

## OKLAHOMA

In 1993 David Stahle of the University of Arkansas's Tree-Ring Laboratory described Oklahoma, which was not opened for homesteading until 1901, as probably the least disturbed state in the union; and Malcolm Cleaveland, also of the laboratory, reported that old-growth sites in the state are so numerous that finding trees worth coring to determine age is simply a matter of traveling along country roads with one's eyes open. The Cross Timbers landscape is dominated by Post Oak and Blackjack Oak, which tend to grow to only 15 to 40 feet in height, with trunks 10 to 20 inches in diameter. The trees grow on savannas and in woodlands, which represent a western outpost of the eastern deciduous forest. The twisted, gnarled oaks did not furnish marketable timber; but many of those on level ground were cleared to make way for agriculture and often, if not removed, were subject to livestock grazing. Today they are falling to development. Chip mills are also a threat. Nevertheless, Stahle could say in 1993 that "thousands and thousands of acres" remained largely unaltered from their presettlement condition (1993).

Since 1993, the Tree-Ring Laboratory has added substance to Stahle's assessment. The Laboratory developed a predictive model to identify likely areas of ancient Cross Timbers woodland in southern Osage County, Oklahoma, based on the location of steep slopes with poor soils. The researchers found that 27,931 acres (11,308 ha) fitted this criteria. They then examined randomly chosen sites in the field. Seventy-four percent of the acreage surveyed supported ancient Cross Timbers. They thus calculated that 20,390 acres (8,255 ha) in southern Osage County still support ancient Cross Timbers. This acreage includes contiguous tracts of up to 700 acres (Therrell and Stahle 1998).

Alynne Bayard at the Laboratory then worked out a predictive model for eastern Oklahoma as a whole. David Stahle wrote in December of 2001 that Bayard "estimates that at least 162 square miles of ancient Cross Timbers still survive in eastern Oklahoma. But we now realize the real number is more like 500 square miles! Seriously. Probably the largest old-growth forest type left in the eastern USA." Stahle continued that Mike Mangione of the Laboratory finds that seedlings and saplings are growing within the ancient Cross Timbers of eastern Oklahoma and that about 15% of trees over 10 cm dbh (diameter at breast height) are more than 150 years old. The oldest trees that Mangione has located in his random sampling are more than 300 years old.

Alynne Bayard told us that "Nearly all of the study sites sampled as part of the Ancient Cross Timbers Project were located on private land and often straddled more than one ownership boundary. However, there are several state parks, recreational areas, and refuges that no doubt harbor important areas" that we did not sample. She described for us the first two areas listed below in order to indicate the "expanses" of Cross Timbers that remain. She noted, however, that "Of course, there are smaller parcels . . . within these complexes that are significant and representative gems of ancient Cross Timbers as

defined by Kuchler” in 1964 (Bayard 2002).

For the Ouachita National Forest we have only one site, forest along a highway in Le Flore County, to add to those presented in our 1993 survey, which were drawn from a 1986 article by Forrest L. Johnson. Susan Hooks, botanist on the Ouachita, told us that the US Forest Service (USFS) has no new information on old-growth sites (2002). The Ozark-Ouachita Highlands Assessment, published in 2000, states that the Assessment’s “Terrestrial Team assessed existing and potential stands” on the Ouachita and two other National Forests. However, the text of the Assessment concentrates on potential stands, ie areas with trees at least 100 years old, and does not describe existing old growth. Furthermore, the Team used databases rather than a field inventory. USFS conducts on-the-ground inventories only when the staff enters stands before an action (Logan 2000).

The Land and Resource Management Plan in force for the Ouachita went into effect in 1986. It was appealed, and in 1990 USFS added amendment 5, as a result of which Special Interest Areas were set up. A letter of intent to revise the current plan was released in May 2002. USFS hopes to have a revised plan in place by October 2005.

