



**Field Guide to  
Native Oak Species of  
Eastern North America**

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D. Birlon  
R. Acclavatti**



FHTET-2003-01  
January 2003

**Front Cover:**

Clockwise from top left: white oak (*Q. alba*) acorns; willow oak (*Q. phellos*) leaves and acorns; Georgia oak (*Q. georgiana*) leaf; chinkapin oak (*Q. muehlenbergii*) acorns; scarlet oak (*Q. coccinea*) leaf; Texas live oak (*Q. fusiformis*) acorns; runner oak (*Q. pumila*) leaves and acorns; background bur oak (*Q. macrocarpa*) bark. (Design, D. Binion)

**Back Cover:**

Swamp chestnut oak (*Q. michauxii*) leaves and acorns. (Design, D. Binion)

**FOREST HEALTH  
TECHNOLOGY ENTERPRISE TEAM**

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**TECHNOLOGY  
TRANSFER**

***Oak Identification***

**Field Guide to  
Native Oak Species of  
Eastern North America**

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United States  
Department of  
Agriculture

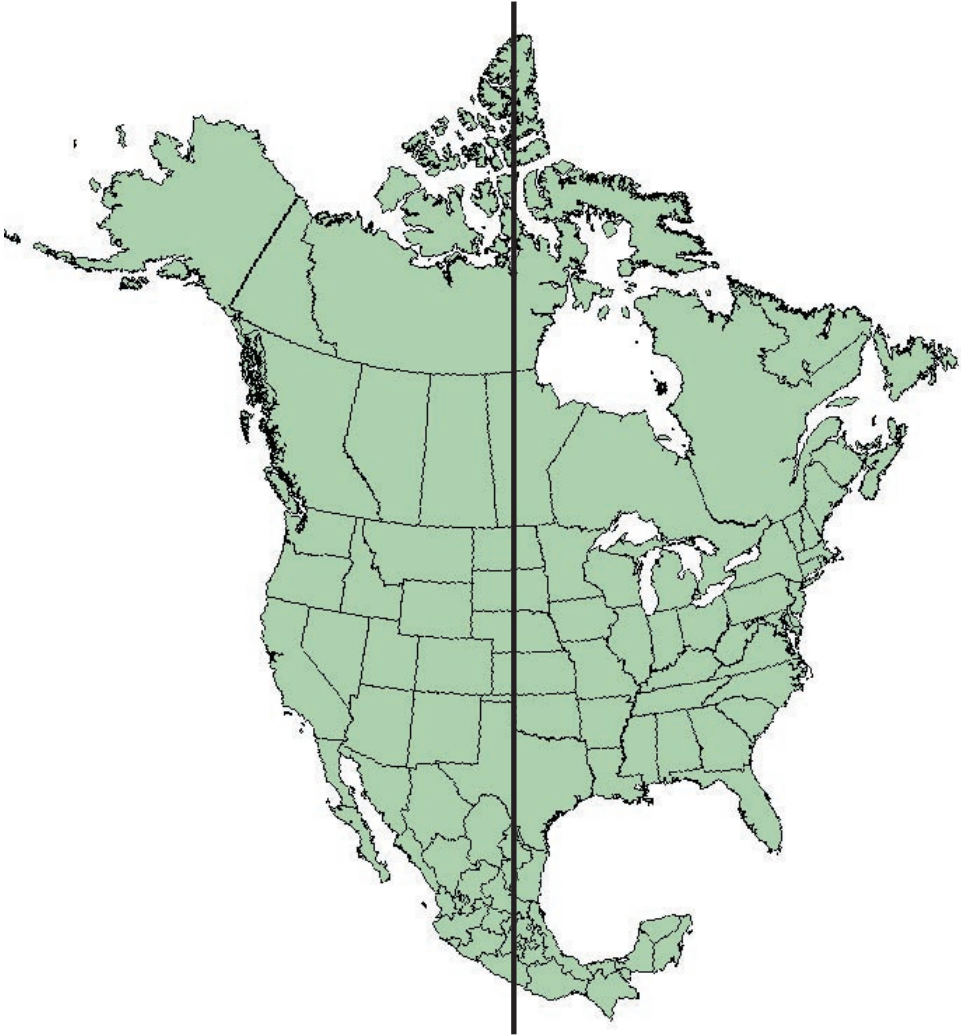


Forest  
Service

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January 2003

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# NORTH AMERICA



**100<sup>th</sup> Meridian**

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## ACKNOWLEDGMENTS

The authors wish to thank all those who helped with this publication. We are grateful for permission to use the drawings illustrated by **John K. Myers**, Flagstaff, AZ, published in the *Flora of North America, North of Mexico*, vol. 3 (Jensen 1997). We thank **Drs. Cynthia Huebner** and **Jim Colbert**, U.S. Forest Service, Northeastern Research Station, Disturbance Ecology and Management of Oak-Dominated Forests, Morgantown, WV; **Dr. Martin MacKenzie**, U.S. Forest Service, Northeastern Area State and Private Forestry, Forest Health Protection, Morgantown, WV; **Dr. Steven L. Stephenson**, Department of Biology, Fairmont State College, Fairmont, WV; **Dr. Donna Ford-Werntz**, Eberly College of Arts and Sciences, West Virginia University, Morgantown, WV; **Dr. Ron Lance**, President, International Oak Society, Chimney Rock, NC; and **Dr. Fernando Zavala-Chavez**, Division of Forest Science, Universidad Autonoma Chapingo, Chapingo, Mexico, for their technical review comments. Their input helped to greatly improve the manuscript. In addition, we thank **Claudia Violette**, Frost Entomological Museum, Pennsylvania State University, University Park, PA, for her editorial services. We are indebted to the following sources for use of various oak images: **Shirley Denton**, Biological Research Associates, Tampa, FL; **Joyce Foster**, U.S. Forest Service, Sumter National Forest, Long Cane Ranger District, Edgefield, SC; **Tihomir Kostadinov**, Student, University of Richmond, Richmond, VA; **Ron Lance**, President, International Oak Society, Chimney Rock Park, Chimney Rock, NC; **Chuck Milner**, U.S. Forest Service, Cibola National Forest, Black Kettle Ranger District, Cheyenne, OK; **Gil Nelson**, Robert K. Godfrey Herbarium, Florida State University, Tallahassee, FL; **Guy Sternberg**, Starhill Forest Arboretum, Petersburg, IL; **Paul Wray**, Department of Forestry, Iowa State University, Ames, IA (photos obtained from Forestry Images web site, University of Georgia); **Texas A&M University**, College Station, TX; and **West Virginia University**, Eberly College of Arts and Sciences (Herbarium), Morgantown, WV. Finally, the authors wish to extend their appreciation to **Nancy Lough** and **Sandy Fosbroke**, U.S. Forest Service, Northeastern Area State and Private Forestry, Information Management and Analysis, Morgantown, WV, for their advice and formatting of this field guide.

Photo credits: **R. Acciavatti** – *Q. havardii* (habitat), *Q. ilicifolia* (habitat); **D. Binion** – *Q. bicolor* (acorn, bark), *Q. falcata* (bark), *Q. havardii* (leaf), *Q. nigra* (bark), *Q. phellos* (bark); **S. Denton** – *Q. chapmanii* (leaf, acorn), *Q. falcata* (acorn), *Q. geminata* (leaf, immature/mature acorn); **J. Foster** –

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*Q. oglethorpensis* (leaf, bark, tree); **T. Kostadinov** – *Q. coccinea* (leaf), *Q. falcata* (leaf), *Q. montana* (bark), *Q. nigra* (leaf), *Q. velutina* (bark); **R. Lance** – *Q. acerifolia* (leaf), *Q. arkansana* (leaf, acorn, bark), *Q. austrina* (leaf, acorn, bark), *Q. boyntonii* (leaf, acorn, tree), *Q. buckleyi* (leaf, acorn, bark), *Q. coccinea* (acorn), *Q. fusiformis* (leaf, acorn, bark), *Q. georgiana* (leaf, acorn), *Q. hemisphaerica* (leaf, acorn), *Q. ilicifolia* (acorn), *Q. incana* (leaf, acorn, bark), *Q. laceyi* (leaf, acorn), *Q. laevis* (leaf, acorn, bark), *Q. laurifolia* (leaf, acorn, bark), *Q. lyrata* (leaf, acorn), *Q. margaretta* (leaf, acorn, tree), *Q. marilandica* (leaf, acorn, bark), *Q. michauxii* (leaf, acorn, bark), *Q. minima* (leaf, acorn, habitat), *Q. montana* (leaf, acorn), *Q. myrtifolia* (leaf, acorn), *Q. pagoda* (leaf, acorn, bark), *Q. phellos* (leaf, acorn), *Q. prinoides* (leaf, acorn), *Q. pumila* (leaf, acorn, habitat), *Q. shumardii* (leaf, acorn), *Q. similis* (leaf, acorn, bark), *Q. sinuata* (leaf, acorn), *Q. texana* (leaf, acorn), *Q. vaseyana* (leaf, acorn), *Q. virginiana* (leaf, acorn); **C. Milner** – *Q. havardii* (acorn); **G. Nelson** – *Q. inopina* (acorn, leaf); **J. Stein** – *Q. ilicifolia* (leaf, bark), *Q. imbricaria* (bark), *Q. muehlenbergii* (bark), *Q. myrtifolia* (bark), *Q. nigra* (acorn), *Q. rubra* (bark), *Q. stellata* (bark), *Q. virginiana* (bark, trunk, tree); **G. Sternberg** – *Q. macrocarpa* (trunk), *Q. mohriana* (leaf, acorn, bark, tree), *Q. pungens* (leaf, acorn, habitat); **Texas A&M** – *Q. fusiformis* (tree), *Q. hemisphaerica* (tree), *Q. vaseyana* (tree); **West Virginia U.** – *Q. coccinea* (bark), *Q. shumardii* (bark); and **P. Wray** – *Q. alba* (leaf, acorn, bark), *Q. bicolor* (leaf), *Q. ellipsoidalis* (leaf, acorn), *Q. imbricaria* (leaf, acorn), *Q. macrocarpa* (leaf, acorn, bark), *Q. muehlenbergii* (leaf, acorn), *Q. palustris* (leaf, acorn, bark), *Q. rubra* (leaf, acorn), *Q. stellata* (leaf, acorn), *Q. velutina* (upper/lower leaf surface, acorn). **Permission should be obtained from the photographers to receive and use quality images for publication.**

The U.S. Forest Service, Forest Health Technology Enterprise Team, Morgantown, WV, published this book with support from the U.S. Forest Service's Northeastern Area State and Private Forestry, Forest Health Protection, Newtown Square, PA; Northeastern Area State and Private Forestry, Information Management and Analysis, Morgantown, WV; and the Southern Region, Forest Health Protection, and Cooperative Forestry, Atlanta, GA.

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# TABLE OF CONTENTS

<b>Introduction</b> .....	1
<b>Species Descriptions</b> .....	5
<i>Q. acerifolia</i> .....	maple-leaf oak.....6
<i>Q. alba</i> .....	white oak.....8
<i>Q. arkansana</i> .....	Arkansas oak.....10
<i>Q. austrina</i> .....	bastard white oak.....12
<i>Q. bicolor</i> .....	swamp white oak.....14
<i>Q. boyntonii</i> .....	Boynton oak.....16
<i>Q. buckleyi</i> .....	Buckley oak.....18
<i>Q. chapmanii</i> .....	Chapman oak.....20
<i>Q. coccinea</i> .....	scarlet oak.....22
<i>Q. ellipsoidalis</i> .....	northern pin oak.....24
<i>Q. falcata</i> .....	southern red oak.....26
<i>Q. fusiformis</i> .....	Texas live oak.....28
<i>Q. geminata</i> .....	sand live oak.....30
<i>Q. georgiana</i> .....	Georgia oak.....32
<i>Q. havardii</i> .....	Havard oak.....34
<i>Q. hemisphaerica</i> .....	laurel oak.....36
<i>Q. ilicifolia</i> .....	bear oak.....38
<i>Q. imbricaria</i> .....	shingle oak.....40
<i>Q. incana</i> .....	bluejack oak.....42
<i>Q. inopina</i> .....	Florida oak.....44
<i>Q. laceyi</i> .....	Lacey oak.....46
<i>Q. laevis</i> .....	turkey oak.....48
<i>Q. laurifolia</i> .....	swamp laurel oak.....50
<i>Q. lyrata</i> .....	overcup oak.....52
<i>Q. macrocarpa</i> .....	bur oak.....54
<i>Q. margaretta</i> .....	sand post oak.....56
<i>Q. marilandica</i> .....	blackjack oak.....58
<i>Q. michauxii</i> .....	swamp chestnut oak.....60
<i>Q. minima</i> .....	dwarf live oak.....62
<i>Q. mohriana</i> .....	Mohr oak.....64
<i>Q. montana</i> .....	chestnut oak.....66
<i>Q. muehlenbergii</i> .....	chinkapin oak.....68

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<i>Q. myrtifolia</i> .....	myrtle oak .....	70
<i>Q. nigra</i> .....	water oak .....	72
<i>Q. oglethorpensis</i> .....	Oglethorpe oak.....	74
<i>Q. pagoda</i> .....	cherrybark oak .....	76
<i>Q. palustris</i> .....	pin oak.....	78
<i>Q. phellos</i> .....	willow oak.....	80
<i>Q. prinoides</i> .....	dwarf chinkapin oak.....	82
<i>Q. pumila</i> .....	runner oak .....	84
<i>Q. pungens</i> .....	sandpaper oak.....	86
<i>Q. rubra</i> .....	northern red oak .....	88
<i>Q. shumardii</i> .....	Shumard oak .....	90
<i>Q. similis</i> .....	swamp post oak .....	92
<i>Q. sinuata</i> .....	bastard oak .....	94
<i>Q. stellata</i> .....	post oak .....	96
<i>Q. texana</i> .....	Texas red oak .....	98
<i>Q. vaseyana</i> .....	Vasey oak .....	100
<i>Q. velutina</i> .....	black oak .....	102
<i>Q. virginiana</i> .....	southern live oak.....	104
<b>Ecosystems of Eastern North America</b> .....		106
Ecoregion Province Legend.....		107
<b>Species Summary</b> .....		108
Table 1. Native Red Oaks .....		109
Table 2. Native White Oaks .....		114
<b>Key to Leaves of Eastern Native Oaks</b> .....		120
Leaf Characteristics .....		121
Oak Groups .....		122
Red Oaks.....		123
White Oaks.....		136
<b>Glossary</b> .....		148
<b>Selected References</b> .....		151
<b>Index of Common Names</b> .....		153
<b>Index of Scientific Names</b> .....		157
<b>Reference Charts for Red and White Oak Leaves</b> .....		161

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## INTRODUCTION

Oaks are primarily temperate region trees and shrubs numbering approximately 600 species worldwide. Oaks have occupied the non-glaciated landscape of North America since the Cretaceous Period. Fifty oak species are represented in two-thirds of the eastern North American forest cover types and dominate 68 percent of hardwood forests (191 million acres).

Oaks have figured prominently in folklore, construction, food sources, medications, and dyes. Great political events have occurred under “charter oaks,” and Native Americans utilized acorns as food (particularly the sweeter white oaks) and the inner bark as medicine (*Q. falcata*, *Q. ilicifolia*, *Q. imbricaria*, *Q. muehlenbergii*, *Q. rubra*, and others). This genus, which includes economically important hardwoods, is also critical for meeting watershed, recreation, and wildlife management goals.

The encroachment of urbanization, agriculture, and hydrologic projects continues to negatively impact oak forest types. Such impacts may necessitate the establishment of conservation districts for vulnerable species. Comments in the text associated with conservation status are based upon information compiled by the World Conservation Monitoring Center and published in association with the International Union for Conservation of Nature and Natural Resources (IUCN) in the *1997 IUCN Red List of Threatened Plants* (Walter and Gillett 1998). In the southern United States, forest management practices favor conifers replacing hardwood forests in rich bottomlands. A new source of concern involves the threat of displacement of native oaks by exotic species. Forest types are placed at risk with the introduction of non-native insects, diseases, and plants. In 1997, a fungal pathogen (*Phytophthora ramorum*) was identified as the cause of Sudden Oak Death (SOD) in California. Screening for potential hosts has identified some susceptible species of eastern red oaks. Additional susceptible hosts include commercial nursery stock (rhododendrons, bay laurel, huckleberry, and others), which increase the probability that SOD will spread to eastern North America.

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As the list of susceptible oak and understory hosts expands, this guide will help fill the need to identify and determine the natural occurrence of specific oak species in eastern North America and document any potential loss of species from states or counties.

This field guide provides an illustrated reference for identification of eastern oaks and can be used in several ways. Oak identification can be accomplished by utilizing the leaf keys, cross referencing scientific or local common names in the index, verifying similarities between leaf specimens and the illustrated oak leaf reference charts, and comparing descriptions provided for each species. Distribution maps may also aid in the separation of similar appearing species. The distribution of each oak species can be further defined according to ecoregion. A map of the eastern North American ecoregion provinces is provided (p. 106) and ecoregion provinces associated with each oak species are also included in the summary tables (pp. 109-119). The same common names may be used for different species or many common names may be applied to a single species in more than one location. Therefore, the preferred name is shown in bold with other names cross referenced in the index. Leaf morphology may vary considerably depending upon a combination of hybridization, tree age, position in the crown, and available sunlight. Many oaks are noted for hybridizing with other species in the same subgenus. Such progeny differ from the typical form, are usually isolated individuals or have a limited distribution, and are not included here. Characteristics used in the field identification key are limited to mature leaves with full exposure to the sun. When using the key, it is recommended that species verification be made by reference to other tree characteristics listed in the text.

The genus *Quercus* is generally divided into two major groups: red (Table 1) and white (Table 2) oaks. White oaks are in the *Quercus* subgenus *Leucobalanus* and have leaves lacking bristles on the lobes or leaf apex. Some species (*Q. havardii*, *Q. minima*, *Q. vaseyana*) have lobes modified into short small points called mucronate tips.

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Acorns require one growing season (annual) to mature. Cup scales are thick, usually with a keel, and have a callus growth at the base. The cup has a smooth inner surface, lacking pubescence. The heartwood has clogged vessels, making it impervious to liquids, a characteristic utilized for cooperage in the wine and liquor industry.

Red oaks are in the *Quercus* subgenus *Erythrobalanus*. This group of oaks is characterized by having leaves with bristles at the tips of the lobes and the leaf apex. The acorns require two growing seasons (biennial) to mature and the overlap in age should be evident when comparing nut size on current and second-year twig growth. Cup scales are thin, flat, and without a callus growth at their base. The inner surface of the cup has velvety hairs. These oaks have open vessels in the heartwood that allow absorption of liquid, a characteristic utilized in the penetration of wood preservatives.

This field guide includes all native oak species occurring east of the 100<sup>th</sup> meridian in North America north of Mexico. The nomenclature and treatment of species follows the protocol in the *Flora of North America* (Jensen 1997). Individual species descriptions are based on several sources (Miller and Lamb 1985, Jensen 1997). Distribution records were obtained from USDA Forest Service data, voucher plant specimens, published state floras, and other literature. Native species in arboreta and landscape plantings outside their natural distribution are excluded from the maps (e.g. Canadian occurrence of scarlet oak (*Q. coccinea*)). The natural distribution of each species is presented at the county level except for Canada and Mexico. There are several species whose range overlaps the 100<sup>th</sup> meridian or the Mexican border; these are documented on the distribution maps. Seven species of white oaks (*Q. fusiformis*, *Q. laceyi*, *Q. mohriana*, *Q. muehlenbergii*, *Q. pungens*, *Q. sinuata*, and *Q. vaseyana*) with a Mexican distribution extending from Texas are also noted on distribution maps. The reader is referred to other publications (Muller 1942, Elias 1980, Zavala-Chavez 1989) for details on the oak flora of Mexico.

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Information on introduced oaks such as the sawtooth oak (*Q. acutissima*), European turkey oak (*Q. cerris*), blue Japanese oak (*Q. glauca*), Chinese evergreen oak (*Q. myrsinifolia*), English oak (*Q. robur*), durmast oak (*Q. petraea*), and oriental oak (*Q. variabilis*) can be found in ornamental and landscape tree publications.



Sawtooth oak



English oak

The leaf shapes of *Q. acutissima* (left) and *Q. robur* (right) are representative of most introduced oak species used as landscape trees. (Images, D. Binion)

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## SPECIES DESCRIPTIONS



Mature bur oak, *Q. macrocarpa* (Photo, G. Sternberg)

## *Quercus acerifolia* Stoyhoff & Hess

### Maple-leaf oak



**GROWTH FORM:** small to medium tree, which grows to 50 feet (15.2 m). **BARK:** dark gray to black with shallow furrows. **TWIGS and BUDS:** gray to grayish-brown, twigs may have slight pubescence; elliptical terminal buds with coloration similar to twigs. **LEAVES:**

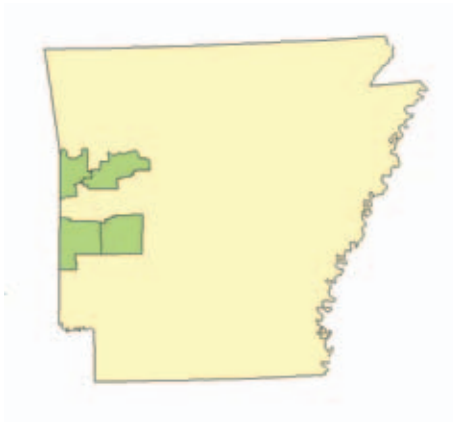
smooth petiole  $\frac{3}{4}$  -  $1\frac{3}{4}$  inches (19 - 44 mm) in length; leaf blade broadly elliptical, 4 - 6 inches (101 - 152 mm) long,  $2\frac{3}{4}$  -  $5\frac{1}{2}$  inches (70 - 140 mm) wide, 5 - 7 lobes with acute bristled tips, base truncated to obtuse, apex acute; smooth and green above, paler green with

axillary tomentum beneath, secondary veins prominent on both surfaces. **ACORNS:** biennial; light brown saucer-shaped cup with pubescent scales, chestnut-brown inner surfaces with pubescent ring around nut scar, covers  $\frac{1}{4}$  -  $\frac{1}{3}$  of the nut; oblong nut with slight pubescence,  $\frac{3}{4}$  inch (19 mm) long.



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**HABITAT:** limited occurrence on slopes and ridges of mountains.  
**DISTRIBUTION:** specific to four counties (Logan, Montgomery, Polk, and Sebastian) in Arkansas.



**COMMENTARY:** The Latin and common names are derived from resemblance of its foliage to that of a maple. Although maple-leaf oak is found in the Ouachita Mountains of Arkansas, there is an unconfirmed report of its occurrence on Rich Mountain, Le Flore County, Oklahoma. Maple-leaf oak is considered endangered by IUCN.

## *Quercus alba* Linnaeus

### White oak

eastern white oak,  
stave oak,  
forked-leaf white oak

**GROWTH FORM:** popular and long-lived shade tree, which grows to 100 feet (30.5 m), with a wide-spreading rounded crown and with numerous horizontal branches. **BARK:** light gray, shallow furrows forming scaly ridges or plates. **TWIGS**

**and BUDS:** slender to stout, gray to reddish-green

twigs with star-shaped pith; buds are reddish-brown and broadly oval

and hairless. **LEAVES:** petiole  $\frac{3}{8}$  - 1 inch (10 - 25 mm) in length;

obovate to elliptical leaves, 4 - 8 inches (101 - 203 mm) long,  $2\frac{3}{4}$  -

$4\frac{3}{4}$  inches (70 - 121 mm) wide, margin with 5 - 9 lobes that are widest beyond middle, deep sinuses extending a third or more to midrib; base

acute to cuneate, apex broadly rounded; dull or shiny grayish green

above, light green with slight pubescence which becomes smooth

beneath as they mature.

**ACORNS:** annual; 1 - 3

acorns on peduncle up to  $1\frac{1}{4}$

inch (32 mm) long, light gray

pubescent cup, enclosing

$\frac{1}{4}$  of the nut; light brown,

oblong nut, up to 1 inch

(25 mm) long; germinates

in the fall after dropping

to the ground. **HABITAT:**

dry upland slopes to well-

drained loam in bottomlands;



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may grow as a shrub at 4,500 feet (1,372 m) elevation in the southern Appalachian Mountains and reaches maximum potential height on lower slopes of the Allegheny Mountains and bottomlands of the Ohio Basin.



**DISTRIBUTION:** eastern Canada and the United States from Quebec and Ontario west to Minnesota, south to Texas, east to Florida, and north to Maine.



**COMMENTARY:** White oak is one of the most important species in the white oak group. The wood is used for furniture, flooring, and specialty items such as wine and whiskey barrels. Used for shipbuilding in colonial times. Continues to be displaced in the market place by several species of red oaks. Acorns are a favorite food source for birds, squirrels, and deer. Used as medication by Native Americans. The largest known white oak specimen had a circumference of 32 feet and grew in the Wye Oak State Park, Talbot County, Maryland. It was destroyed during a storm on June 6, 2002.

## *Quercus arkansana* Sargent

### Arkansas oak Arkansas water oak, water oak

**GROWTH FORM:** a medium sized tree with a narrow crown, growing to 95 feet (28.9 m).

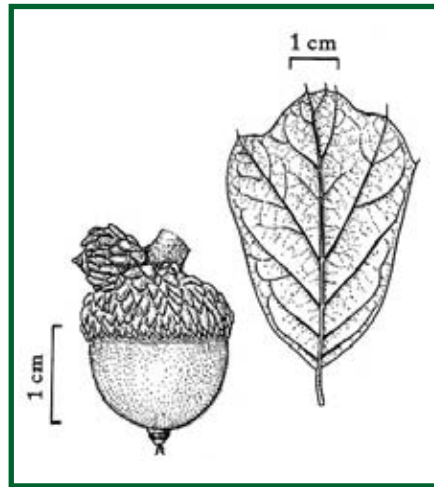
**BARK:** black with deep furrows, inner bark orangish-red.

**TWIGS and BUDS:** brown twigs with gray pubescence and prominent yellowish-brown lenticels; chestnut-brown, ovoid buds with slightly ciliate scale margins. **LEAVES:** obovate

shape, 2 - 6 inches (51 - 152 mm) long, 1  $\frac{3}{8}$  - 4 inches (35 - 101 mm) wide; margin entire with 3 lobes and up to 10 bristle tips, shallow sinuses with rounded lobes; smooth and yellowish-green above,

paler green with axillary tufts of pubescence beneath.

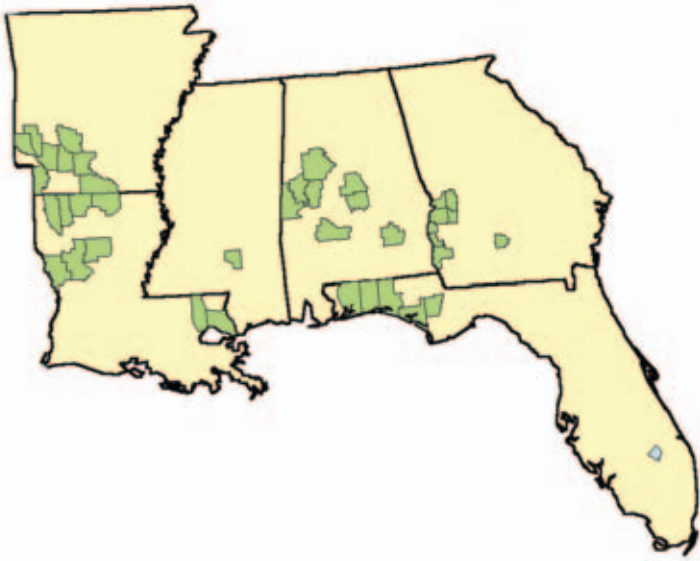
**ACORNS:** biennial; thin, brown, goblet-shaped cup with pubescent scales, inner surface sparse to conspicuously pubescent, covers  $\frac{1}{4}$  -  $\frac{1}{2}$  of the nut; elliptical nut  $\frac{5}{8}$  inch (16 mm) long, mature nut is brown to black with faint stripes.



