

Soil Loss from a Rapidly Eroding Pinyon-Juniper Woodland in Bandelier National Monument, New Mexico: Response to Slash Mulch Treatment

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Abstract. The semi-arid Pinyon-Juniper woodlands of Bandelier National Monument are experiencing soil loss of approximately 17,000 kg/ha per year, an accelerated erosion rate. Earlier studies suggest causes of this rapidly eroding woodland are related to a unnatural transition in vegetation type due to cumulative effects of overgrazing, fire suppression, and a severe drought in the 1950's. At Bandelier National Monument, accelerated erosion is a major natural and cultural resource problem. To study the effectiveness of watershed management practices (slash treatment) in reducing erosion, we utilized sediment check dams to quantify soil loss from twelve microwatersheds (0.1 hectares), six in the treated watershed and six in the adjacent untreated (control) watershed. The overall objective of this research is to directly compare rates of soil loss between the treated and control watersheds. After one field season (9 rainfall-runoff events), our study found soil loss was reduced by two orders of magnitude in response to the slash mulch treatment; ~2,230 kg/ha/season in the control vs. ~21 kg/ha/season in the treated. The practice of slash mulch treatment in a degraded Pinyon-Juniper woodland is providing encouraging evidence that it can reduce accelerated erosion rates in Bandelier National Monument.