

Kendall Beals, PhD

Soil and Ecosystem Ecologist

University of Arizona, [Working Lands Conservation](#)

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SUMMARY

Soil and ecosystem ecologist specializing in soil carbon dynamics in working rangelands. I lead interdisciplinary research evaluating carbon sequestration potential of riparian restoration practices in western U.S. grazing systems, collaborating with scientists, conservation practitioners, and producers to generate actionable guidance that informs USDA-NRCS policy and on-the-ground practice. I have worked in a variety of ecosystems in and outside of the U.S., including Southern Appalachian forests, Midwest grasslands, Southwestern deserts, and tropical forests. In my career I integrate field ecology, biogeochemistry, molecular tools, bioinformatics, and rigorous statistical analysis to advance applied soil health science and climate change mitigation.

EDUCATION

2022 Ph.D., Ecology & Evolutionary Biology, University of Tennessee–Knoxville

2013 B.S., Biology, Dickinson College

EXPERIENCE

Postdoctoral Research Associate

University of Arizona, Working Lands Conservation | 2024 – present

- Lead research evaluating soil carbon sequestration potential of low-tech process-based restoration practices in western U.S. rangelands
- Design, conduct and analyze field-based experiments across restoration treatments and grazing systems
- Lead the writing of scientific manuscripts and assist in writing grant proposals
- Collaborate with USDA-NRCS, conservation NGOs, and producers to translate findings into management-relevant insights
- Presented research at two national conferences
- Supervise and coordinate small team of research technicians in the field and laboratory

Postdoctoral Research Associate

San Diego State University | 2022 – 2023

- Designed and executed field and laboratory experiments to investigate microbial mediation of carbon cycling in tallgrass prairie under land management gradients
- Conducted genomic sequencing, bioinformatics analysis, and statistical analysis to address project objectives
- Led and assisted in the writing of three published scientific papers (one as first author, two as co-author)
- Led the writing of a successful USDA NIFA AFRI postdoctoral fellowship grant
- Presented research at a national conference
- Supervised and coordinated small team of research technicians in the laboratory

Consultant

Basecamp Research | March – June 2023

- Invited to provide expertise in microbial ecology for conservation NGO client

- Designed and conducted bioinformatics and statistical analysis pipeline to identify bacterial and fungal taxa indicative of potential high and low carbon use efficiency

PUBLICATIONS

1. **Beals, K.K.**, Nasto, M.K., Sargeant, P., Smith, R.M., Whittlesey, R., Hulvey, K.B., Lien, A.M. Low-tech process-based restoration promotes early-stage soil organic carbon gains in semi-arid rangeland floodplains using beaver dam analogs. *Journal of Soil and Water Conservation*. In Review.
2. Bell, J.K., Barber, N.A., **Beals, K.K.**, ... (2026). Plant diversity is not a consistent predictor of soil extracellular enzyme activity in field or experimental grasslands. *Ecosphere*. <https://esajournals.onlinelibrary.wiley.com/doi/full/10.1002/ecs2.70633>
3. **Beals, K.K.**, Rosin, C., Herrick, B.M., Zedler, P.H., Bailey-Marren, I., Yao, Z., Barber, N.A. (2025). Woody encroachment increases carbon degradation rates and alters soil microbial community structure in restored and remnant mesic tallgrass prairie. *Applied Soil Ecology*. <https://doi.org/10.1016/j.apsoil.2025.1064626>
4. Mason, C.N., Shahr, S., **Beals, K.K.**, Kelley, S.T., Lipson, D.A., Swingley, W.D., Barber, N.A. (2023). Taxonomic and functional restoration of tallgrass prairie soil microbial communities in comparison to remnant and agricultural soils. *FEMS Microbiology Ecology*. <https://doi.org/10.1093/femsec/fiad120>
5. **Beals, K.K.**, Lebeis, S.L., Bailey, J.K., Schweitzer, J.A. (2023). Conditionality of soil microbial mediation of *Solidago* plant phenotype: indicator taxa within complex microbiomes influence some, but not all *Solidago* traits. *Plant and Soil*. <https://doi.org/10.1007/s11104-022-05828-0>
6. Collins, C.G., Phillips, M.L., **Beals, K.K.**, Bailey, L., O'Brien, J., Dhungana, I., Jech, S. (2022). Mentoring is more than a mentor. *Frontiers in Ecology and the Environment*. <https://doi.org/10.1002/fee.2518>
7. **Beals, K.K.**, Searce, A.E., Swystun, A.T., Schweitzer, J.A. (2022). Belowground mechanisms for oak regeneration: interactions among fire, soil microbes and plant community alter oak seedling growth. *Forest Ecology and Management*. <https://doi.org/10.1016/j.foreco.2021.119774>
8. Kivlin, S.N., Harpe, R.V., Turner, J.H., Moore, J.A.M., Moorhead, L.C., **Beals, K.K.**, Hubert, M.M., Papes, M., Schweitzer, J.A. (2021). Arbuscular mycorrhizal fungal response to fire and urbanization in the Great Smoky Mountains National Park. *Elementa: Science of the Anthropocene*. <https://doi.org/10.1525/elementa.2021.00037>
9. Dickey, J.R., Swenie, R.A., Turner, S.C., Winfrey, C.C., Yaffar, D., Padukone, A., **Beals, K.K.**, Sheldon, K.S., Kivlin, S.N. (2021). The utility of macroecological rules for microbial biogeography. *Frontiers in Ecology and Evolution*. <https://doi.org/10.3389/fevo.2021.633155>
10. **Beals, K.K.**, Moore, J.A., Kivlin, S.N., Bayliss, S.L.J., Lumibao, C.Y., Moorhead, L.C., Patel, M., Summers, J.L., Ware, I.M., Bailey, J.K., Schweitzer, J.A. (2020). Predicting plant-soil feedback in the field: meta-analysis reveals that competition and environmental stress differentially influence PSF. *Frontiers in Ecology and Evolution*. <https://doi.org/10.3389/fevo.2020.00191>
11. Rosin, C., **Beals, K.K.**, Belovitch, M.W., Harrison, R.E., Pendred, M., Sullivan, M.K., Yao, N., Poulsen, J.R. (2020). Assessing the effects of elephant foraging on the structure and diversity of an Afrotropical forest. *Biotropica*. <https://doi.org/10.1111/btp.12758>
12. Van Nuland, M.E., Vincent, J.B., Ware, I.M., Mueller, L., Bayliss, S.L., **Beals, K.K.**, Schweitzer, J.A., Bailey, J.K. (2020). Intraspecific trait variation across elevation predicts a widespread tree species' climate niche and range limits. *Ecology and Evolution*. <https://doi.org/10.1002/ece3.5969>

