

# USE OF TEMPERATURE-SENSITIVE PAINTS AS AN INDEX OF HEAT OUTPUT FROM FIRE

Joanne Rebbbeck<sup>1†</sup>, Daniel Yaussy<sup>2</sup>, Louis Iverson<sup>3</sup>, Todd Hutchinson<sup>3</sup>, Robert Long<sup>4</sup>, Anthony Bova<sup>5</sup>  
and Matthew Dickinson<sup>6</sup>

Early spring, dormant-season prescribed surface fires were conducted in 2001 and repeated in 2005 within thinned and three unthinned mixed-oak forests of southeastern Ohio. In all, 120 ha were burned on three forests. Research has shown that maximum temperatures reached by measurement devices placed in fires can be useful in evaluating fire effects on vegetation. Most commonly used are tags painted with Tempilaq<sup>®</sup> temperature sensitive paints (Tempil Inc., South Plainfield, NJ). Paints melt and change color at specific temperatures. This low-cost (\$0.05 per unit), “low tech” method of measuring the maximum temperature was compared with a high-cost (\$110 per unit), high-tech Type K<sup>®</sup> thermocouple probes and Hobo<sup>®</sup> data logger (Onset Computer Corporation, Bourne, MA) system. Maximum temperatures have been shown to indicate fuel consumption and fireline intensity. Aluminum tags (2.5 x 7 cm) were painted with six (2001) or nine (2005) Tempilaq paints ranging from 79° to 427°C. Tags were hung at the same height (25 cm) and location as the probe tips. Data loggers were programmed to record probe temperature every 1 to 2 seconds. There was very good agreement between the maximum temperatures recorded by the two devices during both fires. Maximum temperatures were higher in the 2005 than in the 2001 fires (the first fires on these sites in decades). During 2001, maximum temperatures in the burn only units were higher than those in the thinned and burned units. No treatment differences were observed in 2005. The impacts of more intense fires on vegetation are being monitored. Paint tags indicate maximum temperatures and are inexpensive, but thermocouple probes provide more information and better correlations with fire behavior.

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<sup>1</sup>Plant Physiologist, <sup>2</sup>Forester, <sup>3</sup>Ecologist, <sup>4</sup>Plant Pathologist, <sup>5</sup>Physical Scientist, and <sup>6</sup>Ecologist, USDA Forest Service, Northern Research Station; <sup>†</sup>Corresponding author, 359 Main Road, Delaware, OH, 43015, 740-368-0054, email: jrebbbeck@fs.fed.us