Elizabeth (Abbey) L. Paulson

PhD, University of Colorado - Boulder

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Curriculum Vitae

EDUCATION

Ph.D., Ecology and Evolutionary Biology. University of Colorado, 2016, GPA 4.0. Dissertation: Assessment of biodiversity and community composition of desert spring systems in the American Southwest, with applications for ecological restoration and conservation.

M.A., Ecology and Evolutionary Biology. University of Colorado, 2012, GPA 4.0. Thesis: Ecology and landscape genetics of invasive species.

B.A., Environmental Science. Mills College, 2005, GPA 3.83.

National Outdoor Leadership School (NOLS). Semester in Patagonia, Chile. Sea kayaking, mountaineering, risk management, expedition behavior, Leave No Trace ethics. Spring 2004.

PROFESSIONAL EXPERIENCE

Assistant Teaching Professor - University of Colorado, Boulder, CO, Fall 2022-present. Introduction to Statistics and Quantitative Thinking (EBIO 1010); General Biology I (EBIO 1210); General Biology II (EBIO 1220); Principles of Ecology (EBIO 2040); Genetics: Molecules to Populations (EBIO 2070); Plants and Society (EBIO 3590) for the Dept. of Ecology and Evolutionary Biology.

Faculty Learning Community - University of Colorado, Boulder, CO, 2015, 2022-2023. Development of learning goals, assessment strategies, and curriculum design; emphasis on the General Biology course series.

Lecturer - University of Colorado, Boulder, CO, Summer 2021-Spring 2022. General Biology I (EBIO 1210) for the Health Professions and Honors Residential Academic Programs; General Biology II (EBIO 1220) for the Health Professions Residential Academic Program; Biology and Society (EBIO 1100) and Evolutionary Biology (EBIO 3080) for the Dept. of Ecology and Evolutionary Biology.

Second Century Stewardship Research Fellow - Acadia National Park + Schoodic Institute + AAAS, 2016-2018. As the National Park System enters its second century, there are new challenges and opportunities for conservation and outreach. My SCS research employed environmental DNA surveys to assess biodiversity patterns and freshwater connectivity in Acadia National Park, Maine. The fellowship also included extensive science communication training and outreach opportunities.

Instructor of Record - University of Colorado, Boulder, CO, Fall 2016. Evolutionary Biology (upper division, required for majors).

Instructor of Record - University of Colorado, Boulder, CO, July 2015. Development and instruction of GIS for Ecologists course. Students became proficient in the use of ArcGIS for ecological analyses and professional mapping.

Teaching Assistant - University of Colorado, Boulder, CO, 2009-2016. Lab instructor for Mammalogy, Principles of Ecology, Plant Biodiversity and Evolution, and Evolutionary Biology. Labs and recitations for General Biology. Course development and recitations for Genetics.

Research Assistant - University of Colorado, Boulder, CO, Jul-Dec 2013. Environmental DNA surveying and community phylogenetics in a Mojave Desert thermal spring system (Ash Meadows, NV).

Research Assistant - University of Colorado, Boulder, CO, Jun-Aug 2012. Population genetic structure of the endangered Ash Meadows speckled dace (*Rhinichthys osculus nevadensis*), inferred from mitochondrial and microsatellite loci.

Research Assistant - University of Colorado, Boulder, CO, Jan-Sept 2010. Mammalian biodiversity in the Southern Rocky Mountains: managed geospatial metadata for ~54,000 historic specimen records, and conducted small mammal trapping surveys along an elevational transect (1650 m to 3720 m).

Staff Scientist - Environmental Science Associates, Portland, OR, Jul 2007- Jun 2009. Threatened and Endangered species surveys, wetland delineations (Clean Water Act), restoration monitoring, habitat assessments, technical writing and editing, GPS data collection and management, GIS mapping and analyses, digital imaging, and graphic design.

Field Investigator - Phoenix Ecological Consulting, Piñon Hills, CA, Mar-Jul 2007. USFWS protocol Mojave ground squirrel surveys at a 1,700-acre site near Victorville, CA.

