

INFLUENCE OF PLANT COMMUNITY STRUCTURE ON RECOVERY OF BELOWGROUND MICROBIAL COMMUNITIES IN RECLAIMED SURFACE MINED SOIL¹

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Abstract. A study was initiated to examine microbial communities in reclaimed surface mined soil under different types of vegetation as part of a larger project to determine how the plant community influences recovery of belowground ecosystem components. Soil samples were collected from surface mine reclamation sites of different ages and nearby undisturbed soils at two mines in Wyoming. Vegetation at the reclaimed sites examined was dominated by either sagebrush and grasses, cool season grasses, or warm season grasses. Plant community characteristics were determined using standard methods. Phospholipid fatty acid (PLFA) analysis was used to characterize soil microbial community structure. Biomarker fatty acids were used to quantify microbial biomass, diversity, and bacterial: fungal ratios, gram-positive: gram-negative fatty acid ratios and the recovery of arbuscular mycorrhizal fungi. Multivariate analysis was used to analyze the data and examine relationships between plant community characteristics and belowground community structure.

Additional Key Words: soil microbial community, PLFA, ecosystem restoration, reclamation, Wyoming.

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