

Alicia J. Foxx, PhD

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EDUCATION

PhD	Northwestern University, 2020. Plant Biology and Conservation Dissertation: <i>Implications of Within-Species Root and Shoot Trait Variation and Plasticity for Species Coexistence</i> . Advisor: Andrea T. Kramer, PhD
<i>Graduate certificate</i>	Kellogg School of Management: Management for Scientists and Engineers
MS	Northwestern University, 2014. Plant Biology and Conservation Thesis: <i>Intraspecific variation in Elymus elymoides root traits and its influence on competitive outcomes</i> . Advisor: Andrea T Kramer, PhD
BS	Elmhurst University, 2012. Biology Advisor: Paul Arriola, PhD

PROFESSIONAL POSITIONS

Postdoctoral Fellow	Oak Ridge Institute for Science and Education Post-doctoral Fellowship with USDA-ARS Applied machine learning research in genomics and bioinformatics for plant-microbe interactions with Adam Rivers, PhD. Jun 2020 – Jun 2022
Research Scientist	NSF Biological Integration Institute: New Roots for Restoration: integrating plant traits, communities, and the soil ecosystem to advance restoration of natural and agricultural systems. Jul 2022

PUBLICATIONS

Published / *undergraduate mentee

1. **Foxx A.J.**, Franco Melendez K.P, Hariharan J., K., Kozik A., Wattenburger C., Godoy-Vitorino F., & Rivers R.R. (2021) Advancing Equity and Inclusion in Microbiome Sciences. *mSystems*; 5(5): e01151-21. <https://doi.org/10.1128/mSystems.01151-21>
2. **Foxx A.J.**, Wojcik S.* (2021) Plasticity in response to soil texture affects the relationships between a shoot and root trait and responses vary by population. *Folia Oecologica*; 48(2): 199-204. <https://doi.org/10.2478/foecol-2021-0020>

3. **Foxx A.J.** (2021) Induced plasticity alters responses to conspecific interactions in seedlings of a perennial grass. *Scientific Reports*; 11: 1-8. <https://doi.org/10.1038/s41598-021-93494-0>
4. **Foxx A.J.**, & Kramer A. (2020). Hidden variation: cultivars and wild plants differ in trait variation with surprising root trait impacts. *Restoration Ecology*; 29: e13336. <https://doi.org/10.1111/rec.13336>
5. **Foxx A. J.** & Kramer, A. (2020). Variation in number of root tips influences survival in competition with an invasive grass. *Journal of Arid Environments*; volume 179. <https://doi.org/10.1016/j.jaridenv.2020.104189>
6. Zeldin J., Lichtenberger T., **Foxx A.J.**, Williams E., & Kramer A. (2020). Intraspecific functional trait structure of restoration-relevant species: Implications for restoration seed sourcing. *Journal of Applied Ecology*; 57: 864-874. <https://doi.org/10.1111/1365-2664.13603>
7. **Foxx A.J.**, & Fort F. (2019). Root and shoot competition lead to contrasting competitive outcomes under water stress: A systematic review and meta-analysis. *PLoS ONE*. 14(12): e0220674. <https://doi.org/10.1371/journal.pone.0220674>
8. **Foxx A.J.**, Barak R., Lichtenberger T., Richardson L., Rodgers A.J., & Williams E. W. (2019). Evaluating the prevalence and quality of Conference Codes of Conduct. *Proceedings of the National Academy of Sciences*. 116 (30): 14931-14936. <https://doi.org/10.1073/pnas.1819409116>
9. Hintz L.*, Eshleman M., **Foxx A.J.**, Wood T., & Kramer A. (2016). Population Differentiation in Early Life History Traits of *Cleome lutea* var. *lutea* in the Intermountain West. *Western North American Naturalist*. 76(1): 6-17. <https://doi.org/10.3398/064.076.0103>

Submitted

10. **Foxx A.J.**, Fort F., & Kramer A. Population root and shoot trait distances vary in how they moderate interaction outcomes.