13. Ware, I.M., Fitzpatrick, C.R., Senthilnathan, A., Bayliss, S.L.J., **Beals, K.K.**, Mueller, L.O., Summers, J.L., Wooliver, R.C., Van Nuland, M.E., Kinnison, M.T., Palkovacs, E.P., Schweitzer, J.A., Bailey, J.K. (2018). Feedbacks link ecosystem ecology and evolution across spatial and temporal scales: Empirical evidence and future directions. *Functional Ecology*. <https://doi.org/10.1111/1365-2435.13267>
14. Kivlin, S.N., Lynn, J.S., Kazenel, M.R., **Beals, K.K.**, Rudgers, J.A. (2017). Biogeography of plant-associated fungal symbionts in mountain ecosystems: A meta-analysis. *Diversity and Distributions*. <https://doi.org/10.1111/ddi.12595>

GRANTS AND AWARDS

- 2024 *The role of woody herbaceous plant-derived carbon inputs on soil organic matter formation and persistence in U.S. rangelands*. USDA NIFA AFRI Postdoctoral Fellowship. **(\$225,000; PI; voluntarily declined)**
- 2022 Outstanding Dissertation by a Graduate Student. Department of Ecology and Evolutionary Biology. University of Tennessee–Knoxville. **(\$500)**
- 2021 Outstanding Scholarly Achievement by a Graduate Student. Division of Biology. University of Tennessee–Knoxville **(\$1,000)**
- 2020 Extraordinary Professional Promise. Chancellor’s Honors Award. University of Tennessee–Knoxville.
- 2019 Hesler Herbarium Student Research Award. UT–Knoxville. **(\$1,100)**
- 2018 Ecological, Evolutionary, and Conservation Genomics Award. American Genetic Association **(\$9,927)**
- 2018 Graduate Student Training Fellowship. Torrey Botanical Society. **(\$1,000)**
- 2018 Student-Faculty Research Award. University of Tennessee–Knoxville. **(\$4,800)**
- 2017 Hesler Herbarium Student Research Award. University of Tennessee–Knoxville. **(\$500)**

PRESENTATIONS (*, invited presentation)

Beals, K.K., Nasto, M.K., Sargeant, P., Smith, R.M., Whittlesey, R., Hulvey, K.B., Lien, A.M. (2026). Process-based restoration in rangeland floodplains: a soil carbon story. Society for Range Management. Oral presentation.

Beals, K.K., Zedler, P., Barber, N.A. (2023). Soil microbial dynamics of carbon cycling respond to woody encroachment and land management history in a mesic tallgrass prairie. Ecological Society of America. Oral presentation.

Beals, K.K., Schweitzer, J.A. (2022). Fire-induced shifts in microbial community composition influence rates of carbon degradation. Soil Ecological Society. Oral presentation.