### **South Canadian River\*** (Pittsburg County)

An area of “relatively contiguous” cover of Cross Timbers that probably exceeds 44,000 acres (77 square miles). The University of Arkansas Tree Ring Laboratory selected at random and sampled three sites within the area. Researchers found that all three are completely old growth, but that each had a different species dominance and composition. Two sites were dominated by Post Oak. Of these sites, one site had only Blackjack Oak as codominant, whereas the other also had Black Hickory, Winged Elm, and Black Oak. The third site was dominated by Blackjack Oak, followed by Post Oak.

The only surveying carried out for most of the 77 square miles has been the interpretation of topographic maps and satellite imagery. Though the area is very large, roads, division among many owners, and land-use activities break it up to some extent. On the other hand, many of the parcels are very remote with little obvious access. Thus their location offers them a certain degree of protection (Bayard 2002).

### **Conjada and Concharly Mountains,\*** near Leonard, along the Arkansas River (Wagoner and Tulsa Counties)

An area of up to 25,000 acres (approximately 40 square miles) with large contiguous tracts of Cross Timbers. The area has multiple private owners and includes no significant public lands. The University of Arkansas Tree Ring Laboratory sampled two sites and found them to be on average 95% old growth. Both sites were dominated by Post Oak, with Blackjack Oak as codominant (Bayard 2002).

### **McCurtain County Wilderness Area,** southeastern Oklahoma (McCurtain County)

A 14,000-acre (5700-ha) area of never-logged Shortleaf Pine-mixed hardwoods. Pines dominate south-facing slopes; hardwoods, mostly oak and hickory, north-facing slopes. Overall, the

forest is on average 60% pine and 40% hardwoods by basal area. Although the forest has not been logged, exclusion of fire since 1926, and the foraging of domestic and feral pigs have impacted the forest's structure (Kelly et al. 1993). The only signs of disruption in the upland away from the reservoir are some dirt roads and a couple of abandoned cabins once occupied by caretakers (Stahle et al. 1985). The State of Oklahoma purchased the land in 1917, and the Oklahoma Department of Wildlife Conservation has managed it as a game reserve since 1926. The department protects the old growth, and keeps the area closed to the public (Kelly et al. 1993).

**Ouachita National Forest**, southeastern Oklahoma (LeFlore County)

**--Beech**

**Creek Area.** An 8000-acre area, including most of Beech Creek watershed, which, like the three areas below, Forrest Johnson describes as "essentially roadless," "relatively undisturbed," and a "good example of presettlement conditions in the Ouachita Mountains." The valley-bottom-floodplain community within Beech Creek has 24 species of trees, none of them dominant. They include Sugar Maple, Bitternut Hickory, Sweetgum, Eastern Hophornbeam, Shumard's Oak, and White Oak.

**--Upper**

**Kiamichi Area.** An 8800-acre area that includes most of Pine Mountain and a large part of the southern slope of Rich Mountain. Vegetation on southern slopes here and in the other three areas is oak-pine forest, with Shortleaf Pine, Post Oak, Blackjack Oak, Black Oak, and Black Hickory prominent.

**--Rich**

**Mountain Area.** A 5000-acre area comprised of most of the Oklahoma part of the north slope of Rich Mountain. Vegetation on upper and mid-level north-facing slopes here and in the other three areas is dominated by Mockernut Hickory. Carolina Basswood and White Oak are also prominent. The most important species on lower north-facing slopes is Shumard's Oak.

**--Black Fork**

**Area.** An area of 4400 acres that includes most of the part of Black Fork Mountain in Oklahoma and a portion of Big Creek Valley. The Black Fork Area is adjacent to the Black Fork Wilderness in Arkansas. Ridge top vegetation found in the Blackfork Area and elsewhere in the three sites listed here is dominated by White Oak. On the highest and narrowest ridges atop Black Fork and Rich Mountains, twisted White Oak, Blackjack Oak, Post Oak, and Black Hickory, little more than 9 feet tall, grow amidst grassy openings and a few boulder fields. Forrest Johnson does not point out specific old-growth sites, but at the very least the stunted ridge top vegetation could be expected to be old growth. Given the number of acres that Johnson describes, the Oklahoma portion of Ouachita National Forest would make a substantial contribution to the East's old-growth inventory, even if only a modest proportion of the vegetation were actually undisturbed (Johnson 1986).

