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## KENTUCKY

In *Trees and Shrubs of Kentucky*, Mary E. Wharton and Roger W. Barbour noted that "Many of the virgin mixed mesophytic forests [in Kentucky that Lucy Braun] analyzed and photographed were cut even before her work was published, and now, of those she studied, only a few small fragments remain that even resemble primary forest. Today no absolutely untouched virgin forests are left in the state" (Wharton and Barbour 1972). Strictly interpreted, their analysis is correct. No absolutely untouched forests remain. However, in 1991 the Kentucky Nature Preserves Commission identified an extensive, little disturbed forest of which scientists previously had no knowledge. The state natural areas inventory that led to this discovery is continuing in 2002, but, because of the results of aerial surveys, researchers do not expect to find any additional large tracts of old growth (Evans 1993, Hines 2002).

The US Forest Service (USFS) is in 2002 revising the management plan for Daniel Boone National Forest and hopes to have a draft revision out in October, 2002. In preparation for the revision, USFS compiled a "Preliminary Inventory of Possible Old Growth Forests" for the Daniel Boone. The preliminary inventory does not identify any stands "as existing old-growth through past inventories or land management decisions." Instead it lists a total of 669,166 acres of "possible old growth" and "future old growth," based on examination of records of the most recent, past field work. The 669,166 acres include existing and proposed Research Natural Areas and other special areas (Knowles 2002). Actually, according to USFS's own records, the existing and proposed Research Natural Areas include existing old growth. Furthermore, a cooperative inventory of the Forest in 1987-1993, focusing on native biodiversity and coordinated by Julian Campbell of The Nature Conservancy, identified various areas of old growth. Most were clusters of patches or sites of less than forty acres in extent. In presenting the Daniel Boone National Forest below, we include the proposed and existing Research Natural Areas and several other sites in the forest reported as actual old growth.

In Kentucky Wildlife Management Areas logging can take place only by a decision of the Fish and Wildlife Commission. Through mid-2002, the Fish and Wildlife Commission has not allowed logging in any of the Wildlife Management Areas. Through tradition, these areas have thus enjoyed informal protection (Walker 2002).

In addition to the 40-or-more-acre tracts across the state that are described individually below, old-growth areas already familiar to scientists include: **Boone County Cliffs**, 30 acres of old-growth maple-basswood-beech, within a 74-acre State Nature Preserve, owned by The Nature Conservancy (Boone County); **Floyd Woods**, 20 acres of bottomland hardwood in private hands but registered with the Nature Preserves Commission (McClellan County); **Bayou Creek Ridge** in the Western Kentucky Wildlife Management Area, approximately 20 acres of mesic bottomland ridge, owned by the Tennessee Valley Authority but managed by the Kentucky Department of Fish and Wildlife Resources (Ballard County); **Murphy's Pond**, a 40-acre pond with 15 or more acres of possibly virgin Baldcypress, owned by Murray State University (Hickman

County) (Goodwin and Niering 1975, Evans 1993). A possible old-growth stand is at **Buck Creek\***--disjunct Northern White-cedar (some individuals 200 years old) with hemlock in a protected north-east facing cove (Pulaski County) (Walker 1987). Three stands on the bottoms of Blood River and Jonathan Creek, tributaries of the Tennessee River, are the only remaining bottomland forests in these watersheds never cleared for agriculture. The stands are **Blood River South** (4.5 acres), **Blood River North** (7.4 acres), and **Jonathan Creek** (5.4 acres), all owned by the Tennessee Valley Authority. In 1993 their trees were more than a hundred years old (Shear et al. 1997).

Individually small and scattered, but in total covering a considerable acreage, Eastern Red-cedar communities inhabit cliff tops in the gorges of the Kentucky River and its tributaries in the Bluegrass region of Kentucky (Anderson, Fayette, Franklin, Jessamine, Madison, Mercer, and Woodford Counties). The communities, which range in size from 2 to 15 acres, are found where the limestone cliffs are topped by thin, clayey soil, low in nutrients and moisture. In these locations the trees are protected from fire. "Some grazing and logging ha[s] occurred in the past in a number of these stands," but others appear to be largely undisturbed. Major associates of the red-cedar, which itself accounts for more than 70% of basal area and density, are White Ash, Redbud, Slippery Elm, Honey Locust, and Chinquapin Oak. The small tree and shrub layer includes Redbud, Fragrant Sumac, and Carolina Buckthorn (Bryant 1989, 1993).

