulder County Audubon Society, Semi-Arid Grasslands Research Center, Nunn, CO. Instructor: gave morning lecture on bee ecology, natural history, and identification; organized and led a field trip exploring native prairie bees.

#### CONFERENCE PRESENTATIONS

\* Undergraduate co-author

- 2020 Ecological Society of America Meeting, Virtual. *Seasonal variation in hostplant chemistry drives sequestration in a specialist caterpillar*. **A. L. Carper**, L. L. Ricardson, & M. D. Bowers. Contributed oral session.
- 2019 Ecological Society of America Meeting, Louisville, KY. *Impacts of host plant on sequestration and immune response across development in a specialist caterpillar*. **A. L. Carper**, M. Enger, & M. D. Bowers. Contributed oral session.
- 2017 Ecological Society of America Meeting, Portland, OR. *Exploring variation in local and landscape factors driving grassland bee communities in Colorado*. **A. L. Carper**, C. J. Schwantes, S. M. Endriss, M. D. Bowers, A. P. Norton, and M. A. Jamieson. Contributed oral session.
- 2017 Front Range Open Space Research Symposium, Boulder, CO. **A. L. Carper** & M. D. Bowers. *The conservation value of woody debris for cavity-nesting bees on Boulder County Open Space*.  
Guild of Rocky Mountain Ecologists and Evolutionary Biologists, University of Colorado Mountain Research Station, CO. **A.L. Carper**. *The impacts of woody debris and its management on Boulder County's wild bee communities*.
- 2016 Ecological Society of America Meeting, Ft Lauderdale, FL. *Local and landscape factors driving bee communities across agroecosystem in Colorado*. **A. L. Carper**, C. J. Schwantes, S. M. Endriss, M. D. Bowers, A. P. Norton, and M. A. Jamieson. Contributed oral session.
- 2014 Entomological Society of America Meeting, Portland, OR. *Conservation grasslands support diverse native bee assemblages in agroecosystems*. **A. L. Carper**, A. P. Norton, M. D. Bowers, C. J. Schwantes, S. M. Endriss, and M. A. Jamieson. Poster presentation.

- 2013 Entomological Society of America Meeting, Austin, TX. *Pollination in suburban environments: Implications for native plant reproduction*. **A. L. Carper**, L. S. Adler, P. S. Warren, and R. E. Irwin. P-IE Section Symposium.
- 2012 Ecological Society of America Meeting, Portland, OR. *Pollination in suburban landscapes: increased bee abundance does not benefit native plants*. **A. L. Carper**, L. S. Adler, P. S. Warren, and R. E. Irwin. Contributed oral session.
- 2010 Entomological Society of America Meeting, San Diego, CA. *Effects of suburbanization on forest bee diversity*. **A. L. Carper**, R. E. Irwin, L. S. Adler, and P. S. Warren. Poster presentation.
- 2010 Ecological Society of America Annual Meeting, Pittsburgh, PA. *Effects of suburbanization on bee abundance, diversity, and plant-pollinator interactions*. **A. L. Carper**, R. E. Irwin, and L. S. Adler. Contributed oral session.
- 2009 Ecological Society of America Annual Meeting, Albuquerque, NM. *Effects of urbanization on bee abundance and diversity*. **A. L. Carper**, R. E. Irwin, and L. S. Adler. Poster presentation.

