Community-based rangeland restoration in Southwestern Colorado

Project Summary

Land degradation is a major challenge in many arid and semi-arid rangelands. As such, there is a widespread need for restoration and climate-adaptive management that promotes ecological functioning and meets the needs of stakeholders in these systems. This study will be conducted in collaboration with RestoreNet, a networked dryland restoration project established in 2018 as a collaborative effort between scientists and local land managers to systematically test restoration techniques across environmental gradients spanning dryland ecosystems of the western US. In 2021, in partnership with a group of Colorado stakeholders, we established two RestoreNet sites in southwestern Colorado. Project parters include local landowners and ranchers in Montezuma and Dolores counties, the USDA Natural Resources Conservation Service (NRCS), Bureau of Land Management (BLM), US Forest Service (USFS), US Fish & Wildlife Service (USFWS), Colorado Parks and Wildlife (CPW), and the Ute Mountain Ute Tribe. Research at these sites will be used to evaluate the effectiveness of a variety of dryland restoration techniques to increase native plant cover, soil health, and ecosystem functioning in degraded Colorado rangelands. Treatments include application of native seed mixes and soil-based restoration treatments that target increased soil health and plant recruitment including biochar, compost, mulch, and super-absorbent polymer beads. This year, we will collect seedling recruitment data from restoration treatment plots to explore differences in treatment success in promoting early restoration outcomes.

Internship Goals & Objectives

Goal: The intern will work with an interdisciplinary group of scientists, Extension specialists, and Colorado stakeholders to:

- Objective 1: *Conduct* seedling recruitment data from restoration field plots to evaluate the effectiveness of restoration treatments.
- Objective 2: *Organize* and analyze seedling recruitment data from year 1 of the project to explore differences in treatment success in promoting early restoration outcomes.
- Objective 3: *Communicate* finings to Colorado RestoreNet partners in a variety of formats including a conference poster, project video, social media posts, and Extension-style fact sheets.

Student Learning Outcomes

1. *Develop* interdisciplinary skill sets in applied ecological restoration, climate-adaptive natural resource management, participatory research, stakeholder engagement.
2. *Collect* plant, soil, and other environmental field data.
3. *Analyze* ecological data and learn data visualization techniques.
4. *Present* research findings in a variety of written and oral formats.
5. *Collaborate* with diverse stakeholders including federal agencies, local landowners, and Tribal partners.

Internship Mentors

- Emily Lockard, Agriculture/Livestock Extension Agent, Montezuma County, CSU Extension
- Retta Bruegger (Regional Specialist, Range Management for Western Colorado, CSU Extension
- Caroline Havrilla, Assistant Professor of Rangeland Ecology and Management, Dept. of Forest and Rangeland Stewardship; Director, Dryland Ecology and Management Lab

Location

The intern for this project will be based in Fort Collins, CO (Larimer County) at CSU. However, the project will involve travel to restoration field sites in southwestern Colorado at the Colorado State University Agricultural Experimental Station – Southwest Colorado Research Center in Yellow Jacket, CO and Ute Mountain Ute lands near Towaoc, CO.