

Lia Ossanna

PHD CANDIDATE · RANGELAND AND RESTORATION ECOLOGIST

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Education

University of Arizona

Tucson, AZ

PHD CANDIDATE IN NATURAL RESOURCES, ECOLOGY OF RANGELANDS

Aug. 2020 - Present

- Advisor: Dr. Elise Gornish
- Minor in Data Science

University of Arizona

Tucson, AZ

BS IN ENVIRONMENTAL SCIENCE WITH HONORS, SUMMA CUM LAUDE

Aug. 2015 - May 2019

- Minors in Sustainable Plant Systems, East Asian Studies
- Thesis: Nitrogen dynamics as an indicator of mine waste revegetation progress

Professional Experience

PhD Candidate

Tucson, AZ

UNIVERSITY OF ARIZONA

Aug. 2020 - Present

- Conducted and published a systematic review and meta-analysis on a management technique that reduces invasive plants using soil carbon amendments.
- Analyzed 10 years of vegetation monitoring for rock detention structures to slow erosion on a southern Arizona ranch; studied soil chemical and microbial response from the 10th year. Working in collaboration with Altar Valley Conservation Alliance.
- Currently conducting analysis to measure dryland plant response to extreme precipitation events at RestoreNet sites, a USGS restoration project spanning across the southwestern US.
- Assisted in surveying and analyzing buffelgrass (*Pennisetum ciliare*) distribution in an urban ecosystem.

Research Specialist

Tucson, AZ

UNIVERSITY OF ARIZONA

May 2019 - Aug. 2020

- Analyzed microbial diversity, community composition, and soil microbe-plant relationships for mine reclamation and rubber biosynthesis in arid lands.
- Managed lab group's quality control standards and protocol optimization for DNA extractions and qPCR.

Undergraduate Researcher

Tucson, AZ

UNIVERSITY OF ARIZONA

July 2016 - May 2019

- Researched mine revegetation to support sustainable reclamation management practices by analyzing quality of waste rock and capping materials (soil samples).
- Managed total nitrogen analysis and DNA extractions for soil and waste rock samples.
- Completed individual research on biogeochemical indicators of soil quality, and the effects of nitrogen cycling and fertility island on ecosystem regeneration for senior Honors Thesis.

Skills

Field work	Plant surveys and rangeland monitoring, soil sampling, plant identification (for the Southwestern US).
Software & coding	Certified Carpentries Instructor, R/RStudio, git/GitHub, Markdown, Quarto, Unix shell, high performance computing (HPC), Shiny apps, \LaTeX (LaTeX), Microsoft Office Suite, ArcGIS Pro.
Laboratory analyses	DNA extraction; PCR, qPCR, amplicon sequencing analysis, gel electrophoresis, soil chemical analysis.

Fellowships & Awards

FELLOWSHIPS

- 2023-2024 **Senior Data Science Ambassador**, University of Arizona
- 2022-2023 **Data Science Ambassador**, University of Arizona
- Fall 2022 **University Sprint Participant**, The Opportunity Project, US Census Bureau
- 2020-2024 **NSF Graduate Research Fellow**, National Science Foundation
- 2020-2021 **Graduate College Fellowship**, University of Arizona
- 2019-2020 **Superfund Research Program Training Core Fellow**, University of Arizona
- 2018-2019 **ASM Undergraduate Research Fellowship**, American Society for Microbiology

AWARDS

- 2022 **ESA Student Travel Grant**, Ecological Society of America, Southwest Chapter
Travel Grant, Graduate and Professional Student Council, University of Arizona
- 2019 **2nd Place Student Poster Presentation**, Society for Ecological Restoration
Outstanding Senior, University of Arizona Department of Environmental Science
Silver Award for Excellence, University of Arizona Honors College
2nd Place SWESx Undergraduate Oral Presentation, UArizona Dept. of Environmental Science
- 2018 **1st Place SWESx Undergraduate Oral Presentation**, UArizona Dept. of Environmental Science
- 2017 **2nd Place SWESx Undergraduate Poster Presentation**, UArizona Dept. of Environmental Science
- 2015-2019 **Dean's List with Distinction**, University of Arizona

Publications

- Lauman, ST, Martyn, TE, Begay, MA, Hovanes, KA, Rodden, IE, **Ossanna, LQR**, & Gornish, E. S. (2023). Youth engagement in ecological restoration. *Restoration Ecology*, e13916. <https://doi.org/10.1111/rec.13916>
- Ossanna LQR** & Gornish ES (2023). Efficacy of labile carbon addition to reduce fast-growing, invasive non-native plants: A review and meta-analysis. *Journal of Applied Ecology*, 60, 218-228. <https://doi.org/10.1111/1365-2664.14324>
- Ossanna LQR**, Serrano K, Jennings LL, Dillon J, Maier RM, Neilson JW (2023). Progressive belowground soil development associated with sustainable plant establishment during copper mine waste revegetation. *Applied Soil Ecology*, 186, 104813. <https://doi.org/10.1016/j.apsoil.2023.104813>

Research Presentations

- Ossanna LQR**, Guglielmo J, Miller M, Davis R, Gornish ES. Effect of rock detention structures on plants and soil: A 10-year case study. Poster presentation: University of Arizona ALVSCE Research Forum. March 2023. Tucson, AZ.
- Ossanna LQR**, Guglielmo J, Miller M, Davis R, Gornish ES. Using rock detention structures to slow erosion in ephemeral streams: A 10-year case study. Oral presentation: Society for Range Management Annual Meeting. February 2023. Boise, ID.
- Ossanna LQR**, Guglielmo J, Miller M, Davis R, Gornish ES. Using rock detention structures to slow erosion in ephemeral streams: A 10-year case study. Oral presentation: Society for Range Management, Arizona Section winter meeting. February 2023. Maricopa, AZ.