In preparation

11. De Vitis M., Havens K., Barak R., Egerton-Warburton L., Ernst A., Evans M., Fant J. **Foxx A.J.**, Hadley K., Jabcon J., O'Shaughnessey J., Ramakrishna S., Sollenberger D., Taddeo S., Urbina Casanova R., Lan X., Woolridge C., Zeldin J., & Kramer A. Diagnosing and treating causes of dark diversity in restoration.

PROFESSIONAL EXPERIENCE

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| 2015 – 2018 | Science journalism collaborations with journalism students under Dr. Donna Leff, PhD (Medill School of Journalism; Northwestern University). |
| Feb 2017 | Science policy advocacy for increased funding for plant restoration research to Legislative directors and assistants of Colorado Senators and Representatives. Washington, D.C. |
| Feb 2017 | Session moderator at the National Native Seed Conference; Washington, DC |
| Nov 2016 | Science policy advocacy for funding to Cook County Commissioners during Forest Preserve Budget hearing to increase funding for the Chicago Botanic Garden. |

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| 2014 - 2016 | ComSciCon Chicago conferences inaugural and year two organizing committee, executing fundraising and performed event responsibilities, Chicago, IL. |
| Jun 2013 –
Aug 2019 | Graduate Housing Assistant, Northwestern University; Live-in position where I organized and hosted 175 events to build community and serve as a student liaison for graduate students - 25 hrs/wk. |

RESEARCH EXPERIENCE

2020-2022: Post-Doctoral Research

Machine learning applications in bioinformatics for microbiome research, including the project lead exploring vertical transmission of microbiome in seeds through experimentation and meta-analytic applications.

2014 – 2020: Dissertation Research

Used meta-analytic techniques to show plant competition differs under root-root compared to shoot-shoot interactions under drought, where root competition is more intense.

Showed that the cultivation process to produce native plant materials reduces the variation in root traits and survival in bluebunch wheatgrass

Provided evidence of induced plastic responses to invasive species that affected future plant interactions.

Showed the importance of competition at the within-population level and that mixing populations in a restoration context may harm long-term coexistence.

2013 – 2019: Research Assistantships

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| Oct 2019 -
Jun 2020 | Assessed ploidy variation in native plants using flow cytometry. Chicago Botanic Garden, Glencoe, IL. |
| Jun 2018 –
Dec 2018 | Collected, identified, and propagated submerged aquatic plants. Chicago Botanic Garden, Glencoe, IL |
| Oct 2017 –
Jun 2018 | Performed vegetative plant cloning and trait quantification of western plant populations and species. Chicago Botanic Garden, Glencoe, IL. |
| Oct 2016 –
Apr 2017 | Created soil property database of habitats of rare plant species local to the Chicago region. The Chicago Botanic Garden. |

Oct 2016 – X-ray and Germination assessment of viability of frozen seeds stored in a seed bank.
Jun 2017 The Chicago Botanic Garden.

Oct 2015 – Insect specimen preparation. The Chicago Botanic Garden.
Apr 2016

Jan 2013 – Germination testing of 26 western plant species. The Chicago Botanic Garden
Apr 2013

2012-2014: MS Thesis

Wild collected seeds and showed that root traits vary by population in *Elymus elymoides* and play a key role in determining competition outcomes with the invasive grass *Bromus tectorum*.

GRANTS

Sept 2021 BII: New Roots for Restoration: integrating plant traits, communities, and the soil ecosphere to advance restoration of natural and agricultural systems.” PI: Allison Miller; Co-PIs: Kay Havens (Chicago Botanic Garden); Sarah Lovell (University of Missouri); Jim Bever (University of Kansas); Kris Callis-Duehl (Danforth Plant Science Center). National Science Foundation Biology Integration Institute. \$12,500,000. Submitted January 27, 2021.