Biological Technician - CSU Stanislaus, CA, Mar 2005-07. Mojave ground squirrel surveys in Red Rock Canyon State Park and Ft. Irwin western expansion area; long-term monitoring at China Lake Naval Base. Collected tissue samples and morphological data. Habitat was characterized at all sites using line-intercept vegetation surveys.

Biological Monitor - Orion Environmental Associates, Sunol, CA, Dec-Jan 2006-07. Biological monitoring for California red-legged frog, California tiger salamander, and Alameda whipsnake, during the geotechnical investigation of the Calaveras Fault.

Research Assistant - UNR, Reno, NV, Jul-Aug 2006. Population survey of the Sand Mountain blue butterfly and its hostplant, Kearney's buckwheat, to assist in ESA listing decision.

Biological Technician - Environmental Science Associates, Oakland, CA, Feb 2006. Tree and rare plant surveys for the San Pablo Dam seismic upgrade, east of Berkeley.

Intern - Belize Foundation for Research and Environmental Education, Toledo, Belize, Jan 2006. Water quality, wildlife, and tropical ecology studies in an undisturbed lowland tropical rainforest.

Teaching Assistant - Mills College Biology Dept., Oakland, CA, Aug-Dec 2005. Exam review sessions, office hours, weekly text review, supplemental material, grading.

Barrett Research Scholar - Mills College Biology Dept., Oakland, CA, May-Aug 2005. Study of butterfly nectaring behavior and phenology in serpentine and chaparral habitats.

Volunteer - Virgin Islands Environmental Resource Station, St. John, USVI, Mar 2001, Jul-Aug 2002. Teaching assistant for local ecology and history classes, ecological field studies, and environmental awareness for Caribbean middle and elementary school students.

PUBLICATIONS

Paulson EL, Chaudoin A, Martin AP (2021) Ecological divergence of a habitat constructed to harbor an endangered species. *Conservation Science and Practice* 3:e471

Paulson EL, Martin AP (2019) Inferences of environmental and biotic effects on patterns of eukaryotic alpha and beta diversity for the spring systems of Ash Meadows, Nevada. *Oecologia* 191:931-944

Paulson EL, Martin AP (2014) Discerning invasion history in an ephemerally connected system: landscape genetics of *Procambarus clarkii* in Ash Meadows, Nevada. *Biological Invasions* 16:1719-1734

Martin AP, **Paulson EL**, Graham R (2013) Geographically disjunct populations and widespread genets in an endangered halophilic plant, the Amargosa niterwort (*Nitrophila mohavensis*). *Conservation Genetics* 14:953-962

Paulson EL, Fairfield H, Martin AP (in prep) Ecological resilience in a restored desert spring.

PRESENTATIONS

Paulson EL. Ecological divergence of a habitat constructed to harbor an endangered species. Invited seminar, April 23rd, 2021. Southwestern Association of Naturalists. Remote meeting.

Paulson EL. Using eDNA to document biodiversity, restore ecosystems, and assess management actions. Invited seminar, August 15th, 2018. The Jackson Laboratory, Bar Harbor, Maine.

Paulson EL. Using eDNA to document biodiversity, restore ecosystems, and assess management actions. Invited panel member (Applying Conservation Genetics and Genomics to Wildlife and Fisheries Management), February 17th, 2018. American Association for the Advancement of Science Meeting. Austin, Texas.

Paulson EL. Environmental DNA in Acadia National Park: from biodiversity conservation to culvert restoration. Invited seminar, August 6th and 22nd, 2017. Earthwatch Expedition, Schoodic Institute at Acadia National Park, Maine.

Paulson EL. EDNA analysis of Acadia's freshwater ecosystems: broad-scale biodiversity and the effects of culverts on stream connectivity. Invited seminar, August 17th, 2017. Acadia National Park Headquarters, Maine.

Paulson EL. Environmental DNA research for biodiversity conservation in Acadia National Park. Invited presentation to Board of Directors, August 8th, 2017. Second Century Stewardship Initiative, Schoodic Institute at Acadia National Park, Maine.

Paulson EL. Biodiversity in Acadia National Park. Invited webinar, March 2nd, 2017. Local high school student group, Schoodic Institute at Acadia National Park, Maine.

