

Curriculum Vitae

James David (Jim) Shaffer

Department of Biology, University of Kentucky

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Education

- 2013- 2023** **Ph.D. in Biology**, *University of Kentucky*. May 2023
Dissertation Title: "Competition and Herbivory Influence the Survival, Growth, and Physiology of Native Tree Seedlings in the Kentucky Inner Bluegrass Savanna-Woodland."
Dissertation Advisor: Scott K. Gleeson (UK Biology); Co-Advisor: John J. Cox (UK Forestry)
- 2010- 2013** **M.S. in Biology**, *University of Kentucky*. August 2013
Thesis Title: "Factors influencing the establishment and survival of native hardwood tree seedlings of the Kentucky Inner Bluegrass Blue Ash-Oak Savanna-Woodland." *Thesis Advisor: Scott K. Gleeson*
- 2002-2006** **B.S. in Ecology & Biodiversity**, *Sewanee: The University of the South*. May 2006
Senior Independent Research Projects: (1) "Water quality of exurban, agricultural, and forested watersheds in the Sequatchie Valley, TN." (2) "Mortality of redbay (*Persea borbonia*) on St. Catherine's Island, GA by the invasive redbay ambrosia beetle (*Xyleborus glabratus*)."
Advisors: (1) Deborah K. McGrath; (2) John P. Evans
- 2000-2002** *Roane State Community College*
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Teaching Experience

University of Maine at Farmington (Instructor of Record, Title: Lecturer I)
Bio110N-Botany for Humans. Lecture and Lab Instructor. (1 semester, Spring 2018)

University of Kentucky (Graduate Teaching Assistant)

Bio303- Introduction to Evolution Recitation. Graduate Teaching Assistant (6 semesters, most recent Spring 2017)

Bio325- Introductory Ecology Lab. Graduate Teaching Assistant (4 semesters, most recent Fall 2014)

Bio325- Introductory Ecology Lab. Lab Development Coordinator and Graduate Teaching Assistant (Spring 2014)

Bio325- Introductory Ecology Lab. TA Co-Coordinator and Graduate Teaching Assistant (Spring 2012)

Bio151- Principles of Biology Lab I. Graduate Teaching Assistant (Spring 2011)

Bio153- Principles of Biology Lab II. Graduate Teaching Assistant (Fall 2010)

University of Kentucky (Grader)

Bio152- Principles of Biology II. Graduate Teaching Assistant (3 semesters, most recent Spring 2019)

University of Kentucky (Guest Instructor)

For365- Wildlife Assessment. Native Mammal Herbivory Lab (Spring 2017)

NSF Research Experience for Undergraduates (REU). Bluegrass Savanna Ecosystem (Summer 2014, 2013, 2012)

Bio325- Introductory Ecology Lecture. Ecology Research Symposium (Fall 2013)

Bio452G- Laboratory in Ecology. Stream Ecology Session (Spring 2011)

Eastern Kentucky University (Guest Instructor)

Bio318- Plant Ecology and Taxonomy Lab. Bluegrass Savanna Restoration (Spring 2015)

Wld382-Wildlife Population Ecology Lab. Bluegrass Savanna Ecology (Summer 2014)

Sewanee: The University of the South

Bio131- Evolution, Ecology, and Biodiversity Lab. Undergraduate Teaching Assistant (Fall 2003 to Spring 2006)

Publications

Published Manuscripts

Westneat, D.F., Potts, L.J., Sasser, K.L., and **Shaffer, J.D.** 2019. Causes and consequences of phenotypic plasticity in complex environments. **Trends in Ecology & Evolution** 34(6): 555-568.
<https://doi.org/10.1016/j.tree.2019.02.010>

Technical Reports

Shaffer, J.D., Gleeson, S.K., and Cox, J.J. 2016. Incorporating Disturbance Ecology into Native Hardwood Tree Seedling Restorations of the Kentucky Inner Bluegrass Savanna-Woodland. Kentucky Department of Fish and Wildlife Resources Annual Research Highlights, 2015. Volume IX. Publication of the Wildlife and Fisheries Division. November 2016, 85 pp. <https://fw.ky.gov/More/documents/2015researchhighlights.pdf>

