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Renewal and Recovery: Shortleaf Pine/Bluestem Grass Ecosystem and Red-cockaded Woodpeckers

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The Ouachita National Forest (Ouachita NF) is comprised of 666,046 ha of pine and mixed hardwood forests in west-central Arkansas and southeastern Oklahoma. The Ouachita NF has proposed landscape-scale habitat restoration that would lead to renewal of once widespread habitat (Mattoon, 1915) dominated by shortleaf pine (*Pinus echinata*) and bluestem grasses (*Andropogon spp.*) on approximately 40,000 ha of the forest area (Fig. 1). This project is unique because of its size, scope of activities, and ecosystem management approach. As renewal of this ecosystem proceeds, it is reasonable to predict improved habitat conditions for numerous species of plants and animals, including Red-cockaded Woodpeckers (*Picoides borealis*).

Mountains (Little and Olmstead, 1931; Smith, 1986a, 1986b; Jansma and Jansma, 1991). This association also occurred elsewhere in the southeastern U.S. (Jackson, 1988; Dickson, 1991; Waldrop et al., 1992). Frequent anthropogenic and lightning caused fire maintained the open condition of these stands in the Ouachitas (Foti and Glenn, 1991; Masters et al., 1993) and elsewhere in the southeast (Waldrop et al., 1992). Fire control efforts have reduced the incidence of wildfire, leading to widespread habitat changes, especially encroachment of dense mid-stories of pine and hardwood trees.

Recent work in the Ouachitas has shown that re-introduction of fire and re-establishment of open conditions in pine-dominated habitats results in increases of understory species diversity as compared to controls (Wilson et al., 1995). Habitat restoration produces changes in the composition of small mammal and breeding bird communities (Lochmiller et al., 1993; Wilson and Masters, 1993). Therefore, based upon historical accounts of habitat and results of this recent research, we hypothesize that other elements of the Ouachita biota have been negatively affected by widespread habitat change. Habitat renewal through forest management can improve conditions for communities of plants and animals affected by past land-use patterns.

The core area for proposed habitat renewal involves 40,000 ha of National Forest lands in Scott and Polk counties, Arkansas (Fig. 1). This area contains a population of Red-cockaded Woodpeckers (Neal and Montague, 1991), a federally-listed species considered a key indicator of pine-grass habitat maintained in an open condition by periodical fire (USF&WS, 1985; Jackson, 1988). The area proposed for habitat renewal was delineated by the known range of the species during the last 20 years (Neal and Montague, 1991). Current planning goals (Ouachita NF, 1990) include 50 breeding groups of Red-cockaded Woodpeckers. The current population estimate for the Ouachita NF is approximately 15 breeding groups (Ouachita NF unpubl. data). Habitat renewal would increase diversity of plants and animals that were likely present during presettlement times, including a recovered population of approximately 250 breeding groups of Red-cockaded Woodpeckers.

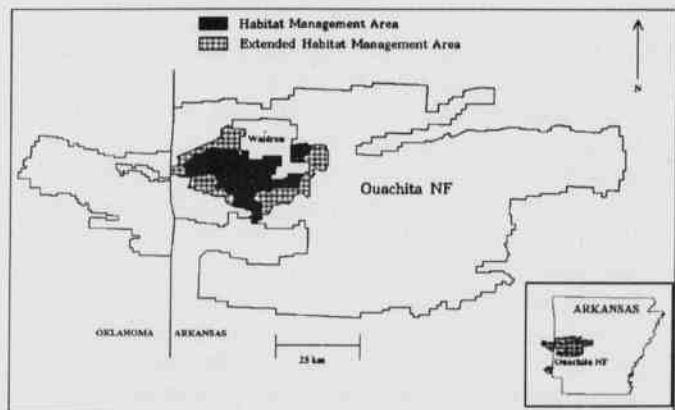


Fig. 1. Area of proposed shortleaf pine/bluestem grass ecosystem renewal on the Ouachita National Forest, Arkansas. The habitat management area is the minimum area required to maintain the existing population of Red-cockaded Woodpeckers. The extended area will be necessary to recover the population and to achieve landscape-scale goals of shortleaf pine/bluestem grass ecosystem renewal.