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**HABITAT:** occurs sporadically on well-drained sandy soils in hardwood stands.

**DISTRIBUTION:** Arkansas and Louisiana east to Georgia and Florida.



**COMMENTARY:** The Latin and common names are derived from its initial discovery in Arkansas. The IUCN considers Arkansas oak rare in Arkansas, endangered in Florida, and vulnerable in Alabama, Georgia, and Louisiana. The largest known Arkansas oak grows in Covington County, Mississippi.

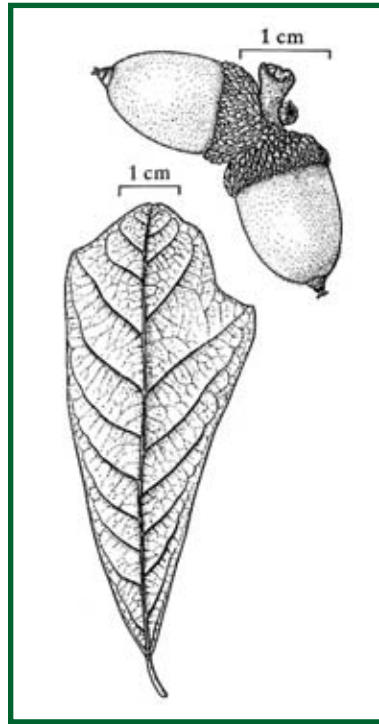
## *Quercus austrina* Small

### Bastard white oak bluff oak

**GROWTH FORM:** large tree growing to 75 feet (22.9 m). **BARK:** pale gray, mature bark developing into broad ridges. **TWIGS and BUDS:** dark brown twigs with corky white lenticels; chestnut-brown ovoid bud with pubescent scales, pointed apex. **LEAVES:** very short petiole up to ¼ inch (6 mm) long; leaf blade narrowly obovate, up to 4 inches (101 mm)



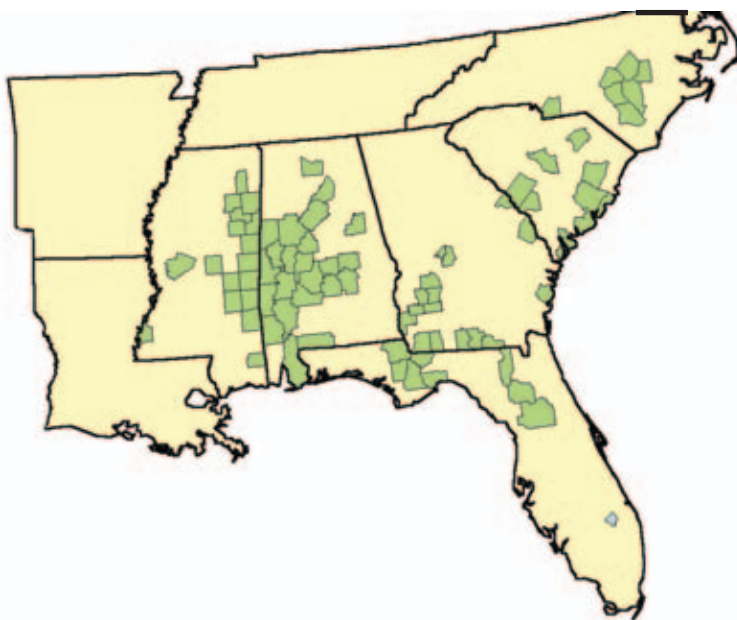
long,  
2 inches  
(51 mm)  
wide;  
margin  
entire with  
3 - 9



rounded lobes, shallow sinuses; base cuneate or attenuate, rounded apex; smooth, shiny, dark green above, grayish-green and smooth with slight axillary pubescence below; secondary veins prominent on both surfaces.

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**ACORNS:** annual; 1 - 2 acorns on a stout peduncle up to  $\frac{5}{8}$  inch (16 mm) in length; goblet-shaped cup with gray scales, covers  $\frac{1}{3}$  -  $\frac{1}{2}$  of the nut; brown ovoid nut,  $\frac{5}{8}$  inch (16 mm) long. **HABITAT:** well-drained, rich bottomland soils along streams and next to river bluffs. **DISTRIBUTION:** Mississippi east to North Carolina.



**COMMENTARY:** Bastard white oak is a widespread species, mostly sporadic, but may be abundant in localized areas. Leaf shape is variable and can be similar to *Q. sinuata* and *Q. nigra*.

## *Quercus bicolor* Willdenow

### Swamp white oak white oak

**GROWTH FORM:** large tree that grows to 100 feet (30.5 m) with an irregular crown. **BARK:** dark gray, deep furrows forming scaly or flat-ridges. **TWIGS and BUDS:** smooth, light brown twigs; buds light orangish-brown, smooth, ovoid and blunt. **LEAVES:** petiole from  $\frac{3}{8}$  - 1 inch (10 - 25 mm) long; leaves are narrowly elliptical to obovate,



varies up to 7 inches (178 mm) long and  $4 \frac{3}{8}$  inches (111 mm) wide; base cuneate to acute, rounded apex; margin with 10 - 20 lobes with shallow

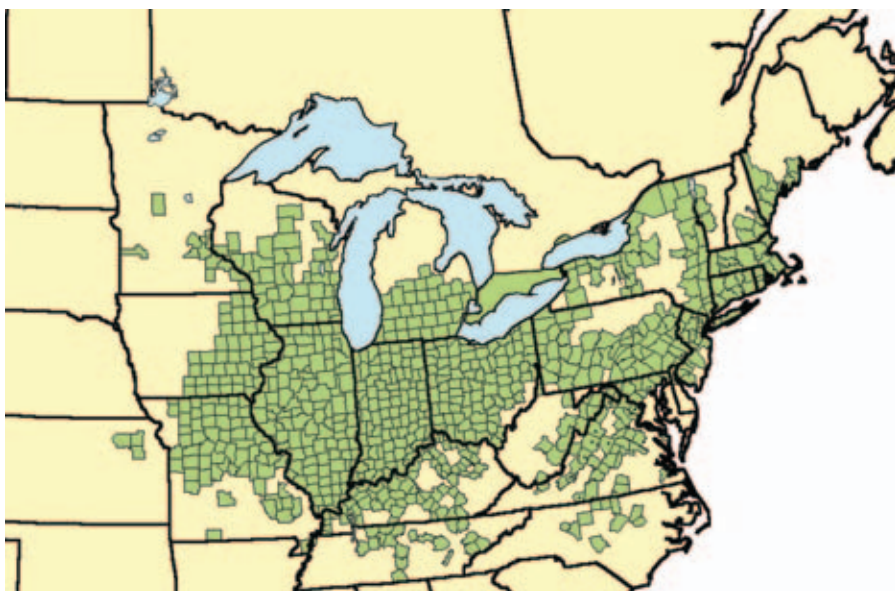
sinuses, distal half of blade may have teeth; glossy dark green above with white velvety pubescence beneath.

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**ACORNS:** annual; 1 - 2 acorns on peduncle up to 4 inches (101 mm) long; grayish-green cup with scales covered with fine gray tomentum, cup rim often has spinose bristles, cup covers  $\frac{1}{2}$  to  $\frac{3}{4}$  of the nut; oblong or ovoid, light brown nut, up to 1  $\frac{1}{4}$  inches (32 mm) long. **HABITAT:** poorly-drained mineral soils.



**DISTRIBUTION:** Minnesota south to Nebraska, east to North Carolina, and north to Quebec and Maine.

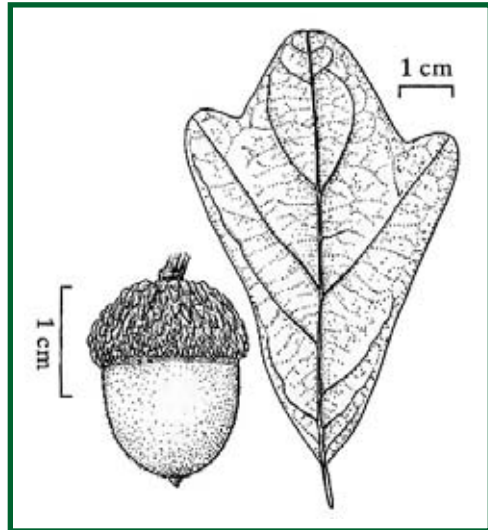


**COMMENTARY:** The scientific name refers to the difference in coloration between upper and lower leaf surface. Swamp white oak produces a hard wood that has been used for construction, cabinet making, boat building, railroad ties, fencing, and cooperage. The Iroquois peoples used this oak as medicine. The two largest known specimens grow in Highland County, Virginia, and Washington County, Ohio.

## *Quercus boyntonii* Beadle

### Boynton oak

**GROWTH FORM:** semi-evergreen deciduous or rhizomatous shrub, which grows to a height of 6 ½ feet (2 m), occasionally to a height of 19 feet (5.8 m). **BARK:** brown and scaly. **TWIGS and BUDS:** light brown pubescent twigs; reddish-brown buds, ovoid with a rounded apex and sparsely pubescent scales. **LEAVES:** petiole up to ⅜ inch (10 mm) long; obovate or narrowly obovate leaves, up to 4 inches (101 mm) long and



2 ⅜ inches (60 mm) wide, base is cuneate; margin with 3 - 5 irregularly rounded lobes; apex triangular-lobed; shiny dark green above, grayish pubescence beneath.

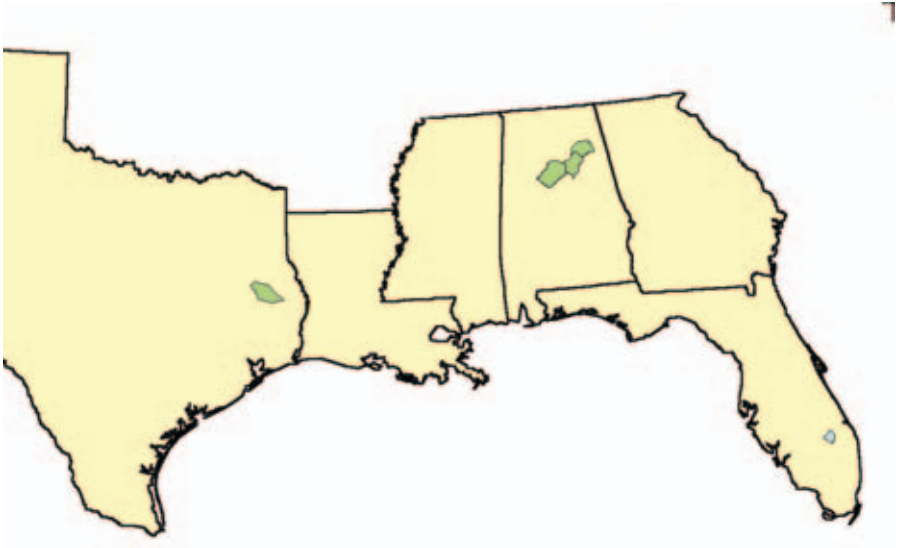
**ACORNS:** annual; 1 - 2 acorns on a peduncle up to ⅜ inch (10 mm) long, pubescent gray cup covers up to ½ of the nut; light brown, ovoid nut with rounded tip, up to ⅝ inch (16 mm) in length.



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**HABITAT:** localized occurrence associated with sandstone outcrops.

**DISTRIBUTION:** rare with a restricted occurrence in Alabama and Texas; found on the summit of Lookout Mountain, Etowah County, Alabama.



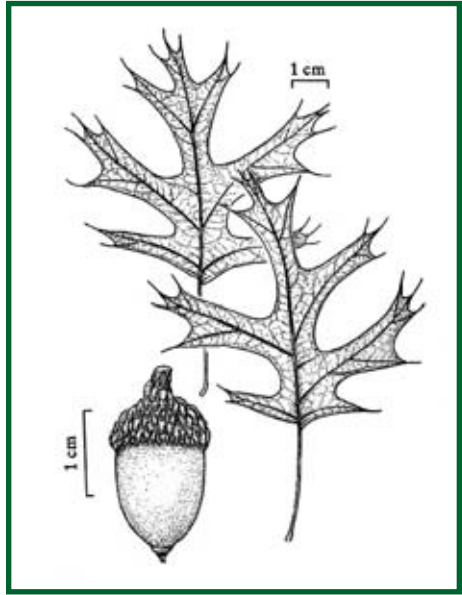
**COMMENTARY:** Boynton oak is rare and rated as endangered by the IUCN. The Texas distribution record is questionable and may have resulted from taxonomic confusion associated with early collections.

## *Quercus buckleyi* Nixon and Dorr

### Buckley oak

Texas red oak,  
Spanish oak, spotted oak

**GROWTH FORM:** considered a small tree that grows to 60 feet (18.3 m). **BARK:** varies from gray and smooth to black and furrowed. **TWIGS and BUDS:** twigs are smooth and vary from gray to brown; terminal buds vary from gray to reddish-brown with ciliated apical scales, ¼ inch (6 mm) in length. **LEAVES:** smooth petiole ¾ - 1 ¾ inches (19 - 44 mm) in



length; leaves are broadly elliptical, up to 4 inches (101 mm) long and 4 ⅜ inches (111 mm) wide, truncate base with 7 - 9 lobes, 12 - 35 awns, lobes may be distally expanded, apex acute to acuminate; glossy green above, light green to coppery-green

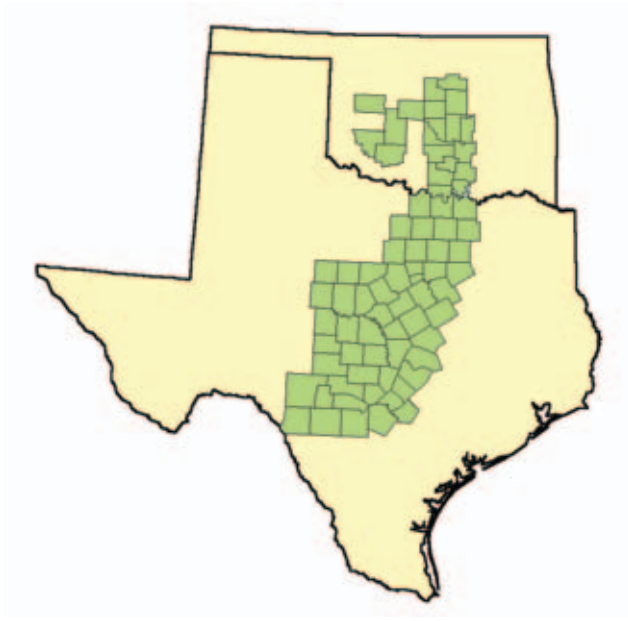
below with tomentum, veins raised on both leaf surfaces.

**ACORNS:** biennial; cup scales smooth to sparsely pubescent,

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inner surface smooth, covers  $\frac{1}{3}$  -  $\frac{1}{2}$  of nut; smooth or slightly pubescent, broadly ovoid nut,  $\frac{3}{4}$  inch (19 mm) long.

**HABITAT:** restricted habitat associated with limestone ridges, slopes and creek bottoms. **DISTRIBUTION:** limited range in central Oklahoma and Texas.



**COMMENTARY:** This species was named for Samuel B. Buckley, botanist and state geologist of Texas. Buckley oak leaves are similar to the Texas red oak, *Q. texana*, but the two species do not overlap in their distributions. This species should be considered a conservation concern. The largest known Buckley oak grows in Travis County, Texas.

## *Quercus chapmanii* Sargent

**Chapman oak**  
Chapman white oak,  
scrub oak

### **GROWTH FORM:**

deciduous or semi-evergreen shrub, which grows to 10 feet (3 m), often rhizomatous, or a small tree to 45 feet (13.7 m).

**BARK:** grayish-brown with irregular scales. **TWIGS and**

**BUDS:** twigs are grayish-tan to yellowish-tan with patches

of fine tomentum, terminal buds are reddish-brown with smooth distal

scales. **LEAVES:** small smooth petiole  $\frac{1}{8}$  inch (3 mm) long; leaves

are obovate,  $1\frac{1}{2}$  -  $3\frac{1}{2}$  inches (38 - 89 mm) long and  $\frac{3}{4}$  -  $1\frac{1}{2}$  inches

(19 - 38 mm) wide, margins are minutely wavy and many have shallow

irregular lobes toward tip of leaf, apex rounded, base cuneate; upper

surface is glossy dark green, and light gray or yellow with yellowish

pubescence beneath. **ACORNS:** annual; 1 - 2 acorns on a peduncle

up to  $\frac{1}{2}$  inch

(13 mm) in

length; cup

has gray

tomentum

on scales,

covering

$\frac{1}{3}$  -  $\frac{1}{2}$  the

nut; light

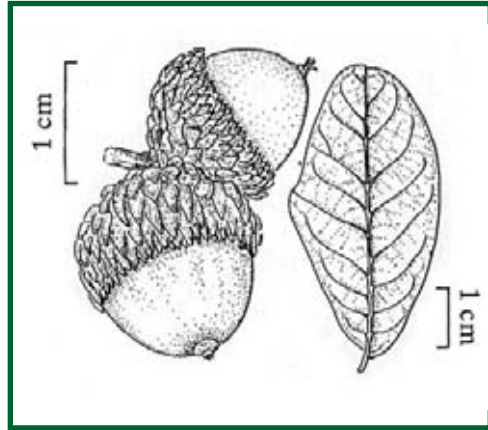
brown nut

is oval with

a rounded

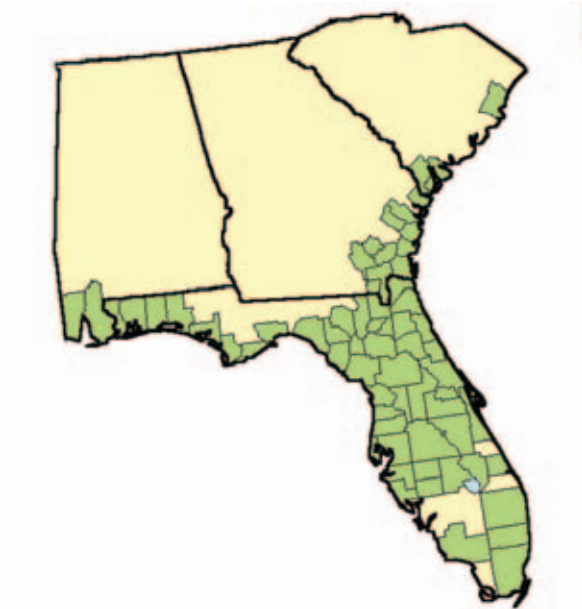
apex, and

may have



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pubescence. **HABITAT:** on xerophytic sandy soils of open pine forest and oak scrublands on sand ridges and coastal dunes in the lower coastal plain near sea level. **DISTRIBUTION:** sporadic occurrence near the coast of Alabama, Florida, Georgia and South Carolina.



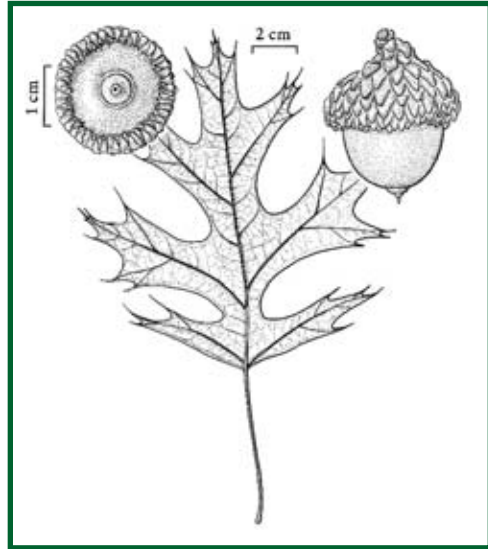
**COMMENTARY:** Named for A. W. Chapman who first described this species in his *Flora of the Southern United States*. Chapman oak is abundant along the west coast of Florida from Tampa Bay north to Panama City. The largest known specimen grows in the Ocala National Forest east of Ocala, Florida.

## *Quercus coccinea* Muenchhausen

**Scarlet oak**  
black oak, red oak,  
Spanish oak

**GROWTH FORM:** fast growing large tree that can obtain a height of 120 feet (36.6 m), with frequent downward arching branches, trunk usually enlarged at the base, and usually retains dead branches. **BARK:** brown with fine fissures and scaly ridges, inner bark is red to orangish-pink. **TWIGS and BUDS:** twigs are smooth

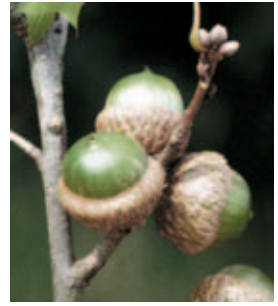
reddish-brown; clustered terminal buds are ovoid and reddish-brown with pubescence near the apex, 5-angled in cross section. **LEAVES:** smooth petiole  $\frac{3}{4}$  -  $2\frac{3}{8}$  inches (19 - 60 mm) in length; leaves are elliptic to obovate,  $2\frac{3}{4}$  -  $6\frac{1}{4}$  inches (70 - 159 mm) long,  $3 - 5\frac{1}{8}$  inches (76 - 130 mm) wide, margins with 5 - 9 lobes extending more than  $\frac{1}{2}$  the distance to the midrib, base truncate, apex acute; upper surface a glossy light green, with tufts of axillary tomentum beneath,



secondary veins raised on both surfaces. **ACORNS:** biennial; cup is a glossy dark reddish-brown, inner surface is smooth and light brown, covering  $\frac{1}{3}$  -  $\frac{1}{2}$  the nut; bluntly oblong nut,  $\frac{1}{2}$  -  $\frac{7}{8}$  inches (13 - 22 mm) in length, smooth

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with concentric rings at apex. **HABITAT:** found in a variety of habitats including poor soils in mixed forests, especially on upland ridges; this oak is probably a climax tree on dry soils. **DISTRIBUTION:** range extends from Maine west to Michigan, south to Missouri and Mississippi, and east to South Carolina and the eastern Atlantic coast.

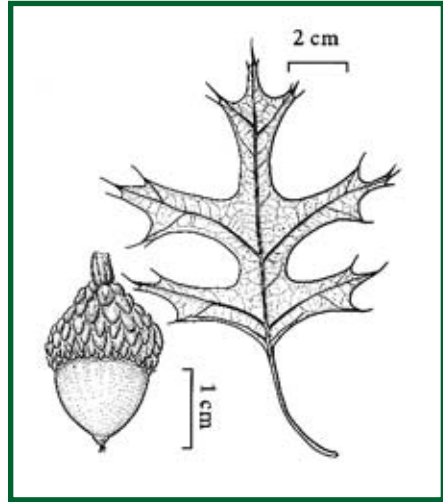


**COMMENTARY:** Scarlet oak lumber is marketed as red oak but is of poorer quality than *Q. rubra* or *Q. velutina*. This species is very susceptible to fire damage because of its thin bark. Such injuries often result in heart rot. Grows rapidly and begins to bear fruit at age 20. Acorns provide food for squirrels, chipmunks, mice, deer, wild turkey, bluejays, and redheaded woodpeckers. Extensively planted as an ornamental tree because of its brilliant autumn color, and has been introduced into Canada and Europe. The largest known scarlet oak grows in Powell County, Kentucky.

## *Quercus ellipsoidalis* Hill

**Northern pin oak**  
jack oak, Hill's oak,  
black oak

**GROWTH FORM:** medium tree grows to 66 feet (20.1 m), rarely to 130 feet (39.6 m), with a narrow crown. **BARK:** dark gray-brown with shallow fissures producing thin plates, inner bark orange in color. **TWIGS and BUDS:** twigs are first covered with hairs and then become smooth and reddish-brown; terminal buds are a shiny reddish-brown with scales ciliated along the margin, slightly angled in cross section. **LEAVES:** smooth petiole  $\frac{3}{4}$  - 2 inches (19 - 51 mm); leaves are elliptical,  $2\frac{3}{4}$  -  $5\frac{1}{8}$  inches (70 - 130 mm) long, and 2 - 4 inches (51 - 101 mm) wide, the base is truncate and the apex is acute, margins



have 5 - 7 deep lobes extending more than  $\frac{1}{2}$  the distance to midrib with bristle-pointed teeth, upper surface is a shiny light green and paler below with minute axillary tufts of tomentum along the midvein.

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**ACORNS:** biennial; outer surface of cup is grayish-brown or reddish-brown and pubescent, inner surface is light brown and smooth, cup covers  $\frac{1}{3}$  -  $\frac{1}{2}$  of the nut; elliptical to ovoid nut  $\frac{1}{2}$  -  $\frac{3}{4}$  inches (13 - 19 mm) long, concentric apical rings are infrequent.



**HABITAT:** dry sandy soils sites in the northern and central boreal forest region; found associated with species of pine, oak, hickory, aspen, and black cherry.

**DISTRIBUTION:** occurs from Ontario south to northern Missouri, and east to Ohio and Michigan.



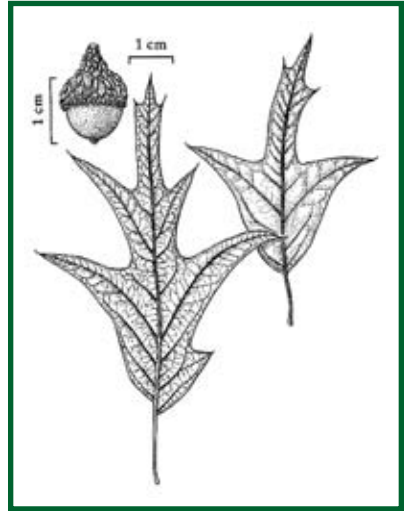
**COMMENTARY:** Northern pin oak is reduced to shrubby growth at the edge of its range. The largest known specimen grows in Bay Village, Cuyahoga County, Ohio.

