

John M. Mola

RESEARCH ECOLOGIST, U.S. GEOLOGICAL SURVEY MENDENHALL FELLOW

Fort Collins Science Center, Fort Collins, Colorado 80521

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Postdoctoral Experience

U.S. Geological Survey

MENDENHALL POSTDOCTORAL FELLOW

Fort Collins, CO

2019-Present

Education

University of California Davis

PH.D. IN ECOLOGY

Davis, CA

2019

Humboldt State University

M.S. IN BIOLOGY

Arcata, CA

2014

Florida State University

B.S. IN ENVIRONMENTAL STUDIES

Tallahassee, FL

2011

Publications

J.M. Mola, J. Hemberger, J. Kochanski, L.L. Richardson, I.S. Pearse. 2021. The importance of forests in bumble bee biology and conservation. *BioScience*. DOI: <https://doi.org/10.1093/biosci/biab121>

J.M. Mola, L.L. Richardson, G. Spyreas, D.N. Zaya, I.S. Pearse. 2021. Long-term surveys support declines in early-season forest plants used by bumble bees. *Journal of Applied Ecology*. DOI: <https://doi.org/10.1111/1365-2664.13886>

J.M. Mola, C. Stuligross, M.L. Page, D. Rutkowski, & N.M. Williams. 2021. Impact of "non-lethal" tarsal clipping on bumble bees (*Bombus vosnesenskii*) may depend on queen stage and worker size. *Journal of Insect Conservation*, 25, 195–201 (2021). <https://doi.org/10.1007/s10841-021-00297-9>.

J.M. Mola, M.R. Miller, S. O'Rourke & N.M. Williams. 2020. Wildfire reveals transient changes to individual traits and population responses of a native bumble bee (*Bombus vosnesenskii*). *Journal of Animal Ecology* DOI: 10.1111/1365-2656.13244

J.M. Mola, M.R. Miller, S. O'Rourke & N.M. Williams. 2020. Forests do not limit bumble bee foraging movements in a montane meadow complex. *Early View at Ecological Entomology* DOI: 10.1111/een.12868

LoPresti, E.F., J. Goidell, **J.M. Mola**, M.L. Page, C.D. Specht, C. Stuligross, M.G. Weber, N.M. Williams, & R. Karban. 2020. A lever action hypothesis for pendulous hummingbird flowers: experimental evidence from a columbine. *Annals of Botany* 125(1):59–65

N.M. Williams, **J.M. Mola**, Stuligross, C., Harrison, T., Page, M., Brennan, R., Rosenberger, N., & Rundlöf, M. 2019. Fantastic bees and where to find them: locating the cryptic overwintering queens of a western bumble bee. *Ecosphere* 10(11):e02949

J.M. Mola & N.M. Williams. 2019. A review of methods for the study of bumble bee movement. *Apidologie* 50:497

LoPresti, E.F., J. VanWyk, **J. M. Mola**, K. Toll, T.E. Miller, & N.M. Williams. 2018. Effects of wildfire on floral display size and pollinator community reduce outcrossing rate in a plant with a mixed mating system. *American Journal of Botany* 105(7):1154–1164

Mola, J.M. & N.M. Williams. 2018. Fire-induced change in floral abundance, density, and phenology benefits bumble bee foragers. *Ecosphere*. 9(1):e02056

Mola, J.M., J.M. Varner, E.S. Jules, & T. Spector. 2014. Altered community flammability in Florida's Apalachicola ravines and implications for the persistence of the endangered conifer *Torreya taxifolia*. *PLoS ONE* 9(8): e103933.

Kreye, J.K., J.M. Varner, J.K. Hiers, & **J.M. Mola**. 2013. Toward a mechanism for eastern North American forest mesophication: differential litter drying across 17 species. *Ecological Applications* 23:1976-1986.

