

(55) 2010 Annual Meeting, Washington, DC



**AAG**  
Association of American Geographers

[About AAG](#)[Membership](#)[Annual Meeting](#)[Jobs/Careers](#)[Education](#)[Publications](#)[Events](#)[Contact Us](#)

## 2010 Annual Meeting, Washington, DC Online Program

**Abstract Title:**

*Fire History and Stand Dynamics of Xeric Mixed Hardwood/Pine Forests, Great Smoky Mountains National Park, Tennessee, U.S.A.*

**is part of the Paper Session:**

[Dendrochronology IV: Dendropyrochronology](#)

scheduled on Thursday, 4/15/10 at 14:40 PM.

**Author(s):**

Lisa B. LaForest\* - University of Tennessee, Knoxville  
Henri D. Grissino-Mayer, Ph.D. - University of Tennessee, Knoxville  
Charles W. Lafon, Ph.D. - Texas A&M University  
William T. Flatley - Texas A&M University

**Abstract:**

The western side of the Great Smoky Mountains National Park contains stands of xeric mixed hardwood and yellow pine trees that escaped earlier intensive logging found in adjacent areas. These forest tracts with large, older trees show evidence of past fire and provide an ideal setting for reconstructing stand histories. At each of 3 low-elevation (ca. 2000 ft) study sites, we constructed a reference yellow pine tree-ring chronology and then determined fire frequency, fire severity, and fire seasonality using cross-sections from selected living trees, recently-dead snags and logs, and remnant wood. Cores and vegetation data collected at three 20 x 50 m plots per site provided age structure, stand structure, and stand composition over time. All three chronologies displayed a high degree of sensitivity to yearly environmental fluctuations and extended back through the 1700s. Analysis of scarred pine sections indicated regular fire events, averaging one fire every 3 to 5 years prior to park establishment in 1934. Most fires occurred during the dormant or early growing season. We found that the stands are converting to fire-sensitive species, strongly driven by red maples. Yellow pine regeneration is weak and is dominated by Virginia pine. The longer-lived, shortleaf and pitch pines are not successfully reproducing under the current disturbance regime. Fire exclusion and other human-related factors have contributed to a loss of suitable habitat for these trees. Mortality from severe southern pine beetle outbreaks has additionally decimated yellow pines, further altering the forest composition and possibly the future fire regime.

**Keywords:**

[dendrochronology](#), [fire history](#), [pine](#), [oak](#), [hardwood](#), [Great Smoky Mountains National Park](#), [Tennessee](#)