## *Quercus falcata* Michaux

### Southern red oak

Spanish oak, swamp red oak,  
water oak, turkey-foot oak

**GROWTH FORM:** moderately fast growing, medium to large tree, which grows to 150 feet (45.7 m); tree with a short bole and a globe shaped crown. **BARK:** dark gray, developing furrows produce ridges and scaly plates; inner bark is orange. **TWIGS and BUDS:** pubescent reddish-brown twig with star shaped pith; reddish-brown terminal bud is ovoid and pubescent. **LEAVES:** petiole  $\frac{3}{4}$  -  $2\frac{3}{8}$  inches (19 - 60 mm) in length, smooth to sparsely



pubescent; leaves are elliptical to ovate, 4 -  $11\frac{3}{4}$  inches (101 - 298 mm) long and  $2\frac{3}{8}$  -  $6\frac{1}{4}$  inches (60 - 159 mm) wide, u-shaped base, margin has 3 - 7 deeply divided lobes with 1 - 3 bristle-tipped teeth, apex longer than

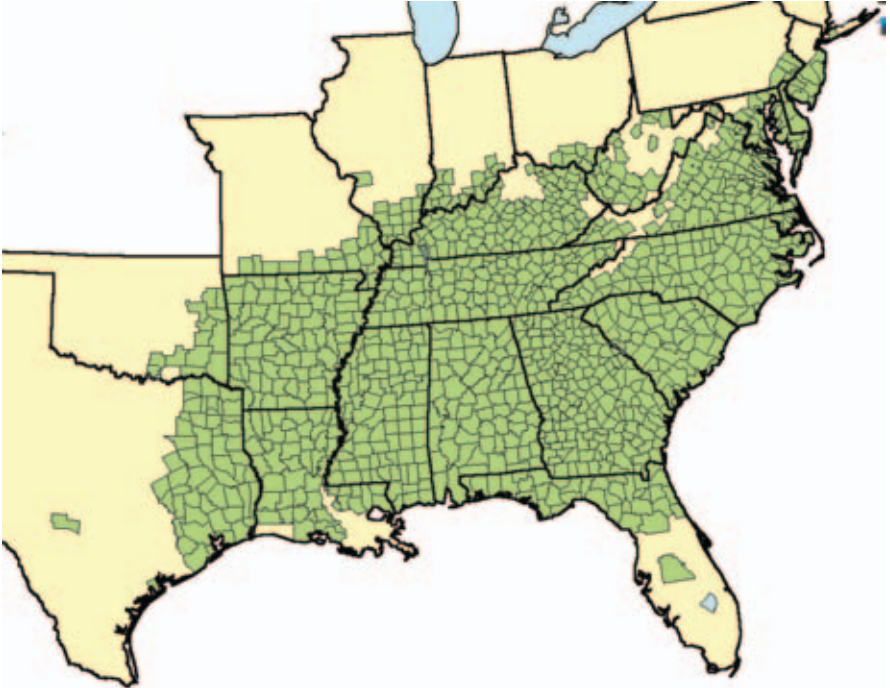
lateral lobes; upper surface a glossy green often with some pubescence along midrib, lower surface covered with gray or tawny pubescence, secondary

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veins raised on both surfaces. **ACORNS:** biennial; thin, reddish-brown cup with pubescent inner and outer surface, usually covers up to  $\frac{1}{3}$  of the nut; rounded, brown nut,  $\frac{3}{8}$  -  $\frac{5}{8}$  inch (9 - 16 mm) long, may be striated at the tip with pubescence.



**HABITAT:** dry upland sites of sandy or clay loam throughout the southeastern United States. **DISTRIBUTION:** occurs from New Jersey and Florida west to Oklahoma and Texas.

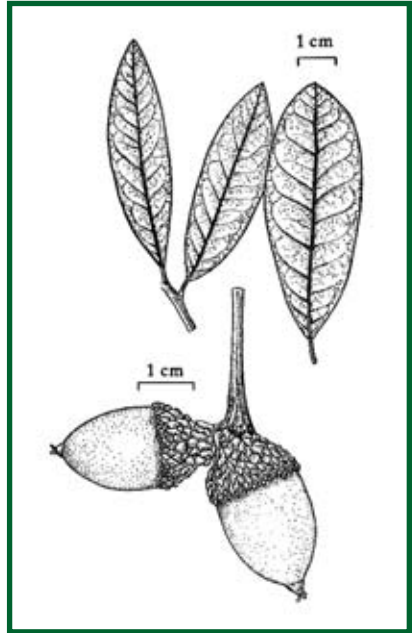


**COMMENTARY:** Southern red oak lumber is marketed as red oak for construction and furniture. This oak is common throughout the South and often called Spanish oak because of the association with early Spanish settlement. The largest known southern red oak grows in Upson County, Georgia.

## *Quercus fusiformis* Small

**Texas live oak**  
scrub live oak, live oak

**GROWTH FORM:** evergreen shrub or small tree, which grows to 40 feet (12.2 m) with a spreading crown. **BARK:** dark gray, developing furrows produce ridges and scaly plates; inner bark is orange. **TWIGS and BUDS:** light gray pubescent twigs, slender and stiff; bud reddish to dark brown, ovate with smooth or pubescent scales. **LEAVES:** petiole less than  $\frac{3}{8}$  inch (10 mm) long; leaves are thick elliptical or narrowly ovate  $1\frac{1}{8}$  -  $3\frac{1}{2}$  inches (29 - 89 mm) long, and  $\frac{3}{4}$  -  $1\frac{1}{2}$  inches (19 - 38 mm) wide, base cordate, leaf margin entire and slightly revolute (rolled under), may be irregularly toothed at tip or along sides, apex usually obtuse or rounded and may end in a tiny point, upper surface a glossy light to dark green,



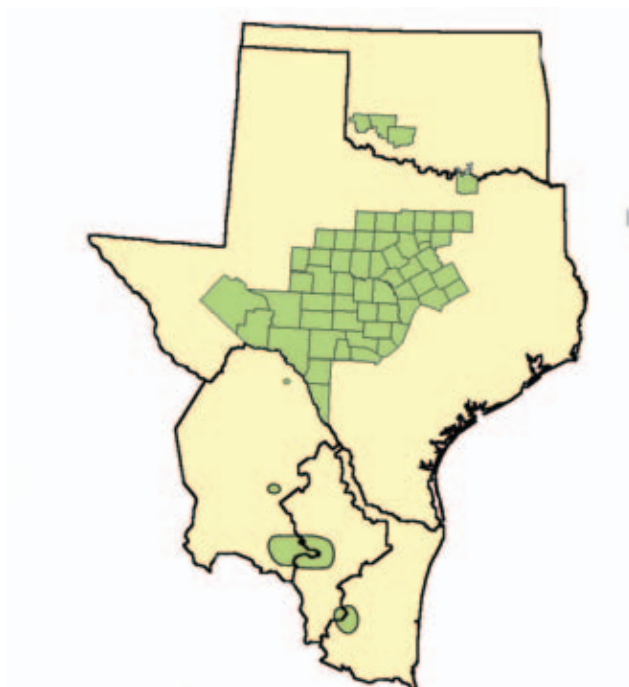
grayish-green beneath with dense pubescent bloom that rubs off.

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**ACORNS:** annual; peduncle  $\frac{1}{8}$  -  $1\frac{1}{8}$  inches (3 - 29 mm) supporting 1 - 5 nuts, cup has narrow base, light gray scales with reddish-tips may be smooth or pubescent encloses  $\frac{1}{4}$  -  $\frac{1}{2}$  of nut; dark brown, narrow and oblong nut with light brown stripes,  $\frac{5}{8}$  - 1 inch (16 - 25 mm) long.



**HABITAT:** limestone or calcareous loam soils. **DISTRIBUTION:** limited to Oklahoma, Texas and the mountains of northeastern Mexico (Coahuila, Nuevo Leon, and Tamaulipas).



**COMMENTARY:** The largest known Texas live oak grows in Real County, Texas.

## *Quercus geminata* Small

### Sand live oak

#### **GROWTH FORM:**

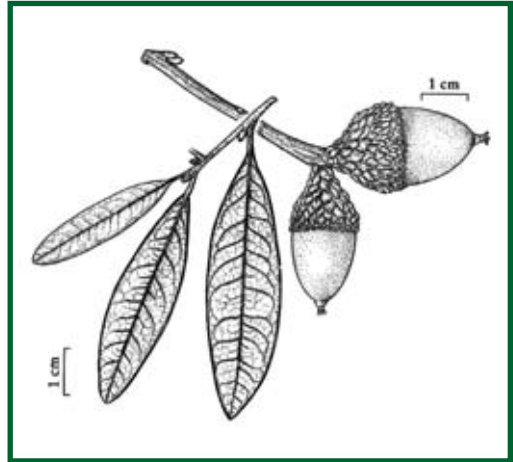
evergreen rhizomatous shrub or medium tree to 50 feet (15.2 m), occasionally to 95 feet (28.9 m). **BARK:**

dark brown or black with scaly plates. **TWIGS**

**and BUDS:** light tan to light gray pubescent twigs becoming smooth the

second year; dark brown ovoid buds, scale margins may be pubescent.

**LEAVES:** short petiole  $\frac{1}{8}$  -  $\frac{3}{8}$  inch (3 - 10 mm) in length, leaf blade narrowly elliptic,  $1\frac{3}{8}$  -  $2\frac{3}{8}$  inches (35 - 60 mm) long  $\frac{3}{8}$  -  $1\frac{1}{8}$  inches (10 - 29 mm) wide, cupped beneath, base cuneate, margins entire



revolute (wavy); upper surface is shiny, light to dark green with impressed secondary veins, lower surface covered with dense whitish bloom (glaucous) that rubs off.

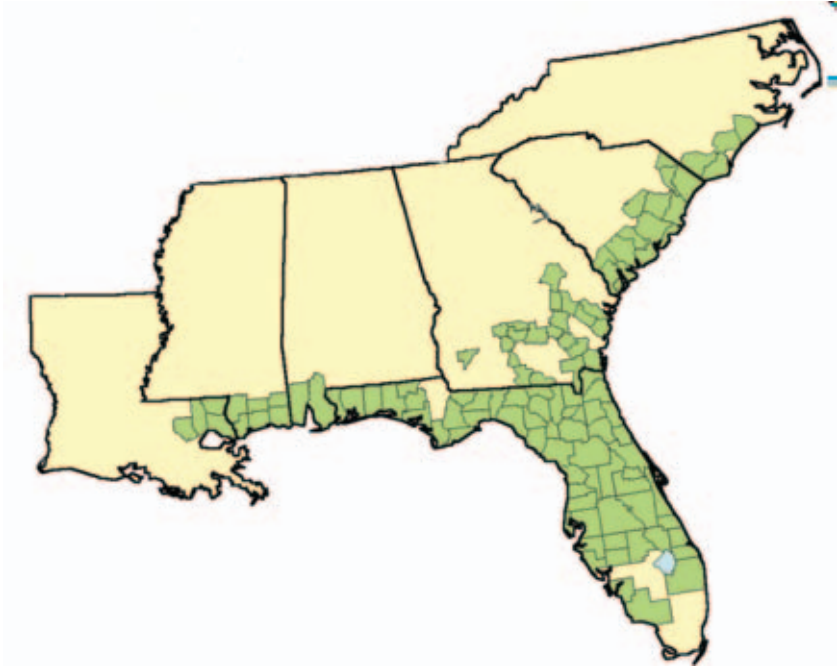
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**ACORNS:** annual; produced in clusters of 1 - 3 on long peduncles  $\frac{3}{8}$  - 4 inches (10 - 101 mm) in length; cup with whitish or gray scales that are smooth or pubescent, covers  $\frac{1}{3}$  of nut; smooth, dark brown, ovoid or barrel-shaped nut,  $\frac{5}{8}$  - 1 inch (16 - 25 mm) long.



**HABITAT:** deep sandy soils in mixed pine or hardwood stands.

**DISTRIBUTION:** Louisiana to North Carolina on the coastal plain.

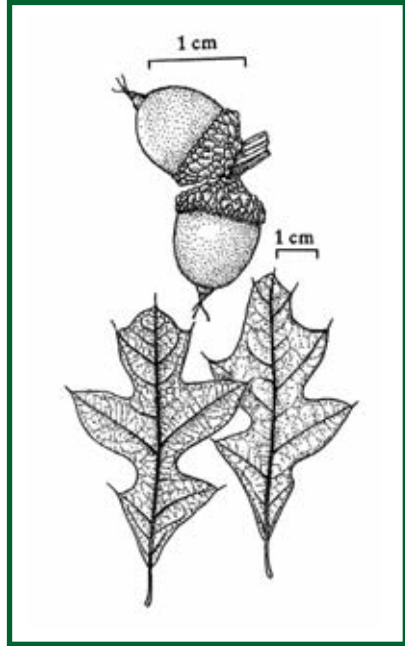


**COMMENTARY:** Sand live oak is utilized as lumber and landscape plantings. The largest sand live oaks (co-champions) are both located in Gainesville, Alachua County, Florida.

## *Quercus georgiana* Curtis

### Georgia oak

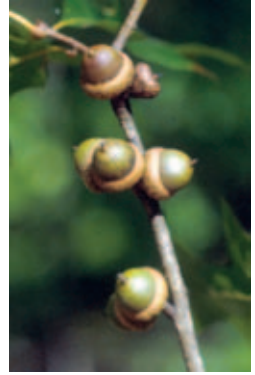
**GROWTH FORM:** small, slow growing tree with a compact crown reaching a normal high of 26 feet (7.9 m), occasionally reaches 75 feet (22.9 m). **BARK:** gray to light brown, mature bark becomes scaly. **TWIGS and BUDS:** smooth red twigs with prominent light brown lenticels; buds are reddish-brown, ovoid with smooth scales that may be ciliated. **LEAVES:** petiole  $\frac{1}{4}$  -  $\frac{7}{8}$  inch (6 - 22 mm) long, usually with a few hairs; leaf blade broadly elliptical and thin,  $1\frac{1}{2}$  -  $5\frac{1}{8}$  inches (38 - 130 mm) long,  $\frac{3}{4}$  -  $3\frac{1}{2}$  inches (19 - 89 mm) wide, with a cuneate or obtuse base, margin with 3 - 5 pointed bristle-tipped lobes; surface is a shiny green above, pale green below with axillary tufts of tomentum. **ACORNS:** biennial; short-stalked cup, thin walled and saucer-shaped, outer surface slightly pubescent with



smooth inner surface, covering  $\frac{1}{3}$  of the nut; brown subglobular nut,  $\frac{3}{8}$  -  $\frac{1}{2}$  inch (10 - 13 mm) in length.

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**HABITAT:** restricted to granitic outcrops and dry slopes in the Piedmont Plateau at approximately 1700 feet (518 m) elevation; found in the oak-pine forest types associated with *Q. montana*, *Q. marilandica*, and *Q. stellata*.  
**DISTRIBUTION:** Alabama east to South Carolina.

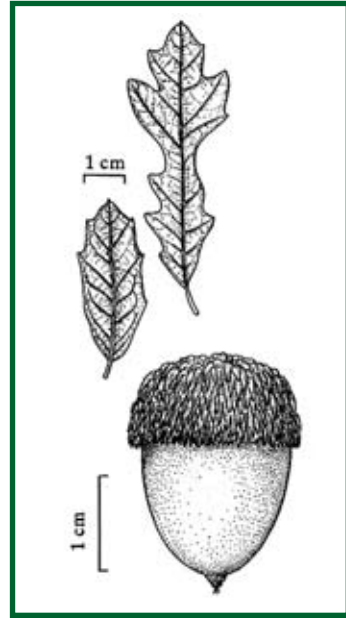


**COMMENTARY:** Georgia oak was originally described from specimens collected on Stone Mountain in Georgia. This species is a conservation concern and listed as threatened by the Smithsonian Report. The largest known Georgia oak grows in Clarke County, Georgia.

## *Quercus havardii* Rydberg

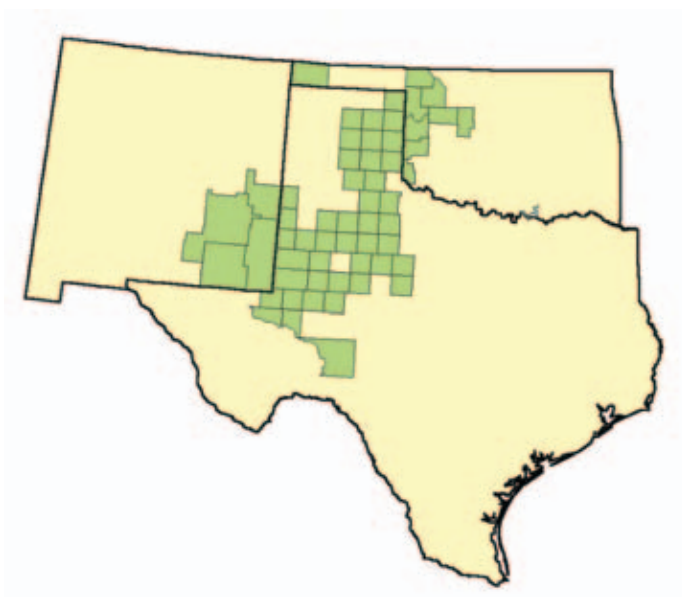
### Havard oak shin oak, shinnery

**GROWTH FORM:** rhizomatous shrub with a normal height of 3 feet (0.9 m) and exceptional specimens to 30 feet (9.1 m). **BARK:** papery, light gray. **TWIGS and BUDS:** brown pubescent twigs, becoming smooth with age; ovoid terminal buds are a dark reddish-brown. **LEAVES:** short petiole to  $\frac{1}{4}$  inch (6 mm); leaves are ovate or elliptical, 2 - 4 inches (51 - 101 mm) long,  $\frac{3}{4}$  - 2 inches (19 - 51 mm) wide; thick and with a rounded or cuneate base, margins generally have deep lobes with 2 - 3 rounded teeth on each side, apex rounded; upper surface shiny light green, lower surface has densely tawny tomentum. **ACORNS:** annual; solitary or paired on a



peduncle up to  $\frac{3}{8}$  inch (10 mm), a pubescent reddish-brown cup, which covers  $\frac{1}{3}$  -  $\frac{1}{2}$  of nut; brown, ovoid nut, 1 inch (25 mm) long.

**HABITAT:** sandy soils and sand dunes; grows in areas devoid of almost all other trees. **DISTRIBUTION:** New Mexico, Oklahoma, and Texas.



**COMMENTARY:** This species was named for the U.S. Army surgeon and botanist, Valery Havard. Because Havard oak thrives in a harsh environment, it functions as a sand dune stabilizer and provides critical habitat for the endangered sand dune lizard (*Sceloporus arenicolus*). Although the acorns are an important food source for wildlife, the leaves are toxic to livestock. Use of herbicides to eradicate Havard oak has resulted in habitat loss and a drastic decline in sand dune lizard populations. The largest known Havard oak grows in Yoakum County, Texas.

## *Quercus hemisphaerica* Bartram ex Willdenow

### Laurel oak Darlington oak

**GROWTH FORM:** short-lived evergreen, medium to large tree that can grow to heights of 100 feet (30.5 m). **BARK:** dark brown with deep furrows producing flat ridges. **TWIGS and BUDS:** smooth, brown to dark red twigs; reddish to purplish-brown ovoid buds, scale margins smooth or ciliated. **LEAVES:** short smooth petiole up to  $\frac{1}{4}$  inch (6 mm) in length; leaf blade narrow ovate or elliptical,  $1\frac{1}{8}$  -  $4\frac{3}{4}$  inches (29 - 121 mm) long,  $\frac{3}{8}$  -  $1\frac{1}{2}$  inches (10 - 38 mm) wide, leathery, base

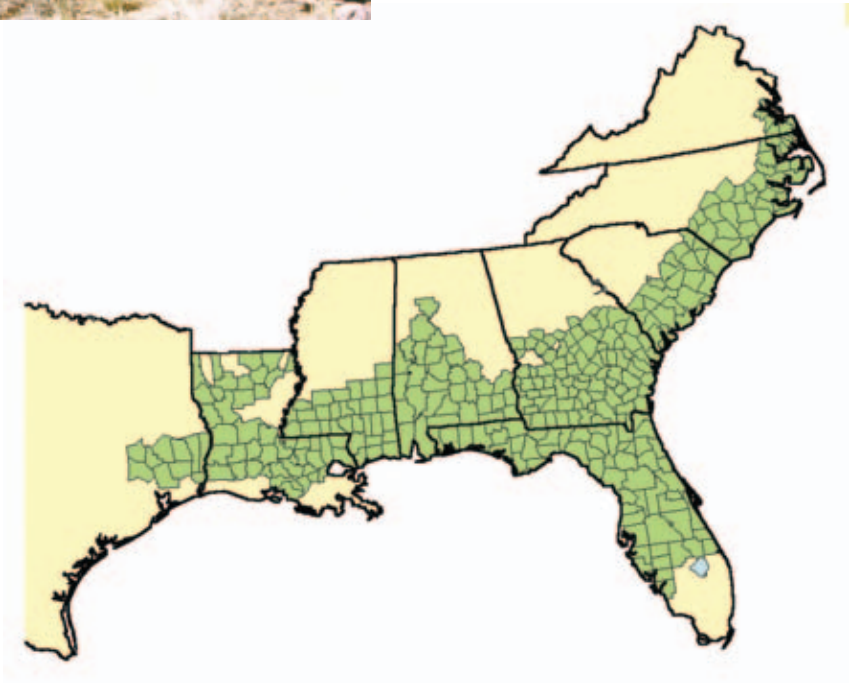


obtuse or rounded, margin entire or with shallow lobes near apex. Both surfaces are smooth, or rarely with minute axillary tufts or tomentum beneath.

**ACORNS:** biennial; sessile; cup has fine pubescence on scales and on inner surface, covering up to  $\frac{1}{3}$  of nut; ovoid to hemispherical nut, dark brown to black,  $\frac{1}{2}$  inch (13 mm) long.



**HABITAT:** moderately dry sandy soils. **DISTRIBUTION:** Texas east to Virginia.



**COMMENTARY:** Laurel oak is fast growing and matures in about 50 years. Used for firewood and as an urban shade tree. The largest known laurel oak grows near Wrens, Jefferson County, Georgia.

## *Quercus ilicifolia* Wangenheim

### Bear oak scrub oak

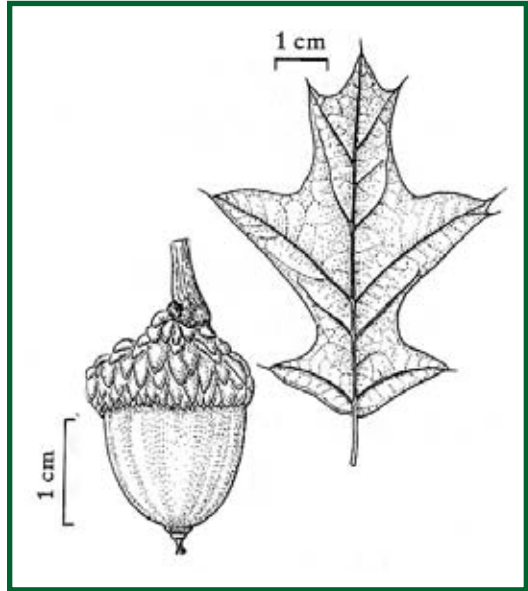
#### **GROWTH FORM:**

deciduous shrub or small tree, which normally grows to a height of 18 feet (5.5 m) and occasionally to 41 feet (12.5 m).

**BARK:** dark gray, thin mature bark becoming scaly.

**TWIGS and BUDS:** pubescent yellowish-brown to brown twigs when young, dark brown and smooth when older; terminal buds ovoid and  $\frac{1}{8}$  inch (3 mm) long.

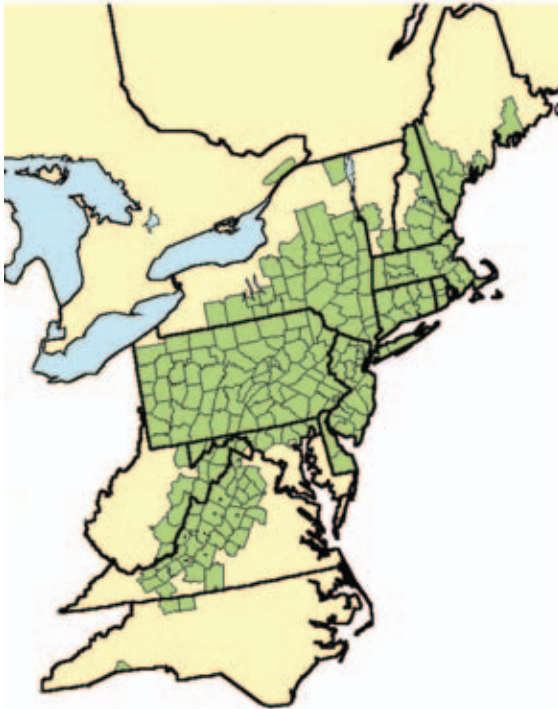
**LEAVES:** smooth petiole up to  $2\frac{3}{8}$  inches (60 mm) in length; leaves are ovate to elliptical, 2 -  $4\frac{3}{4}$  inches



(51 - 121 mm) long, 1 1/8 - 3 1/2 inches (29 - 89 mm) wide, base cuneate (wedge shaped), 3 - 7 lobes separated by shallow sinuses and ending in 1 - 3 bristle-tipped teeth, apex usually has 3-tipped lobe, thick



and leathery, upper surface shiny dark green, lower surface pale green to gray with dense woolly pubescence, secondary veins raised on both surfaces. **ACORNS:** biennial; cup is reddish-brown with pubescent scales, inner surface pubescent, covers up to 1/2 of the nut; ovoid, light brown nut with faint stripes and minute pubescence, up to 5/8 inch (16 mm) long. **HABITAT:** often found in pure stands associated



with dry sandy, barren, and rocky hillsides, or mountainous terrain.

**DISTRIBUTION:**

Maine to North Carolina.

**COMMENTARY:**

Bear oak is a transition species that depends upon stand disturbance. Fire promotes this species. Acorns provide food for wildlife, especially turkey and grouse. The Iroquois peoples used bear oak for treating gynecological problems. The largest known bear oak grows near Romney, Hampshire County, West Virginia.

## *Quercus imbricaria* Michaux

### Shingle oak laurel oak

**GROWTH FORM:** medium tree which normally grows to 65 feet (19.8 m), occasionally to 105 feet (32 m), and has a rounded crown. **BARK:** grayish-brown with shallow fissures becoming scaly ridges, pinkish inner bark. **TWIGS and BUDS:** twigs are smooth and brown or slightly pubescent; large terminal bud is brown and 5-angled in cross-section, scales are pubescent with ciliated edges. **LEAVES:** smooth petiole to  $\frac{3}{4}$  inch (19 mm); ovate and widest near the middle,  $3\frac{1}{8}$  - 8 inches (79 - 203 mm) long,  $\frac{5}{8}$  - 3 inches (16 - 76 mm) wide, margin entire and may be slightly wavy and turned under, base obtuse, apex obtuse and tipped with one bristle, shiny dark green above, light whitish-green with uniform pubescence below. **ACORNS:** biennial;



1 - 2 formed on stout peduncle, cup minutely pubescent on outer surface, inner surface is



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smooth and tan to reddish-brown, enclosing up to ½ of nut; nearly round nut, ⅜ - ¾ inch (10 - 19 mm) long, chestnut-brown with faint stripes, and concentric rings around apex. **HABITAT:** moderately dry to moist soils. **DISTRIBUTION:** Iowa south to Louisiana, east to North Carolina, and north to Massachusetts.



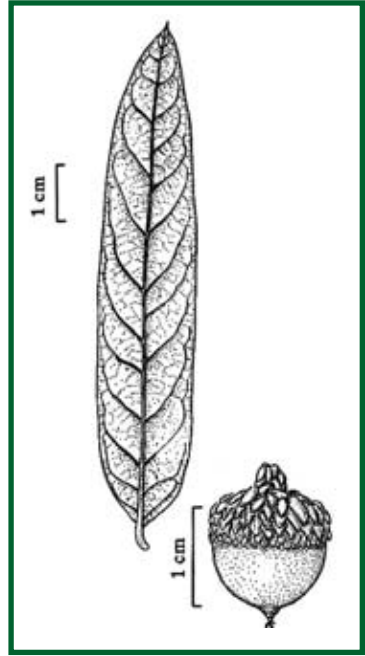
**COMMENTARY:** The common name of this oak refers to the use of its wood as shingles by early settlers. The Cherokee people used the bark of shingle oak as medication. The largest shingle oak grows in Cincinnati, Hamilton County, Ohio.