Shaffer, J.D., Gleeson, S.K., Cox, J.J., and Lhotka, J.M. 2014. Ecological Factors Influencing Native Hardwood Seedling Establishment in the Kentucky Inner Bluegrass Blue Ash-Oak Savanna-Woodland. Kentucky Department of Fish and Wildlife Resources Annual Research Highlights, 2013. Volume VII. Publication of the Wildlife and Fisheries Division. October 2014, 90 pp.
<https://fw.ky.gov/More/Documents/2013ResearchHighlights.pdf>

Dissertation & Thesis

Shaffer, J.D. 2023. Competition and Herbivory Influence the Survival, Growth, and Physiology of Native Tree Seedlings in the Kentucky Inner Bluegrass Savanna-Woodland. *Theses and Dissertations--Biology*. Paper 93.
https://uknowledge.uky.edu/biology_etds/93/

Shaffer, J.D. 2013. Factors Influencing the Establishment and Survival of Native Hardwood Tree Seedlings of the Kentucky Inner Bluegrass Blue Ash-Oak Savanna-Woodland. *Theses and Dissertations--Biology*. Paper 15. http://uknowledge.uky.edu/biology_etds/15/

Newsletters

Shaffer, J.D. 2016. Emerald Ash Borer Threatens Native Ash Trees. EcoLink: Newsletter of the Ecological Research and Education Center (Field Station of the Bluegrass). Ecolink 1(2): 2.
http://darwin.uky.edu/~erec/documents/EcoLink_V01-I02.pdf

Shaffer, J.D. 2016. Tree Restoration in Kentucky Bluegrass Woodlands. EcoLink: Newsletter of the Ecological Research and Education Center (Field Station of the Bluegrass). Ecolink 1(1): 2.
http://darwin.uky.edu/~erec/documents/EcoLink_V01-I01_Feb2016.pdf

Manuscripts in Preparation (dissertation chapter, draft in progress, or work presented at a national conference)

Shaffer, J.D., Gleeson, S.K., Cox, J.J., and Lhotka, J.M. Does Competitor and Herbivore Reduction Influence Survival and Growth of Tree Seedlings? *In prep.* Target Journal: Forest Ecology and Management.

Shaffer, J.D., Gleeson, S.K., Cox, J.J., and Lhotka, J.M. Preferences and behavior of ungulate, lagomorph, and rodent herbivory on twelve experimentally planted hardwood tree species. *In prep.* Target Journal: Forest Ecology and Management.

Shaffer, J.D. and Gleeson, S.K. Leaf anatomy, morphology, and ecophysiology in response to manipulated competitive environment: costs to growth, survival, and herbivory on twelve deciduous tree species. *In prep.* Target Journal: The New Phytologist.

Shaffer, J.D., Gleeson, S.K., and Cox, J.J. Impacts of Prescribed Fire and Post-Fire Herbivory on Tree Seedling Growth in a Kentucky Bluegrass Savanna-Woodland Old-Growth Remnant. *In prep.* Target Journal: American Midland Naturalist.

Shaffer, J.D., Gleeson, S.K., Cox, J.J., and Lhotka, J.M. Prescribed fire impacts on the survival and growth of experimentally planted tree seedlings in the Kentucky Bluegrass Savanna-Woodland. *In prep.* Target Journal: Forest Ecology and Management.

Mentoring

I have had the distinct honor to mentor and guide capstone independent research projects for two University of Maine at Farmington and eleven University of Kentucky undergraduates. These students have transected the diversity of student type and have included visiting international, underrepresented minority, first generation, and non-traditional college students. Their work engaged them directly in the multifaceted skills required to implement ecological fieldwork. Their research participation provided invaluable experiences on the collaborative effort required to follow scientific research from development to dissemination. Products of their research have been presented at local and national conferences.