Jun 2018 Plant Biology and Conservation Travel Award; Northwestern University

Feb 2017 Plant Biology and Conservation Research Award; Northwestern University

June 2014 Plant Biology and Conservation Travel Award; Northwestern University

Mar 2013 Plant Biology and Conservation Research Award; Northwestern University

FELLOWSHIPS & COMMENDATIONS

2013; 2018; 2019 Graduate Housing Assistant Excellence Award; Northwestern Residential Services

Feb 2018 Elmhurst University American Dream Fellowship; Honorary Fellowship

Apr 2016 Black Graduate Student Association’s 19th Annual Conference; Poster award

May 2012	James F. Berry Biology Chairperson's Award; Elmhurst College
May 2008	Gottlieb Memorial Hospital Scholarship
May 2008	Pepsi College Scholarship

SERVICE TO THE FIELD

2020 – exp. 2023	Associate Editor: Ecological Solutions and Evidence, British Ecological Society
Manuscript Reviews	2020: Biological Conservation New Phytologist Ecology 2021: Plant Signaling & Behavior Plant Ecology Ecosphere African Journal of Plant Sciences Restoration Ecology

INVITED SPEAKING ENGAGEMENTS

Apr 2021	Elmhurst University, Importance of Native Plant Conservation
Feb 2018	Keynote address delivery at inaugural Elmhurst College American Dream Fellowship Competition for first generation college students; Elmhurst, IL.

CONFERENCE PRESENTATIONS

2018	Exploring the role of plastic responses in competitive intensity and coexistence. Foxx, A, Allen, B, & Kramer, A. Ecological Society of America
2018	Impact of plasticity on competition and coexistence. Foxx, A, Allen, B, & Kramer, A. Chicago Botanic Garden
2017	Competitive intensity among and between seedlings: what do the roots tell? Foxx, A. National Native Seed Conference
2017	Rooting Intraspecific variation and plasticity in coexistence. Foxx, A. Chicago Botanic Garden
2016	Impact of intraspecific variation in root traits of a perennial grass on competitive outcomes. Foxx, A & Kramer, A. Black Graduate Student Association Conference

- 2016 The role of root trait diversity in seedling establishment. Foxx, A. Chicago Botanic Garden.
- 2016 Seed Bank Germination. Foxx, A. Chicago Botanic Garden
- 2015 Does number of lateral roots in *Elymus elymoides* populations vary and influence competitive outcomes with cheatgrass? Foxx, A & Kramer, A. National Native Seed Conference
- 2014 Variation in Intraspecific Root Traits of *Elymus elymoides* & Implications for water stress tolerance and competition. Foxx, A & Kramer, A. Colorado Plateau Native Plant Program.
- 2014 Intraspecific variation in *Elymus elymoides* root traits and its influence on competitive outcomes. Chicago Botanic Garden
- 2014 Intraspecific variation in *Elymus elymoides* root traits and its influence on competitive outcomes. Botanical Society of America
- 2012 The Impact of Weed Competition - Preliminary Studies. Associated Colleges of the Chicago Area Symposium.

MENTOR EXPERIENCES

- Oct - Dec 2018 Lake Forest College Internship mentor with data collection, visualization, and analyses: Anissa Loyola
- Jul - Dec 2018 High school science fair project mentor with experiment work: Raymond Diaz
- Jul - Sept 2017 College First mentor with experimental work and data collection: Giovanie Lanzo
- Jun - Sept 2017 NSF REU mentor with data collection, analysis, visualization, and communicating research findings: Brooke Allen
- Apr - May 2016 Mentor Matching Engine mentor with data interpretation: Breanna Giametta
- Feb - May 2016 Mentor Matching Engine mentor with experimental design and data interpretation: Elise Miedlar
- Nov - Dec 2015 Lake Forest College Internship mentor with data collection and visualization: Siobhan Wojcik

Jun - Aug 2015	Y.O.U. Summer Science Club mentor on introducing young children to science experiments, 2.5 hours per week
Apr - Jun 2015	Science Club mentor on working with grade school children to science experiments, 2.5 hrs/wk
Jun - Sept 2014	NSF REU mentor with experimental design, data collection, analysis, visualization, and communicating research findings: Giselle Varrientos
Jun - Sept 2014	NSF REU co-mentor with data analysis and interpretation: Lisa Hintz
Nov - Dec 2013	Lake Forest College Internship mentor with data collection and communication of experiment: Osja Brinson
Jul 2013 & Jul 2014	Mentor to grade school student on root trait measurements: Grace Guarraia