#### **Blanton Forest State Nature Preserve**, in southeastern Kentucky (Harlan County)

Within a preserve that in mid-2000 totaled 3055 acres, 2239 acres of little disturbed forest, encompassing an entire side of Pine Mountain. Communities include hemlock-mixed mesophytic, oak-pine, Appalachian oak (White Oak and Chestnut Oak most common but other species contributing), mountain bogs, cliffs, rock overhangs, and mountain streams. Pitch Pine dominates some areas; Shortleaf Pine and Virginia Pine are also present. The occurrence of pines is coincident with the driest forest at the summit. American Chestnut was once an important component but it all died in the 1930s and 1940s from blight. Traces of an old homestead can be seen at the mountain's base, one part of the forest apparently underwent limited logging, cattle may have grazed a section, and someone tried to cut an off-road vehicle trail in a corner of the tract; but these activities did little noticeable damage.

Blanton Forest supports more than four hundred plant species and scores of animal species, including more than a dozen that the State Nature Preserves Commission monitors because of their rarity within the state. One of the many streams that descend from the mountaintop bogs is home to a population of federally listed Blackside Dace (*Phoxinus Cumberlandensis*).

The Kentucky Natural Heritage Program identified and began exploring the site in 1991. The Blanton family had owned and protected the old growth since the beginning of the century. In 1995 a 1075-acre portion was purchased from the descendants of Grover Blanton and a state nature preserve established. The Kentucky State Nature Preserves Commission has since acquired an additional 1164 acres of old growth from the Blanton family, plus 816 acres of forested buffer. It hopes to acquire gradually 3645 additional acres of buffer to expand the preserve to 6700 acres. The buffer will be comprised of forests of varying quality, some of which may include pockets of old growth (Evans 1993 and 2000, News 2001, Scott 2002).

Pine Mountain, the location of Blanton Forest, is in its entirety “a rugged, heavily forested” fault scarp, over 120 miles long, rising 1000 to 1500 feet above the adjacent valley floors and extending north from near Jellico, Tennessee to Elkhorn City, Kentucky. It covers some 150,000 acres, 40,000 of which lie in Virginia. The Kentucky Natural Lands Trust, which spearheads the campaign to raise money for Blanton Forest, decided in 2002 to work with the Kentucky Nature Preserves Commission to protect “the ecological and biological integrity of the entire mountain” (Evans 2002).

**Latourneau Woods**, western Kentucky (Fulton County)

An 870-acre bottomland hardwood forest in the Mississippi River floodplain. The forest is “largely undisturbed” by logging, as reflected in its relatively even-aged structure, because mixed stands of bottomland hardwoods were basically even-aged before logging and natural mortality changed composition and structure. The dominant trees in order of importance are Sugarberry, Green Ash, Pecan, and American Elm. A few Swamp White Oak are present. The trees are widely spaced, with many four and five feet in diameter. Catbriers, Cane, Poison Ivy, and Trumpet Vine are prolific. The site floods, four or five feet deep, with the spring rains. The state has acquired the site for the Kentucky Department of Fish and Wildlife Resources from a private owner. (Bryant 1990 and 1993; Boebinger 2001).

**DANIEL BOONE NATIONAL FOREST**, southeastern and east-central Kentucky

--**Right Fork of Elisha Creek**, in Redbird Wildlife Management Area (Leslie County). A 315-acre, proposed Research Natural Area (RNA), some 218 acres of which are old-growth Chestnut Oak and Tulip Tree-White Oak-Northern Red Oak. The old growth is on a southeast ridge and southwest facing slopes. The dominant canopy species are Chestnut Oak, White Ash, and Tulip Tree. In 1979 one of the Chestnut Oaks, with a 28.9 inch dbh (diameter at breast height), was cored and found to be 221 years old. Trees of secondary prevalence in the canopy are Sourwood, Black Oak, Scarlet Oak, and Mockernut Hickory. Trees prominent in the understory include Red Maple, Bitternut Hickory, Mockernut Hickory, Beech, Cucumber Tree, and Chestnut Oak (Demeritt 1992a).

