

Rapidly Eroding Piñon-Juniper Woodlands in New Mexico: Response to Slash Treatment

Brian K. Hastings,* Freeman M. Smith and, Brian F. Jacobs

ABSTRACT

The semi-arid piñon-juniper (*Pinus edulis* Engelm. and *Juniperus monosperma* [Engelm.] Sarg.) woodlands of Bandelier National Monument are experiencing rapid soil loss. Earlier studies suggest that causes of this rapidly eroding woodland are related to an unprecedented rapid transition of ponderosa pine savanna to piñon-juniper woodland as a result of cumulative historical effects of overgrazing, fire suppression, and a severe drought in the 1950's. To study the effectiveness of slash treatment in reducing soil loss in degraded piñon-juniper woodlands, we utilized sediment check dams to quantify soil loss from 12-paired microwatersheds (300-1100 m²) within an existing paired watershed study. Six of the 12 microwatersheds were located in a 41-ha (treatment) watershed with scattered slash treatment, and the other 6 microwatersheds were located in an adjacent 35-ha (control) untreated watershed. The primary purpose of our research was to quantify the rates of soil loss between the treated and control microwatersheds. Soil loss was measured from 15 individual storms during the months of June-September (2000 and 2001). Soil loss was reduced 2 orders of magnitude in response to the slash treatment (In 2000: 2,700 kg/ha control vs. 25 kg/ha treatment; In 2001: 2,000 kg/ha control vs. 60 kg/ha treatment). The practice of slash treatment in degraded piñon-juniper woodlands is providing encouraging evidence of its efficacy in reducing soil loss in Bandelier National Monument by encouraging herbaceous recovery in intercanopy areas. Restored pinyon-juniper woodlands, as the result of slash treatment, provide a forest structure similar to pre-grazing and pre-fire suppression conditions and a decreased catastrophic fire hazard.