**--Forest along Highway 1 Scenic Drive\*** (Le Flore County). Well over a thousand acres of old-growth hardwoods—"noncommercial" Post Oak, Blackjack Oak, with some Northern Red Oak—scattered on the steeper slopes and higher elevations along Highway 1 Scenic Drive, which runs east-west through a section of the Forest. The Highway crosses Winding Stair Mountain (Seay 1995). The scenic route begins in Mena,

Arkansas and is also mentioned under that state.

**Keystone Ancient Forest Preserve**,\* northeastern Oklahoma (Osage County).

A new 1100-acre preserve, representative of the Cross Timbers. The tree species on the preserve include Blackjack Oak, Post Oak, Black Oak, Black Hickory, American Ash, and Winged Elm. Many individuals of each species may be at or above the natural longevity for the species. The Tree Ring Laboratory has documented a Post Oak over four hundred years old, and Eastern Red-cedar over five hundred years in age. The preserve supports nine vegetation associations, including forests of Post Oak, Blackjack Oak, and hickory; Red-cedar and Black Oak in rocky ravines, Post Oak savannas, Blackjack Oak barrens, Black Oak slopes, grassy glade openings, and tallgrass prairie. Much of the tallgrass prairie and some of the Post Oak savanna appear to have been directly disrupted by human activity, which took the form of grazing livestock, building roads, and clearing land in connection with exploration for oil. However, there are no other obvious signs of disturbance.

The Cross Timbers Preserve, which is on land that Stahle and his colleagues "discovered" and worked to put into permanent protected status, is owned by the city of Sand Springs. It was purchased from a private owner with funds from the Oklahoma Department of Transportation. The Nature Conservancy has a management agreement with the city and, in 2002, was developing a management plan. The preserve overlooks Keystone Reservoir and is adjacent to a 108-acre tract purchased by the Tulsa Audubon Society to protect the American Bald Eagle and to land owned by the US Army Corps of Engineers (Hollenbeck 2002, Stahle 1995, Stahle et al. 1996).

**Wichita Mountains Wildlife Refuge**, southwestern Oklahoma (Comanche County)

Old-growth Cross Timbers woodland, within the 60,000-acre Refuge, which President McKinley withheld from settlement in 1901. Originally oak savanna was the dominant community in the Refuge, and areas of scattered old-growth Post Oak can still be found. Heavy grazing and fire suppression, however, encouraged the formation of woodlands of Post Oak, Blackjack Oak, and Eastern Red-cedar among the Refuge's extensive grasslands (Dooley and Collins 1984). James Smith, Refuge Manager, lists the following "old growth woodlots": Mount Marcy (300 acres), Big Bull Pasture (80 acres), Black Bear Mountain (300 acres), West Research Pasture (150 acres), Hollis Canyon (150 acres), Mt Scott Canyon (80 acres), Pennington Tunnel (100 acres), and Quanah Mountain (80 acres) (1993).

Stahle et al. cored trees on a 100-acre site on the east side of Quanah Mountain, and found the Post Oak on the lower slopes to be 200 to 250 years old. The woodlands at the Quanah Mountain location graded into savanna and into occasional cedar and shrubs growing on granite outcrops. The only obvious sign of disturbance at the site was a browse line in the understory due to the Refuge's large number of herbivores (Stahle et al. 1985). Many eastern forests are suffering from over-browsing by deer, since the top predators, like wolves and cougar, have been eliminated or greatly reduced in numbers.

Stahle describes the forest within the Refuge as a whole, as varying from very open, prairie

outlier type communities to densely wooded areas (Stahle 1993, Stahle et al. 1985). The Fish and Wildlife Service's Bureau of Sport Fisheries and Wildlife manages the Refuge, parts of which are closed to the public.

**Lake Eufaula**, southeastern Oklahoma (Pittsburg County)

Scattered sites

dominated by small Post Oak on ridges and hills around the reservoir known as Lake Eufala. Stahle et al. cored a privately-owned, 40-acre site, with Post Oak 200 to 250 years in age and around 30 feet tall. The sampled oak were growing on a rocky, south-facing slope (Stahle et al. 1985).

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