UNDERSTORY FIRE EFFECTS ON PIN CHERRY (*PRUNUS PENSYLVANICA* L. F.) SEED GERMINATION

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Abstract—Pin cherry (*Prunus pensylvanica* L. f.) is an undesirable species in silvicultural systems that aim to produce high quality sawtimber and pulpwood. During stand initiation, pin cherry can rapidly capture canopy growing space and relegate other species to subcanopy positions as it is among the most rapid growers in height. It is estimated that pin cherry seed can remain viable for 50-150 years (Wendel 1990) and its germination is stimulated by regeneration cutting or other intense canopy disturbance. The intense competitive positioning of pin cherry during stand initiation can result in reduced growth or mortality of more desirable species. Although relatively short-lived, pin cherry can comprise a significant amount of stocking up to age 20. This prolonged dominance decreases efficiency and flexibility of early precommerical thinnings: thinning crews will likely focus on eliminating pin cherry rather than selecting crop trees from among competing desirable species. The intent of this poster is to document the effects of an understory fire on dormant pin cherry seed germination and to discuss implications for potential control of this species.

On April 3, 1997, a 3.8-acre wildfire was started by a downed powerline near Anjean, Greenbrier Co., WV. Merchantable stand basal area was 116 sq. ft. per acre in the 46-year-old northern hardwood stand, comprised of yellow-poplar, black cherry, red oak, sugar maple, and birch. The fire moved up the 30- to 40-percent south-facing slope burning only the uppermost portion of the leaf litter and charring the lower trunk bark of overstory trees.

On April 11, 1997, ten 0.001-acre regeneration plots were established to assess fire effects on germination of the pin cherry seedbank. Numbers of seedlings (less than 4.5 feet) were recorded. Five plots were located in the burned area and five plots in the adjacent unburned area, all were beneath pin cherry stems that ranged from 6 to 12 inches dbh. In the burned area, three of the pin cherry stems were living and two were dead; in the unburned area two were living and three were dead. In July 1997, seedlings were again counted on all plots.

Three months following the fire, pin cherry was the most abundant species on the burned regeneration plots, averaging 26,400 seedlings per acre. Root suckers of living pin cherry trees were observed but not counted in the regeneration assessment. No pin cherry seedlings were observed on the unburned plots. Species richness was higher in the unburned area (14 species) than in the burned area (7 species).

The germination of pin cherry seed observed following this understory burn was surprising because of the intact and complete canopy cover present at the time of and following this relatively low intensity burn. Most references describing the germination of pin cherry seed suggest that some degree of canopy disturbance is required to stimulate the dormant seed bank (e.g., Marks 1974); germination of dormant seed has been shown to result from high fluctuations of soil temperature (Laidlaw 1987) and from increased soil nitrate levels (Auchmoody 1979), both characteristics found in forest soils following intense canopy disturbances.

Fire also stimulates pin cherry seed germination, although no mention has been made in the literature that low intensity understory burning leads to this result. Pin cherry establishment is usually linked with some type of intense canopy disturbance. Low intensity understory burning may provide a means to reduce potential competition by pin cherry. If dormant seeds in the seedbank of untreated stands can be stimulated to germinate, then these shade intolerant seedlings will likely die out in the low light environment of the forest understory before the stands are regenerated.

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