EFFECTS OF PRESCRIBED BURNING, MECHANICAL, AND CHEMICAL TREATMENTS TO CURTAIL RHODODENDRON DOMINANCE AND REDUCE WILDFIRE FUEL LOADS

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More than a century of fire suppression has resulted in the increased abundance of Rosebay Rhododendron (*Rhododendron maximum* L.) throughout the Appalachian Mountains. Rhododendron has historically been most frequently associated with mesic sites, but can now be found proliferating toward drier midslope and ridgetop areas. The increased presence of rhododendron in understories of the Appalachian Mountains has negatively affected forest health. Two such negative effects are the stunted growth or absence or overstory tree regeneration and the creation of dangerous fuel complexes. The purpose of this study was to determine the efficacy and efficiency of various vegetation control measures (and their combinations) on the vigor of rhododendron and fuel loading within rhododendron thickets. The three vegetation control procedures were prescribed fire, herbicide application, and mechanical cutting.

Our experimental design consisted of three replications of an unbalanced split-plot design. Each replication contained eight half-acre study plots, each plot representing one of the following treatments:

1. Prescribed fire
2. Prescribed fire and herbicide
3. Mechanical cutting and prescribed fire
4. Herbicide and prescribed fire
5. Mechanical cutting
6. Mechanical cutting and herbicide
7. Herbicide
8. Control (no treatment)

Prescribed fires were ignited by hand and by helicopter, with target fire behavior of high-intensity 4-6 foot (1.22-1.83 m) flame lengths. Chainsaw crews performed the mechanical cutting treatment, felling all *R. maximum* stems on a plot. Backpack sprayers were used to implement herbicide application. Imazapyr as Stalker® and Triclopyr as Garlon 4® were applied either as a basal spray with a Hy-Grade EC® vegetable oil carrier or as a foliar spray with a water carrier.

Fuel loading by fuel class and live rhododendron stems per acre in 2-cm stem classes are the data discussed in this summary. Mechanical cutting significantly increased fine woody fuel loading within an *R. maximum* thicket. Herbicide application and prescribed burning showed no significance in fine woody fuel addition/reduction. Prescribed burning significantly reduced litter fuel loading on sites dominated by *R. maximum*. In the first year after treatment, none of our prescriptions reduced total fuel loading**.**

Mechanical cutting and prescribed burning treatments resulted in heavy basal sprouting. Herbicide application successfully controlled sprouting as a combination treatment but was unable to control larger *R. maximum* stems. Some replications of our prescribed burning treatments resulted in excellent topkill of *R. maximum*, while others were mostly ineffective in achieving any mortality.

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