FIRE IN OAK WOODLANDS:
A GENERAL LAND OFFICE PERSPECTIVE

Tom Foti
Department of Arkansas Heritage, Ozark-St. Francis National Forests, 605 W. Main Street, Russellville, AR 72801, USA

David H. Jurney and Tamara Hocut
USDA Forest Service, Ozark-St. Francis National Forests, 605 W. Main Street, Russellville, AR 72801, USA

ABSTRACT

The General Land Office records of witness trees provide the reference condition for arboreal vegetation, reflect conditions circa 1815–1845, and represent the potential historic vegetation that existed prior to the extensive disturbances caused by European settlement.

The data were compiled from surveyor’s notes and were linked as a layer to the ArcView geographic information system (GIS) layer for the study area. Nine land types, based on topographic position, slope, and aspect are derived from the GIS. Twenty-eight tree species were identified by common name. Species found in all land types include white oak, black gum, hickory, and red oak. Pines and black oaks are found in all land types but the floodplain. Pines were present in the toe slope adjacent to the floodplain.

Four basic indices were produced and are comparable to modern botanical analyses:

- Relative density: number of times a species occurs out of the total N observations;
- Basal area: sum of all diameters–species–landtype–landtype association;
- Relative dominance: total basal area of each species divided by basal area of all species;
- Importance value: add the relative density of each species to the relative dominance.

In the floodplain, three species dominate: white oak (31.6%), black gum (18.4%), and elm (13.2%). The toe slope is adjacent to the floodplain and contains five dominant species: white oak (33.3%), black oak (13.3%), pine (11.1%), black gum (7.7%), and beech (7.7%).

The north aspect is divided into three parts: lower, middle, and upper slope. The lower slope is dominated by five species: white oak (43.8%), black oak (16.9%), pine (10%), hickory (5.8%), and black gum (5.4%). The middle slope is dominated by five species: white oak (43.8%), black oak (16.9%), pine (10%), hickory (5.8%), and black gum (5.4%). The upper slope is dominated by four species: white oak (45.7%), black oak (14.9%), black gum (10.2%), and pine (7.1%).

The south aspect is also divided into lower, middle, and upper slopes. The lower slope is dominated by three species: white oak (29.4%), black oak (23.5%), and pine (20.5%). The middle slope is dominated by five species: white oak (29.3%), pine (28.5%), black oak (17.6%), red oak (4.7%), and black gum (4.7%). The upper slope is dominated by five species: white oak (34.1%), pine (21.5%), black oak (20.5%), red oak (6.8%), and hickory (6.3%).

The uplands are characterized by rolling to broken flat ridgetops. These areas are dominated by three species: white oak (43%), black oak (22.9%), and pine (13.8%).