- Ossanna LQR**, Gornish ES. Efficacy of labile carbon addition to reduce exotic invasive plants: A meta-analysis. Oral presentation: Ecological Society of America Annual Meeting. August 2022. Montreal, Quebec, Canada.
- Ossanna LQR**, Sittig J, Miller M, Davis R, Gornish ES. Induced meandering watershed restoration using rock structures to decrease arroyo erosion. Poster presentation: Society for Range Management Annual Meeting. February 2022. Santa Fe, NM.
- Ossanna LQR**, Serrano K, Jennings LL, Maier RM, Neilson JW. Vegetation-driven soil development during waste rock reclamation at a copper mine. Oral presentation: Soil Science Society of America Annual Meeting. November 2020. Virtual.
- Neilson JW, **Ossanna LQR**, Placido D, Elshikha DE, Dong C, Ponciano G, Maier RM, McMahan C. Associations between the Guayule (*Parthenium argentatum* G.) rhizosphere microbiome, plant growth stage, and rubber production. Oral presentation: Soil Science Society of America Annual Meeting. November 2020. Tucson, AZ (Virtual).
- Ledesma L, **Ossanna LQR**, Placido D, Elshikha DE, Dong C, Ponciano G, McMahan C, Maier RM, Neilson JW. Associations between soil rhizosphere bioavailable phosphorus, phosphorus solubilizing microorganisms, and guayule growth stage and rubber production. Poster presentation: Soil Science Society of America Annual Meeting. November 2020. Virtual.
- Ossanna LQR**, Brown KS, Chen Y, Placido D, Elshikha DE, Dong C, Ponciano G, Wang S, Waller PM, Diereg D, McMahan C, Maier RM, Neilson JW. The significance of the soil microbiome to guayule production. Oral presentation: SBAR Annual Retreat. July 2020. Tucson, AZ (Virtual).
- Jennings LL, **Ossanna LQR**, Fontana C, Farrell H, Kline A, Gornish E, Neilson JW, Maier RM. Biotic potential of degraded soil development on reclaimed mine tailings in southern Arizona. Poster presentation: American Geophysical Union Annual Meeting. December 2019. San Francisco, CA.
- Ossanna LQR**, Serrano K, Jennings LL, Neilson JW, Maier RM. Identifying biogeochemical indicators to measure fertility island effects during mine waste revegetation. Poster presentation: NIEHS Superfund Research Program Annual Conference. November 2019. Seattle, WA.
- Ossanna LQR**, Serrano K, Jennings LL, Neilson JW, Maier RM. Nitrogen dynamics as an indicator of mine waste revegetation progress. Poster presentation: Society for Ecological Restoration Southwest Chapter Annual Conference. November 2019. Tucson, AZ.
- Ossanna LQR**, Placido D, Elshikha DE, Dong C, Ponciano G, McMahan C, Maier RM, Neilson JW. Root-zone microbiome dynamics and guayule rubber production. Poster presentation: SBAR Annual Retreat. September 2019. Tucson, AZ.
- McMahan C, Placido D, Elshikha DE, Dong C, Ponciano G, **Ossanna LQR**, Neilson JW. Dormancy and the guayule (*Parthenium argentatum* G.) soil microbiome. Poster presentation: Association for the Advancement of Industrial Crops Annual Conference. September 2019. Tucson, AZ.
- Ossanna LQR**, Serrano K, Jennings LL, Neilson JW, Maier RM. Nitrogen dynamics as an indicator of mine waste revegetation progress. Poster presentation: American Society of Microbiology Annual Conference. June 2019. San Francisco, CA.
- Ossanna LQR**, Serrano K, Jennings LL, Neilson JW, Maier RM. Nitrogen dynamics as an indicator of mine waste revegetation progress. Oral presentation: University of Arizona SWESx. March 2019. Tucson, AZ.
- Ossanna LQR**, Serrano K, Jennings LL, Neilson JW, Maier RM. Nitrogen dynamics as a biogeochemical indicator of revegetation progress for mine waste rock. Poster presented at: Soil Science Society of America Annual Conference. January 2019. San Diego, CA.
- Jennings LL, **Ossanna LQR**, Theilmann ML, Neilson JW, Maier RM. Microbial bio-indicators of degraded lands on reclaimed mine tailings in southern Arizona. Invited oral presentation: Soil Science Society of America Annual Conference. January 2019. San Diego, CA.
- Serrano K, **Ossanna LQR**, Jennings LL, Neilson JW, Maier RM. Biogeochemical factors affecting phosphorous availability during revegetation of mine waste rock slopes. Poster presentation: Soil Science Society of America Annual Conference. January 2019. San Diego, CA.
- Ossanna LQR**, Serrano K, Jennings LL, Neilson JW, Maier RM. Using total nitrogen and DNA biomass content as biogeochemical indicators of incipient soil development through measuring mine waste rock revegetation. Oral presentation: University of Arizona SWESx. April 2018. Tucson, AZ.