#### COAUTHORED CONFERENCE PRESENTATIONS

\* Undergraduate co-author

- 2020 Society for the Preservation of Natural History Collections. Online. *What happens when you let an ecologist loose on your Specify database: Semi-automated data cleaning using R*. A.L. Carper and T.S. Karim. Organized oral session.
- 2019 Entomological Society of America Annual Meeting, St. Louis, MO. *Phytochemical and immunological mediation of interactions between a pathogenic densovirus and its lepidopteran hosts*. N. Muchoney, M. D. Bowers, P. Mason, A L. Carper and A. Smilanich. Organized oral session.
- 2018 Entomological Society of America Annual Meeting, Vancouver, BC. *Host-plant dependent variation in survival against a lepidopteran densovirus*. A. Smilanich, A. Wantanabel, N. Muchoney, C. Chung, **A. L. Carper** and M. D. Bowers. Contributed oral session.
- Entomological Society of America Annual Meeting, Vancouver, BC. *Larval host-plant species influences development and survival of viral infection in *Anartia jatrophae* (Lepidoptera: Nymphalidae)*. N. Muchoney, M. D. Bowers, **A. L. Carper**, and A. Smilanich. Contributed oral session.
- American Association of Geographers Meeting, New Orleans, LA. *Changes in wild bee diversity and abundance along an urban-rural gradient*. K. Birdshire, C. Briles, and **A. L. Carper**. Poster session.
- 2017 Entomological Society of America Meeting, Denver, CO. *Assessing the effects of the Conservation Reserve Program on cavity-nesting bees in Colorado agroecosystems*. A. M. Morphew\*, **A. L. Carper**, M. D. Bowers, and M. A. Jamieson. Poster session.
- Ecological Society of America Meeting, Portland, OR. *Effects of woody debris and its management on wild bee communities along Colorado's Front Range*. K. Bohanon\*, **A. L. Carper**, and M. D. Bowers. Poster session.
- 2016 Ecological Society of America Meeting, Ft Lauderdale, FL. *Conservation grassland plantings promote wild cavity-nesting bee reproduction in agroecosystem*. A. M. Morphew\*, **A. L. Carper**, M. D. Bowers, and M. A. Jamieson. Poster session.

- 2015 Entomological Society of America, Annual Meetings, Minneapolis, Minnesota. Scott V.L., A.P. Rose, C.J. Schwantes, K.B. Wolfson, **A.L. Carper**, and M.D. Bowers. *The Bees' Needs: Assessing the conservation value of bee nesting blocks through citizen science.*
- 2014 Entomological Society of America, Annual Meetings, Portland, OR. *Extreme weather events and native bees: Effects of the 2013 Colorado Flood.* Scott, V.L., **A. Carper**, M.D. Bowers.
- 2014 GECO Conference, Grand Junction, CO. *Wild bees living on the edge.* C. J. Schwantes, **A. L. Carper**, A . P. Norton, M. D. Bowers, and M. A. Jamieson.

#### INVITED SEMINARS

- 2016 Oakland University, Dept. of Biological Sciences, Seminar (10/25/2016): *Factors driving wild bee community dynamics across agroecosystems of Colorado.*
- 2014 Colorado State University, Dept. of Bioagricultural Sciences and Pest Management, Seminar (2/26/2014): *Land-use change, bees, and plant-pollinator interactions.*
- 2013 University of Wisconsin-Madison, Dept. of Entomology, Seminar (9/13/2013): *Land-use change, bees, and plant-pollinator interactions.*

#### INVITED TALKS

- 2020 City of Boulder, Bee Boulder Festival (9/12/2020): *The Natural History of Colorado's Native Bees.*
- 2019 City of Fort Collins Natural Areas (12/17/2019): *Wild bee conservation in Boulder County and beyond.*
- 2019 4<sup>th</sup> Annual Colorado Pollinator Summit: CU Panel (11/1/2019): *The CU Museum of Natural History's role in pollinator research and education.*
- 2019 Boulder County Audubon Society (9/24/2019): *Wild bee conservation in Boulder County and beyond.*
- 2019 University of Colorado Museum of Natural History (9/17/2019): *Protecting Colorado's Pollinators: how you can help inform and impact their conservation*
- 2019 Boulder County Beekeepers Association (9/4/2019): *An introduction to Colorado's wild bees: their taxonomy and ecology*
- 2018 3<sup>rd</sup> Annual Colorado Pollinator Summit: Plenary Speaker (11/9/2017): *The Natural history of Colorado's native bees: informing conservation through ecological research.*
- 2018 University of Colorado Museum of Natural History (9/19/2018): *Colorado's wild bees: The fascinating ecologies of our most important pollinators.*  
Audubon Society of Greater Denver, Conservation in Colorado Adult Lecture Series (1/24/2018): *Wild bee diversity, ecology, and conservation in Colorado.*
- 2017 2<sup>nd</sup> Annual Colorado Pollinator Summit: Science and Research Panel (11/2/2017): *Factors driving wild bee community dynamics in Colorado.*
- 2016 Boulder County Parks and Open Space Advisory Committee Meeting (11/17/2016): *Native pollinators on riparian open spaces.*  
High Country Conservation Advocates, Environmental Possibility Series (8/21/2016): *Native bee conservation along the Front Range and beyond.*  
Boulder County Parks and Open Space Brown Bag Lunch (7/5/2016): *Pollinators on Boulder County's Riparian Open Spaces.*

The Mile Hive Bee Club (6/14/2016): *Native bee diversity, ecology, and conservation*.