## *Quercus incana* Bartram

### Bluejack oak

sandjack oak, upland willow oak,  
cinnamon oak, shin oak,  
turkey oak

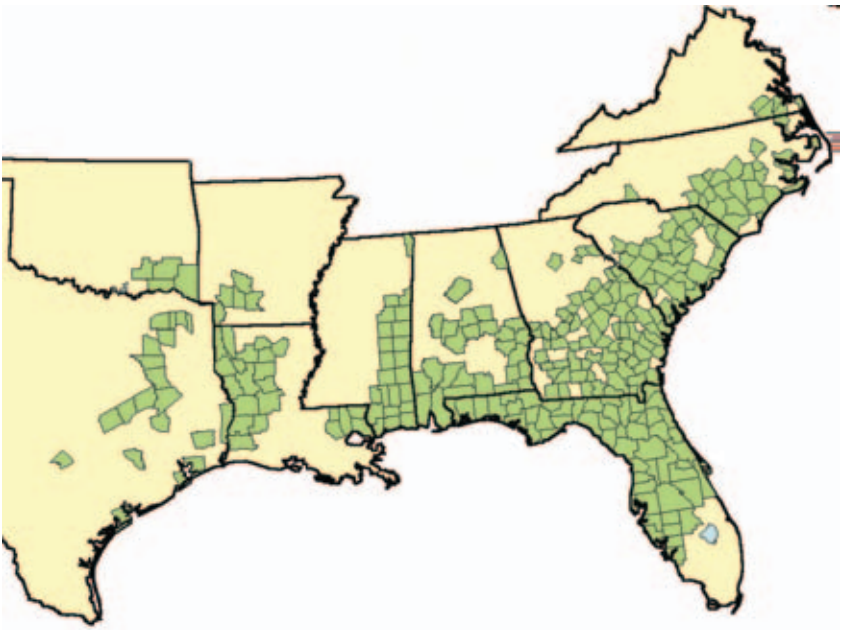
**GROWTH FORM:** shrub or small tree that grows up to 55 feet (16.8 m), with irregular spreading open crown, often forming thickets. **BARK:** thick dark gray to black, wide furrows forming rough square plates. **TWIGS and BUDS:** brown twigs, densely pubescent when young; reddish-brown buds, narrowly ovoid and 5-angled in cross-section, often with hairs at apex. **LEAVES:** short, pubescent petiole less than  $\frac{3}{8}$  inch (10 mm) long; leaf is narrowly ovate to elliptical,  $1\frac{1}{8}$  - 4 inches (29 - 101 mm) long  $\frac{1}{2}$  -  $1\frac{3}{8}$



inches (13 - 35 mm) wide, base acute to rounded, apex acute with a bristle-tip, margin is entire (juvenile foliage may have 2 - 3 shallow lobes), thick and leathery, upper surface shiny bluish-green with raised veins and sparsely pubescent along midrib, pubescence beneath with axillary



tufts of hair. **ACORNS:** biennial; 1 - 2 nuts sessile or on peduncle of less than  $\frac{1}{4}$  inch (6 mm); cup with pale pubescent reddish-brown scales, inner surface pubescent, cup usually bowl shaped, covering up to  $\frac{1}{2}$  of nut; oval, brown nut with faint stripes,  $\frac{3}{8}$  -  $\frac{5}{8}$  inches (10 - 16 mm) long. **HABITAT:** well-drained sandy soils of barrens and ridges. **DISTRIBUTION:** Texas and Oklahoma east to Florida and Virginia.



**COMMENTARY:** Bluejack oak acorns provide food for birds, squirrels, raccoons, and deer. The largest known specimen grows in Pasco County, Florida.

## *Quercus inopina* Ashe

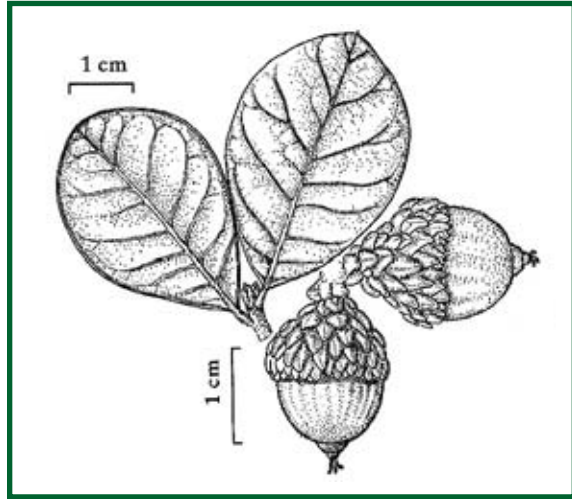
### Florida oak

#### **GROWTH FORM:**

evergreen shrub that grows to 16 feet tall (4.9 m). **BARK:**

light gray. **TWIGS and BUDS:** light to dark purplish-brown, twigs may have slight pubescence, terminal buds somewhat ovoid with a blunt tip,

5-angled in cross section. **LEAVES:** smooth or sparsely pubescent petiole  $\frac{1}{8}$  -  $\frac{3}{8}$  inch (3 - 10 mm) in length; leaves are elliptical to ovate or spatulate,  $1\frac{1}{2}$  -  $3\frac{3}{8}$  inches (38 - 86 mm) long and  $1 - 1\frac{3}{4}$  inches (25 - 44 mm) wide, base is acute to rounded;

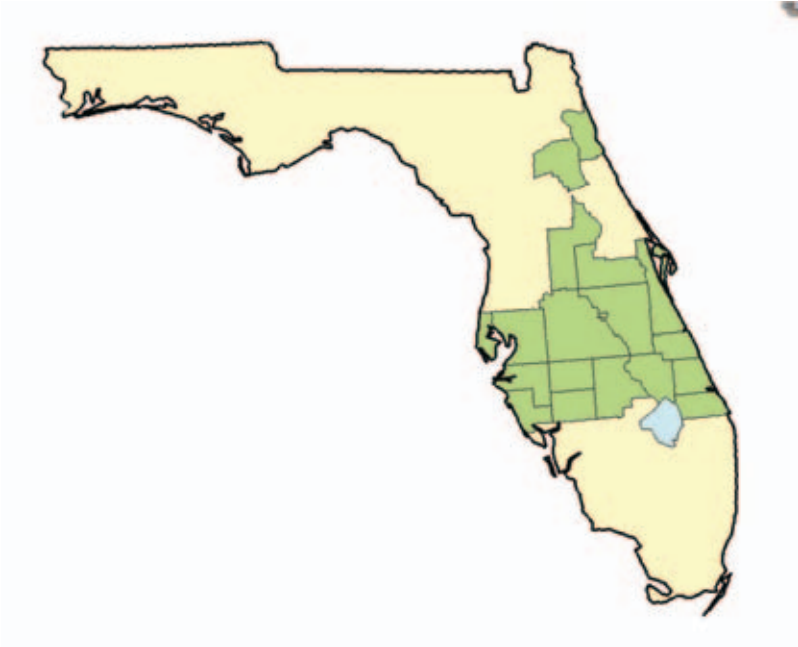


or rugose, convex with an entire margin, may have scattered hairs along midrib, lower surface with a light scurfy pubescence, often covered with ascocarps of fungi. **ACORNS:** biennial; cup with pubescent scales, inner surface half or more pubescent,

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cup covering  $\frac{1}{3}$  -  $\frac{1}{2}$  of nut; oval to elliptical nut, up to  $\frac{5}{8}$  inch (16 mm) in length.

**HABITAT:** sandhill ridges or upland terraces in scrub communities. **DISTRIBUTION:** restricted to localized areas in central Florida.



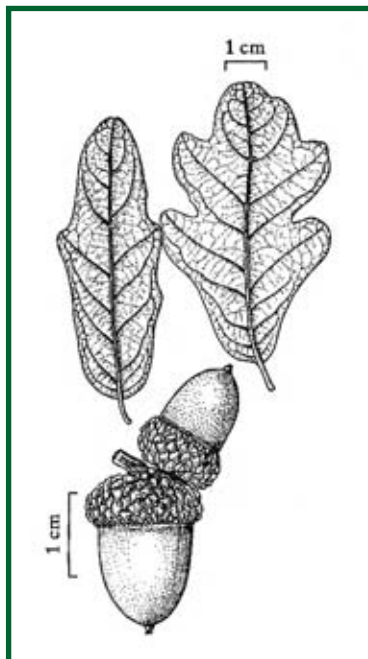
**COMMENTARY:** Florida oak is a conservation concern and rated indeterminate by IUCN.

## *Quercus laceyi* Small

### Lacey oak

canyon oak, smoky oak,  
rock oak

**GROWTH FORM:** small to medium tree, which grows up to 60 feet (18.3 mm). **BARK:** light gray with shallow furrows and scaly ridges. **TWIGS and BUDS:** young twigs are gray and pubescent, mature limbs become smooth and reddish-brown; smooth, brown ovoid buds. **LEAVES:** petiole varies from  $\frac{1}{8}$  -  $\frac{1}{2}$  inch (3 - 13 mm) long; leaf blade is obovate or elliptical,  $1\frac{1}{2}$  -  $3\frac{1}{2}$  inches (38 - 89 mm) long,  $1\frac{1}{8}$  -  $2\frac{1}{2}$  inches (29 - 63 mm) wide, margin of the leaf is entire or with shallow lobes, trees growing on moist sites may have leaves with deep lobes that resemble white oak (*Q. alba*), secondary veins often end in a tooth, apex rounded; smooth, green above, juvenile leaves have a white pubescence beneath, mature leaves become smooth beneath.



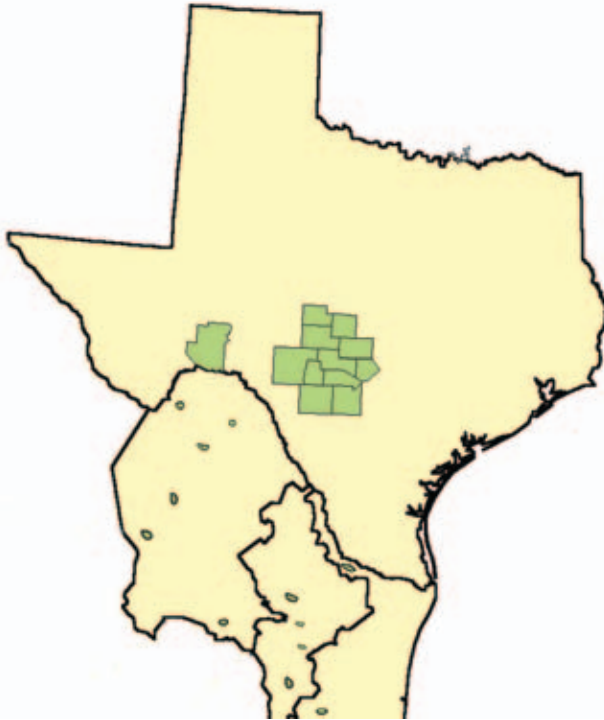
### ACORNS:

annual;  
1 - 3 acorns  
on a short  
peduncle up  
to  $\frac{3}{8}$  inch  
(10 mm)  
in length,  
saucer-  
shaped  
cup with  
pubescent  
scales,



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covers up to  $\frac{1}{3}$  of the nut; oblong or barrel-shaped nut, usually blunt at both ends, up to  $\frac{3}{4}$  inch (19 mm) long. **HABITAT:** often found associated with limestone outcrops, woodland, and riparian zones with mixed stands of ash, basswood and other oaks, a component of the pine-juniper-madrone-oak forest type of northern Mexico at elevations between 6,000 - 8,200 feet (1,830 - 2,500 m). **DISTRIBUTION:** restricted to southern and southwestern parts of the Edwards Plateau in Texas and in the Mexican states of Coahuila, Nuevo Leon, and Tamaulipas.

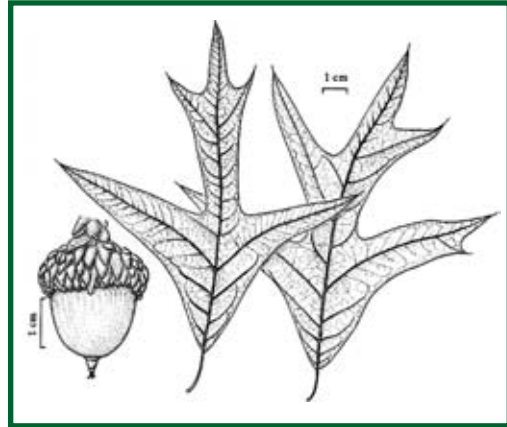


**COMMENTARY:** Named for Howard Lacey, who first collected specimens on his property near Kerrville, Texas. Lacey oak has no commercial value but does provide habitat for wildlife, and is sometimes used for fuel. The largest known Lacey oak grows in Blanco County, Texas.

## *Quercus laevis* Walter

### Turkey oak

Catesby oak,  
Coastal Plain scrub oak,  
scrub oak,  
turkey-foot oak



**GROWTH FORM:** shrub or small tree normally growing to 43 feet (13 m), occasionally to 72 feet (21.9 m) in height; tree has irregular open crown with crooked branches. **BARK:**

gray to dark gray, mature bark is deeply furrowed with irregular ridges, reddish inner bark. **TWIGS and BUDS:** dark chestnut-brown twigs with a gray cast, sparsely pubescent, chestnut-brown bark with pubescence; narrowly ovoid buds. **LEAVES:** smooth petiole  $\frac{1}{4}$  - 1 inch (6 - 25 mm) long; leaf blade broadly ovate or triangular in outline; 4 - 8 inches (101 - 203 mm) long,  $3 \frac{1}{8}$  - 6 inches (79 - 153 mm) wide near middle, base is acute or rounded and decurrent on petiole, margin with 3 - 7 lobes which looks similar to a turkey's foot, usually with 1 - 3 bristle-tipped teeth, sinuses between lobes are deep; leaf surface

is smooth and light green above, paler green below with axillary tufts of reddish hair, raised veins on both surfaces.

**ACORNS:** biennial; nearly sessile short-stalked peduncle; cup



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has pubescent scales with red margins, pubescent inner surface, goblet-shaped cup covering  $\frac{1}{3}$  of nut; broadly elliptical, light brown nut with faint stripes,  $\frac{3}{4}$  -  $1\frac{1}{8}$  inch (19 - 29 mm) long, tip often covered with short white pubescence.

**HABITAT:** dry sandy and well-drained soils on ridges in the southeastern coastal plain. **DISTRIBUTION:** Louisiana east to Florida and north to Virginia.



**COMMENTARY:** Turkey oak is well adapted to drought stress and fire. It has no commercial value, but acorns provide food for turkey, deer, and small mammals. This species is similar to *Q. falcata* in leaf shape and can be distinguished by the tapered leaf base and axillary tufts, whereas the southern red oak leaves have a u-shaped base and pubescence covering the entire lower leaf surface. The largest known specimen of turkey oak grows in Pasco County, Florida.

## *Quercus laurifolia* Michaux

### Swamp laurel oak

laurel oak, Darlington oak,  
diamond-leaf oak, laurel-leaf oak,  
water oak, obtuse oak

**GROWTH FORM:** semi-evergreen with leaves retained until the following spring; short-lived medium tree that grows up to 80 feet (24.4 m) with a dense rounded crown. **BARK:** dark brown, mature bark turning black with deep furrows and broad flat ridges.

**TWIGS and BUDS:** smooth reddish-brown twigs; buds are ovoid, pointed and covered with shiny chestnut-brown scales. **LEAVES:** short, smooth petiole up to ¼ inch (6 mm) long; leaf blade broadly elliptical and thin, 1 ¼ - 4 ¾

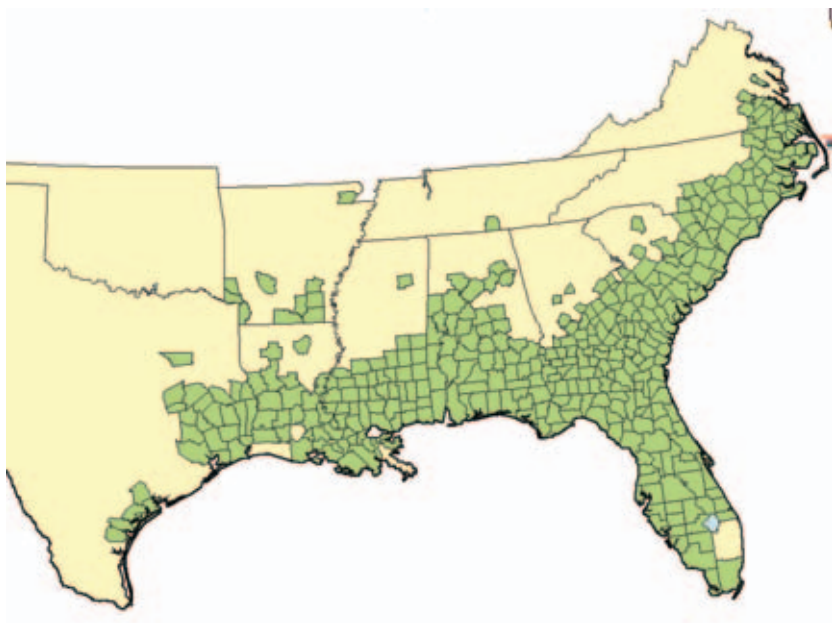
inches (32 - 121 mm) long, ⅝ - 1 ¾ inches (16 - 44 mm) wide, base cuneate, bristle-tipped acute apex, may be irregularly 3-lobed, shiny

green upper surface and pale green below with a yellow midrib, both surfaces are smooth.



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**ACORNS:** biennial; nearly sessile, saucer-like cup with pubescent scales and pubescent inner surface, enclosing up to  $\frac{1}{4}$  of nut; nearly round dark brown nut,  $\frac{5}{8}$  inch (16 mm) in length. **HABITAT:** moist soils of the southeastern coastal plain and associated with typical mesic hardwoods. **DISTRIBUTION:** Texas east to Florida and north to Virginia.



**COMMENTARY:** Swamp laurel oak is often used as an ornamental in the South. President L. B. Johnson planted one at the White House in Washington, DC. The largest known specimens of swamp laurel oak are growing in Norfolk County, Virginia, and Okaloosa County, Florida.

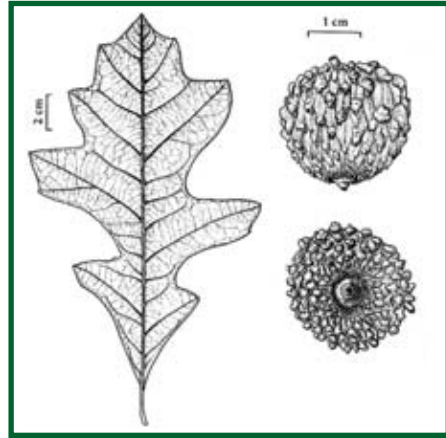
## *Quercus lyrata* Walter

### Overcup oak

swamp post oak, water white oak, swamp white oak

**GROWTH FORM:** medium to large slow growing tree up to 80 feet (24.4 m), occasionally to 155 feet (47.2 m), with a rounded crown. **BARK:** gray with deep furrows and scaly ridges or plates. **TWIGS and BUDS:** grayish pubescent twigs becoming smooth with

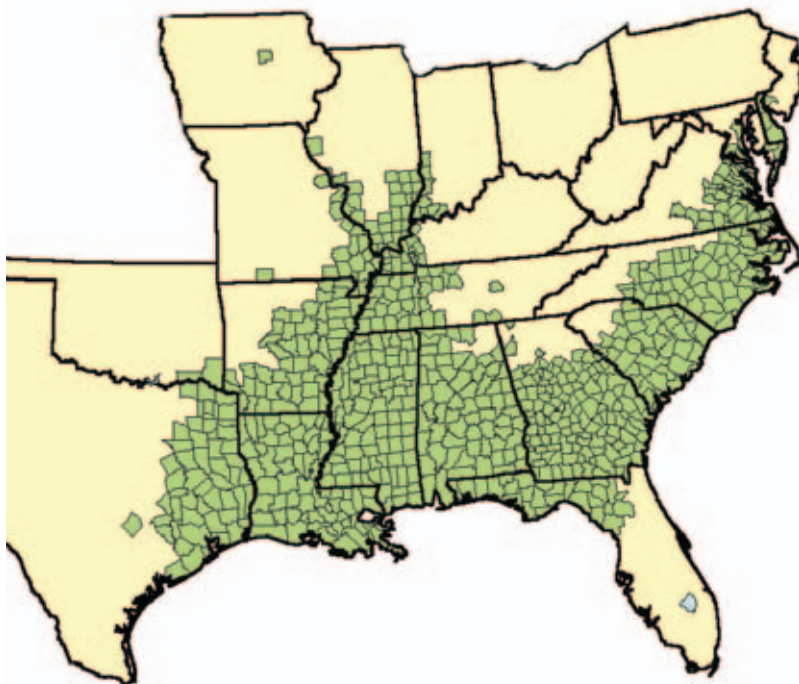
age; ovoid buds with light brown pubescent scales. **LEAVES:** petiole  $\frac{3}{4}$  inch (19 mm) in length; leaf blade narrowly oblong, 4 - 6  $\frac{1}{2}$  inches (101 - 165 mm) long, 2 - 4 inches (51 - 101 mm) wide, base cuneate to acute, margins deeply lobed with sinuses greater than  $\frac{1}{2}$  way to midrib, lobes rounded with 1 - 3 teeth; surface dark green (may be shiny) above, and pubescent grayish-green below, with a whitish bloom that rubs off. **ACORNS:** annual; 1  $\frac{1}{2}$  inch (38 mm) peduncle with 1 - 2 acorns; spheroid shaped cup with gray pubescent scales,



covering most of the nut; light brown, ovoid or oblong nut, 1 - 2 inches (25 - 51 mm) long, finely

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pubescent. **HABITAT:** restricted to poorly-drained lowlands of the Southern coastal plain and major rivers of the South and mid West. **DISTRIBUTION:** Delaware and New Jersey south to Florida, west to Texas, and north through the Mississippi Valley and drainages to Iowa, Illinois and Indiana.



**COMMENTARY:** This oak species is often utilized as white oak lumber. The largest known specimen of overcup oak grows in Bertie County, North Carolina.

## *Quercus macrocarpa* Michaux

### Bur oak

mossy-cup oak, blue oak,  
prairie oak,  
mossy-overcup oak

**GROWTH FORM:** slow growing, large tree that grows to 100 feet (30.5 m), with a massive trunk, broad crown, and large branches.

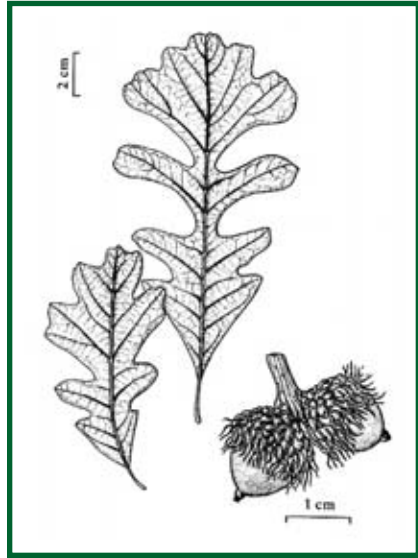
**BARK:** thick light gray bark, deep furrows producing scaly ridges, fire resistant. **TWIGS and BUDS:**

pubescent light brown twigs with corky wings or ridges; ovoid light brown to gray buds, smooth  $\frac{1}{4}$  inch (6 mm) long. **LEAVES:** petiole

$\frac{5}{8}$  - 1 inch (16 - 25 mm) in length; leaf blade is obovate to narrowly elliptical in outline,  $2\frac{3}{4}$  - 6 inches (70 - 152 mm) long, 2 - 5 inches (51 - 127 mm) wide, 5 - 7 lobed with center sinuses nearly reaching midrib, base rounded to cuneate, rounded apex; dark green above, grayish-green with finely dense pubescence below.

**ACORNS:** annual; 1 - 3 acorns on stout peduncle  $\frac{1}{4}$  -  $\frac{3}{4}$  inch (6 - 19 mm)

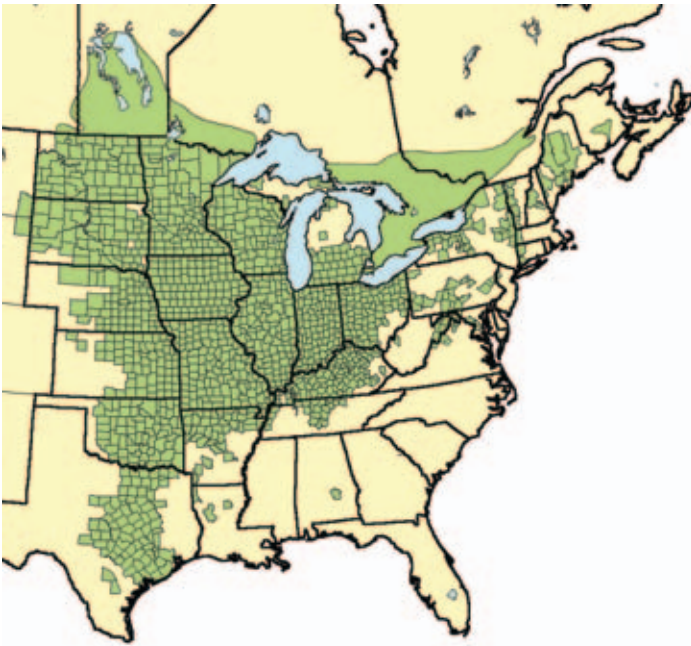
long; deep cup with grayish pubescent scales, scales near cup rim forming a fringe around the nut, enclosing  $\frac{1}{2}$  -  $\frac{7}{8}$  of nut; light brown, broadly elliptical nut, finely pubescent, 1 - 2 inches (25 - 51 mm)



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long. **HABITAT:** widely distributed and capable of withstanding a wide range of harsh conditions (one of the most drought resistant oaks) throughout eastern North America; usually found on limestone or calcareous clay.

**DISTRIBUTION:** Saskatchewan east to New Brunswick, southwest to Texas, and north to Montana.



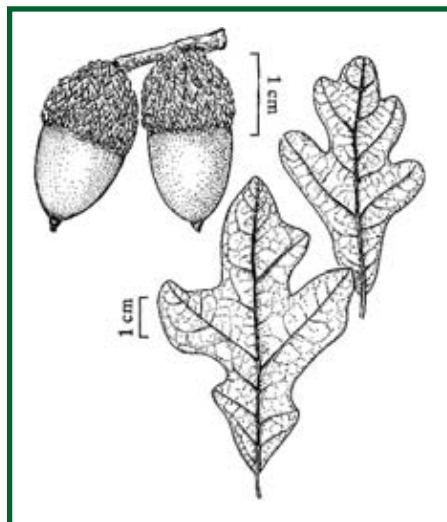
**COMMENTARY:** Bur oak extends farther north than any other oak species and becomes shrubby at the northern and eastern limits of its range. This oak's wood quality is similar to white oak and is often used for construction, flooring, and cooperage. The common name is derived from the bur-like fringe of the acorn cup. Many bur oaks are historically important and one has been designated as a National Historic Landmark in Kansas. Native Americans used bur oak as medication for heart problems and other ailments. The largest known specimen grows near Parris, Bourbon County, Kentucky.

