SURVIVAL OF *PHYTOPHTHORA CINNAMOMI* IN SOIL AFTER PRESCRIBED FIRE IN A SOUTHERN APPALACHIAN MOUNTAIN FOREST

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The use of prescribed fire has become a common management strategy in fire-adapted forests of the southern Appalachian Mountains. Little is known about the direct effects of fire on survival of species of *Phytophthora* naturally present in forest soils. Therefore, the effects of fire on survival of *P. cinnamomi* was assessed during two low-intensity prescribed fires that were set in a mixed oak-pine forest within the Jocassee Gorges natural area in northwestern South Carolina during February 2007. *P. cinnamomi* is known to occur throughout this forest site. Before the first fire, six plots were established in the area to be burned and two plots were established in adjacent areas that would not be burned. Before the second fire, four plots were established in the area to be burned and one plot was established in an area that would not be burned. In each plot, seven 100-ml aliquots of forest soil naturally infested with *P. cinnamomi* in aluminum-mesh packets were placed at 2 cm and 10 cm below the soil surface. Temperature sensors attached to dataloggers were placed with each packet and recorded temperature in the soil at 1.5-second intervals. Sensors also were used to measure above-ground temperature during the second fire. After the fires, the soil in each packet was assayed for *P. cinnamomi* using a baiting bioassay procedure.

During the second fire, maximum temperatures 30 cm above the soil surface in each plot ranged from 47 to 111°C. Soil temperatures in the non-burned plots during both fires ranged from 7 to 13°C at both 2 cm and 10 cm below the soil surface. However, in the burned plots, soil temperatures ranged from 7 to 14°C at 10-cm depths and from 11 to 42°C at 2-cm depths. After the two fires, *P. cinnamomi* was recovered from all 42 soil aliquots from both depths in the three plots in non-burned areas. *P. cinnamomi* also was recovered from all 70 soil aliquots buried at 10 cm and from 69 of 70 aliquots buried at 2 cm in the burned areas; it was not recovered from one soil aliquot placed 2 cm beneath the soil surface during the first fire—where the soil temperature reached 42°C for 40 min. In this study, the direct effect of low-intensity, prescribed fire had minimal impact on the survival of *P. cinnamomi* in soil.