- Spring 2019 – 2021** Isaiah Reed. Height and diameter differences in southern and northern species of tree seedlings in response to a changing climate in Maine. Entering Coast Guard, Fall 2021.
- Spring 2019 – 2021** Jordan Fried. Bud and leaf phenology differences in southern and northern species of tree seedlings in response to a changing climate in Maine.
- Spring 2017** Ehren Anderson. Deer herbivory influences sapling architecture after five years of browsing.
-Earned MS in Biology, University of KY, Spring 2019.
-Auburn University Veterinary Medicine Program, Class of 2023.
- Summer 2016** Zach Hackworth. Hardwood tree seedling physiology in manipulated shade environments.
-Earned MS in Forestry, University of Kentucky, Spring 2018.
-Currently employed as Research Forester for University of Kentucky, Department of Forestry and Natural Resources.
- Spring 2016** Ryan McDuffie. Fire effects on invasive poison hemlock (*Conium maculatum*).
-Employed as Environmental Educator by Catalina Island Marine Institute 2 years; Employed by Adventures Cross Country (ARCC), a Service Travel Educational Institution.
- Spring 2016** Pierre Fwelo. Soil nutrient responses to controlled burning of a restored native grassland.
-Earned MS in Public Health at UK, pursuing PhD in Public Health.
- Summer 2015** Jessica Lima-Guin. (Foreign exchange student from Brazil). Impacts of experimental shading on growth and photosynthetic rates of native hardwood tree seedlings of the Kentucky Bluegrass Savanna-Woodland.
- Fall 2014** Matthew Hillenbrand. Temperature influences chlorophyll loss in deciduous tree leaves.
- Summer 2014** Daniel Reed. Fire sensitivity and re-growth in hardwood tree seedlings after prescribed fire in a Kentucky Bluegrass Savanna-Woodland Old-Growth remnant.
- Spring 2012-2014** Cameron Bate. Herbivory by small mammals and ungulates on native hardwood tree seedlings of the Kentucky Bluegrass Savanna.
- Fall 2011** Steve Morgan. Native vegetation diversity and biomass in restored fields of the Kentucky Bluegrass Savanna.
- Summer 2011** Jon Johnson. Field methods in restoration and native plant ecology.
- Currently employed by Florida Department of Natural Resources as Conservation Officer.
- Spring 2011** Tommy Lyman. Restoration ecology of Kentucky Bluegrass Savanna trees.
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Honors and Awards

- 2023** Department of Forestry and Natural Resources Graduate Student Award of Excellence. University of Kentucky (\$250).
- 2018** College of Arts & Sciences Outstanding Teaching Award. University of Kentucky (\$500).
- 2018** Biology Department Outstanding Teaching Assistant Award. University of Kentucky.
- 2017** Biology Department Outstanding Teaching Assistant Award. University of Kentucky.

- 2016** **Student Poster Presentation Award.** 2016 Joint Meeting of the Kentucky and Tennessee Prescribed Fire Councils (\$250).
- 2014** **Graduate Student Oral Presentation Award.** American Society of Plant Biologists-Southern Section (ASPB-SS) Annual Meeting (\$150).
- 2013** Travel Honorarium. Daughters of the American Revolution (DAR) (\$50).
- 2010-2023** Teaching Assistantship and Tuition Waiver. University of Kentucky (Total: \$188,000).
- 2002-2006** Academic Scholarships. Sewanee: The University of the South (Total: \$63,850).
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Funding Awarded

- 2021** -**Project Canopy Planning and Education Grant**, Maine Forest Service and USDA Urban and Community Forestry CFDA (Total: \$12,000)
- 2019** -University of Kentucky, Biology Department Conference Travel Support Grant (Total: \$541)
- 2011-2016, 2019** -University of Kentucky, Biology Department Ribble Summer Research Grant (Total: \$4,300)
- 2011-2016** -G. Flora Ribble Conference Travel Enrichment Grant (Total: \$2,500)
- 2011-2016** -University of Kentucky Graduate School Conference Travel Grant (Total: \$1,525)
- 2016** -University of Kentucky Forestry Department Conference Travel Award (\$472)
- 2012** -**Kentucky Native Plant Society (KNPS) Graduate Research Award** (\$500)
- 2011, 2013** -G. Flora Ribble Research Fellowship (Total: \$4,000)
- Total Funding Awarded: \$25,838**
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Presentations