## *Quercus margaretta* Ashe

### Sand post oak

dwarf post oak, runner oak,  
scrubby post oak, post oak

**GROWTH FORM:** shrub or small tree, occasionally rhizomatous, slow growing with dense rounded crown, normally grows to 32 feet (9.8 m), occasionally to 87 feet (26.5 m). **BARK:** light gray, shallow fissures with scaly ridges. **TWIGS and BUDS:** smooth slender gray twigs; reddish-brown terminal bud, ovoid with pointed apex, smooth or sparsely pubescent. **LEAVES:** short petiole  $\frac{1}{8}$  -  $\frac{3}{8}$  inch (3 - 10 mm) long; leaf blade cruciform in outline,  $1\frac{1}{2}$  - 3 inches (38 - 76 mm) long,  $\frac{3}{4}$  -  $1\frac{1}{2}$  inches (19 - 38 mm) wide; moderate to deep 5-lobed margin, base cuneate to rounded, apex broadly rounded,



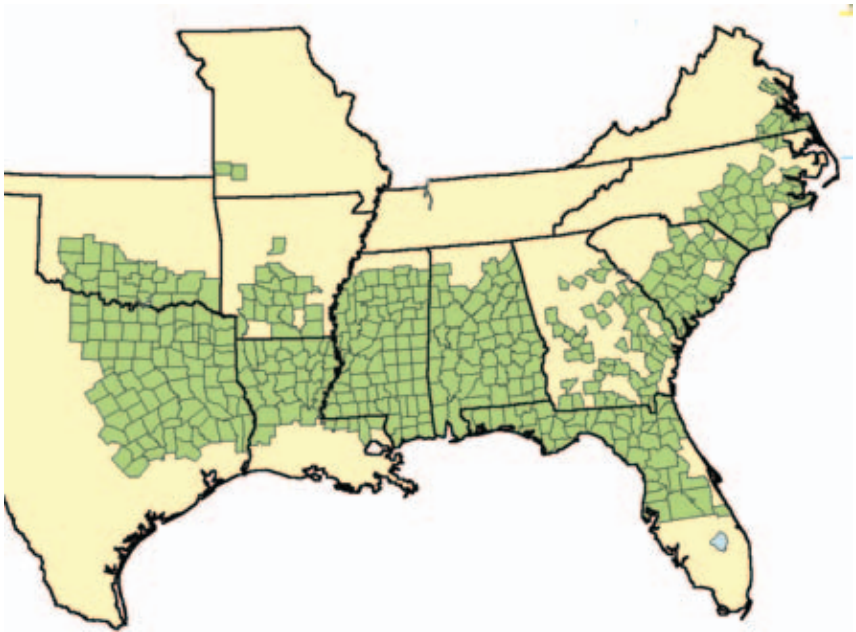
lobes rounded; shiny dark green above, light green and densely



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pubescent below.

**ACORNS:** annual; 1 - 3 acorns are sessile or produced on a peduncle up to  $\frac{3}{4}$  inch (19 mm); globe shaped gray pubescent cup, enclosing  $\frac{3}{4}$  of the nut; light brown nut ovoid with rounded apex,  $\frac{5}{8}$  - 1 inch (16 - 25 mm) long. **HABITAT:** understory or open-grown species on deep sandy and gravel soils in southern oak-pine forest types. **DISTRIBUTION:** Texas,



Oklahoma and Missouri, east to Florida, and Virginia.

**COMMENTARY:** Sand post oak provides a suitable habitat for wildlife species. Acorns provide food for turkeys and other game birds. The largest known sand post oak grows in Florida Caverns State Park near Marianna, Jackson County, Florida.

## *Quercus marilandica* Muenchhausen

**Blackjack oak**  
barren oak, black oak,  
jack oak

**GROWTH FORM:** small to medium sized tree usually between 15 - 45 feet (4.6 - 19.8 m), occasionally to 95 feet (28.9 m), with an open irregular spreading crown of crooked branches and some dead twigs, slow growing and short lived.

**BARK:** thick rough bark, nearly black, with deep furrows, mature bark forming irregular or rectangular plates, orange inner bark.

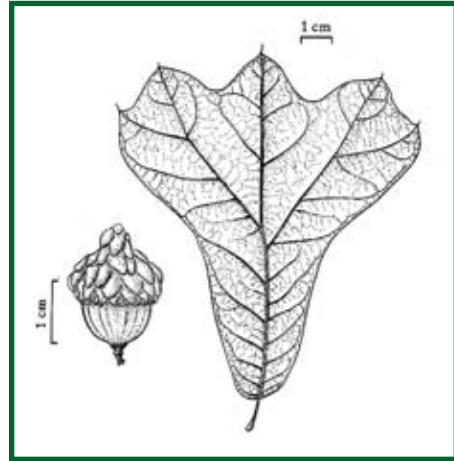
**TWIGS and BUDS:** light brown twigs, finely pubescent; narrowly ovoid pointed buds, reddish-brown pubescent scales, 5-angled in cross section.

**LEAVES:** pubescent petiole  $\frac{1}{4}$  -  $\frac{3}{4}$  inch (6 - 19 mm) long; leaf broadly triangular and widest near tip,  $2\frac{3}{4}$  - 8 inches (70 - 203 mm) long,  $2\frac{3}{4}$  - 8 inches (70 - 203 mm) wide, leathery, base rounded, thickened blade with 3 - 5 broad lobes, with 1 - 3 bristle-tipped teeth, apex obtuse; glossy yellowish-green above, pale green with dense brown pubescence (scurfy) below, secondary veins raised

on both surfaces.

**ACORNS:**

biennial, 1 - 2 acorns on a short stalk, reddish-brown top-shaped cup with pubescent scales, inner surface pubescent, enclosing  $\frac{1}{3}$  -  $\frac{2}{3}$

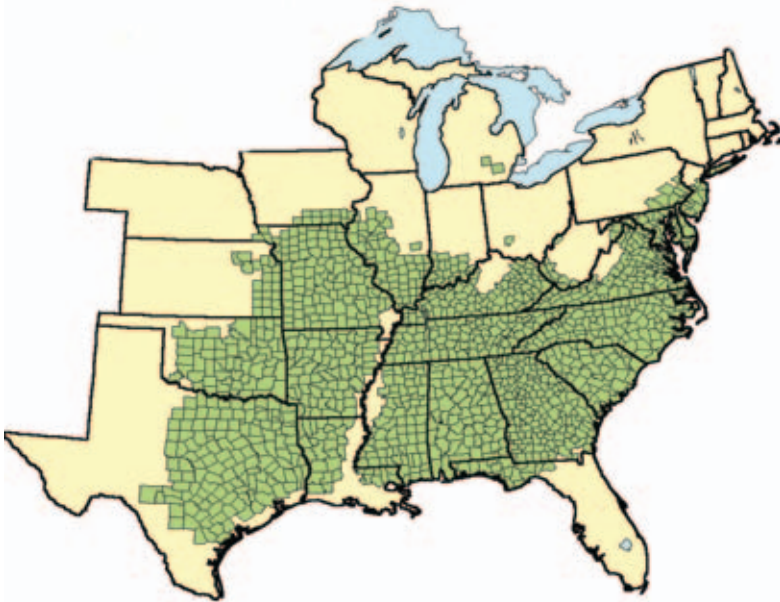
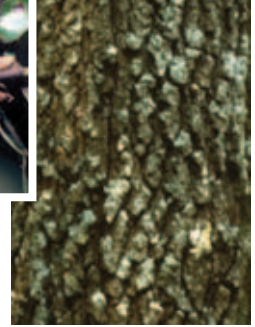


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of the nut; long elliptical nut,  $\frac{1}{2}$  -  $\frac{3}{4}$  inches (13 - 19 mm) in length, often faintly striped, ends in a stout point at the tip.

**HABITAT:** usually exists on rather poor sites with dry sandy or clay soils in the central and southern forest regions.

**DISTRIBUTION:** Iowa east to New Jersey and Long Island, New York, south to Florida, west to Texas, and north to Nebraska.

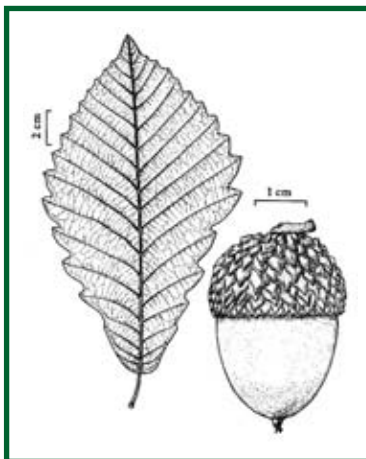


**COMMENTARY:** Blackjack oak is one of the few species of red oaks that shares the white oak group characteristic of vessels blocked by tyloses. This oak is considered a pioneer species. It is not a high value timber species, but the wood is used for railroad ties, fence posts, and charcoal. The Latin name originated from the description of specimens collected in Maryland. Western populations in Texas and Oklahoma are often recognized as *Q. marilandica* var. *asheri*. Choctaw people used blackjack oak as medication to aid in childbirth. The largest known specimen grows in Peach County, Georgia.

## *Quercus michauxii* Nuttall

### Swamp chestnut oak basket oak, cow oak

**GROWTH FORM:** large tree growing to 48 - 100 feet (15 - 30.5 m), occasionally to 155 feet (47.2 m), with a compact rounded crown and chestnut like foliage, often with a limbless trunk to 40 feet (12.2 m). **BARK:** light gray, rough, flaky ridges. **TWIGS and BUDS:** juvenile growth is green, progressing to brown during the first winter and turning gray during second year; ovoid, reddish-brown bud, apex may be blunt or pointed, sparsely pubescent scales. **LEAVES:** short petiole  $\frac{1}{4}$  -  $\frac{3}{4}$  inch (6 - 19 mm) long; obovate leaves widest beyond the middle,  $2\frac{3}{4}$  - 11 inches (70 - 279 mm) long, 2 - 7 inches (51 - 178 mm) wide, wavy margin with 9 - 14 pair of rounded teeth, base acuminate, apex broadly rounded with an abruptly pointed tip; shiny dark green above, grayish-green with dense pubescence (felty to the touch) below. **ACORNS:** annual; 1 - 3 on peduncle  $\frac{1}{2}$  -  $1\frac{1}{4}$  inches (13 - 32 mm) long; deep, bowl-shaped cup with brown pubescent scales, enclosing  $\frac{1}{2}$  of nut; light to dark brown, ovoid nut,

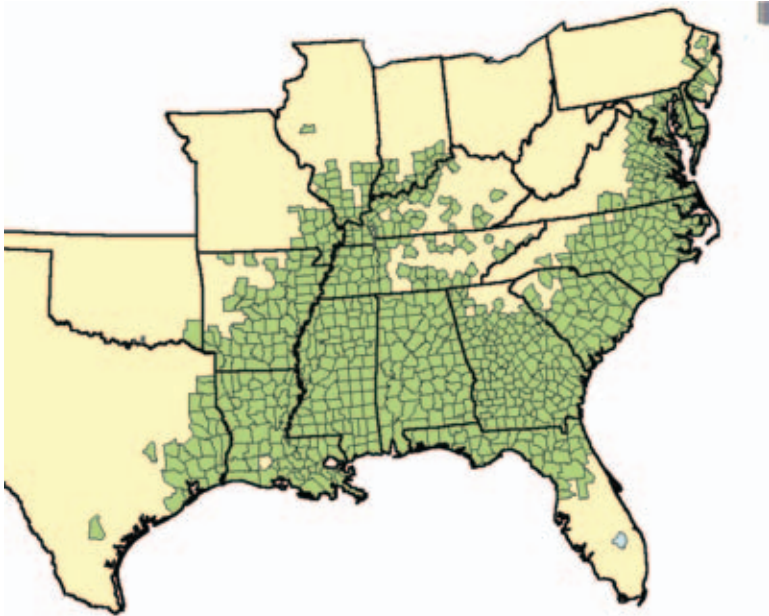


1 -  $1\frac{3}{8}$  inches (25 - 35 mm) long. **HABITAT:** occurs on a variety of moist soils and well-drained alluvial floodplains in the central and southern forest regions.

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**DISTRIBUTION:**

Illinois east to New Jersey, south to Florida, west to Texas, and north to Missouri.



**COMMENTARY:** Named for French botanist, Frances A. Michaux, who wrote a three volume treatise on the trees of eastern North America. Swamp chestnut oak is considered an early succession species with mature trees retarding growth of understory vegetation due to an allelopathic effect. The acorns are food for humans, cattle, deer, and small mammals. The nuts are sweet enough to eat raw without boiling. Two of these common names were derived from its use for basket material and as food for cows. The largest known swamp chestnut oak grows in Fayette County, Alabama.

## *Quercus minima* (Sargent) Small

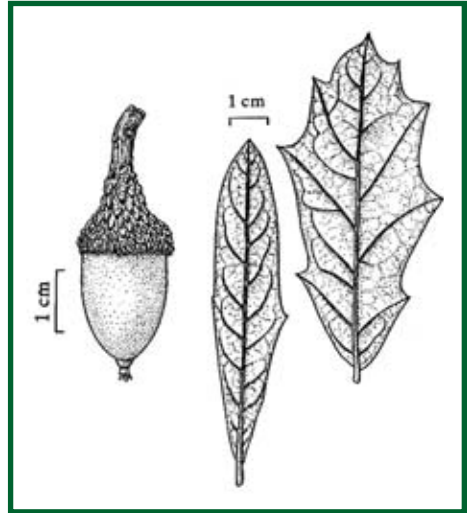
### Dwarf live oak minimal oak

#### **GROWTH FORM:**

rhizomatous shrub, tardily deciduous or evergreen, 3 feet (0.9 m), forming thickets of unbranched stems. **BARK:** smooth, brown to light gray.

**TWIGS and BUDS:** light gray, smooth twigs in second year; small globe shaped bud, dark brown to grayish-brown scales. **LEAVES:** very short

petiole  $\frac{1}{8}$  -  $\frac{1}{4}$  inch (3 - 6 mm) long; obovate or oblanceolate leaf,  $1\frac{1}{2}$  -  $4\frac{3}{4}$  inches (38 - 121 mm) long,  $\frac{3}{4}$  - 2 inches (19 - 51 mm) wide, base cuneate, apex acute to rounded, margins flat or slightly wavy; glossy light to dark green above, light green with whitish



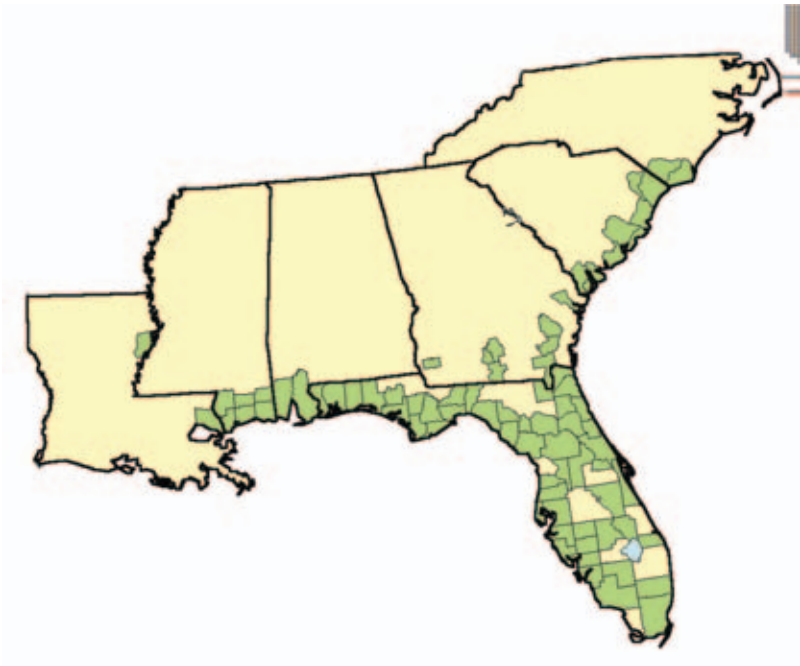
bloom below.

#### **ACORNS:**

annual;  
1 - 3 acorns  
on peduncle  
 $\frac{1}{8}$  -  $1\frac{1}{8}$  inches  
(3 - 29 mm)  
long, goblet-  
shaped cup  
with grayish  
scales, with or  
without minute  
pubescence,  
encloses up  
to  $\frac{1}{2}$  of nut;  
narrowly



oval, dark brown nut,  $\frac{5}{8}$  - 1 inch (16 - 25 mm) long. **HABITAT:** pine and scrub forests on deep sandy soils. **DISTRIBUTION:** Louisiana east to Florida, and north to North Carolina.

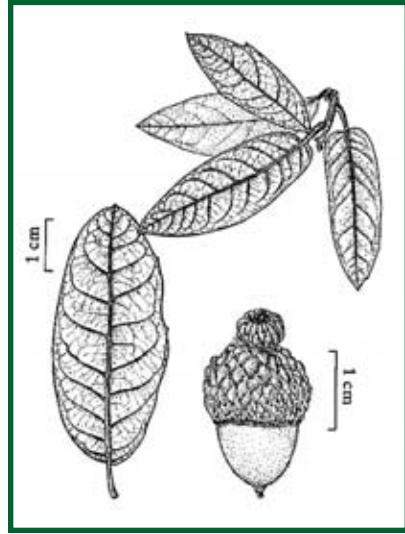


**COMMENTARY:** Dwarf live oak is maintained to provide food and shelter for wildlife in habitats where fire is used as a tool to reduce competing vegetation in longleaf and slash pine management. This oak species can produce acorns at 3 years of age.

## *Quercus mohriana* Buckley

**Mohr oak**  
shin oak, scrub oak

**GROWTH FORM:** evergreen or deciduous shrub, rhizomatous and usually forming thickets, occasionally forms a small tree to 20 feet (6.1 m) with irregular spreading crown. **BARK:** thick gray bark with rough scaly ridges. **TWIGS and BUDS:** densely pubescent grayish-brown twigs, blunt ovoid buds with light brown to chestnut pubescent scales. **LEAVES:** short petiole to ¼ inch (6 mm); thick and leathery oblong to elliptical, 1 ⅞ - 3 inches (29 - 76 mm) long, ¾ - 1 ¼ inches (19 - 32 mm) wide, rounded base, apex rounded or acute, margin usually entire and wavy, may have a few teeth, shiny dark green above, grayish pubescence beneath with prominent raised secondary veins. **ACORNS:** annual; 1 - 2 acorns produced on a peduncle to ⅝ inch (16 mm); deep cup with pubescent scales, and

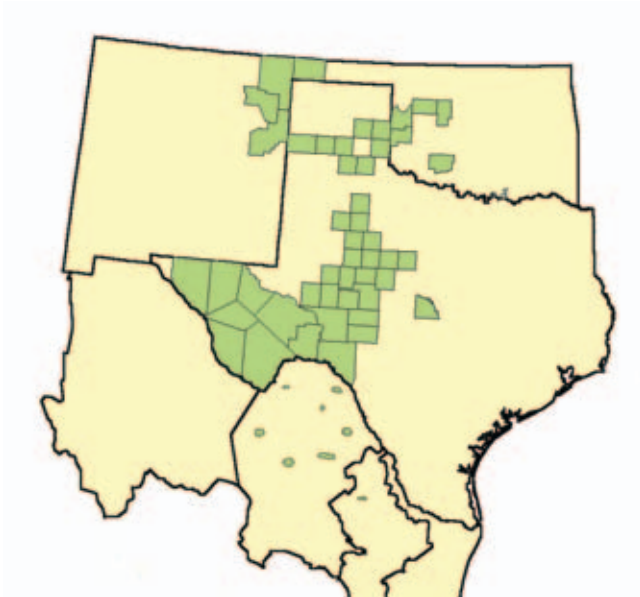


enclosing ½ of nut; oval to broadly elliptical, brown nut to ⅝ inch (16 mm) in length. **HABITAT:** limestone soils in the Lower



Sonoran Life Zone, at elevations between 2000 - 4000 feet (610 - 1219 m).

**DISTRIBUTION:** Oklahoma and New Mexico south to Texas and northern Mexico (Coahuila and Nuevo Leon).



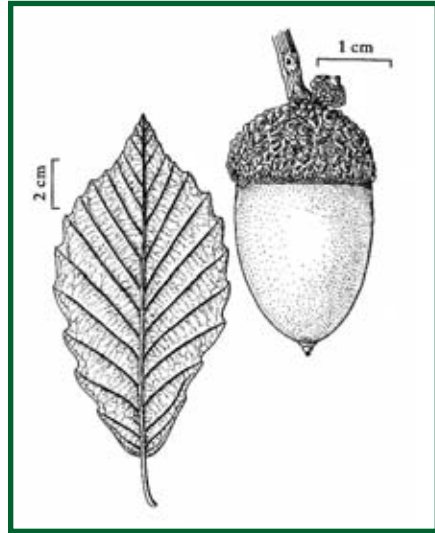
**COMMENTARY:** Named for botanist, Charles Mohr, who wrote about the flora of Alabama. Mohr oak provides good habitat for wildlife. The largest known specimen grows in the Guadalupe Mountains National Park, Texas.

## *Quercus montana* Willdenow

### Chestnut oak

rock chestnut oak,  
mountain chestnut oak,  
rock oak, tanbark oak

**GROWTH FORM:** medium to large tree, 65 - 145 feet (19.8 - 44.2 m), broad open and irregular crown, chestnut like foliage. **BARK:** dark reddish-brown to dark gray, mature bark with deep v-shaped furrows producing broad ridges. **TWIGS and BUDS:** stout twigs, dark green to reddish-brown; light brown to reddish-brown ovoid bud, pointed apex, bud scales may have slight pubescence. **LEAVES:** yellow petiole  $\frac{3}{8}$  -  $1\frac{1}{4}$  inches (10 - 32 mm) long; leaf blade obovate,  $4\frac{3}{4}$  - 8 inches (121 - 203 mm) long,  $2\frac{3}{8}$  - 4 inches (60 - 101 mm) wide, margins have 10 - 14 rounded teeth, base subacute, apex broadly acuminate; thick firm blade, shiny dark yellowish-green above, light green with slight pubescence along veins below.



**ACORNS:** annual; 1 - 2 acorns on peduncle  $\frac{3}{8}$  - 1 inch (10 - 25 mm) long; cup has gray scales

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with red tips, pubescent inner surface, encloses  $\frac{1}{3}$  -  $\frac{1}{2}$  of nut; chestnut-brown, long oval nut,  $\frac{3}{4}$  -  $1\frac{1}{2}$  inches (19 - 38 mm) long. **HABITAT:** shallow soils, dry sandy soils, and rocky upland forests. **DISTRIBUTION:** southern Ontario, south to Louisiana, east to Georgia, and north to Maine.



**COMMENTARY:** The bark of chestnut oak has a high tannin concentration and was once used for tanning leather. Thus the common name ‘tanbark oak.’ Acorns provide a food source for turkey, rough grouse, songbirds, deer, and small mammals. This species is commonly referred to as *Q. prinus* in forestry literature. The largest known chestnut oak grows in the Great Smoky Mountains National Park, Tennessee.

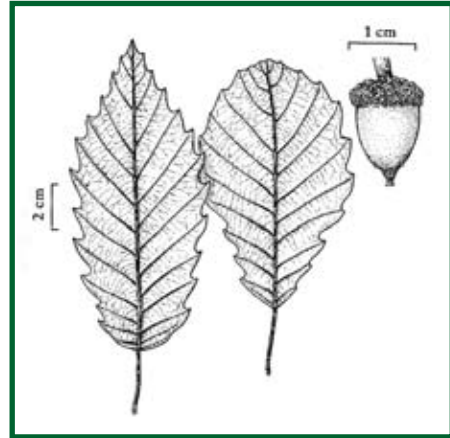
## *Quercus muehlenbergii* Engelm

### Chinkapin oak

chestnut oak,  
yellow chestnut oak,  
yellow oak,  
rock chestnut oak, rock oak

**GROWTH FORM:** medium to large tree 45 - 110 feet (19.8 - 33.5 m), narrow rounded crown. **BARK:** light gray, thin and scaly. **TWIGS and BUDS:** slender, brown twigs turning gray in second year;

reddish-brown terminal bud, broadly ovate with a blunt apex, sparsely pubescent. **LEAVES:** smooth petiole  $\frac{3}{8}$  -  $1\frac{1}{4}$  inches (10 - 32 mm) long; leaf blade obovate to oblanceolate, 2 - 6 inches (51 - 152 mm) long,  $1\frac{1}{2}$  -  $3\frac{1}{8}$  inches (38 - 79 mm) wide, thickened and leathery, margins regularly undulate, numerous parallel side veins, each ending in a tooth or shallow lobe, base truncate or cuneate, apex pointed; shiny dark green above, light green with minute pubescence below. **ACORNS:** annual; 1 - 2 acorns on peduncle  $\frac{1}{4}$  inch (6 mm) in length; thin cup with gray pubescence, covering  $\frac{1}{4}$  -  $\frac{1}{2}$  of the nut;

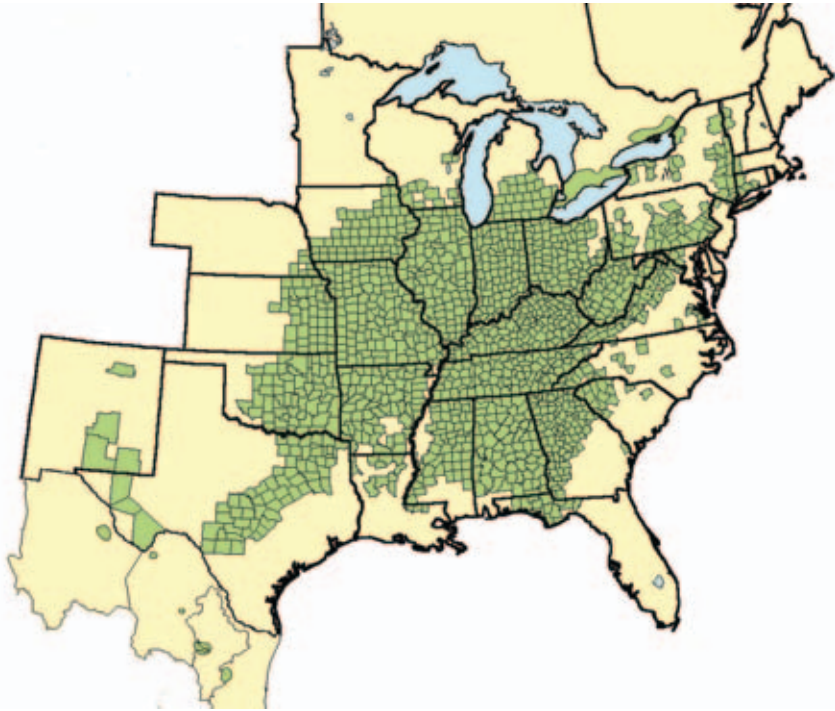


oblong to ovoid nut,  $\frac{5}{8}$  - 1 inch (15 - 25 mm) long.

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**HABITAT:** limestone and calcareous soils in mixed deciduous and pine forests.

**DISTRIBUTION:** Vermont west to Ontario and Minnesota, southwest to New Mexico and northeastern Mexico (Chihuahua, Coahuila, Nuevo Leon, and Tamaulipas), east to Florida, and north to Massachusetts.



**COMMENTARY:** Chinkapin oak was named after the botanist Henry Muehlenberg. This oak's shrubby growth is associated with poor environmental conditions at the extreme edges of its distribution. This oak species is localized throughout its range and seems dependent upon soil type and a pH above 6.0. It can readily reproduce by sprouts. Chinkapin oak can be separated from *Q. prinoides* on the same site by its single stem and sparse acorn production. The largest known chinkapin oak grows in Clark County, Kentucky.