University of Colorado Museum of Natural History (3/15/2016): *What we're learning about The Bees' Needs: an update on research, discoveries, and lessons from your backyards*.

## PRESS CONTRIBUTIONS

- 2020 How to create a bee-friendly garden in Denver to support Colorado's more than 900 native species. *The Denver Post*: Special to the Denver Post. Covington, Linnea. <https://theknow.denverpost.com/2020/08/04/bee-garden-denver-colorado/242739/>
- 2020 Boulder County's native bee species thrive in disturbed environments. *The Denver Post*: Web Edition Articles. Spina, John. <https://www.denverpost.com/2020/02/09/boulder-county-native-bee-species-thrive/>
- Boulder County's native bee species thrive in disturbed environments. *The Daily Camera*. Spina, John. <https://www.dailycamera.com/2020/02/08/boulder-countys-native-bee-species-thrive-in-disturbed-environments/>
- 2019 Flood of painted lady butterflies enrich Boulder County's late summer palette. *The Daily Camera*. <https://www.dailycamera.com/2017/09/19/flood-of-painted-lady-butterflies-enrich-boulder-countys-late-summer-palette/>
- How to be a guardian of pollinators. 8/1/2019. *Left Hand Valley Courier*. Dorvee, Vickee. [http://www.lhvc.com/news/how-to-be-a-guardian-of-pollinators/article\\_1789e660-b400-11e9-97c6-5ba386becaa0.html](http://www.lhvc.com/news/how-to-be-a-guardian-of-pollinators/article_1789e660-b400-11e9-97c6-5ba386becaa0.html)
- 2018 Some Insects Taste With Their Feet and Hear With Their Wings. *National Geographic*. Langley, Liz. <https://www.nationalgeographic.com/animals/2018/09/insects-butterflies-anatomy-senses-animals/>
- 2017 Parasitoid wasp pupae cluster on a leaf after feasting on a caterpillar. *The Daily Camera*. Mitton, Jeffrey. <https://www.dailycamera.com/2017/07/13/jeff-mitton-parasitoid-wasp-pupae-cluster-on-a-leaf-after-feasting-on-a-caterpillar/>
- CU Boulder collection is a hive of information on the world of bees. *The Daily Camera*. Brennan, Charlie. <https://www.dailycamera.com/2017/07/07/cu-boulder-collection-is-a-hive-of-information-on-the-world-of-bees/>

## GRADUATE COMMITTEES

Mullins, Jessica. *TBD* (Expected 2021). Master's Thesis. CU-Boulder. Committee member.

Birdshire, Kristen. *Changes in Wild Bee Diversity and Abundance Along an Urban to Rural Gradient* (2018). Master's Thesis. CU-Denver. External committee member.

## MENTORED UNDERGRADUATE RESEARCH

Morphew, Alexandra. *Assessing the effects of the Conservation Reserve Program on cavity nesting bees in Colorado* (2017). Undergraduate Honors Theses. 1405. [https://scholar.colorado.edu/honr\\_theses/1405](https://scholar.colorado.edu/honr_theses/1405)

Enger, Micaela. *Effects of host plant and developmental stage on caterpillar immune response* (2017). Undergraduate Honors Theses. 1333. [http://scholar.colorado.edu/honr\\_theses/1333](http://scholar.colorado.edu/honr_theses/1333)



Bohanon, Kelsey. *Impacts of woody debris management on cavity-nesting bees and wasps* (2017). Independent Research.

Morphew, Alexandra. *The impacts of land-use on bees in agroecosystems: does the Conservation Reserve Program promote cavity-nesting bee communities* (2015). Independent Research.