Invited Presentations

- 2023** **Shaffer, J.D.** Plant Community Ecology in the Kentucky Bluegrass Savanna-Woodland. Centre College. Danville, KY. **Invited Speaker**
- 2023** **Shaffer, J.D.** Bottom-Up and Top-Down Ecological Processes: The Role of Climate and Disturbance in the Kentucky Inner Bluegrass Savanna-Woodland. Tennessee Wesleyan University. Athens, TN. **Invited Speaker**
- 2019** **Shaffer, J.D.** Burned and Eaten: Fire and Herbivory as Ecological Disturbances in the Kentucky Bluegrass Savanna-Woodland. University of Maine at Farmington. Farmington, ME. **Invited Speaker**
- 2017** **Shaffer, J.D.** Patterns and Processes in Terrestrial Ecosystems: Biomes and the Kentucky Bluegrass Savanna-Woodland. Campbellsville University. Campbellsville, KY. **Invited Speaker**
- 2015** **Shaffer, J.D.** Dynamic disturbance: Survival and growth of Kentucky Bluegrass Savanna-Woodland tree seedlings. Kentucky Botanical Symposium. Lexington, KY. **Invited Speaker**

Award Winning Presentations

- 2016** **Shaffer, J.D.**, D.J. Reed, C.P. Bate, S.K. Gleeson, and J.J. Cox. Prescribed fire impacts on tree seedling growth in a Kentucky Bluegrass Savanna-Woodland remnant. 2016 Joint Meeting of the Kentucky and Tennessee Prescribed Fire Councils. Ft. Campbell, KY. **Student Poster Presentation Award Winner (\$250).**
- 2014** **Shaffer, J.D.**, S.K. Gleeson, J.J. Cox, and J.M. Lhotka. Mammalian herbivory on fourteen experimentally planted native hardwood tree seedlings of the Kentucky Bluegrass savanna-woodland community. The American Society of Plant Biology-Southern Section (ASPB-SS) Annual Meeting. Lexington, KY. **Graduate Student Oral Presentation Winner (\$150).**

National Conference Oral Presentations

- 2019** **Shaffer, J.D.**, S.K. Gleeson, J.M. Lhotka and J.J. Cox. Fuel load manipulations influence prescribed fire intensity and severity in an experimentally restored Kentucky Bluegrass savanna-woodland. Ecological Society of America (ESA) Annual Meeting. Louisville, KY.

- 2016 **Shaffer, J.D.**, D.J. Reed, C.P. Bate, S.K. Gleeson, and J.J. Cox. Prescribed fire impacts on tree seedling growth in a Kentucky Bluegrass Savanna-Woodland remnant. Ecological Society of America (ESA) Annual Meeting. Ft. Lauderdale, FL.
- 2014 **Shaffer, J.D.**, S.K. Gleeson, J.J. Cox, and J.M. Lhotka. Mammalian herbivory on fourteen experimentally planted native hardwood tree seedlings of the Kentucky Bluegrass savanna-woodland community. The Wildlife Society (TWS) Annual Meeting. Pittsburg, PA.
- 2014 **Shaffer, J.D.**, S.K. Gleeson, J.J. Cox, and J.M. Lhotka. Mammalian herbivory on fourteen experimentally planted native hardwood tree seedlings of the Kentucky Bluegrass savanna-woodland community. Ecological Society of America (ESA) Annual Meeting. Sacramento, CA.