## *Quercus myrtifolia* Willdenow

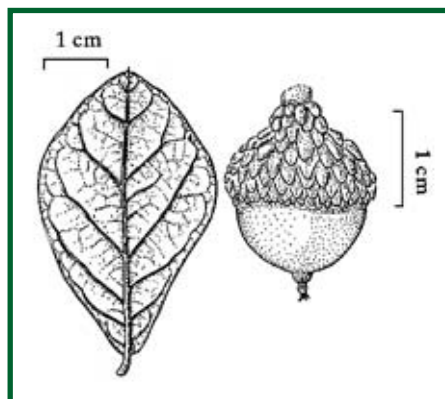
### Myrtle oak scrub oak

**GROWTH FORM:** evergreen shrub or small tree that grows to 36 feet (11 m), rounded crown has crooked branches and a tendency to form thickets.

**BARK:** gray and smooth, becoming furrowed with age. **TWIGS and BUDS:**

pubescent reddish-brown twigs; ovoid buds that narrow to a point, reddish-brown scales, sometimes with pubescent tan tufts at apex.

**LEAVES:** very short smooth petiole to  $\frac{1}{4}$  inch (6 mm); leaves are narrow to broadly obovate,  $\frac{5}{8}$  - 2 inches (16 - 51 mm) long,  $\frac{3}{8}$  - 1 inch (10 - 25 mm) wide, base rounded, apex rounded or with a bristle-tipped tooth, thick and leathery, margins with edges turned under and

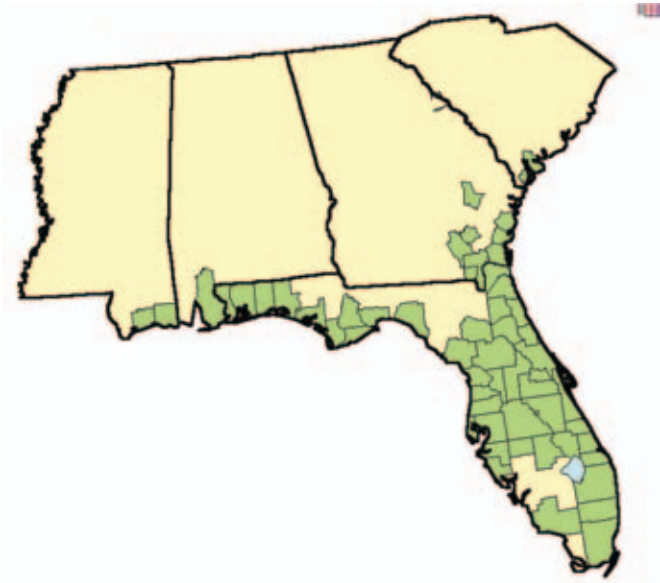


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occasionally wavy; shiny dark green above, light green beneath with axillary tomentum and some specimens have a yellowish scurfy bloom. **ACORNS:** biennial; 1 - 2 acorns on each peduncle, goblet-shaped, pubescent gray cup covering  $\frac{1}{4}$  -  $\frac{1}{3}$  of the nut, inner surface pubescent; nut almost round,  $\frac{1}{4}$  -  $\frac{1}{2}$  inch (6 - 13 mm) long, dark brown when mature. **HABITAT:** dry sandy ridges in mixed stands of yellow pines and dry-site hardwoods; usually the most abundant species in scrub oak forests of *Q. incana*, *Q. laevis*, *Q. marilandica*, *Q. margaretta*, *Q. geminata*, and *Q. virginiana*.



**DISTRIBUTION:** South Carolina, south to Florida, and west to Mississippi at sea level on the Coastal Plain.



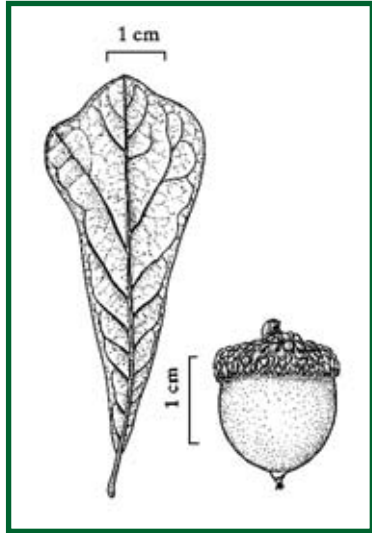
**COMMENTARY:** Myrtle oak is most abundant on islands off the coasts of Mississippi, Alabama, and Florida. The largest known specimen of myrtle oak grew in Fort Clinch State Park, Nassau County, Florida, until its recent death.

## *Quercus nigra* Linnaeus

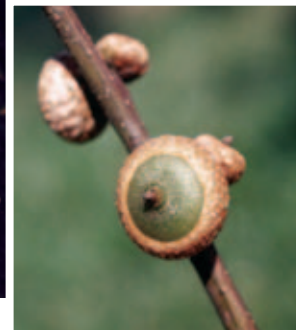
### Water oak

possum oak, spotted oak,  
pin oak, red oak

**GROWTH FORM:** medium to large tree with a slender trunk and rounded crown that can grow to 120 feet (36.6 m); leaves usually retained during the winter. **BARK:** light brown to black with furrows producing scaly ridges on mature bark. **TWIGS and BUDS:** smooth red twigs, chestnut-brown, ovoid bud with pubescent scales and a pointed apex. **LEAVES:** short smooth petiole  $\frac{1}{8}$  -  $\frac{3}{8}$  inch (3 - 10 mm) long; obovate or oblong leaves widest near apex,  $1\frac{1}{4}$  -  $4\frac{3}{4}$  inches (32 - 121 mm) long,  $\frac{5}{8}$  -  $2\frac{1}{2}$  inches (16 - 63 mm) wide, base cuneate, margin entire, 2 - 3 bristle-tipped lobes, dull green above, pale green with axillary pubescent tufts below. **ACORNS:** biennial; 1 - 2 acorns with a short peduncle, shallow cup



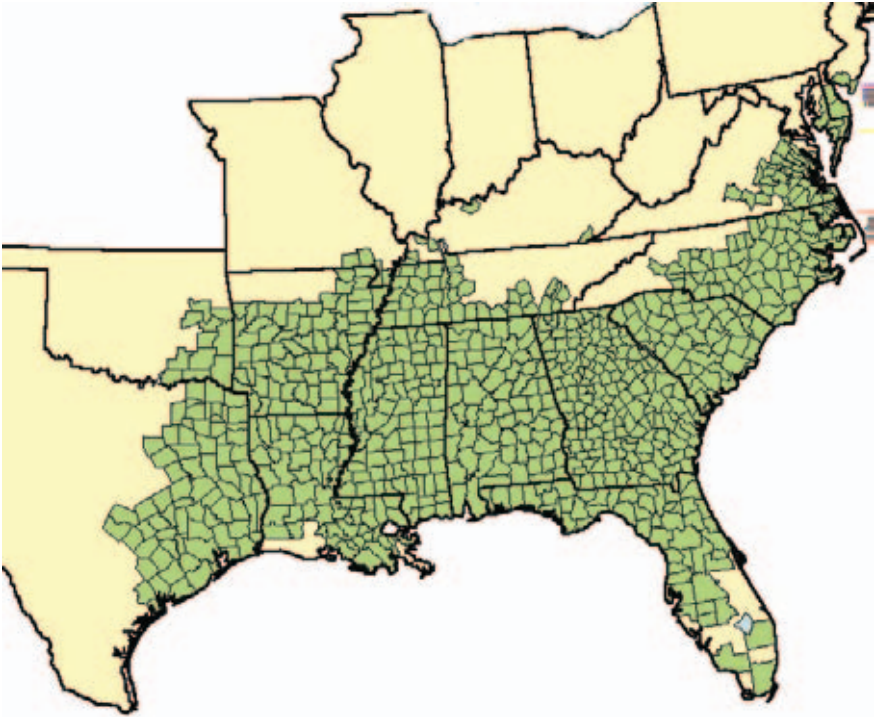
with pubescent outer and inner surface, covers up to  $\frac{1}{4}$  of nut; nearly round





nut,  $\frac{3}{8}$  -  $\frac{5}{8}$  inch (10 - 16 mm) long, nearly black at maturity, often with faint stripes.

**HABITAT:** found on wet lowland to moist upland soils. **DISTRIBUTION:** New Jersey south to Florida, west to Texas, north to Missouri, and east to Virginia.

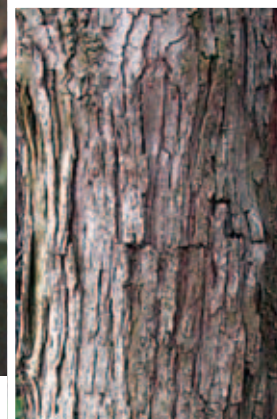
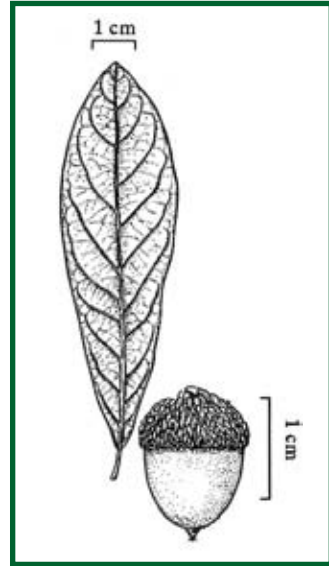


**COMMENTARY:** Water oak is a short to moderately long-lived tree, often used as a rapidly growing shade tree in the South. Not a high value commercial species because of excessive splitting, but its wood is utilized as rough construction lumber. Acorns provide food for turkey, ducks, quail, deer, and other small mammals. The two largest known specimens of water oak are located in Jones County, Mississippi, and near Ferriday, Concordia Parish, Louisiana.

## *Quercus oglethorpensis* Duncan

### Oglethorpe oak

**GROWTH FORM:** medium to large tree, which can grow to 80 feet (24.4 m), straight trunk with occurrence of epicormic branching, crooked-branched crown. **BARK:** light gray, shallow furrows with scaly ridges. **TWIGS and BUDS:** twigs smooth, purplish-brown with conspicuous lenticels; rounded buds with chestnut-brown to dark gray pubescent scales. **LEAVES:** short petiole  $\frac{1}{8}$  -  $\frac{1}{4}$  inch (3 - 6 mm) long; narrowly elliptical to obovate, margins entire or slightly undulating near apex, sometimes wavy, slightly rounded at both ends; dull dark green above, yellowish-green with velvety pubescence below. **ACORNS:** annual; 1 - 2 acorns on a peduncle of  $\frac{1}{4}$  inch (6 mm) or less, short cup has gray scales with tan pubescence, covers up to  $\frac{1}{3}$  of the nut;





ovoid (egg-shaped) nut,  $\frac{3}{8}$  -  $\frac{3}{4}$  inch (10 - 19 mm) long, dark grayish-brown with a covering of short fine soft hairs. **HABITAT:** moist soils and drained terraces along streams, and in loblolly pine-hardwood sites. **DISTRIBUTION:** localized populations in South Carolina, Georgia, Mississippi, and Louisiana.



**COMMENTARY:** Oglethorpe oak is a relatively new species described in 1940 and named after specimens first collected from Oglethorpe County, Georgia. This oak is a poor producer of acorns and subject to fire damage. The IUCN considers this oak a conservation concern and has categorized it as vulnerable. The largest known Oglethorpe oak grows near Lexington in Oglethorpe County, Georgia.

## *Quercus pagoda* Rafinesque

### Cherrybark oak

bottomland red oak, red oak,  
swamp red oak,  
swamp Spanish oak,  
Elliott oak, scalybark oak

**GROWTH FORM:** one of the largest and fastest growing of the southern red oaks, often reaching heights of 130 feet (39.6 m). **BARK:** nearly black with short scaly ridges. **TWIGS and BUDS:** light brown pubescent twigs, ovoid bud with light chestnut-brown pubescent scales, 5-angled in cross section.

**LEAVES:** smooth petiole  $\frac{3}{4}$  - 2 inches (19 - 51 mm) in length; leaf ovate or obovate,  $3\frac{1}{2}$  - 12 inches (89 - 305 mm) long,  $2\frac{3}{8}$  -  $6\frac{1}{4}$  inches (60 - 159 mm) wide, base cuneate to rounded, apex acute, margin with 5 - 11 lobes ending in 1 - 3 bristle-tipped teeth, middle

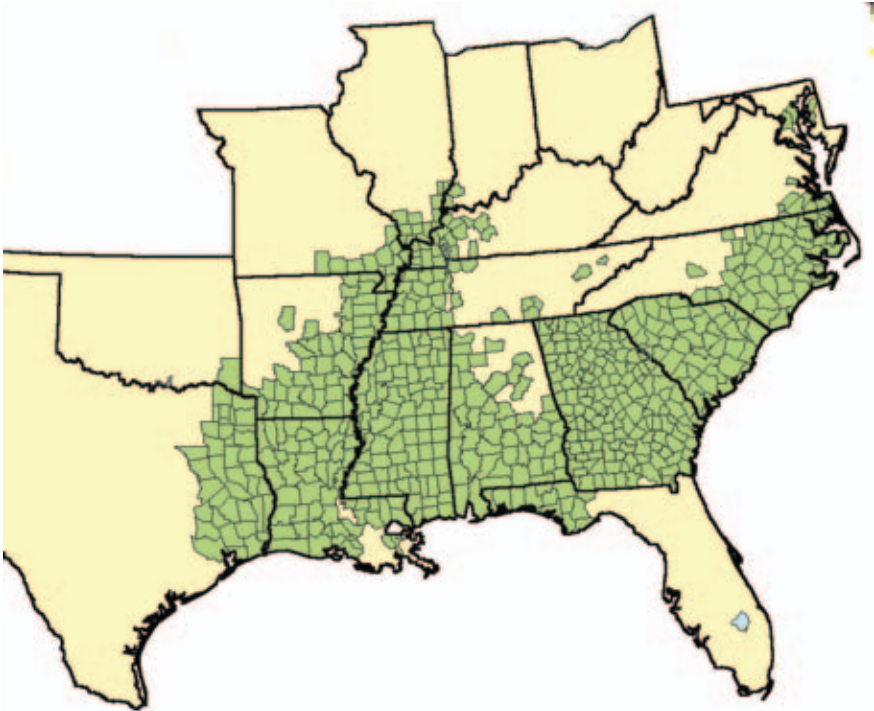
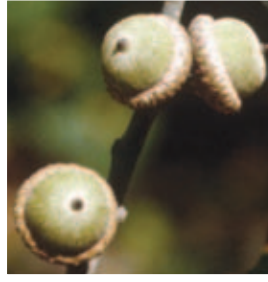


lobes usually spread at right angles to the midrib, shiny dark green above, pale gray pubescence below, secondary veins raised on both surfaces.

**ACORNS:** biennial; 1 - 2 acorns on each peduncle, chestnut-brown cup with pubescent scales, inner surface pubescent, covers  $\frac{1}{3}$  -  $\frac{1}{2}$  of the nut; rounded brown nut with short

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fine pubescence and faint stripes,  $\frac{5}{8}$  inch (16 mm) long. **HABITAT:** well-drained lowland soils in the bottomland hardwood types. **DISTRIBUTION:** Maryland south to Florida, west to eastern Texas, and north to southern Illinois.



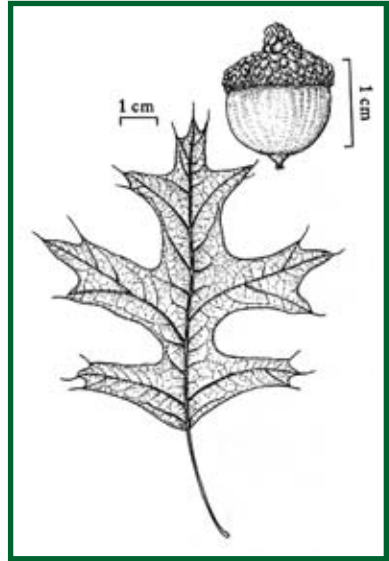
**COMMENTARY:** Cherrybark oak is a valuable timber species because of its large size and fast growth, but a tree usually takes 25 years to produce a crop of acorns. Its common name derives from the resemblance of its bark to that of black cherry. The two largest known cherrybark oaks grow in Westmoreland County and Sussex County, Virginia.

## *Quercus palustris* Muenchhausen

### Pin oak

swamp oak, Spanish oak,  
swamp Spanish oak, water oak

**GROWTH FORM:** medium to large tree 50 - 130 feet (15.2 - 39.6 m), somewhat conical crown with horizontal inner branches and lower branches angled downward. **BARK:** gray-brown, smooth juvenile bark, mature bark with broad scaly ridges, pink inner bark. **TWIGS and BUDS:** twigs shiny chestnut-brown; ovoid bud with pointed apex, chestnut-brown scales. **LEAVES:** smooth petiole  $\frac{3}{4}$  -  $2\frac{1}{2}$  inches (19 - 63 mm) long; elliptical to oblong leaf, 2 -  $6\frac{1}{4}$  inches (51 - 159 mm) long, 2 -  $4\frac{3}{4}$  inches (51 - 121 mm) wide, base truncate, apex acute, margin with 5 - 7 lobes with 1 - 3 bristle-tipped teeth, deep sinuses nearly to the midvein, basal lobes somewhat recurved; glossy dark green above, light green below with axillary tufts or tomentum next to raised veins.



### **ACORNS:**

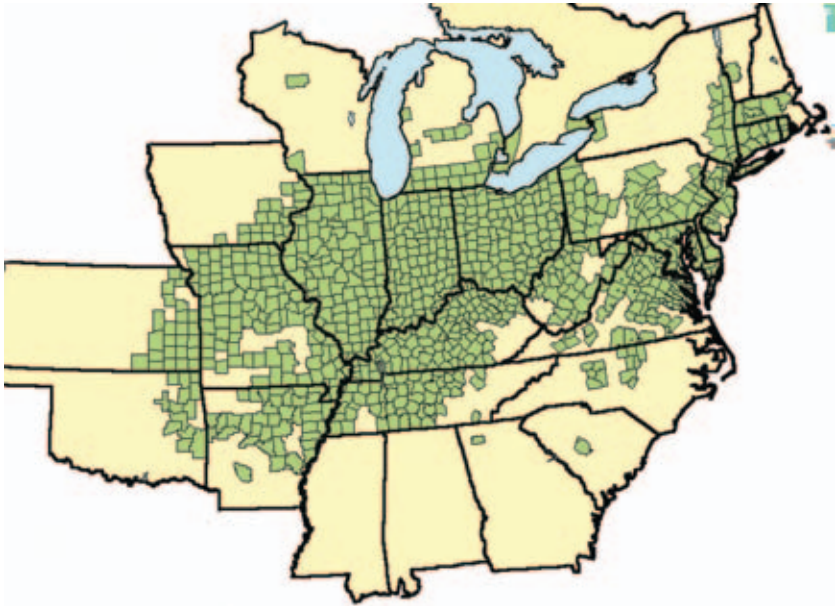
biennial, clusters of 1 - 2 acorns on each peduncle, thin reddish-brown cup, smooth scales, enclosing  $\frac{1}{4}$  of the nut; rounded nut,  $\frac{5}{8}$  inch (16 mm) in length, light brown and often striped.

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**HABITAT:** wet-site species found in nearly pure stands on poorly-drained soils; usually tolerates intermittent flooding during the dormant season but not during the growing season; extensive stands



of pin oak are found on glacial till, with excessive moisture during the winter and spring; not adapted to alkaline soils. **DISTRIBUTION:** Vermont and Ontario, south to North Carolina, west to Oklahoma, and north to Wisconsin.



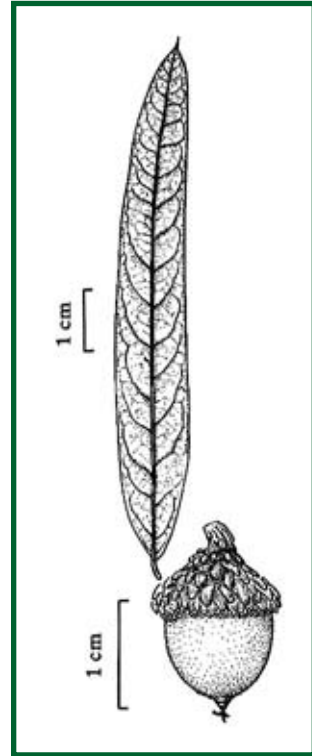
**COMMENTARY:** Pin oak is extensively planted as an ornamental in North America and has been introduced into central and western Europe as a shade tree. It is noted for a shallow root system that allows easy transplanting. Native Americans used bark from this tree for medicine. The largest known pin oak grows in Bell County, Kentucky.

## *Quercus phellos* Linnaeus

### Willow oak

pin oak, peach oak,  
swamp willow oak, black oak

**GROWTH FORM:** medium to large trees that grow to 140 feet (42.7 m), with a rounded crown and spur-like branches, long-lived with rapid growth and heavy acorn production. **BARK:** young bark is smooth and dark gray, mature bark with deep furrows and rough ridges, pink inner bark. **TWIGS and BUDS:** smooth red to chestnut-brown twigs; ovoid bud with pointed apex, smooth chestnut-brown scales. **LEAVES:** short smooth petiole up to  $\frac{1}{4}$  inch (6 mm) in length; narrowly oblong or lanceolate, 2 - 4  $\frac{3}{4}$  inches (51 - 121 mm) long,  $\frac{3}{8}$  - 1 inch (10 - 25 mm) wide, margin entire with bristle-tipped apex, both base and apex are acute; light green and slightly shiny above, duller pale green below, some



with grayish pubescence.

### **ACORNS:**

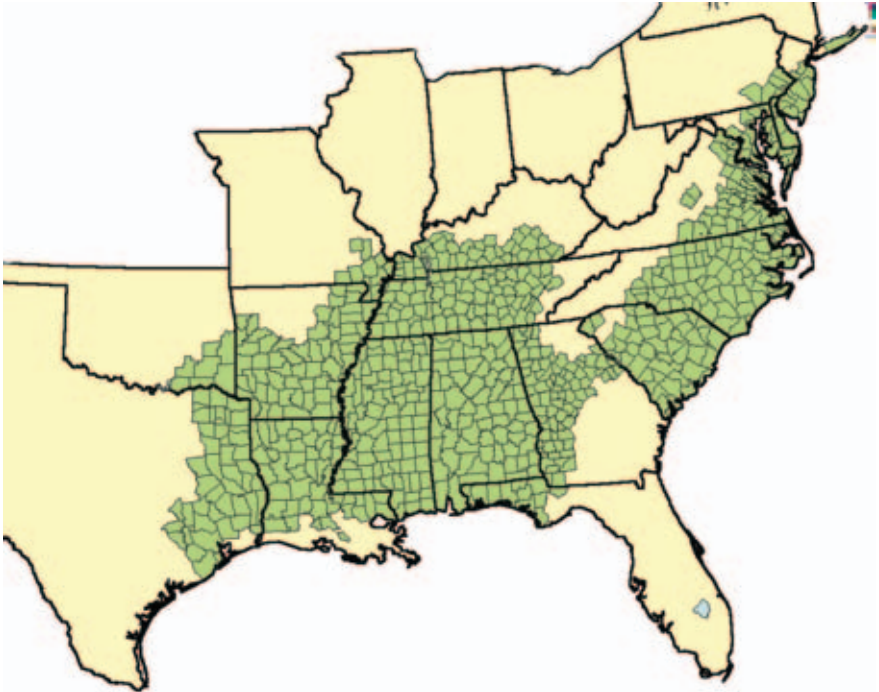
biennial; 1 - 2 nearly stalkless acorns, shallow saucer shaped cup with pubescent scales, light brown pubescent inner surface, enclosing up to  $\frac{1}{3}$  of the nut; nearly oval

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nut,  $\frac{3}{8}$  -  $\frac{1}{2}$  inch  
(10 - 13 mm) long,  
brown with  
faint stripes.

**HABITAT:** moist  
alluvial soils along  
streams and rivers.

**DISTRIBUTION:**  
New York, west to  
Missouri, south to  
Texas, east to Florida, and north to  
Delaware.

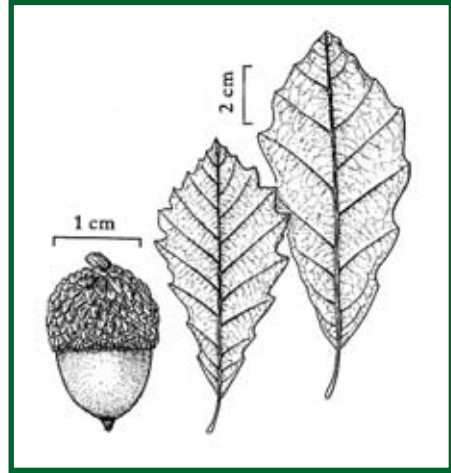


**COMMENTARY:** Willow oaks are easily transplanted because of their shallow root system. This oak's acorns are an important food source for wildlife. The largest known specimen of willow oak grows in Thomaston, Upson County, Georgia.

## *Quercus prinoides* Willdenow

### Dwarf chinkapin oak scrub chestnut oak

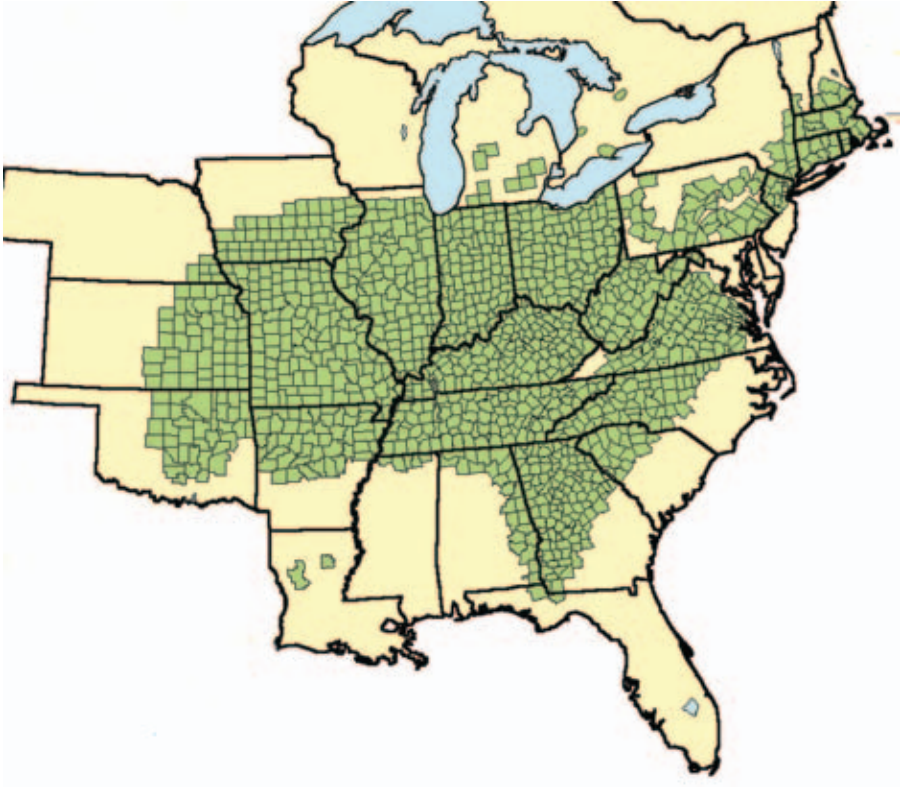
**GROWTH FORM:** rhizomatous shrub or a small tree to 25 feet (7.6 m). **BARK:** thin gray bark with furrows and scaly ridges. **TWIGS and BUDS:** grayish twigs, broadly rounded bud brown to chestnut-brown with a blunt apex, scales have some pubescence. **LEAVES:** short-petiole  $\frac{1}{4}$  -  $\frac{5}{8}$  inch (6 - 16 mm); leathery leaves are obovate,  $1\frac{1}{2}$  -  $5\frac{1}{2}$  inches (38 - 140 mm),  $\frac{3}{4}$  -  $2\frac{1}{2}$  inches (19 - 63 mm), margin undulate or toothed with 3 - 8 pair of short rounded teeth, base cuneate, apex rounded; shiny dark green above, light green below with slight pubescence. **ACORNS:** annual;



1 - 2 acorns on peduncle up to  $\frac{3}{8}$  inch (10 mm), thin cup with short gray pubescent scales, covering up to  $\frac{1}{3}$  of nut; oblong to oval light brown nut, up to  $\frac{3}{4}$  inch (19 mm) long.