--**Rock Creek Research Natural Area**, (Laurel County). A hemlock-mixed mesophytic forest within a gorge extending from a ridge crest of the Cumberland Plateau to the Rockcastle River. An RNA, which follows the outline of the gorge, occupies 190 acres; the gorge is approximately 148 feet deep and one and a quarter miles long (Winstead and Nicely 1976). Thompson and Jones describe the old growth as the 190 acres of the RNA (2001). Though often referred to as virgin, the gorge has undergone “some cutting,” including removal of scattered large White Oak, Tulip Tree, mixed oak, and hemlock in 1915-1917. As of 1938 there was “little evidence of cutting” on the less accessible land near the head of the creek (Hemingway 1938). The “approximately 120-acre central ravine forest” dates back to 1781 according to USFS, and another 54 acres in the upper tributary ravines date back to 1822-1831 (KSNPC 1996).

Dominant tree species on the upper- three fourths of the gorge are Eastern Hemlock, Sourwood, Sweet Birch, Tulip Tree, and American Holly. Most important in

the shrub layer are thickets of Great Rhododendron. The floodplain is habitat for River Birch, Black Willow, and Silver Maple among other species. On the rim of the gorge the trees are second growth. The Forest Service clearcut an area there in 1965, and made another cut in the late 1980s. The gorge has been a National Natural Landmark since 1975 (Cameron & Winstead 1978, Kluempke 1993, Strojan 1993).

The Kentucky State Nature Preserves Commission has recommended that USFS expand the RNA to include the entire watershed of Rock Creek, 1029 acres in extent and 95% forested. Unusual features of the watershed in addition to the old growth are massive sandstone cliffs and rare plant and animal species including Lucy Braun's White Snakeroot (*Ageratina luciae-brauniae*) and Rafinesque's Big-eared Bat (*Corynorhinus rafinesquii*) (KSNPC 1996). Researchers have identified 117 woody species --112 native, 5 exotic--within the watershed as a whole (Thompson and Jones 2001). An estimated 85% of the watershed is owned by USFS. Much of the private land is along a road, which would make acquisition difficult (Wilcox 2000).

**--Beaver Creek Wilderness Area** in the Somerset District (McCreary County). A "ravine system with several old-growth areas" within the 4791-acre Wilderness (Campbell 1995). The old growth includes 95 acres of A-quality Appalachian mesophytic and hemlock-mixed forest along Little Hurricane Fork and Freeman Fork. Within the watershed of Beaver Creek, USFS owns, in addition to the Wilderness Area, the Beaver Creek Wildlife Management Area, which is managed by the Kentucky Department of Fish and Wildlife Resources (KSNPH 1998). The Wildlife Management Area is on ridges surrounding the Wilderness.

**--Tight Hollow**, in Red River Gorge Geological Area (Wolfe County). A 72-acre old-growth stand of virgin Tulip Tree-Eastern Hemlock with trees as old as 221 years (Richardson 1990, Demeritt 1992b). Only 283 acres of the 321-acre mesic sandstone gorges that make up the Hollow are within the National Forest, and the Hollow can only be entered by crossing private land. The staff of the Daniel Boone has proposed Tight Hollow for Research Natural Area status.

Hemlock, with dbh often 50-70 cm and occasionally 100 cm, dominates the old growth, most of which is on the east side of the Hollow. Co-dominant Tulip Tree range up to 150 cm dbh, with 70-120 cm frequent. Other canopy trees include American Beech (50 to 100 cm), White Pine (to 100 cm), Cucumbertree (50-70 cm), Red Maple (to 50 cm), Chestnut Oak, American Basswood, and Sweet Birch. Rhododendron dominates the understory. Rare plant species found within the area include Lucy Braun's White Snakeoot and Small Enchanter's Nightshade (*Circaea alpina*) (KSNPC 1996).

**--Jellico Creek** in the Stearns District (McCreary County). Fifty to 100 acres of old growth, in which Eastern Hemlock, American Beech, and Sugar Maple are locally dominant. (Campbell 1995; Campbell 1998)

**--Little South Fork**, in the Stearns District (Wayne/McCreary Counties). A mixed deciduous forest labeled by Campbell as an "outstanding old growth section" of at least 40 acres to possibly 100 acres (1998). The forest is on the slope above an impoundment of the lower section of the river. The Little South Fork corridor forms the southwestern boundary of the Daniel Boone National Forest (Campbell 1995, 1998).

