

# Fire Effects on Archaeological Sites in the Southwestern USA: Preservation Issues and Treatments

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## Abstract

Historic fire suppression, increased forest densities, and recent warm drought conditions have led to more frequent and severe wildfires in the Southwestern USA, burning over thousands of archaeological sites on public lands in the past decade. With ongoing climate change, predicted increases in fire frequency and intensity threaten a number of premier archaeological zones in this region. Fires often destroy historic structures, damage archaeological sites, and significantly alter cultural landscapes. Fire fighting efforts can also adversely impact archaeological sites directly by the construction of firelines (by both hand crews and heavy equipment) and even by the use of fire retardant chemicals. These issues are well-illustrated at Bandelier National Monument, a 13,000 ha national park unit in northern New Mexico that contains over 3,000 archaeological sites, which has been affected by three major wildfires in recent years, and which therefore has been a locus of research on fire effects on cultural resources. For example, the 1996 Dome Fire burned 6300 ha in and adjoining Bandelier, burning across 515 archaeological sites in the park; 80% suffered post-fire erosion, resulting in erosion mitigation treatments on 56 sites and salvage excavations to 6 sites. Post-fire treatments to mitigate erosion impacts to archaeological sites include: placement of excelsior mats, straw mulch, water diversion structures, and emplacement of logs to slow surface runoff. Overall, a variety of studies at Bandelier and elsewhere in the Southwest have documented numerous effects that fire can have on archaeological sites, including: heat damage to building stones; heat-alteration effects on stone and ceramic artifacts; and perhaps most importantly, an increase in soil erosion that causes impacts to archaeological sites by moving artifacts from their original location, and destroys features such as structures, hearths, middens, and other features. Land managers and archaeologists are now applying a number of techniques to reduce the impacts and threats of wildland fire on archaeological sites, starting with intensive field inventory and documentation, followed by fuel reduction projects that may use prescribed fire to reduce fuels, removal of artifacts susceptible to heat impacts, and even pre-construction of fuel breaks and firelines around at-risk sites.

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