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**HABITAT:** dry rocky soils such as sandstone or shale outcrops associated with oak pine types. **DISTRIBUTION:** New Hampshire and Florida, westward to Iowa and Oklahoma.

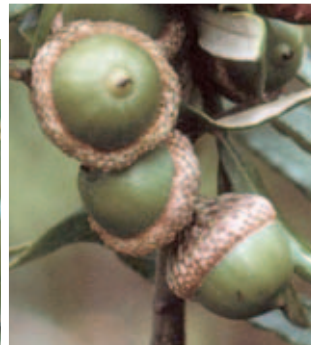
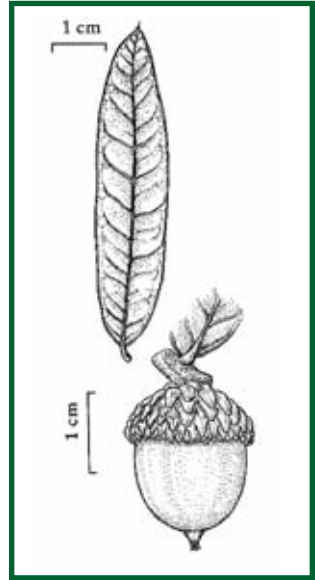


**COMMENTARY:** Dwarf Chinkapin oak can produce acorns at 3 - 5 years. The largest known dwarf chinkapin oak is growing in Richardson County, Nebraska.

## *Quercus pumila* Walter

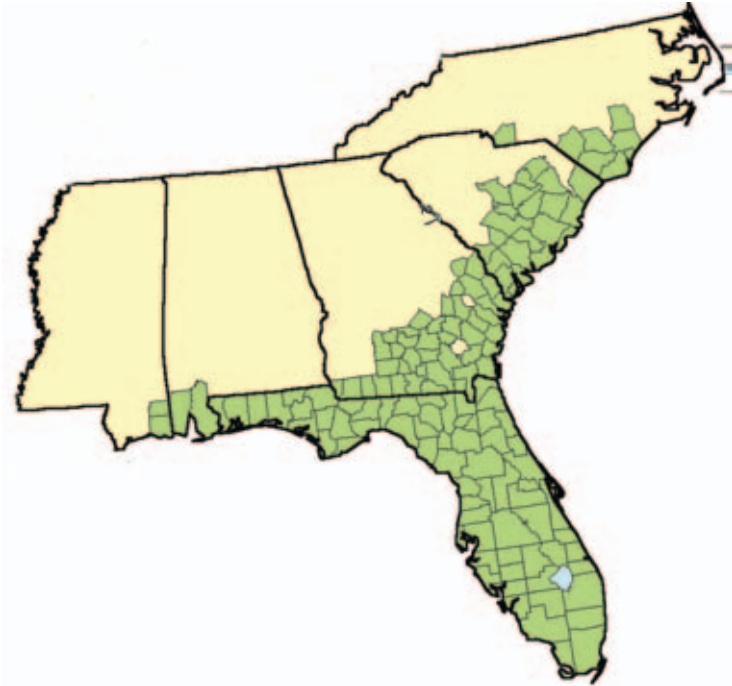
### Runner oak running oak

**GROWTH FORM:** small shrub, which grows to 3 feet (0.9 m); often holds its leaves during winter. **BARK:** gray to dark brown. **TWIGS and BUDS:** brown to chestnut-brown twigs with sparse to dense pubescence; chestnut-brown, ovoid buds, scales with ciliated margins. **LEAVES:** very short pubescent petiole up to  $\frac{1}{4}$  inch (6 mm); oblong to narrowly oblong leaf, 1 - 4 inches (25 - 101 mm) long,  $\frac{3}{8}$  - 1  $\frac{1}{4}$  inches (10 - 32 mm) wide, margin entire with revolute edges, base acute to rounded, apex acute to rounded with bristle; green above with impressed veins, slightly concave below with grayish-brown pubescence. **ACORNS:** annual; deep saucer-shaped cup with pubescent scales, inner surface pubescent, covers up to  $\frac{2}{3}$  of the nut; rounded to broadly oval nut, up to  $\frac{5}{8}$  inch (16 mm) in length.



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**HABITAT:** dry sandy soils on the coastal plain.  
**DISTRIBUTION:** North Carolina to Florida, and west to Mississippi.



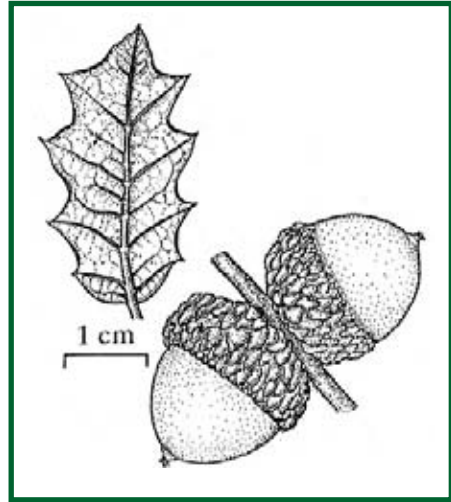
**COMMENTARY:** Runner oak responds with sprouting and increased acorn production when fire is used as a management tool for longleaf pine.

## *Quercus pungens* Liebmann

### Sandpaper oak

pungent oak, scrub live oak,  
encino oak

**GROWTH FORM:** shrub or small tree that grows to a height of 10 feet (3.1 m), evergreen or subevergreen. **BARK:** thin light brown, papery and flaky. **TWIGS and BUDS:** young gray twigs are pubescent and become smooth with age; buds are dark chestnut-brown with sparse pubescence. **LEAVES:** short petiole up to  $\frac{3}{8}$  inch (10 mm) in length; elliptic to oblong leaves,  $\frac{3}{8}$  -  $\frac{3}{4}$  inch (10 - 19 mm) wide, margins usually wavy and coarsely toothed or with spinose lobes; base rounded, apex acute or obtuse with mucronate tip; thick and leathery leaf blade, shiny yellowish-green with minute hairs

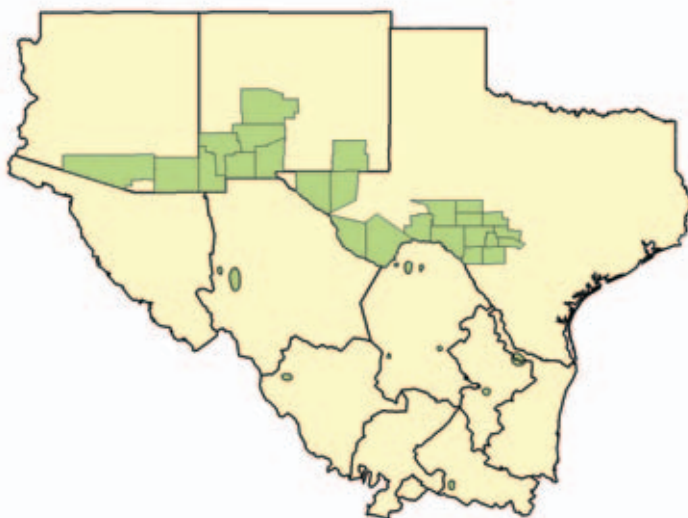


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presenting a rough texture above, dense pubescence mixed with stiff hairs beneath, sandpaper to the touch on both surfaces. **ACORNS:** annual; 1 - 2 sessile or short-stalked peduncle up to  $\frac{1}{8}$  inch (3 mm) long, chestnut-brown, top-shaped cup with gray pubescence, enclosing  $\frac{1}{4}$  of the nut; light brown, ovoid nut, up to  $\frac{1}{2}$  inch (13 mm) long.

**HABITAT:** mountains in the Lower Sonoran Life Zone associated with oak-juniper-pinyon dry woodlands.

**DISTRIBUTION:** Arizona east to Texas, and in northern Mexico (Durango, Chihuahua, Coahuila, Nuevo Leon, Tamaulipas, and San Luis Potosi).



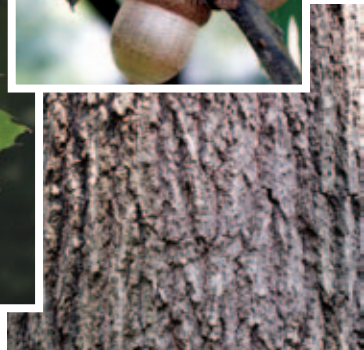
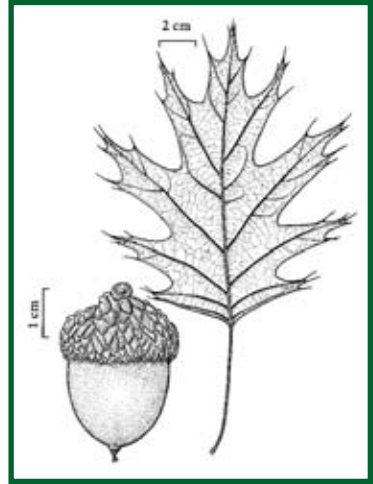
**COMMENTARY:** The rough surface of the leaves is reflected in the common name. Sandpaper oak acorns provide food for birds, javelinas, mule deer, bighorn sheep, and various small mammals.

## *Quercus rubra* Linnaeus

### Northern red oak

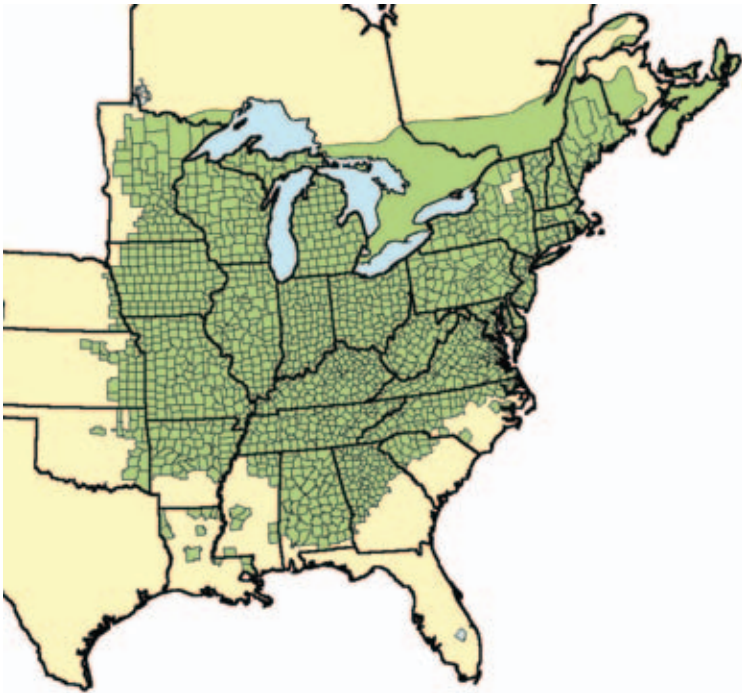
red oak, gray oak, eastern red oak,  
mountain red oak

**GROWTH FORM:** medium to large tree that grows to 100 feet (30.5 m), rounded crown with large branches; fast growing tree that transplants easily, often forming pure stands. **BARK:** mature bark dark gray to black, shallow furrows separating wide scaly ridges, upper trunk has flat, shiny plate-like ridges, inner bark pink. **TWIGS and BUDS:** smooth, reddish-brown twigs; ovoid buds are pointed with pubescent chestnut-brown scales. **LEAVES:** smooth reddish petiole 1 - 2 inches (25 - 51 mm) long; elliptical leaves, 4  $\frac{3}{4}$  - 8 inches (121 - 203 mm) long, 2  $\frac{3}{8}$  - 4  $\frac{3}{4}$  inches (60 - 121 mm) wide, margin with 7 - 11 lobes, each with 1 - 3 bristle-tipped teeth, sinuses are less than  $\frac{1}{2}$  distance to the midrib, base broadly cuneate, apex acute; dull to lustrous dark green above, gray to light yellowish-green below with short axillary tufts of brown tomentum.



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**ACORNS:** biennial; 1 - 2 acorns are stalkless or on a very short peduncle, shallow or deep saucer shaped cup enclosing up to  $\frac{1}{2}$  of nut, reddish-brown pubescent scales with dark margins, inner surface with ring of pubescence around scar; oblong to nearly oval nut,  $\frac{5}{8}$  -  $1\frac{1}{4}$  inches (16 - 32 mm) long, brown with gray stripes. **HABITAT:** variety of moist soils with a loam texture. **DISTRIBUTION:** Quebec and Nova Scotia, south to South Carolina and Georgia, west to Oklahoma, and north to Ontario.



**COMMENTARY:** Northern red oak is the most valuable timber species in the red oak group. It has been used in construction, flooring, and furniture. The British Royal Navy once used it in shipbuilding. With some taxonomic treatments, populations of northern red oak that had leaves with red petioles and smaller acorns were given the varietal designation of *Q. rubra* var. *borealis*. A source of food for wildlife, it starts fruiting at age 25 and produces substantial crops after 50 years. Acorns germinate in the spring following seedfall. Native Americans utilized northern red oak as medicine for numerous ailments. The largest known specimen grows in Monroe County, New York.

## *Quercus shumardii* Buckley

### Shumard oak

spotted oak, swamp oak,  
Schneck oak,  
Schneck red oak,  
Shumard red oak,  
southern red oak,  
swamp red oak

**GROWTH FORM:** one of the largest southern red oaks growing to 150 feet (45.7 m), large round open crown, usually has a clear bole with a buttressed base and shallow root system.

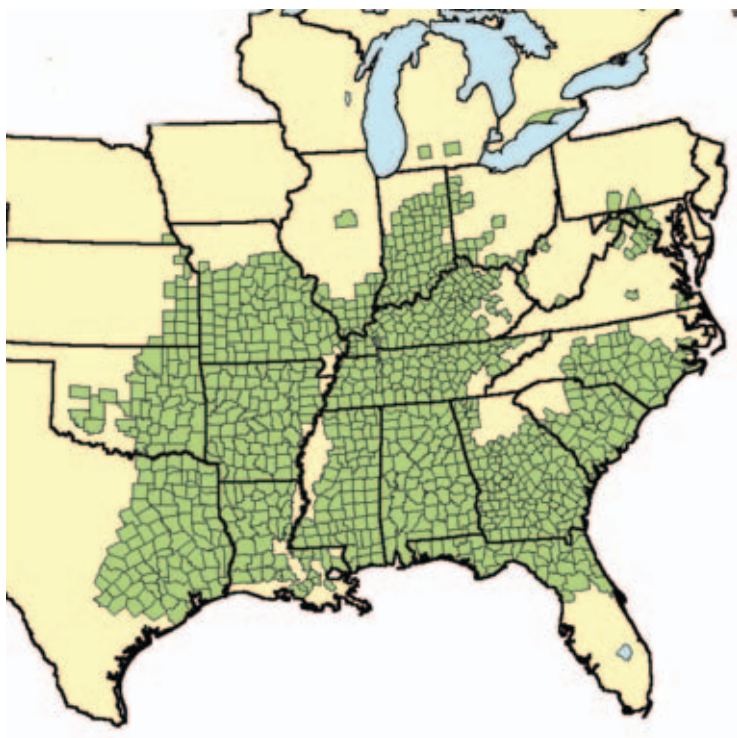
**BARK:** dark gray mature bark, shallow furrows, scaly exposed ridges are lighter gray, inner bark pink. **TWIGS and BUDS:** smooth gray to light brown twigs; ovoid buds with smooth gray scales, 5-angled in cross section. **LEAVES:**

petiole smooth,  
 $\frac{3}{4}$  -  $2\frac{3}{8}$  inches  
(19 - 60 mm);  
broadly elliptical  
leaves, 4 - 8



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inches (101 - 203 mm) long,  $2\frac{3}{8}$  - 6 inches (60 - 152 mm) wide, margin with 5 - 9 lobes with 2 - 5 bristle-tipped teeth, deep sinuses more than half way to midvein, base truncate, apex acute; shiny dark green above, slight luster or dull green beneath with axillary tufts of tomentum, veins raised on both surfaces. **ACORNS:** biennial; 1 - 2 acorns on a peduncle, thick saucer shaped cup with blunt scales, inner surface pubescent around scar, covering up to  $\frac{1}{3}$  of nut; ovoid to broadly oblong, brown mature nut,  $\frac{1}{2}$  -  $1\frac{1}{4}$  inches (13 - 32 mm) long. **HABITAT:** well-drained soils along streams and rivers. **DISTRIBUTION:** Pennsylvania south to Florida, west to Texas, north to Nebraska, and northeast to Michigan and Ontario.



**COMMENTARY:** Named after Benjamin F. Shumard, state geologist of Texas in mid-1800s. Shumard oak produces good quality timber for construction, flooring and furniture, and is often considered more valuable than northern red oak. Moderately fast growing with a shallow root system. The largest known Shumard oak grows in Overton Park Forest, Tennessee.

## *Quercus similis* Ashe

### Swamp post oak

delta post oak, bottomland post oak,  
Mississippi Valley oak, yellow oak

**GROWTH FORM:** medium to large tree grows up to 100 feet (30.5 m).

**BARK:** gray to brown, shallow furrows with narrow scaly ridges. **TWIGS and**

**BUDS:** pubescent yellowish-gray twigs; round chestnut-brown buds with pubescent scales at the base, smooth scales at apex.

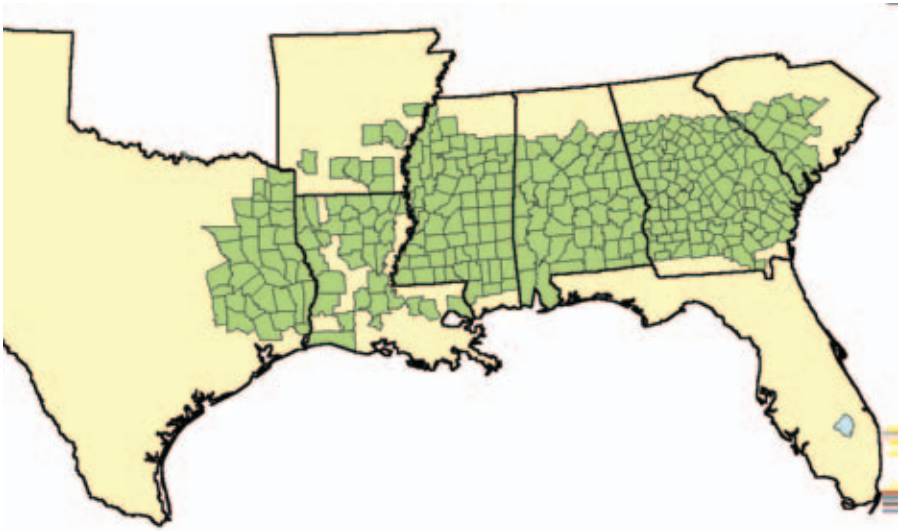
**LEAVES:** short petiole of less than  $\frac{3}{8}$  inch (10 mm); leaves obovate with 4 - 6 lobes, usually 3 lobes above the middle, 3 - 6 inches (75 - 152 mm) long, 2 - 2  $\frac{1}{2}$  inches (51 - 63 mm) wide, base rounded



alternate, apex rounded; glossy dark green above, grayish-green beneath. **ACORNS:** annual; 1 - 3 acorns on a peduncle; cup is gray, rounded cup-shaped with pubescent scales, covers up to  $\frac{1}{2}$  of the nut; ovoid to barrel-shaped nut,  $\frac{5}{8}$  -  $\frac{3}{4}$  inch (16 - 19 mm) long, light brown or chestnut in color.

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**HABITAT:** wet bottomlands; grows in association with *Q. michauxii*, *Q. pagoda*, *Q. shumardii*, ash, hickories, and blackgum. **DISTRIBUTION:** South Carolina west to Texas.



**COMMENTARY:** The largest known swamp post oak grows in Richland Parish, Louisiana.

## *Quercus sinuata* Walter

### Bastard oak

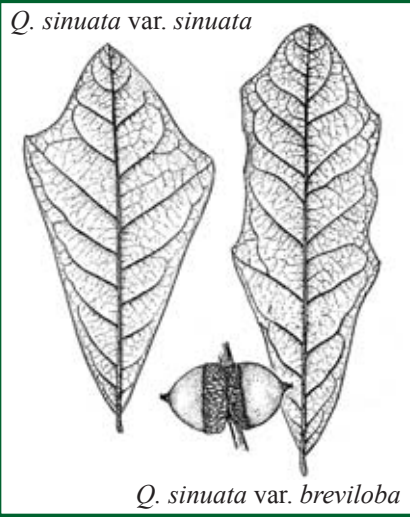
Durand oak, Bigelow oak, bastard white oak, bluff oak, Durand white oak, white shin oak, scrub oak, white oak

**GROWTH FORM:** var. *breviloba* varies from clonal shrub to small tree with occasional specimen that grows to 55 feet (16.8 m); var. *sinuata* small to large tree that grows to 95 feet (28.9 m), with solitary or multiple trunks. **BARK:**

gray to light brown with shallow to deep furrows and scaly ridges; thin barked trees are susceptible to fire.

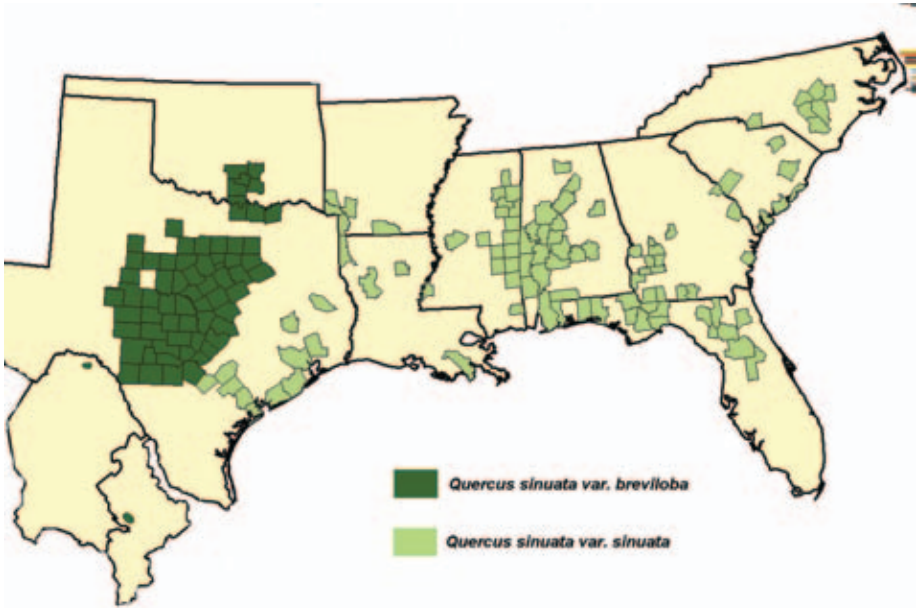
**TWIGS and BUDS:** twigs vary from light gray to chestnut-brown, may have warty surface

(var. *breviloba*); chestnut-brown, ovoid buds with ciliated margins. **LEAVES:** smooth short petiole up to ¼ inch (6 mm) long; thin oblong leaf, 1 ¼ - 4 ¾



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inches (32 - 121 mm) long, 1 - 2  $\frac{3}{8}$  inch (25 - 60 mm) wide, base acute to attenuate-rounded, margin entire or usually with 3 - 9 rounded lobes, apex rounded; dull to shiny dark green above, pubescent grayish-green beneath. **ACORNS:** annual; 1 - 2 acorns on a peduncle up to  $\frac{1}{4}$  inch (6 mm) in length, thin shallow saucer-shaped cup with gray scales, encloses  $\frac{1}{8}$  -  $\frac{1}{4}$  of nut; ovoid or oblong, light brown to chestnut-brown nut,  $\frac{1}{4}$  -  $\frac{3}{4}$  inch (6 - 19 mm) long. **HABITAT:** rich alluvial and limestone soils in woodlands and prairies. **DISTRIBUTION:** var. *sinuata* species from North Carolina and Florida, west to Oklahoma and Texas, south into Mexico; *Quercus sinuata* var. *breviloba* occurs on the Edwards Plateau of Texas southward into Mexico (along the eastern side of the Sierra Madre Oriental) in the states of Coahuila and Nuevo Leon.



**COMMENTARY:** The recorded distribution of *Q. sinuata* var. *sinuata* in North Carolina may be due to the misidentification of *Q. austrina*. The largest known specimen of *Q. sinuata* var. *breviloba* grows in Travis County, Texas, and the largest specimen of *Q. sinuata* var. *sinuata* is found in Stewart County, Georgia.

## *Quercus stellata* Wangenheim

### Post oak iron oak

**GROWTH FORM:** shrub to medium sized tree with a dense rounded crown, slow growing up to 85 feet (25.9 m) under good environmental conditions.

**BARK:** gray with shallow fissures and scaly ridges.

**TWIGS and BUDS:**

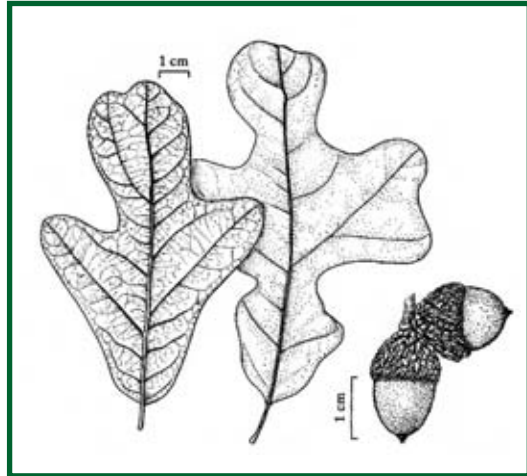
pubescent yellowish-gray

twigs; chestnut-brown, ovoid buds with pubescent scales and a pointed apex.

**LEAVES:** petiole  $\frac{1}{8}$  -  $\frac{5}{8}$  inch (3 - 16 mm) long; thick and leathery obovate leaf,  $1\frac{1}{2}$  - 6 inches (38 - 152 mm) long,  $\frac{3}{4}$  - 4 inches (19 - 101 mm) wide, margins with 5 - 7 shallow to deep lobes, middle lobes are opposite and resemble a Maltese Cross, base attenuate-rounded, apex rounded; dull or shiny dark green above with rough texture, pubescent yellowish to gray-green beneath, star-shaped hairs.