National Conference Poster Presentations

- 2013 **Shaffer, J.D.**, S.K. Gleeson, J.J. Cox, and J.M. Lhotka. Factors influencing the establishment and survival of native hardwood tree seedlings of the Kentucky Inner Bluegrass blue ash-oak savanna-woodland. Ecological Society of America (ESA) Annual Meeting. Minneapolis, MN.
- 2012 **Shaffer, J.D.**, S.K. Gleeson, J.J. Cox, J.M. Lhotka. The influence of grass competition and herbivory on native hardwood seedling establishment in the Inner Bluegrass of Kentucky. Ecological Society of America (ESA) Annual Conference. Portland, OR.

Regional Conference/Symposia Presentations

- 2017 *Anderson, E.E., & **J.D. Shaffer**. Architectural Responses of Native Trees to Deer Herbivory in the Kentucky Bluegrass Savanna-Woodland. Center for Ecology, Evolution, and Behavior (CEEB) Annual Symposium. University of Kentucky, Lexington, KY. **Undergraduate presenter*.
- 2017 **Shaffer, J.D.**, S.K. Gleeson, and J.J. Cox. Prescribed Fire Dynamics in an Experimentally Reconstructed Kentucky Bluegrass Savanna-Woodland. Center for Ecology, Evolution, and Behavior (CEEB) Annual Symposium. University of Kentucky, Lexington, KY.
- 2016 *McDuffie, R., **J.D. Shaffer**, S.K. Gleeson, P. Fwelo. Poison Hemlock Response Following Prescribed Fire. Center for Ecology, Evolution, and Behavior (CEEB) Annual Symposium. University of Kentucky, Lexington, KY. **Undergraduate presenter*.
- 2016 *Fwelo, P., S.K. Gleeson, **J.D. Shaffer**, R. McDuffie. Prescribed Fire Temperatures and the Impact on Soil Moisture. Center for Ecology, Evolution, and Behavior (CEEB) Annual Symposium. University of Kentucky, Lexington, KY. **Undergraduate presenter*.
- 2016 **Shaffer, J.D.**, D.J. Reed, C.P. Bate, S.K. Gleeson, and J.J. Cox. Prescribed fire impacts on tree seedling growth in a Kentucky Bluegrass Savanna-Woodland remnant. Experimental Urban Ecology: An NSF-Sponsored Workshop. Ecological Research and Education Center (EREC), Lexington, KY.
- 2016 **Shaffer, J.D.**, D.J. Reed, C.P. Bate, S.K. Gleeson, and J.J. Cox. Prescribed fire impacts on old-growth remnants, and experimental plantings, of Kentucky Bluegrass Savanna-Woodland tree seedlings. Ecolunch Seminar Series. Lexington, KY.
- 2016 **Shaffer, J.D.**, D.J. Reed, C.P. Bate, S.K. Gleeson, and J.J. Cox. Prescribed fire impacts on tree seedling growth in a Kentucky Bluegrass Savanna-Woodland. Center for Ecology, Evolution, and Behavior (CEEB) Annual Symposium. University of Kentucky, Lexington, KY.
- 2016 **Shaffer, J.D.** A Tale of Two Disturbances: Herbivory and Fire impact tree seedling success in the Kentucky Bluegrass Savanna-Woodland. Ecolunch Seminar Series. Lexington, KY.
- 2015 *Connor English, Emily Griggs, Hejab Malik, Ryan McDuffie, Olivia Windhurst, Rose Marks, **James Shaffer**, Joshua Radner, Cynthia Townsend, Patricia Works, Kimberly Zeidler-Watters, and Philip Crowley. A Module on Sustainability & Garden Science for Elementary Schools. 2015 University of Kentucky STEM Teaching Enhancement Workshop and Scholarly Forum. Lexington, KY. **Undergraduate presenter*.
- 2014 *Reed, D.J., **J.D. Shaffer**, C.P. Bate, and J.J. Cox. Seedling reaction to Fire in a Bluegrass Savanna Ecosystem. Natural Resources and Environmental Science (NRES) Capstone Presentations. University of Kentucky, Department of Forestry, Lexington, KY. **Undergraduate presenter*.
- 2014 **Shaffer, J.D.**, S.K. Gleeson, J.J. Cox, and J.M. Lhotka. Mammalian herbivory on fourteen experimentally planted native hardwood tree seedlings of the Kentucky Bluegrass savanna-woodland community. Center for Ecology, Evolution, and Behavior (CEEB) Annual Symposium. University of Kentucky, Lexington, KY.