TEACHING EXPERIENCES

Apr 2021	Data Carpentry support staff – R and data management
Jan - Apr 2019	Quantitative Methods in Ecology and Conservation. Teaching Assistant Northwestern University. <i>Responsibilities:</i> Graded homework, in-class assistant, held office hours. Instruction using R statistical software.
Mar - Jun 2017	Evolutionary Processes. Teaching Assistant, Northwestern University. <i>Responsibilities:</i> Graded quizzes and tests, in-class assistant, held office hours.
Apr - Jun 2016	Evolutionary Processes. Teaching Assistant, Northwestern University. <i>Responsibilities:</i> Graded quizzes and tests, in-class assistant, held office hours.
Jan - Apr 2013	Health of the Biosphere, Teaching Assistant, Northwestern University. <i>Responsibilities:</i> Graded quizzes and tests, in-class assistant, held office hours.
Jul 2010 & 2012	Math and Science Summer Academy, High school student tutor & lab assistant Elmhurst College, 140 contact hours (2 weeks). <i>Responsibilities:</i> Graded quizzes, tutored, assisted in lab, supported team building.

ADDITIONAL RESEARCH OUTPUTS

Technical Summaries

- Kramer, A., **Foxx, A.** 2015. Propagation protocol for production of Propagules (seeds, cuttings, poles, etc.) *Cleome lutea* Hook. Seeds Chicago Botanic Garden - Research Glencoe, Illinois. In: **Native Plant Network**. URL: <http://NativePlantNetwork.org>. US Department of Agriculture, Forest Service, National Center for Reforestation, Nurseries, and Genetic Resources.

Popular Articles & Media Coverage of Research

- Academic conferences lack tools to prevent sexual misconduct, discrimination
<https://scienmag.com/academic-conferences-lack-tools-to-prevent-sexual-misconduct-discrimination/>
- Rooting for Native Plants. 2016. Julie Beck; The Chicago Botanic Garden.
http://my.chicagobotanic.org/science_conservation/rooting-for-native-plants/
- **Foxx, Alicia.** Plants' roots helped them move onto land. 60-Second Science
http://my.chicagobotanic.org/science_conservation/60-second-science-plants-roots-helped-them-move-to-land/

COMMUNITY SERVICE & VOLUNTEER SERVICE

Apr 2019	<i>Northwestern University Service Project</i> , Organized and lead planting of campus native plant garden
2019 & 2017	<i>The Night Ministry</i> , Organized and lead toiletry kit creation and donation for homeless LGBTQ+ youth
Jun 2018	<i>Evanston Scholars</i> , Participated in panel on graduate school experiences for high school students
Apr 2018	<i>Purple Pantry</i> , Participated in food distribution for students in need
Apr 2018	<i>Chicago Botanic Garden Science Festival</i> , lead an activity explaining molecules to children
Jun 2016	<i>Stellar Girl Program</i> , delivered a presentation to young girls on my research to encourage their futures in science
May 2016	<i>Northwestern University Service Project</i> , Participated in invasive plant removal as part of the Botany Club
Apr - Jun 2016	<i>STEAM</i> , designed and executed art x science activities for grade school students on drawing the benefits of plant diversity
Mar 2016	<i>Somme Woods, Cook County Forest Preserve</i> , Volunteer to cut trees

Dec 2015	<i>McCutcheon Elementary School Science Fair Judge</i> assessed and scored grade school student's science fair projects.
Nov 2015	<i>LaBagh Woods, Cook County Forest Preserve</i> , Volunteer native seed cleaning
Jul 2015	<i>Elmhurst College</i> , invited outreach speaker to encourage pursuit of secondary education of high school students
Jul 2014	<i>Firewise: Botany in Action, Idaho Botanic Garden</i> , brush removal volunteer
Feb - Jun 2014	<i>New Life for Old Bags</i> service project, Organized and lead plastic bag collection and processing for converting to bed mats for homeless people
Jun 2013	<i>World Environment Day, Chicago Botanic Garden</i> , conducted seed and invasive species demonstration and communicated importance of conservation with public
Feb 2013 & 2015	<i>Elmhurst College</i> invited outreach speaker for college students to encourage the pursuit of graduate school.