Beals, K.K., Bailey, J.K., Schweitzer, J.A. (2021). Bouncing back from burn: examining asynchrony in soil microbial responses to wildfire over time. Ecological Society of America. Oral presentation.

***Beals, K.K.**, Bailey, J.K., Schweitzer, J.A. (2021). Bouncing back from burn: examining asynchrony in soil microbial responses to wildfire over time. National Park Service (National Capital Area) Science Spillover. Oral presentation.

Beals, K.K., Bailey, J.K., Schweitzer, J.A. (2021). Bouncing back from burn: long-term monitoring of GSMNP soil microbial stability from Chimney Tops 2 wildfire. Great Smoky Mountains National Park Science Colloquium. Oral presentation.

Beals, K.K., Bailey, J.K., Schweitzer, J.A. (2020). Fire induced changes to the soil microbiome shift plant phenotype. Natural Areas Conference. Poster presentation.

Beals, K.K., Lebeis, S.L., Bailey, J.K., Schweitzer, J.A. (2020). Importance of soil microbiome for plant phenotype differs among traits and plant species. Ecological Society of America. Poster presentation.

Scearce, A., Swystun, A., **Beals, K.K.**, Franklin, J., Hughes, K., Schweitzer, J.A. (2020). Oak regeneration after Chimney Tops II fire is influenced by pine seedling neighbors and soil microbes. Great Smoky Mountains National Park Science Colloquium. Oral presentation.

***Beals, K.K.**, Moore, J.A.M., Moorhead, L., Hubert, M., Kivlin, S.N., Schweitzer, J.A. (2020). Burning questions: How wildfire alters ecosystem dynamics in a Southeastern forest through disruptions of plant-soil interactions. National Ecological Observatory Network. Oral presentation.

Beals, K.K., Bailey, J.K., Schweitzer, J.A. (2019). Burning questions: Importance of plant-soil microbiome interactions and how the Chimney Tops fire affects this ecological internet. Science at Sugarlands, Great Smoky Mountains National Park. Oral presentation.

Beals, K.K., Bailey, J.K., Schweitzer, J.A. (2019). Burning questions: the role of wildfire severity on plant function through disruptions of plant-soil interactions. Ecological Society of America. Oral presentation.

Beals, K.K., Bailey, J.K., Schweitzer, J.A. (2019). Hidden players of plant function: variation in soil microbiome conditioning source influences phenotypic variation in a common perennial. Soil Ecology Society. Oral presentation.

Beals, K.K., Bailey, J.K., Schweitzer, J.A. (2019). Understanding Chimney Tops 2 wildfire from the ground up: functional response of plant-soil interactions to fire. Great Smoky Mountains National Park Science Colloquium. Oral presentation.

Beals, K.K., Bailey, J.K., Schweitzer, J.A. (2018). Hidden players of plant function: the role of the soil microbiome on plant phenotype. Ecological Society of America. Oral presentation.

TEACHING AND MENTORSHIP

Plant Ecology (EEB 433), University of Tennessee (4 semesters)

Field Ecology (EEB 415), University of Tennessee (1 semester)

Skills of Biological Investigation Laboratory (BIOL 159), University of Tennessee (6 semesters)

Cell, Genetic, and Physiology Laboratory (BIOL 101), University of Tennessee (1 semester)

Natural History of Vertebrates (BIOL 332), Dickinson College (1 semester)

Mentored 3 undergraduate researchers (2017 – 2022); two now pursuing PhDs.

Co-authored peer-reviewed publication (Forest Ecology & Management, 2022).

SERVICE AND OUTREACH

Panel Reviewer, National Science Foundation (DEB, 2022, 2023)

Peer Reviewer: *Frontiers in Forest and Global Change*; *Nature Communications*; *Soil Biology & Biochemistry*; *Journal of Ecology*; *Plant and Soil*; *Fungal Ecology*

Co-organizer, Women in Soil Ecology Network (2020 – 2024)

Presentations to the public

San Diego Mission Trails Regional Park. Eco Ambassadors Program for Teens. “Non-Profit Stakeholder-Focused Science.” (2025).

San Diego Mission Trails Regional Park. Eco Ambassadors Program for Teens. “Adventures with a Soil Scientist.” (2023, 2024).

National Park Service: National Capital Area. Science Spillover event. “Bouncing back from burn: examining asynchrony in soil microbial responses to wildfire over time.” (2021).

Great Smoky Mountains National Park. Science at Sugarlands event. “Importance of plant-soil microbiome interactions and how the Chimney Tops fire affects this ecological internet.” (2019).

ADDITIONAL SKILLS

- R, R Markdown
- Git version control
- Large language models
- Amazon Web Service
- Extensive fieldwork in a wide diversity of ecosystems
- Wilderness First Responder certified
- French (professional working proficiency)