- 2014** **Shaffer, J.D.**, S.K. Gleeson, J.J. Cox, and J.M. Lhotka. Mammalian herbivory on fourteen experimentally planted native hardwood tree seedlings of the Kentucky Bluegrass savanna-woodland community. The Wildlife Society-Kentucky Chapter (KY-TWS) Annual Meeting. Barren River Lake State Park, KY.
- 2013** **Shaffer, J.D.**, S.K. Gleeson, J.J. Cox, and J.M. Lhotka. Factors influencing the establishment and survival of native hardwood tree seedlings of the Kentucky Inner Bluegrass blue ash-oak savanna-woodland. Center for Ecology, Evolution, and Behavior (CEEB) Annual Symposium. University of Kentucky, Lexington, KY.
- 2013** **Shaffer, J.D.** Factors influencing the establishment and survival of native hardwood tree seedlings of the Kentucky Inner Bluegrass blue ash-oak savanna-woodland. Thesis Defense. University of Kentucky, Department of Biology, Lexington, KY.
- 2013** **Shaffer, J.D.** The influence of grass competition and herbivory on native hardwood seedling establishment in the Inner Bluegrass Savanna of Kentucky. UK Biology Graduate Student Association Poster Presentation Event. University of Kentucky, Lexington, KY.
- 2012** **Shaffer, J.D.** Travel Based, Experiential Courses at UK: Fragile Ecosystems of Texas and Florida. Ecolunch Seminar Series. University of Kentucky, Lexington, KY.
- 2012** **Shaffer, J.D.** The influence of grass competition and herbivory on native hardwood seedling establishment in the Inner Bluegrass Savanna of Kentucky. Ecolunch Seminar Series. University of Kentucky, Lexington, KY.
- 2006** **Shaffer, J.D.** and D.A. McGrath. Water quality in exurban, agricultural, and forested watersheds in the Sequatchie Valley, TN. Scientific Sewanee Conference. The University of the South, Sewanee, TN.
- 2006** **Shaffer J.D.**, J.L. Reid, and D.A. McGrath. Photosynthetic rates, water use efficiency, and xylem pressure potential in *Quercus prinus* and *Sassafras albidum* in a clear-cut and a secondary forest. Scientific Sewanee Conference. The University of the South, Sewanee, TN.

Service

- 2024** Invited Journal Reviewer, Science of the Total Environment. Elsevier Publishing.
- 2024** Invited Journal Reviewer, Australian Journal of Botany. CSIRO Publishing.
- 2018-2024** **Researcher and Site Co-Coordinator, Common Campus Tree Seedling Project**. University of Maine at Farmington, Farmington, ME; Schoodic Institute, Winter Harbor, ME.
- 2018-2024** Farmington Conservation Commission, Associate Member. Farmington, ME.
- 2022** Riparian Zone Reforestation Volunteer, Temple Stream Dam Removal. Atlantic Salmon Federation and Farmington Conservation Commission. Farmington, ME.
- 2018** Invited Speaker, Rotary Club of Farmington. Farmington, ME.
- 2018** Poster Presentation Judge, Michael D. Wilson Symposium. University of Maine at Farmington. Farmington, ME.
- 2017** **Symposium Organizer, 16th Annual Center for Ecology, Evolution, & Behavior (CEEB) Symposium**. University of Kentucky, Lexington, KY.
- 2017** Planting Coordinator and Invasive Species Removal Director, Urban Forest Initiative. Ecological Research and Education Center (EREC). University of Kentucky, Lexington, Ky.
- 2016-2017** **Oversight Advisory Committee Member, Ecological Research and Educational Center (EREC)**. University of Kentucky, Lexington KY.
- 2016** Invited Journal Reviewer, Journal of the Kentucky Academy of Sciences. Louisville, KY.
- 2016** Biobonanza Exhibitor, Biology Department Open-House. University of Kentucky, Lexington, KY.
- 2016** Training Committee At-Large Member, Kentucky Prescribed Fire Council. Frankfort, KY.
- 2015** **Program Developer and Classroom Instructor, Sustainability and Garden Science Outreach Project. Yates Elementary, Lexington, KY**
- 2015** Science Fair Judge, Glendover Elementary. Lexington, KY
- 2011-2015** **Volunteer Coordinator, Reforest the Bluegrass**. Lexington, KY
- 2014** **President, Biology Graduate Student Association (BGSA)**. University of Kentucky, Lexington. KY
- 2013** Guest Speaker, Daughters of American Revolution (DAR), Nashville Chapter Meeting. Nashville, TN.