Ossanna LQR, Gil-Loaiza J, Jennings LL, Maier RM, Neilson JW. Determining biogeochemical indicators of soil quality: Measuring mining waste rock revegetation progress using total nitrogen and biomass content. Poster presentation: University of Arizona SWESx. April 2017. Tucson, AZ.

Professional Development

WORKSHOP HELPER:

Place-based Health Informatics Research Education Program (PHIRE)

Tucson, AZ

UNIVERSITY OF ARIZONA

May 2023

- Served as helper and co-instructor for 3 workshops on version control with git/GitHub and introductory data visualization in R. Program is designed for undergraduates in health and biological sciences.

BRIDGES Data Science Skills Workshop, Pt. 2

Tucson, AZ

UNIVERSITY OF ARIZONA

Oct. 2022

- Served as helper for an intensive all-day workshop on version control with git/GitHub, data wrangling in R, and RNA sequencing analysis. Program designed for graduate students studying ecosystem genomics.

Data Carpentry for Ecologists Workshop

Tucson, AZ

UNIVERSITY OF ARIZONA

Sept. 2022

- Served as helper for a 4-day workshop on introductory data organization, data visualization, and data wrangling in R.

Intro to R I: Base R

Virtual/Tucson, AZ

RESEARCH BAZAAR ARIZONA

May 2022

- Served as helper for workshop on introduction to base R.

Intro to git/GitHub I & II: CLI

Virtual/Tucson, AZ

RESEARCH BAZAAR ARIZONA

May 2022

- Served as helper for workshop on introduction to version control with git & GitHub via command line interface.

WORKSHOPS ATTENDED:

Carpentries Instructor Training

Virtual

THE CARPENTRIES

Dec. 2022

- 2-day intensive training workshop to become a certified Carpentries Instructor, and teach workshops about introductory coding skills needed for researchers.

Rangeland Monitoring 101 Workshop

Prescott, AZ

UNIVERSITY OF ARIZONA COOPERATIVE EXTENSION

Nov. 2022

- Full day workshop to review and practice rangeland monitoring methods.

Container Basics Workshop

Virtual

CYVERSE

May 2022

- 2-day intensive workshop on how to use containers workflows and improve reproducibility.

Reproducibility and Data Science Skills Workshop

Virtual/ Tucson, AZ

UNIVERSITY OF ARIZONA

Feb. - Apr. 2022

- 10-session workshop covering Git and GitHub, project management and best practices for coding, and data cleaning and visualization in R.

Foundational Open Science Skills Workshop

Virtual

CYVERSE

Sept. - Nov. 2021

- 10-week workshop covering the principles and practice of open science, developing data management plans and metadata standards, and using CyVerse infrastructure.

Software Carpentry Workshop

Tucson, AZ

UNIVERSITY OF ARIZONA

Oct. 2019

- 2-day intensive workshop on introductory Unix shell, Git/GitHub, and R/RStudio skills.

Transdisciplinary Environmental Science for Society

Virtual/Tucson, AZ

UNIVERSITY OF ARIZONA

Sept. 2019

- 4-week course designed to connect scientific knowledge with policymakers and practitioners through transdisciplinary research to solve complex environmental problems.

Leadership & Service

- 2023-2024 **Natural Resources Graduate Student Organization**, Vice President
- 2023-2024 **Young Professionals Conclave**, Chair, AZ section of Society for Range Management
- Spring 2023 **ResBaz Arizona**, Steering Committee member and conference organizer
- Tucson Women in Data Science (WiDS)**, Conference organizer
- Mar 2023 **Graduate and Professional Student Council**, Travel grant reviewer, University of Arizona
- Southern Arizona Regional Science and Engineering Fair (SARSEF)**, Judge
- 2022-2023 **Natural Resources Graduate Student Organization**, Range Management Representative
- July 2022 **ESA Early Career Outstanding Restoration Paper Award**, Judge
- Mar 2022 **Southern Arizona Regional Science and Engineering Fair (SARSEF)**, Judge
- Mar 2022 **UArizona Ecological Restoration Club**, Invited talk
- Girls on outdoor Adventures for Leadership and Science (GALS)**, Mentor
- 2021 **Reflecting on Postdoc Mentoring**, Panelist, University of Arizona
- ESA Early Career Outstanding Restoration Paper Award**, Judge
- 2019 **SBAR Project Puente**, Mentor for undergraduate intern, University of Arizona
- KXCI Thesis Thursday**, Invited guest, KXCI Community Radio

PROFESSIONAL MEMBERSHIPS

Society for Range Management, Society for Ecological Restoration, Ecological Society of America