

**Effects of Fire Intensity on Invasives, Stand Structure and Fuel Loading in  
Shenandoah National Park**

by

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(Abstract)

The influence of wildfire intensity on fuel loading, invasive species, species richness, diversity, and evenness was studied at Shenandoah National Park. The majority of National Parks identify invasive species as the biggest threat to their goal of maintaining native ecosystems. Eight study sites were stratified into 3 burn classes (high intensity, low intensity, and control), and three transects were randomly located so that nested plots and fuel transects were measured at a distance of 15 m, 45 m, and 75 m from a road or trail. A subsample of plots were used to determine specific gravity and quadratic mean diameter for each size class of fuel and to determine the bulk density of the duff and litter layers. High intensity fires initially reduced species diversity and evenness in the tree and herbaceous strata, but after 14 years tree species diversity and evenness returned to levels found in unburned areas, while the herbaceous diversity was not associated with time since burn. Low intensity fires resulted in the greatest impacts in the shrub stratum. The presence of invasive species was associated with more even and diverse vegetation in all strata, perhaps because invasive species were relatively sparse. Fuel loadings were reduced initially by high intensity fires, but quickly returned to the same level as unburned areas. High intensity fires  $\geq 14$  years old had significantly higher total fuel loadings than more recent high intensity burns. However, there was no

significant difference in fuel loading between burned and unburned areas. Although these initial findings indicate that invasive species will not persist after fire disturbance, continual monitoring by National Parks would be prudent.