TECHNICAL REPORTS AND NON-PEER REVIEWED PUBLICATIONS

Colla, S., R. Hatfield, S. Jepsen, J.B. Koch, **J.M. Mola**, & L. Richardson in Williams, P. & S. Jepsen. (Eds.). 2020. North America Region. IUCN Bumble Bee Specialist Group Report 2020

Smith, T.A., J.P.Strange, E.C.Evans, B.M.Sadd, J.C.Steiner, **J.M.Mola** & K. Traylor-Holzer. (Eds.). 2020. Rusty Patched Bumble Bee, *Bombus affinis*, Ex Situ Assessment and Planning Workshop: Final Report. IUCN SSC Conservation Planning Specialist Group, Apple Valley, MN, USA

Mola, J.M. 2019. Bumble bee movement ecology and response to wildfire with an emphasis on genetic mark-recapture techniques. Doctoral Dissertation. University of California Davis. [Link available at JohnMola.com/pubs]

Mola, J.M. 2014. The role of native bees on organic farms in Humboldt County, California. Master's Thesis. Humboldt State University. <http://hdl.handle.net/2148/1956>

Presentations

INVITED

- 2022 The response of bumble bees and their floral food sources to wildfire in California. *Sonoma State University*.
- 2022 Endangered bumble bees: Science on the threats and recovery. *USGS Friday Findings Webinar Series*.
- 2022 The importance of forests in bumble bee ecology and conservation. *California State Polytechnic Humboldt*.
- 2021 The impact of western fires on bumble bees. *Natural Areas Conference*.
- 2021 The response of bumble bees and their floral food sources to wildfire in California. *Point Blue Conservation Science Seminar Series*.
- 2021 Understanding the roles of fires and forests in bumble bee conservation. *Florida State University Ecology and Evolution Departmental Seminar*.
- 2021 Appreciating the role of forests in bumble bee conservation. *Colorado State University Natural Resource Ecology Laboratory Soup and Science Seminar Series*, Virtual.
- 2020 Exploring the role of forests in bumble bee conservation. *Meeting of the Pan Pacific Entomological Society*, Virtual.
- 2019 Bumble bee tracking methods. Co-Organized with Dr. Jamie Strange. *BOMBUSS 2.0 Conference*, York, Ontario, Canada.
- 2013 Diverse crops and diverse pollinators. *Humboldt State University Sponsored Programs Foundation PI Celebration*, Arcata, California, USA. **First-ever student invited to talk at this annual event.**
- 2013 The ecology and management of wild bees on Humboldt County organic orchards. *Alistair and Judith McCrone Awards Ceremony*. *Humboldt State University*, Arcata, California, USA.

CONTRIBUTED

- 2020 Long term declines in forest plants critical to bumble bees. *Entomological Society of America Annual Conference*, Virtual.
- 2020 Current research on bumble bees with a focus on the endangered rusty patched bumble bee. *Fort Collins Science Center Seminar Series*, Virtual.
- 2019 The response of bumble bees to grassland wildfire revealed via genetic mark-recapture. *Pacific Branch of the Entomological Society of America*, San Diego, California, USA.
- 2018 Foraging range and habitat use of bumble bees in a Sierra Nevada meadow complex. *Entomological Society of America Annual Conference*, Vancouver, Canada.
- 2018 The effect of fire on bumble bees revealed via genetic mark-recapture. *Bay Area Society for Conservation Biology Symposium*, Davis, California, USA.
- 2017 SNPs v. MSATs - a comparison of costs, utility, and error in sibship reconstructions. *BOMBUSS Conference*, Logan, Utah, USA. **Awarded a student travel scholarship.**
- 2017 Bees benefit from fire due to a lengthened post-fire flowering season. *Ecological Society of America Annual Conference*, Portland, Oregon, USA.
- 2017 Bees benefit from fire due to a lengthened post-fire flowering season. *Graduate Student Symposium in Ecology*, Davis, California, USA. **Runner-up "best talk" at conference.**
- 2017 Motivational differences and co-foraging behaviors of bumble bee queens and workers. *Student Seminar Series*, Davis, California, USA.
- 2014 The role of native bees on organic farms in Humboldt County, California. *Master's Thesis Defense*, *Humboldt State University*, Arcata, California, USA.

