

Effect of Burn Residue Proximity on Growth of 5 Planted Mixed-Conifer Species After 6 Years¹

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Abstract

Burned areas represent a significant amount of the forest landscape that can potentially be planted following site preparation techniques that use burning of woody residue. However, managers implementing post-harvest or post-wildfire regeneration efforts face uncertainty in expected performance of seedlings planted in or around post-burn residues (i.e. ash substrates). To address this uncertainty, five species were planted following site preparation beneath a shelterwood overstory in a Sierra Nevada mixed conifer forest. We planted seedlings within, on the edge, and outside of ash substrates following experimental burning of uniform debris piles. After six years, height and radial growth were evaluated with respect to burn pile proximity. For Douglas-fir, sugar pine, ponderosa pine, and giant sequoia, relative and absolute height and radial growth were influenced by burn pile proximity. In general, seedlings planted within burn piles grew better than seedlings planted on the edges and outside of burn piles. Incense cedar growth was not influenced by burn pile proximity. Shrub competition also varied by burn pile proximity, but was only important in explaining Douglas-fir height growth. Mortality for all species was low regardless of burn pile proximity. Further opportunities exist for this study exploring the effects of fire-caused soil nutrient changes on seedling growth over time.

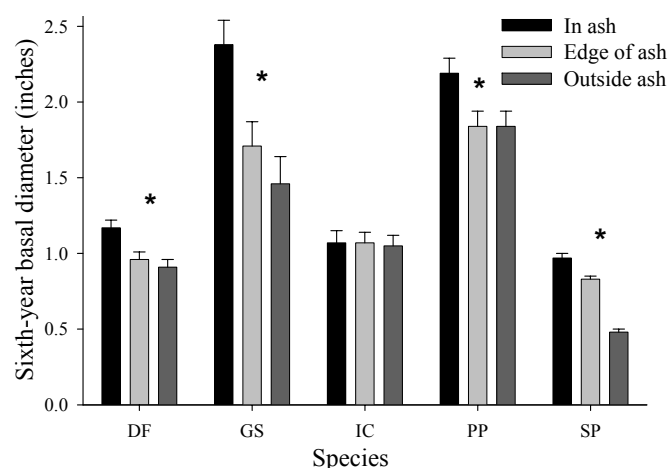


Figure 1--Mean basal diameters (and standard errors) of seedlings six years after planting by ash bed position. * denotes a significant ($p < 0.05$) influence of ash bed proximity on mean height using a general linear model with shrub competition as an explanatory variable (ANCOVA).

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