Historical accounts support the concept that open woodlands dominated by shortleaf pines and a lush herbaceous understory comprised of bluestem grasses and various forbs occurred widely in the Ouachita

The goal of increasing the Red-cockaded Woodpecker population on the Ouachita NF to 250 groups has been made more realistic due to recent advances in management techniques. Translocation of individual birds between populations (Allen et al., 1993), installation of artificial cavities and modification of natural cavities (Carter et al., 1989; Allen, 1991; Copeyon et al., 1991), and the reduction of predation and interspecific cavity competition (Neal et al., 1992; Withgott et al., 1993; Montague et al., 1993; Montague, unpubl.) are now management options.

Continuing traditional use of the forest's resources is integral to the project's success. Scenarios have been proposed which would provide for integrated management in forest ecosystem including both wildlife and economic objectives (Seagle et al., 1987; Franklin, 1989; Hyde, 1989). In this project area, timber harvest levels would remain close to present levels, but their purpose would be redirected toward ecosystems management objectives (Fig. 2). With or without this restoration project, long term harvest levels will experience a modest decline.

fires, storms, and insect outbreaks and by emulating these events through the use of prescribed fire and timber harvest. The following are key elements of this approach: 1) using fire and tree cutting to simulate natural disturbance patterns, 2) using natural events such as insect outbreaks and wind storms to provide open conditions and opportunities for natural forest regeneration, 3) increasing the minimum time between regeneration cutting from 70 years to 120 years, which would allow for development of older trees required by Red-cockaded Woodpeckers and other cavity-using species, 4) maintaining mixtures of native pines and hardwoods, 5) developing and maintaining forested linkages between mature forest habitats, 6) minimizing ecotonal differences between contiguous stands and reducing habitat fragmentation, and 7) recognizing that people are an important part of this system by permitting a variety of economic, recreation, and scientific activities within the restoration area.

Human intervention in resource management is essential, given the inability of natural processes to function at pre-settlement landscape scales in a modern world. Renewal and restoration in the shortleaf pine/bluestem grass ecosystem should permit recovery of a diverse biota that has declined throughout this century.

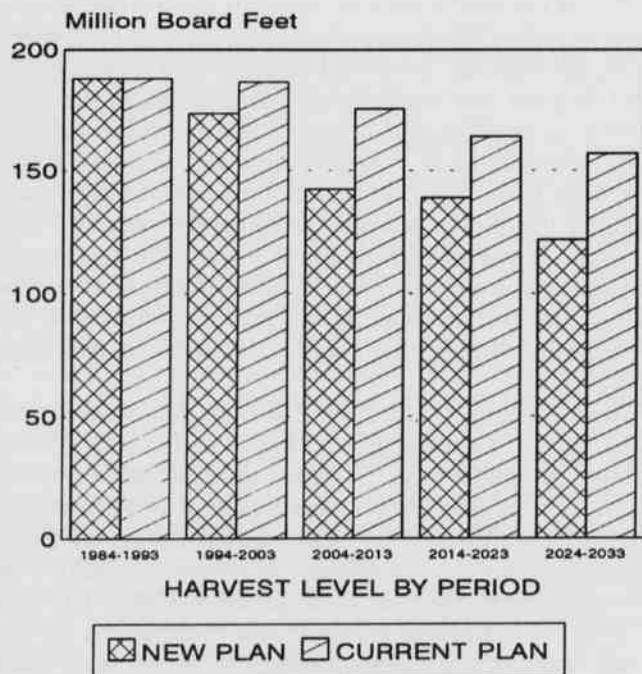


Fig. 2. Projected timber volume for next 50 years from shortleaf pine/bluestem grass ecosystem renewal area, Ouachita National Forest, Arkansas.

Shortleaf pine/bluestem grass ecosystem renewal would be achieved by the use of natural events such as

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