The Restoration of Oak-Hickory Forests in the Central Hardwoods: Results of a Landscape-scale Prescribed Burning Experiment in Ohio

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Abstract.—Oaks have been an important component of eastern deciduous forest communities since the end of the last glaciation, 10,000 years BP. There is wide recognition that oaks are highly fire adapted, and that fire played an important role in the ecology of oak forests in the past, particularly in promoting the dominance of oak in regeneration layers. In southern Ohio, forest composition and structure has changed since aggressive fire protection was implemented. Although oaks still dominate the overstory, advanced regeneration is dominated by species such as yellow-poplar, maples and blackgum. The objectives of this project are to determine ecological response of mixed-oak communities in southern Ohio to prescribed underburning under frequent and infrequent fire regimes. Four study areas, ~ 90 ha each, were selected in 1994 in the hilly country of the unglaciated Allegheny Plateau. These areas are dominated by oak forests > 80 years old. Study areas were stratified by an estimator of available soil moisture based on landscape physiographic characteristics and soil water holding capacity. This integrated moisture index (IMI) is a good predictor of vegetation composition, as well as songbird species occurrence. Study areas and plots were installed in 1994 and pre-burning data were gathered in 1995. The four study areas are divided in thirds; two early spring burning treatments and an unburned reference. The frequent treatments were burned annually (1996-1999) and infrequent treatments were burned twice (1996 and 1999). Physical and biological attributes of the forests were fully monitored between 1995 and 1999. These low-intensity fires had significant effects on soil and litter distribution and composition and structure of herbaceous and small diameter vegetation, but many of these effects likely will be short-lived. There were consequent changes in ground-nesting bird populations, but not in those nesting elsewhere. Insect communities were little altered.

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Fire Ecology of Marshes and Canebrakes in the Southeastern United States

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Abstract.—Most marshes in the United States can be considered fire communities. With the exception of true salt marsh (salinity 3-4%), maintenance of species diversity in marshes is dependent upon frequent fire. Plant species diversity in marshes decreases as salinity increases and increases as fire frequency increases. Canebrake, another fire community, once covered at least 10 million acres in stream bottomlands and peatlands of the southeastern United States. This comprised critical habitat for a number of rare plant and animal species. Far less than 1% of this habitat remains, canebrakes having disappeared after fire was removed from the landscape. When fire is kept out, canebrake succeeds to multistoried wooded communities such as bottomland hardwoods, pocosin, pond pine forest, red maple forest, and bay forest. Rare, fire-dependent plants native to canebrakes include golden sedge (*Carex lutea*), *Lilium iridollae* and *Lilium gazarubrum*. Important wildlife species include Swainson's warbler, Bachman's warbler, and a butterfly, St. Francis satyr. Canebrake also is a fire frequency indicator community. A historical record of canebrake for a particular location indicates that that region once experienced a frequent fire regime. Studies of succession in canebrakes indicate that the original fire frequency ranged mostly between 2-8 years between fires. Protection and restoration of canebrake requires management with fire, and has been almost entirely overlooked in site management and conservation planning.

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