Eradication Methods of Paulownia tomentosa in the Hot Springs National Park

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Hot Springs National Park implemented controlled burns in the old growth areas of Sugarloaf Mountain in March 2010 and February 2016 with the intention of restoring habitat for shortleaf pine and Ouachita blazing star, a species of special concern. Following the February 2016 burn of the southern section, an outbreak of Paulownia tomentosa, an invasive tree with the potential to outcompete shortleaf pine and Ouachita blazing star, was observed. An ArcGIS map created of four prescribed burn regions on Sugarloaf Mountain showed the outbreak was limited primarily to Old Growth Sugarloaf South. This suggests that Paulownia germination could be dependent upon burn conditions, as it is likely to be universally present within the seed bank. To create an eradication plan for Paulownia, seeds were tested for temperature-dependent germination rates and plants in the outbreak area were tested for their response to mechanical and chemical methods of eradication. Lab tests found germination rates decreased as the temperature rose: 76% germination in the control group, 67% germination in the 60? and 80? groups, 27% germination in the 100? group, and 0% germination in the 120? and 140? groups. Field tests found that a control group grew an average of 1.4 inches/week, while 53% of trees subjected to four cuttings and 100% of trees subjected to cutting and painting with glyphosate were killed. Thus, higher germination rates of Paulownia were likely not the result of hotter burn temperatures in Old Growth Sugarloaf South and glyphosate is a highly effective eradication measure.

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