POSTERS

- 2020 Postfire environment reveals floral limitation of bumble bee body size, colony abundance, and reproductive output. *Colorado Pollinator Summit*, Virtual.
- 2019 Postfire environment reveals floral limitation of bumble bee body size, colony abundance, and reproductive output. *International Pollinator Conference*, Davis, California, USA.
- 2018 Response of bumble bees to fire revealed via genetic mark-recapture. *Entomological Society of America Annual Conference*, Vancouver, Canada.
- 2018 Bumble bee movement and landscape genetics revealed via high-throughput sequencing. *Keeping Bees Healthy Symposium*, Davis, California, USA. **First place in poster contest.**
- 2017 Fire-induced change in flowering phenology benefits bumble bees. *Keeping Bees Healthy Symposium*, Davis, California, USA. **Third place in poster contest.**
- 2016 Fine-scale population genetic structure and movement ecology of the yellow-faced bumblebee (*Bombus vosnesenskii*). *Keeping Bees Healthy Symposium*, Davis, California, USA. **Awarded cash prize in poster contest.**
- 2015 Constructing a dynamic map of bumblebee colony density and foraging movements. *Keeping Bees Healthy Symposium*, Davis, California, USA.
- 2011 Contrasting flammability of adjacent plant communities: Florida's Apalachicola Bluffs and Ravines. *Ecological Society of America Annual Conference*, Austin, Texas, USA.

Service and Leadership

EXPERT GROUPS AND COMMITTEES

Western Bumble Bee Species Status Assessment Expert Group

2021-Present

INVITED EXPERT

U.S. Fish and Wildlife Service

Native Bee Monitoring Research Coordination Network

2021-Present

INVITED PARTICIPANT

BOMBUSS: Building Our Methods By Using Sound Science

2020-Present

ORGANIZING MEMBER

Conservation Planning Specialist Group meeting on management of *Bombus affinis*

2020

INVITED EXPERT

Minnesota Zoo

SPECIAL PROGRAMS

Database of Early-Career Pollinat* Ecologists

2020-Present

FOUNDER AND HOST

shorturl.at/irP15

"Young Pistils" Support Group for Early-Career Pollination Ecologists

2020-Present

FOUNDER AND MODERATOR

Slack Workspace

Social Justice in Ecology Reading Group

2020

Co-Host

Virtual

Queen Quest Bumble Bee Community Science Project

2019-Present

LEAD ORGANIZER

QueenQuest.org

EDITORIAL POSITIONS

Guest editor for a Special Issue of *Prairie Naturalist*

MANUSCRIPT REVIEWER

Apidologie, *Ecography*, *Basic and Applied Ecology*, *Conservation Physiology*, *International Journal of Wildland Fire*, *Forest Ecology and Management*, *Biodiversity and Conservation*, *Ecology and Evolution*, *Journal of Animal Ecology*, *Journal of Applied Ecology*, *Journal of Pollination Ecology*, *Illinois Natural History Survey*, *Journal of Insect Conservation*, *Ecological Entomology*, *Scientific Reports*, *Oecologia*, *Anthropod-Plant Interactions*, *Journal of Applied Ecology*, *Ecology and Evolution*, *Ecological Entomology*, *California Agriculture*

30+ reviews conducted.

ORGANIZED CONFERENCE SESSIONS

Conserving Insects in a Vertebrate-minded World

CO-ORGANIZER

2021

Entomological Society of America

COLLEGE, PROGRAM, AND DEPARTMENTAL SERVICE

The Aggie Brickyard

CO-FOUNDER & EDITOR

2016-2019

<https://aggiebrickyard.github.io>

UC Davis Graduate Group in Ecology Open Lab Meetings

CO-FOUNDER

2015-2019

Davis, CA

College of Agricultural and Environmental Science Education Committee

STUDENT REPRESENTATIVE

2017

Davis, CA

UC Davis Graduate Student Association

REPRESENTATIVE

2014-2017

Davis, CA

UC Davis Graduate Group in Ecology Admissions Committee

APPLICATION REVIEWER

2015, 2016

Davis, CA

UC Davis Graduate Student Symposium in Ecology

ORGANIZER

2016-2017

Davis, CA

UC Davis Ecology Graduate Student Association

CO-CHAIR

2015-2016

Davis, CA

UC Davis Graduate Group in Ecology

ORIENTATION LEADER

2015, 2016, 2018

Davis, CA

Funding

FELLOWSHIPS

| | | |
|--------------|--|-----------|
| 2019-Present | U.S. Geological Survey, Mendenhall Postdoctoral Fellowship | |
| 2018-2019 | University of California Davis, Professors for the Future Fellow <i>Year-long professional development and pedagogical training fellowship</i> | |
| 2013-2018 | National Science Foundation, Graduate Research Fellowship | \$133,500 |
| 2014-2016 | University of California Davis, Graduate Group in Ecology Fellowship | \$43,000 |
| 2013 | Humboldt State University, Allistair and Judith McCrone Graduate Fellowship <i>Awarded to one student campus-wide annually</i> | \$3,000 |