Paulson EL, Fairfield H, Martin AP. Ecological resilience in a restored desert spring. Oral presentation, November 18th, 2016. Desert Fishes Council Meeting. Albuquerque, New Mexico.

Paulson EL. EDNA community analysis in Acadia National Park. Invited seminar, August 25th, 2016. Acadia National Park Headquarters, Maine.

Paulson EL. Community ecology and restoration of desert springs. Public dissertation seminar, December 4th, 2015. University of Colorado, Dept. of Ecology and Evolutionary Biology colloquium series. Boulder, Colorado.

Paulson EL, Martin AP. Comparative analysis of eukaryotic community assemblages in Devils Hole and its constructed analog. Oral presentation, November 20th, 2015. Desert Fishes Council Meeting. Death Valley National Park, California.

Paulson EL. Using molecular methods to study dispersal of aquatic organisms across an ephemerally connected landscape. Invited seminar, October 19th, 2015. University of Colorado Biogeography course. Boulder, Colorado.

Paulson EL, Martin AP. Using environmental DNA for long-term monitoring of desert spring systems. Oral presentation, November 20th, 2014. Desert Fishes Council Meeting. Cabo del San Jose, Baja, Mexico.

Paulson EL, Martin AP. Invasive crayfish in a desert spring system: using landscape genetics to inform ecological restoration. Oral presentation, November 16th, 2012. Desert Fishes Council Meeting. Death Valley National Park, California.

Paulson EL, Martin AP. Invasive crayfish in a desert spring system: using landscape genetics to inform ecological restoration. Oral presentation, August 7th, 2012. Ecological Society of America Meeting. Portland, Oregon.

Paulson EL, Martin AP. Invasive crayfish in a desert spring system: using landscape genetics to inform ecological restoration. Oral presentation, April 9th, 2012. International Association for Landscape Ecology Symposium. Newport, Rhode Island.

Paulson EL. The effects of anthropogenic land-use change on landscape connectivity for Front Range butterflies. Oral presentation, October 15th, 2011. High Country Lepidopterists Meeting. Boulder, Colorado.

Paulson EL, Martin AP. Landscape genetics of invasive crayfish in a desert spring system, and implications for restoration. Oral presentation, October 5th, 2011. Dept. of Ecology and Evolutionary Biology Brown Bag seminar series. Boulder, Colorado.

Paulson EL, Martin AP. *Procambarus clarkii* in a desert spring system: Using landscape genetics to implement effective restoration. Oral presentation, September 18th, 2011. Guild of Rocky Mountain Ecologists and Evolutionary Biologists Meeting. Rocky Mountain Research Station, Colorado.

ACADEMIC GRANTS and AWARDS

Jim Deacon Memorial Award, Desert Fishes Council, $2,100 (2016)

Research Fellowship, Schoodic Institute at Acadia National Park, $2,500 (2016)

EBIO graduate student research grant, $1,350 (2015)

Beverly Sears graduate student research grant, $1,000 (2014)

Desert Fishes Council travel grant to annual meeting, $200 (2014)

EBIO graduate student research grant, $1,600 (2014)

Society for Wetland Scientists student research grant, $1,000 (2014)

EBIO graduate student research grant, $1,000 (2013)

Beverly Sears graduate student research grant, $1,000 (2012)

United Government of Graduate Students travel grant, $300 (2012)

US International Association for Landscape Ecology student travel award, $500 (2012)

EBIO graduate student research grant, $2,000 (2011)

DeWind Award for butterfly conservation research, Xerces Society, $3,750 (2011)

Boulder County Nature Association research grant, $1,000 (2011)

Mills College Presidential Scholarship, $39,000 (2001-2005)

Mills College Scheffler Pre-Medical Scholarship, $10,000 (2001-2005)

TECHNICAL SKILLS and TRAINING

Laboratory processing of environmental and organismal DNA samples

Bioinformatic processing and analysis of high-throughput and Sanger DNA sequence data

Genetic, phylogenetic, and community analysis: R, bash, QIIME, USEARCH, GeneMapper, Sequencher, STRUCTURE, PAUP*, MacClade, GenoDive, Arlequin, FigTree, TCS

Geographic Information Systems (ArcGIS, ESRI) and GPS (Trimble, Garmin)