**--Blue Warbler Stand**, in the Berea District (Rockcastle County). Sixty or more acres of old-growth mixed mesophytic forest on a steep slope adjacent to land owned by Appalachia-Science in the Public Interest. With the permission of the US Forest Service,

ASPI has made a trail above the old growth in order that visitors can look down into it (Fritsch 2002).

### **Mammoth Cave National Park** (Hart County)

Approximately 300 acres of primarily oak/hickory forest and mesic ravines with American Beech associates in what is known as Big Woods. A private owner preserved the forest prior to National Park Service ownership. Human disturbance has been minimal. American Chestnut trees that died were removed, as were, on a selective basis, a few other logs. A tornado toppled a swath in spring 1985 (Evans 1990, Gregory 1992, McCune and Henckel 1993).

**\*\*Also in the park, floodplain forest along the Green River and a creek emptying into it supports large, old sycamores and beech trees. David Cignoni measured sycamores at over fourteen feet and sixteen feet in diameter. He measured beech trees near the river at about ten feet in diameter ([Cignoni 2009](#)).**

### **Lilley Cornett Woods**, in southeastern Kentucky (Letcher County)

Approximately 260 acres of largely uncut mixed mesophytic forest in a 554-acre wooded tract, owned by the state of Kentucky (Brotzge 1989). William H. Martin identified nine distinct communities in the old-growth portion of the Woods. Beech communities comprise 50% of the forest. "Oak, sugar maple-basswood-tulip poplar, and hemlock communities comprise the remainder of the Woods, in order of decreasing area." The area has been grazed, and dead trees cut and removed (Martin 1975). Two mining companies owned the right to mine beneath the land. Through the Kentucky Heritage Land Conservation Fund, the state purchased the coal estate that belonged to Enterprise Coal. Kentucky River Coal still holds mining rights, but has not applied for a permit to mine (Martin 2001).

### **Pine Mountain Wildlife Management Area**, in southeastern Kentucky (Letcher County)

Stands of old-growth mixed mesophytic and Appalachian oak forest, each possibly 50 to 100 acres in size. Many of the trees are several hundred years old. The Kentucky Department of Fish and Wildlife Resources owns the Management Area (Evans 1993, 2000; Walker 2002). Pine Mountain is a long mountain, only part of which is within the Management Area. Blanton Forest, described above, is on this mountain but outside the Management Area.

### **\*\*Wolf Pen Branch Mill Farm**, north of Louisville (Jefferson County)

On a 412-acre farm, approximately 187 acres of mesic forest. The location of the forest, in a farming area near a major city, strongly suggests that it experienced logging, but the land is sufficiently steep as to have made use for crops or grazing unlikely (French 2006). The only obvious signs of logging are a few cut stumps beside pathways.

The forest is uneven-aged. The majority of the trees are 50-150 years in age, and have a DBH of 10 to 30 inches. Dominant species in the canopy include basswood, oaks, hickories, American Beech, and Tulip Tree (Cochran 2000). Some of the beech are sizeable, and may be the remnants of early logging, since beech was not considered to be a desirable species (French 2006). The subcanopy includes White Ash, Sugar Maple,

Flowering Dogwood, and Pawpaw. The shrub layer is diverse, and the spring wildflower assemblage, supported by a thick layer of detritus, rich. Among the wildflowers are Black Cohosh and Large-Flowered Trillium, which are frequent in Eastern Kentucky but are otherwise not represented in the Outer Bluegrass. The locally and state rare Goldenseal, Ginseng, and Synandra (*Synandra hispidula*) are also present. Rotten stumps and logs provide habitat for salamanders and a variety of snails (Cochran 2000).

Sallie Bingham purchased the farm in two parcels in 1986 and 1987 after she learned that it was for sale and was about to be bought by a developer. In 1991 she donated a conservation easement (valued at more than \$4.5 million) and an endowment to maintain the property to River Fields land trust and the Kentucky Heritage Council. In addition to the mesic woods, the farm includes pastureland and a historic mill (Walfort 1999; French 2006).