RESEARCH FUNDING (\$839,448 CUMULATIVE)

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|--------------|--|-----------|
| 2021 | U.S. Fish and Wildlife Service Region 3 Support Population genetics studies of <i>B. affinis</i> | \$48,000 |
| 2021 | Great Lakes Restoration Initiative Grant Indirect efforts of restoration techniques on endangered Rusty Patched Bumble Bee and co-occurring species | \$100,000 |
| 2020 | Great Lakes Restoration Initiative Grant Bumble bee genetic diversity and pathogen presence in the Great Lakes Watershed: Are <i>Bombus affinis</i> hotspots good habitats for other bumble bees? | \$161,000 |
| 2020 | Fort Collins Science Center Internal Grant Continued support for bumble bee population genetics | \$6,000 |
| 2019 | Great Lakes Restoration Initiative Grant Long-term trends in floral resource and habitat quality for <i>Bombus</i> in Illinois and a comparison of habitats in high priority sites | \$500,000 |
| 2015,'16,'18 | University of California Davis, Henry A. Jastro Graduate Research Award | \$9,000+ |
| 2015,'17 | American Museum of Natural History, Theodore Roosevelt Memorial Grant | \$3,160 |
| 2015,'16 | University of California Davis, Natural Reserve System Grant | \$5,000+ |
| 2016 | Northern California Botanists Graduate Research Scholarship | \$1,600 |
| 2016 | University of California, Mathias Graduate Student Grant | \$3,000 |
| 2014 | California Native Plant Society, Callahan Scholarship | \$1,388 |
| 2013 | Humboldt State University, Master's Student Grant | \$300 |
| 2013 | Humboldt State University, Brusca Invertebrate Zoology Scholarship | \$1,000 |
| 2010 | National Science Foundation, Research Experience for Undergraduates | |

PERFORMANCE AWARDS

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| 2021 | USGS Star Award |
| 2020 | USGS Performance Award |
| 2018 | Best Poster, <i>Keeping Bees Healthy Symposium</i> |
| 2017 | BOMBUSS Student Travel Award |
| 2016 | California Native Plant Society, Helen Sharsmith Award |
| 2010 | Florida State University, Student Star Award |

Teaching

PEDAGOGICAL TRAINING

Seminar on College Teaching

Fall 2018

UNIVERSITY OF CALIFORNIA DAVIS

- Course offered through the Center for Educational Effectiveness designed to teach pedagogical principles, assessments and assignments, active learning, lesson and course design, teaching to diverse students, and preparation through practice.

LEAD OR CO-INSTRUCTOR

Urban Bees: Conserving pollinators in human dominated lands

Spring 2018

UNIVERSITY OF CALIFORNIA DAVIS

Co-instructor with Neal Williams

- I conceptualized, designed, and taught this First-Year Seminar. Gave lectures, guided discussion, and facilitated students through group projects. For many students, this was their first small-group class and first hands-on research experience.

Fire and Forbs Weekly Seminar

Winter 2018

UNIVERSITY OF CALIFORNIA DAVIS

Co-organizer with Eric LoPresti

- Developed the scope of the seminar and the schedule of readings.

GUEST LECTURES

Conservation Biology

Fall 2021

AMERICAN RIVER COLLEGE

Virtual

Wildlife Conservation and Management

Spring 2021

AMERICAN RIVER COLLEGE

Virtual

Conservation Biology

Fall 2020

AMERICAN RIVER COLLEGE

Virtual

Ecology

Winter 2019

AMERICAN RIVER COLLEGE

Sacramento, CA

Plant Ecology

Fall 2015

HUMBOLDT STATE UNIVERSITY

Arcata, CA

General Botany

Spring 2014

HUMBOLDT STATE UNIVERSITY

Arcata, CA

TEACHING ASSISTANT

ABI50A - Learning Science By Doing

Fall 2018

UNIVERSITY OF CALIFORNIA DAVIS

Davis, CA

General Botany

2012-2013

HUMBOLDT STATE UNIVERSITY

Arcata, CA

Mentoring & Advising

Jade Kochanski

2020

RESEARCH ASSISTANT (MIDWESTERN BUMBLE BEES)