## PROFESSIONAL EXPERIENCE

- 2015 - current *Museum Associate*, Entomology, Invertebrate Paleontology, and Public Sections  
Museum of Natural History, University of Colorado, Boulder, CO 80309
- 2008 *Research Technician*, Dept. of Biological Sciences, Dartmouth College, Hanover, NH. Supervisor: Dr. Rebecca Irwin.
- 2006-2008 *Laboratory/Field Assistant*, Dept. of Entomology, North Carolina State University, Raleigh, NC. Supervisor: Dr. Fred Gould.
- 2004-2006 *Agricultural Research Technician I*, Dept. of Entomology, North Carolina State University, Raleigh, NC. Supervisor: Dr. Jules Silverman.
- 2001-2004 *Laboratory Assistant*, Dept. of Entomology, North Carolina State University, Raleigh, NC. Supervisor: Dr. Jules Silverman.
- 2001 *Conservation Intern/Field Research Assistant*, Sandhills Ecological Institute, Southern Pines, NC. Supervisor: Kerry Brust.

## PROFESSIONAL AFFILIATIONS

Ecological Society of America  
Entomological Society of America  
Lepidopterist's Society  
Kansas Entomological Society  
Guild of Rocky Mountain Ecologists and Evolutionary Biologists

## SYNERGISTIC ACTIVITIES

- (a) *Mentoring*: I have supervised and mentored dozens of undergraduate students from the University of Colorado-Boulder, Dartmouth College, and North Carolina State University through research activities and general advising. During my dissertation, I mentored four female students through their participation with field research. Two completed graduate degrees in the Departments of Entomology and Plant Biology at North Carolina State University and one in Biology at Eastern Carolina University. The fourth completed vet school at the College of Veterinarian Medicine at North Carolina State University. At CU-Boulder, I have mentored 36 undergraduate students, including 25 women, across a wide diversity of ages, ethnicities, and backgrounds, and through independent research, grant writing, and honor's theses. I have also helped mentor three graduate students and served on the graduate committee for a student at CU-Denver and at CU-Boulder. I have also published with undergraduate co-authors and am currently collaborating with two students on separate manuscripts from their undergraduate research.
- (b) *Outreach*: I engage the public whenever possible through direct interactions, including personal meetings and correspondence, but also through the development of informational

booklets that I have provided to cooperating communities, such as the USDA Farm Service Agency, the Natural Resource Conservation Service, and farmers and ranchers in eastern Colorado. I have also collaborated with the University of Colorado Biological Science Initiative to document and share my research through their ScienceLIVE program. Much of this was from results of my collaboration with educators and the Museum of Natural History on our citizen science research program, *The Bees' Needs*. I served as the content expert for the development of two exhibits at the Museum of Natural History: *Becoming Butterflies* and *Curious Connections*. I helped a design student, Kao Kupadakvinij, with specimen photography and ecological expertise for his Honor's Thesis Exhibition: *Entomology in the Fine Arts: A Voice for the Little Guys*. I have also given numerous outreach talks to local organizations, through the CU Museum of Natural History, and through regional conservation organizations. Most recently I agreed to serve on the planning committee for the 2020 Colorado Pollinator Summit, in an effort to integrate scientists into discussions of pollinator conservation with managers, policy makers, and the public.

- (c) *Professional Service*: My primary service in my academic profession has been through peer review. I have reviewed manuscripts for *Functional Ecology*, *Perspectives in Plant Ecology, Evolution and Systematics*, *Urban Ecosystems*, *mSystems*, and *Global Change Biology*. I also revised a chapter of exam and online test bank questions for the fifth edition of *Ecology* (Bowman et al 2020) for Oxford University Press. This included revising online testing materials and connecting testing materials to revised learning objectives. I volunteer my taxonomic expertise in bees to help in determinations of wild bees from nearby research projects and have assisted in studies from the University of Colorado, Denver, CU-Boulder, Colorado State University, the USGS, and CU-Boulder's Environmental Design Program. In addition, through graduate school I served on the Ecology and Evolutionary Biology Retreat Planning Committees, planning and organization the Dartmouth EEB program annual departmental retreats. I also served as the departmental seminar organizer, moderating intradepartmental seminar series for the EEB Program and arranging presenter schedules and weekly departmental email updates.