**Shillalah Creek Wildlife Management Area**, southeastern Kentucky (Bell County)

An estimated 100+ acres of old-growth forest, ranging from dry oak to mixed mesophytic, on a steep, rugged north-facing slope. The same slope has many small pockets of old growth in hollows and ravines. Shillalah Creek is managed by the Kentucky Department of Fish and Wildlife Resources (Evans 1993, 2000; Walker 2002).

**Dinsmore's Woods State Nature Preserve**, in northern Kentucky (Boone County)

A 107-acre mesic, possibly old-growth, hardwood forest. There are no historical records or signs of any significant modification between the 1830s, when private owners obtained it, and 1974, when a tornado caused "selective" damage (Held et al. 1998). The Nature Conservancy, which owns the forest, describes it in a flyer as "relatively mature" and "relatively undisturbed." Before the tornado, the canopy and understory were dominated by Sugar Maple, with American Beech as the subdominant. Since 1974 the importance value of Sugar Maple has increased, as has that of oaks. The importance value of other species has declined (Held et al. 1998). The preserve is adjacent to the Dinsmore Homestead, and a state park is across the road from it. Because the state park is open to horses, the preserve has a problem with horses. Garlic mustard, which spreads rapidly and replaces native vegetation, is also a problem (Mazyck 2000).

**Greenwood Forest**, south-central Kentucky (Christian County)

A 198-acre oak-hickory forest, of which 62 acres on the eastern side have experienced only minimal disruption. There in the 1940s a few hickories and oaks were cut for tobacco sticks, but no grazing took place during at least the period 1963 to 1993. The western side of the forest was selectively harvested between 1990 and 1995.

The forest is located on the Pennyroyal Plain, a karstic landscape, and is a remnant of the 5000-acre McGaughey Swamp. Most of the swamp had been drained and cleared by 1979, and is now growing crops. Fields border three sides of the 62 acres of little disturbed forest.

Oaks, hickories, Red Maple, elms, Sweetgum, and beeches make up more than 85% of the canopy importance value. Winged Elm, Slippery Elm, Red Maple, Pawpaw, Hackberry, Ironwood, and Shagbark Hickory account for more than 67% of the importance value of the sapling/small tree stratum. Beech, elms, Red Maple, Coralberry (*Symphoricarpos orbiculatus*) dominate the shrub/woody seedling layer. The evidence

suggests that any major disturbance of the canopy, from natural or anthropogenic causes, would bring to an end oak domination of the canopy (Chester et al. 1995).

The forest is protected by the private partnership that owns it (Greenwood 2002).

**\*\*Griffith Woods**, central Kentucky (Harrison County)

Forty or fifty acres of old-growth savanna on the 745-acre former Griffith Farm. The savanna supports large, old specimens of Bur Oak, Chinquapin Oak, and Blue Ash, along with some Honey Locust. One of the Chinquapin Oaks is estimated to be four- to five-hundred years old. However, the groundlayer is severely degraded. Kentucky 31 Fescue grows among the trees, as do Poison Hemlock and bush honeysuckle. Restoration is urgently needed.

The Griffith Family owned and protected the farm from the Revolutionary War into the twenty-first century. In 2002, two nieces sold it to The Nature Conservancy. The University of Kentucky bought from The Conservancy the portion south of a road that crosses the farm. This portion includes the old-growth savanna; the balance of the university's land is old field. An organization called Friends of Griffith Woods (859-229-7711) is seeking help with removal of invasive species and conducting educational activities.

**Curtis Gates Lloyd Wildlife Management Area**, north-central Kentucky (Grant County)

Forty acres of old-growth mixed hardwood forest divided into two twenty-acre tracts separated by a field. At one time the two areas were part of a single wooded tract. Tree species include Sugar Maple, White Ash, American Beech, Shagbark Hickory, and Black Oak. Very little of the native flora other than the trees is present, and Garlic Mustard is a major problem, despite attempts to eradicate it. The Kentucky Department of Fish and Wildlife Resources, which owns the area, allows it to be used for archery practice (Bryant 1993, Bryant 1985, KNPC 2000, Walker 2002).

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