

Hydrologic Research in Large Scale Fire-Restoration Treatments : More Water for Arizona?

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ABSTRACT

Ponderosa pine forests in the western United States are undergoing restoration treatments in form of tree harvesting and prescribed fire on an unprecedented scale in part to reduce the risk of catastrophic, stand replacing wildfires. The research presented here describes a study to measure watershed-scale responses of an operational restoration and fuels treatment on the Coconino National Forest, Arizona. The ecosystem variables to be measured are water yield and peak flood flows. The study utilizes the existing watersheds of the Beaver Creek Experimental Watersheds south of Flagstaff, Arizona. Five watersheds (between 76 and 722 ha) were reinstrumented with streamgauges in 2006. There are over 20 years of hydrologic, climatic, vegetation, fuels, soils, and wildlife data from the 1960s through the 1980s and beyond which provide background for the study. We have compared one years worth of new hydrologic data to the previous data. The comparison reflects the effects of over 25 years of non-restricted vegetation growth on water yield and peak flows. The restoration treatments carried out by the Coconino National Forest include one watershed 55% thinned and 100% burned, one 22% thinned and 33% burned, two 100% burned and one control watershed. This type of information has been identified as being critical for continued fuels treatment in Arizona and the Southwest. Watershed research done previously in the region never addressed the combination of continued thinning and burning to reduce wildfire hazard and its effects on water availability.