U.S. Geological Survey

Annabelle H. Louderback-Valenzuela

2018

RESEARCH ASSISTANT (BUMBLE BEE MEASUREMENTS)

UC Davis

Maya Argaman

2016

FIELD ASSISTANT (POSTFIRE PLANT QUALITY)

UC Davis

Jared Borba

2015

FIELD ASSISTANT (BUMBLE BEE PLANT USE)

UC Davis

Grace Blacker

2013

RESEARCH ASSISTANT (POLLEN IDENTIFICATION)

Humboldt State University

Corey Andrikopoulos

2013

FIELD ASSISTANT (POLLINATOR CROP VISITATION)

Humboldt State University

Research Assistantships

CaliBombus Bumble Bee Monitoring Program

CO-ADVISED BY DRS. HOLLIS WOODARD (UCR) AND NEAL WILLIAMS (UCD)

Graduate Student Researcher
2019

Bumble bee responses to floral resource pulses

CO-ADVISED BY DRS. ROSEMARY MALFI (UCD) AND NEAL WILLIAMS (UCD)

Graduate Student Researcher
2015-2016

Long-term phenology research of Rocky Mountain wildflowers

CO-ADVISED BY DRS. AMY ILER (RMBL) AND DAVID INOUE (RMBL)

Research Assistant
2011

Phenology of Rocky Mountain native bees

ADVISED BY DR. REBECCA IRWIN (RMBL)

Research Assistant
2011

Florida Natural Areas Inventory plant monitoring

ADVISED BY AMY JENKINS, M.S.

Intern
2011

Vegetation censusing on Gulf of Mexico barrier islands

CO-ADVISED BY DRS. TOM MILLER (FSU) AND ELISE GORNISH (UA)

Research Assistant
2010

Ecological interactions within pitcher plants

ADVISED BY DR. TOM MILLER (FSU)

Field and lab assistant
2008-2010

Scientific Outreach & Communication

WRITING AND INTERVIEWS

- 2021 Buzzes, Drones, Wasps: Disc Golf Courses as Pollinator Paradise on Parked: A Disc Golf Blog – <https://parkeddiscgolf.org/2021/06/07/buzzes-drones-wasps-disc-golf-courses-as-pollinator-paradise/>
- 2016, 2017 Several articles in *The Aggie Brickyard* available in print and online – <https://aggiebrickyard.github.io>
- 2017 Interview with The California Aggie “Better Bee-lieve it” – about the listing of *Bombus affinis*. <https://theaggie.org/2017/02/02/better-bee-lieve-it-uc-davis-entomologist-helped-list-bee-as-endangered/>
- 2013 The importance of native bees for agriculture – Presentation to Klamath-Trinity Resource Conservation District. *Hoopa Valley Tribal Reservation*. Featured on KIDE radio.
- 2012 Ecology and management of *Osmia lignaria* on Diverse Humboldt County orchards. *Interview with KRFH Humboldt State's Campus Radio*

EVENTS

- 2020 Bee Colorful Drawing Activity *Bay Area Science Festival* Virtual event originally located in San Francisco, California.
- 2018 Where do bees go and how do we know? *2nd Annual California Honey Festival* Woodland, California. **Invited Speaker**
- 2017 Tour Guide for Pollinator-friendly plantings. *Western Apicultural Society Meeting* Davis, California.
- 2015 Pollinator-friendly farming presentation. *Hoes Down Festival* Capay Valley, California
- 2014 Cavity nesting bee workshop (Open to general public. Self-designed and taught.) *Center for Appropriate Technology* Arcata, California
- 2011 Kid's Camp Instructor, Pollination Week and Seed Dispersal and Plant Reproduction *Rocky Mountain Biological Laboratory* Gothic, Colorado

Skills and Technical Expertise

Computer Languages Software & Tools

R, Markdown, BASH, LaTeX, HTML
QGIS, Microsoft Office Suite, Google Docs, Git, Cluster computing, COLONY