

Diablo Trust Piñon-Juniper Restoration Sites: Restoring Structure to Woodlands and Savannas

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Abstract—Piñon-juniper restoration sites are being implemented in northern Arizona on lands managed by the Diablo Trust that have experienced increased piñon and juniper densities. Such land managers want to restore basic ecosystem structure and function to their lands in a way that preserves their livelihoods and open space in the region. The first objective of this project was to create reference conditions by reconstructing age structure and spatial arrangement to 1860, prior to livestock grazing, across three soil types. Stand reconstruction using stem mapping and ring counts revealed pulses of juniper establishment between 1860 and 1880 on both basalt and sandstone-derived soils. Limestone-derived soil showed no increase during this time period, but rather steady increase in tree density since approximately 1700. Juniper trees in 1860 across all soil types were found in clumps of a minimum radius of 15 m. Presettlement diameter distributions and basal area were reconstructed and used to develop structure control (e.g., BDq) prescriptions to best approximate stand conditions of both piñon-juniper savannas and woodlands. After these appropriate density and distributions were determined, the next phase of this project is to test restoration methods, which include burning, seeding, and slash treatments (leave tree, pile, lop and scatter) to determine which treatment fosters greatest understory plant response.

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