- 2013 Kentucky Biodiversity Day Presenter, Legislature Informational Event at the Capitol. Frankfort, KY.
2011-2012 **Ecolunch Seminar Series Coordinator.** University of Kentucky, Lexington, KY.
2011 Planting Coordinator, Griffith Woods WMA Native Tree Restoration. Harrison County, KY
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Related Employment

- 2010 Stream Restoration Technician, Obed Watershed Community Association. Crossville, TN.
-Engaged in stream erosion control and revegetation of eroded streams. Installed erosion control revetments to trap sediments and built riprap barriers to prevent undercutting of stream banks. Planted riparian zone woody shrubs and trees.
- 2009 Seasonal Naturalist, Nashville Parks Department, Beaman Park Nature Center. Nashville, TN.
-Operated Nature Center for 2,300-acre forested municipal park. Built and maintained trail system. Developed and delivered nature programming to the public. Inventoried biodiversity. Planned and developed park infrastructure and activities.
- 2008 Assistant Manager, Shaffer Quarries. Crossville, TN.
-Assisted in daily operations of building stone and masonry company. Spoke with customers, took orders, and prepared stone shipments. Loaded semi-trucks with forklift. Built stone walls, columns, patios, and walkways using masonry techniques. Manufactured stone to customer specifications with hammer and chisel, diamond saw, pneumatic stone cutter. Developed website for company.
- 2007 Field Research Technician, Dinkins Biological Consulting. Powell, TN.
-Conducted field biology work contracted by the Tennessee Department of Environment and Conservation concerning the population status of the federally endangered Painted Snake-Coiled Forest Snail (*Anguispira picta*). Conducted populations surveys and habitat evaluations on unique limestone cliff face habitat.
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Technical Skills and Experiences

- Working knowledge of R Statistical Package, JMP Statistical Package, Microsoft Office suite.
 - Operational expertise with the Licor 6400XT Portable Photosynthesis Machine.
 - Identification of trees, wildflowers, birds, mammals, reptiles, amphibians, and rocks of North America.
 - General Biology Lab Skills (microscope, spectrophotometer, cultures, electrophoresis, pipetting, PCR, etc.).
 - Direct knowledge with ecosystems of North America from personal travel/research experience:
 - Eastern Deciduous Forests (Blue Ridge, Cumberland Plateau, Central Hardwoods, Northern Hardwoods);
 - Atlantic Coast Maritime Forests and Barrier Islands (SC, GA, FL, FL Keys); Florida Interior Ecosystems (e.g. Everglades); Desert Southwest (Texas, Arizona, New Mexico, Utah); Rocky Mountain West (Colorado, Wyoming, Montana, Idaho); Pacific Northwest (Coastal Range, Sierra Nevada, Cascades); Great Plains; Great Lakes; Alpine Tundra (Colorado, Montana, Maine).
 - Personal collection of plant specimens and wildlife/landscape photography for teaching labs.
 - Operational experience with field vehicles and heavy equipment (ATV, UTV, four-wheel drive, forklift, bobcat).
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Professional Affiliations

Ecological Society of America (ESA), The Wildlife Society (TWS), Kentucky Native Plant Society (KNPS), Kentucky Prescribed Fire Council (KPFC)
