Does Fire Disturbance Impact Soil Microbiomes and Plant Communities in the Southwestern USA?

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Background/Objectives. The reduction in precipitation and higher temperatures due to climate change increase the probability of more frequent, high intensity, and high severity wildfires across the southwestern USA. Thinning and prescribed burns are commonly used as forest management practices to mitigate catastrophic wildfires in ponderosa pine (*Pinus ponderosa*) forests. However, prescribed burns can degrade forest understories including the grasses and their associated arbuscular mycorrhizae fungi (AMF). We are investigating the impact of time since prescribed fire on grass and AMF species richness and abundance in a ponderosa pine forest in northeastern New Mexico. The study area is state owned land near Black Lake, New Mexico where the land is utilized by neighboring ranchers for cattle grazing. This area has also been managed with restoration tools such as thinning and prescribed fires, but little to no research has been conducted. The objectives of this project are to investigate the impact of time-since fire on 1) grass species richness and abundance, 2) AMF species richness and abundance, and 3) grass and AMF interactions.

Approach/Activities. Grass species richness and abundance will be calculated through biomass and speciation using field methods in the study area. AMF species richness and abundance will be identified genotypically using target sequencing and minION nanopore technologies in the NMHU lab.

Results/Lessons Learned. This project will contribute to our understanding of the temporal dynamics and resilience of grasslands after the use of prescribed fires as a restoration management tool to maximize grass productivity, understory resilience and forage quality under the current climate change conditions.