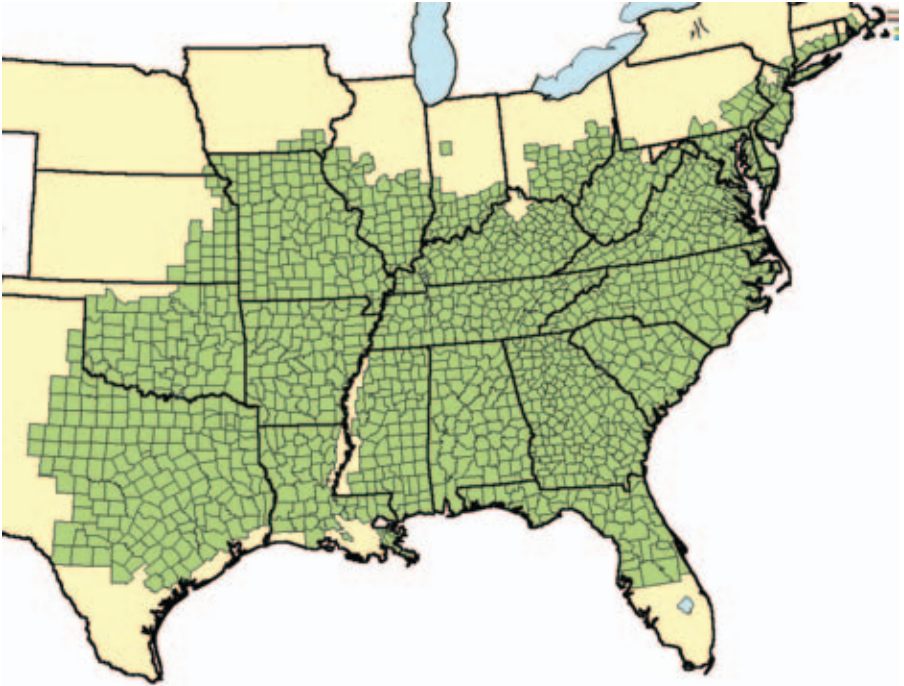
**ACORNS:** annual;

1 - 3 acorns on peduncle to  $\frac{1}{4}$  inch (6 mm), top-shaped or saucer-shaped thin cup with gray pubescent scales,





enclosing  $\frac{1}{4}$  -  $\frac{2}{3}$  of the nut; rounded, light brown nut, may have dark brown faint strips,  $\frac{3}{8}$  -  $\frac{3}{4}$  inch (10 - 19 mm) long. **HABITAT:** occurs on poor upland clay and sandy soils. **DISTRIBUTION:** Massachusetts south to Florida, west to Texas, north to Iowa, and east to Pennsylvania.



**COMMENTARY:** Post oak is a valuable timber species marketed as white oak. Post oak is drought resistant and can be used on drier sites in the landscape plantings. The extreme western populations in Oklahoma and Texas, existing in harsh conditions, are usually shrubs or small trees. The common name derives from its use as fence posts. Native Americans used post oak as medication. The largest known specimens are growing in Jackson County, Georgia and Surry County, Virginia.

## *Quercus texana* Buckley

### Texas red oak

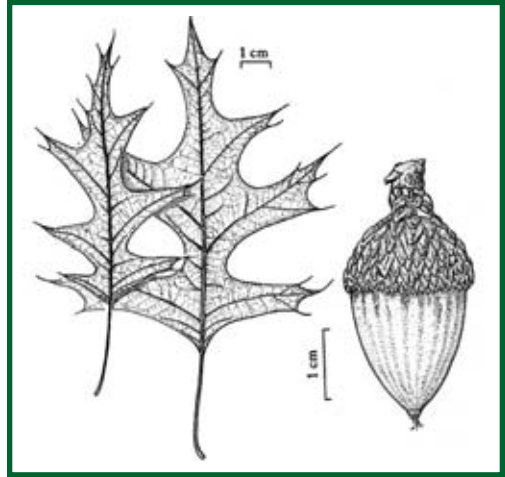
Nuttall oak, red oak,  
Red River oak, pin oak,  
striped oak

**GROWTH FORM:** medium to large tree, which grows to 115 feet (35 m), fast growing with an open crown.

**BARK:** gray-brown to dark brown with shallow fissures and flat ridges. **TWIGS**

**and BUDS:** smooth, gray to chestnut-brown twigs; grayish-brown, ovoid bud,

often with ciliated scales at bud apex. **LEAVES:** smooth petiole from  $\frac{3}{4}$  - 2 inches (19 - 51 mm) long; ovate to obovate leaf margins with 5 - 11 lobes, each lobe with 1 - 3 bristle-tipped teeth; 3 - 8 inches (76 - 203 mm) long, 2  $\frac{1}{4}$  - 5  $\frac{1}{4}$  inches (57 - 133 mm) wide, base almost truncate, apex acute ending in a bristle, lobes separated by deep sinuses, lobes at midleaf are usually opposite; smooth dark

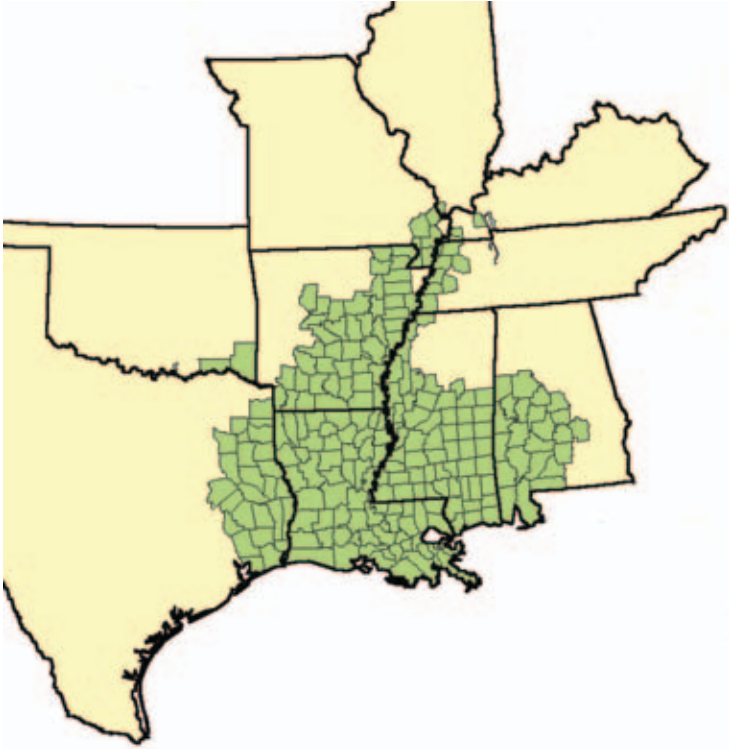


green above, pale green below with axillary tufts of tomentum.

**ACORNS:** biennial; solitary or clustered acorns on peduncle, goblet-shaped thin cup with pubescent

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inner and outer surface, covers  $\frac{1}{3}$  -  $\frac{1}{2}$  of the nut; chestnut-brown, egg-shaped nut with faint strips,  $\frac{5}{8}$  - 1 inch (16 - 25 mm) in length, may be pubescent. **HABITAT:** wet clay soils along streams. **DISTRIBUTION:** lower Mississippi Valley from Alabama west to Texas and Oklahoma, and northeast to Illinois and Kentucky.



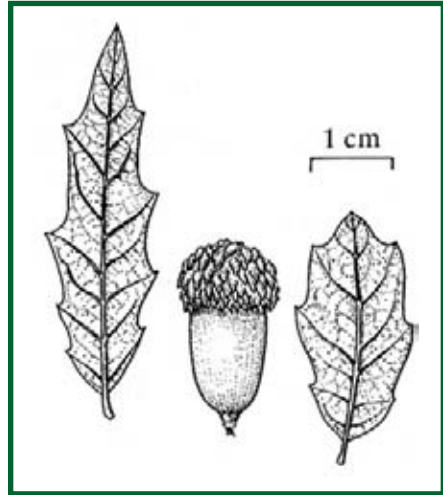
**COMMENTARY:** Prior to 1927, there was confusion regarding the taxonomic status of Texas red oak. *Quercus texana* has been applied to *Q. buckleyi* and *Q. gravesii*, or considered to be *Q. nuttallii*, or varietal forms of *Q. shumardii* and *Q. rubra*. The largest known Texas red oak specimens are growing in Washington County, Mississippi and in Morehouse Parish, Louisiana.

## *Quercus vaseyana* Buckley

**Vasey oak**  
shin oak, scrub oak

**GROWTH FORM:** shrub or small tree, which grows to 50 feet (15.2 m), evergreen or subevergreen. **BARK:** dark brown, furrowed and shedding in long strips. **TWIGS and BUDS:** pubescent red to grayish-brown twigs; reddish-brown or gray, ovoid buds with obtuse apex, sparsely pubescent to smooth scales with ciliated margins.

**LEAVES:** petiole up to  $\frac{1}{4}$  inch (6 mm) in length; oblong to narrowly lanceolate leaves,  $\frac{3}{4}$  -  $2\frac{1}{2}$  inches (19 - 63 mm) long,  $\frac{3}{8}$  -  $\frac{3}{4}$  inch (10 - 19 mm) wide, margin is entire or mucronate-tipped 6 - 10 shallow lobes, lobes acute to obtuse; base obtuse to rounded, apex acute or rounded; leaf blade leathery and may be slightly convex, shiny dark green above, pale densely pubescent beneath. **ACORNS:**

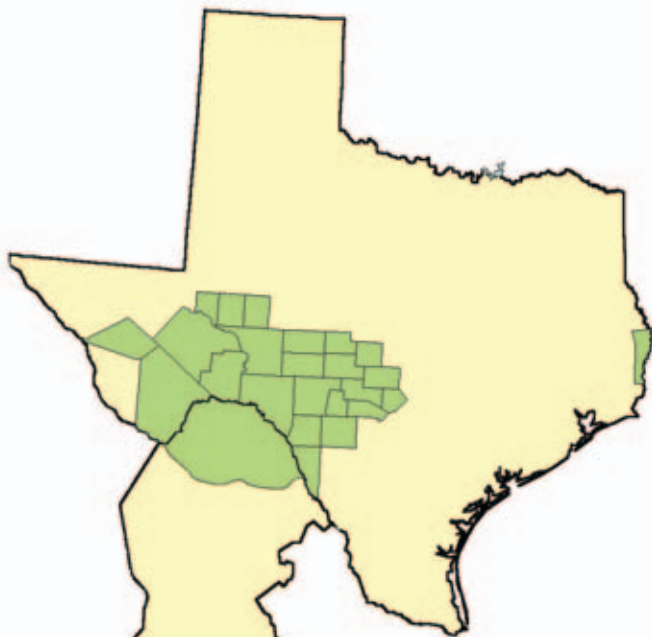


annual; 1 - 2 acorns are sessile or on a short peduncle up to  $\frac{1}{8}$  inch (3 mm) long, reddish-brown cup, enclosing up to  $\frac{1}{4}$  of the nut; shiny light chestnut-brown, ellipsoidal or oblong nut, up to  $\frac{3}{4}$  inch (19 mm) long.

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**HABITAT:** limestone slopes and ridges in mesquite and juniper woodlands.

**DISTRIBUTION:** the pinyon-juniper forests of western Texas and northern Mexico (Coahuila).



**COMMENTARY:** Vasey oak acorns are a food source for wildlife and the wood is used as fuel. The largest known specimens are growing in Big Bend National Park, Brewster County, Texas and in Val Verde County, Texas.

## *Quercus velutina* Lamarck

### Black oak

yellow oak, quercitron oak,  
yellow-bark oak, smooth-bark oak

**GROWTH FORM:** medium to large tree, 50 - 110 feet (15.2 - 33.5 m) in height, open and wide spreading crown. **BARK:** thick dark brown to black bark with deep furrows, rough ridges, yellow or orange inner bark. **TWIGS and BUDS:** smooth to pubescent chestnut-brown twigs, pith star-shaped; ovoid buds with tan pubescence, 5-angled in cross sections. **LEAVES:** petiole 1 - 2  $\frac{3}{4}$  inches (25 - 70 mm) long, may have sparse pubescence; obovate leaf outline, 4 - 11  $\frac{3}{4}$  inches (101 - 298 mm) long, 3 - 6 inches (75 - 153 mm) wide, margin has 5 - 9 lobes ending in 1 - 4 bristle-tipped teeth, base obtuse to truncate, apex acute; glossy dark green to yellow green above, pale green with scurfy pubescence and axillary tomentum beneath, raised secondary veins on both surfaces. The pubescence



is shed during late summer.

**ACORNS:** biennial; 1 - 2 short stalked acorns on short peduncle; reddish-brown pubescent cup, thick top-shaped with fringed edge, pubescent inner surface covers up to

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½ of nut; ovoid to elliptical nut, up to ¾ inch (19 mm) long, light reddish-brown with faint stripes. Nut germination is in the spring following seedfall.

**HABITAT:** dry uplands but grows best on lower slopes in rich well-drained soils.

**DISTRIBUTION:** Maine west through Ontario to Minnesota, and south to Texas and Florida.



**COMMENTARY:** Black oak is a valuable timber species marketed as other red oaks. The bark was once used as a source for the yellow dye, quercitron, and for tannins to tan leather. Acorns are a food source for turkey, ruffed grouse, songbirds, deer, squirrels, and other small mammals. Black oaks begin to produce acorns at age 20, with optimum production at 40 - 75 years. The largest known specimen occurs in Westmoreland County, Virginia.

## *Quercus virginiana* Miller

### Southern live oak

live oak, Virginia live oak,  
Spanish oak

**GROWTH FORM:** varies in form from a rhizomatous shrub to a large tree of 80 feet (24.4 m), trees having a dense spreading crown, trunk buttressed at the base, evergreen with leaves dropping after initial growth in the spring. **BARK:** dark brown to black, deep furrows with scaly ridges. **TWIGS and BUDS:** pubescent gray juvenile twigs, smooth older twigs; reddish-brown, ovate buds with gray scale margins may have pubescence. **LEAVES:** short petiole up to  $\frac{3}{8}$  inch (10 mm) in length; thick oblong leaf with a revolute margin, 1  $\frac{3}{8}$  - 4 inches (35 - 101 mm) long,  $\frac{3}{4}$  - 2 inches (19 - 51 mm) wide, margin entire, base cuneate to rounded, apex rounded and may have bristled tip; shiny light



to dark green above, grayish-green and densely pubescent beneath.



**ACORNS:** annual: 1 - 3 acorns on

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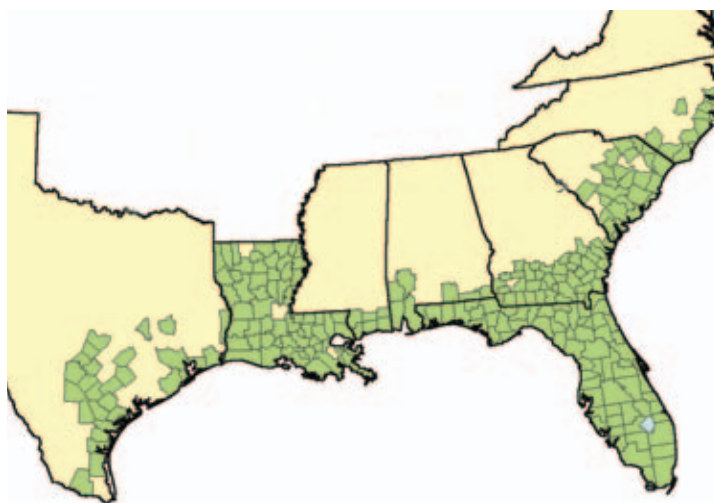
peduncle  $\frac{3}{8}$  -  $\frac{3}{4}$  inch (10 - 19 mm) long; deep goblet-shaped cup, scales are light gray with reddish tips and often pubescent, enclosing  $\frac{1}{4}$  -  $\frac{1}{2}$  of the nut; mature



nut is dark brown to almost black narrowly oblong,  $\frac{5}{8}$  - 1 inch (16 - 25 mm) in length. **HABITAT:** sandy soils in the lower Coastal Plain.

**DISTRIBUTION:** Virginia, south to Florida, and west to Texas.

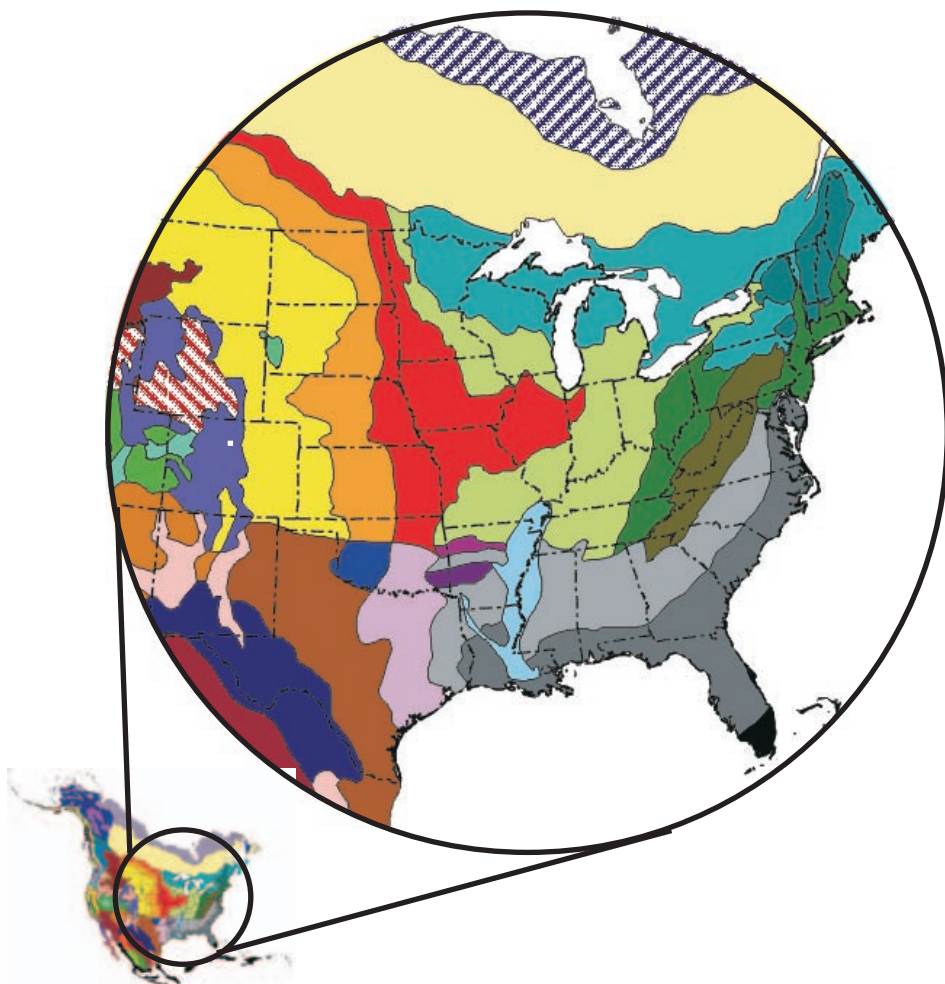
**COMMENTARY:** Southern live oak is a valuable timber species



with tough dense wood, difficult to saw and dry, but suitable for construction, shipbuilding, and firewood. The first publicly owned forestland, at the end of the eighteenth century, was for the purpose of preserving the supply of southern live oak for the Navy's shipbuilding needs. Many of these oaks have been designated as 'Historic Trees' throughout the South. The Houma tribe used this oak to cure dysentery. The largest known specimens are growing in Mandeville, St. Tammany Parish, Louisiana and in Ware County, Georgia. Each of these champion trees have canopies that cover approximately  $\frac{1}{3}$  acre.

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## ECOSYSTEMS OF EASTERN NORTH AMERICA\*



























\* Bailey, Robert G. 1998. Ecoregions map of North America: Explanatory note. Misc. Publ. 1548. Washington, DC: USDA Forest Service. 10 p.

[www.fs.fed.us/institute/ecolink.html](http://www.fs.fed.us/institute/ecolink.html)

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## Ecoregion Province Legend

	132	Taiga (boreal forests)
	211	Mixed deciduous-coniferous forests
	M211b	Mixed forest - coniferous forest - tundra, high
	221a	Broadleaved forests, oceanic
	221b	Broadleaved forests, continental
	M221	Deciduous or mixed forest - coniferous forest - meadow
	M222	Broadleaf forest - meadow
	231	Broadleaved-coniferous evergreen forests
	M231	Mixed forest - meadow
	232	Coniferous-broadleaved semi-evergreen forests
	251	Forest-steppes and prairies
	252	Prairies and savannas
	M311	Steppe or semidesert - mixed forest - alpine meadow or steppe
	313	Steppes and shrubs
	314	Shortgrass steppes
	321	Semideserts
	M321	Semidesert - shrub - open woodland - steppe or alpine meadow*
	323	Deserts on sand
	331	Steppes
	332	Dry steppes
	M333	Steppe - coniferous forest
	411	Open woodlands, shrubs, and savannas
	M411	Open woodland - deciduous forest - coniferous forest - steppe or meadow*
	R	Riverine or floodplain forest along the banks of a river

\* Not shown on map

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## SPECIES SUMMARY



This “Treaty Oak” is a southern live oak (*Q. virginiana*) located at Jessie Ball duPont Park, Jacksonville, Florida. Folklore attributes this oak as a treaty site for Native Americans in northeastern Florida. This tree has a crown that covers approximately 1/4 acre. (Photo, J. Stein)

**Table 1. Native Red Oaks**

<i>Quercus</i> Species	Comments
<p><i>acerifolia</i> Maple-leaf oak</p>	<p>Very limited area in state of AR on mountain slopes and ridge tops. Listed as ‘endangered’ by IUCN*. Synonymy: <i>Q. shumardii</i> in part.</p> <p><b>M231</b></p>
<p><i>arkansana</i> Arkansas oak, Arkansas water oak, water oak</p>	<p>Rare. Localized on well-drained sandy soils in the states of AR, LA, AL, GA, FL, and TX. Listed as ‘endangered’ in FL; ‘rare’ in AR; and ‘vulnerable’ in AL, GA, and LA by IUCN*. Synonymy: <i>Q. caput-rivuli</i>.</p> <p><b>231</b> <b>232</b> <b>R</b></p>
<p><i>buckleyi</i> Buckley oak, Texas red oak, Spanish oak, spotted oak</p>	<p>Found on limestone ridges, slopes, and creek bottoms in the states of OK and TX. Synonymy: <i>Q. texana</i>, <i>Q. rubra</i> in part, <i>Q. shumardii</i> in part.</p> <p><b>252</b> <b>313</b> <b>314</b></p>
<p><i>coccinea</i> Scarlet oak, black oak, red oak, Spanish oak</p>	<p>Found on poor soils in the eastern United States. Used as a landscape tree.</p> <p><b>211</b> <b>M211b</b> <b>221a</b> <b>221b</b> <b>M221</b> <b>231</b> <b>232</b></p> <p><b>R</b></p>
<p><i>ellipsoidalis</i> Northern pin oak, jack oak, Hill’s oak, black oak</p>	<p>Northcentral North America on sandy sites.</p> <p><b>211</b> <b>221b</b> <b>251</b></p>

\* (IUCN) International Union for Conservation of Nature and Natural Resources

**Table 1. Native Red Oaks (cont.)**

<i>Quercus</i> Species	Comments
<p><i>falcata</i></p> <p><b>Southern red oak</b>, Spanish oak, swamp red oak, water oak, turkey-foot oak</p>	<p>In dry upland conditions on sandy or clay loam soils in the southern half of the eastern United States. Synonymy: <i>Q. digitata</i>.</p> <p>221a 221b M221 M222 231 M231 232</p> <p>252 314 R</p>
<p><i>georgiana</i></p> <p><b>Georgia oak</b></p>	<p>Small trees on granitic outcrops in the states of GA, AL, and SC.</p> <p>232</p>
<p><i>hemisphaerica</i></p> <p><b>Laurel oak</b>, Darlington oak</p>	<p>On sandy soils in the southern United States.</p> <p>231 232 R</p>
<p><i>ilicifolia</i></p> <p><b>Bear oak</b>, scrub oak</p>	<p>Small trees/shrubs on disturbed sandy or rocky sites in the northeastern United States. Synonymy: <i>Q. nana</i>.</p> <p>211 M211b 221a M221</p>
<p><i>imbricaria</i></p> <p><b>Shingle oak</b>, laurel oak</p>	<p>Dry to mesic sites in the mid-eastern and central United States.</p> <p>221a 221b M221 M222 231 M231 232</p> <p>251 R</p>
<p><i>incana</i></p> <p><b>Bluejack oak</b>, sandjack oak, upland willow oak, cinnamon oak, shin oak, turkey oak</p>	<p>Small trees on dry sandy soils in the southeastern United States. Synonymy: <i>Q. cinerea</i>.</p> <p>231 M231 232 252 R</p>

**Table 1. Native Red Oaks (cont.)**

<i>Quercus</i> Species	Comments
<i>inopina</i>  Florida oak	Deep sandy ridges and terraces in central FL.  231
<i>laevis</i>  Turkey oak, Catesby oak, Coastal Plain scrub oak, scrub oak, turkey-foot oak	Dry sandy soils in the southeastern United States. Synonymy: <i>Q. catesbaei</i> .  231 232 411
<i>laurifolia</i>  Swamp laurel oak, laurel oak, Darlington oak, diamond-leaf oak, laurel-leaf oak, water oak, obtuse oak	Southeastern United States. Synonymy: <i>Q. obtusa</i> , <i>Q. rhombica</i> .  221b 231 232 252 314 411 R
<i>marilandica</i>  Blackjack oak, barren oak, black oak, jack oak	Deep sands and shallow soils in southcentral and eastern North America.  221a 221b M221 M222 231 M231 232 251 252 313 314 331
<i>myrtifolia</i>  Myrtle oak, scrub oak	Small trees/shrubs on sandy areas in the states of AL, FL, GA, MS, and SC.  231 411

**Table 1. Native Red Oaks (cont.)**

<i>Quercus</i> Species	Comments
<p><i>nigra</i></p> <p><b>Water oak</b>, possum oak, spotted oak, pin oak, red oak</p>	<p>On moist or wet soils from the southeastern United States to the state of TX. Synonymy: <i>Q. nana</i>, <i>Q. uliginosa</i>.</p> <p>221a 221b M221 M222 231 M231 232</p> <p>252 411 R</p>
<p><i>pagoda</i></p> <p><b>Cherrybark oak</b>, bottomland red oak, red oak, swamp red oak, swamp Spanish oak, Elliott oak, scalybark oak</p>	<p>On well-drained lowland soil in the southeastern United States. Synonymy: <i>Q. falcata</i> in part, <i>Q. leucophylla</i>, <i>Q. pagodifolia</i>.</p> <p>221a 221b 231 232 R</p>
<p><i>palustris</i></p> <p><b>Pin oak</b>, swamp oak, Spanish oak, swamp Spanish oak, water oak</p>	<p>Poorly drained, clay soils in mid-central and eastern United States and Canada.</p> <p>211 M211b 221a 221b M221 M222 231</p> <p>232 251 R</p>
<p><i>phellos</i></p> <p><b>Willow oak</b>, pin oak, peach oak, swamp willow oak, black oak</p>	<p>On flood plains and moist soils of the central and southern United States. Popular shade tree in the southeastern United States.</p> <p>221a 221b M221 M222 231 M231 232</p> <p>252 R</p>
<p><i>pumila</i></p> <p><b>Runner oak</b>, running oak</p>	<p>Shrubs on dry sandy soils in the southeastern United States.</p> <p>231 232 411</p>

**Table 1. Native Red Oaks (cont.)**

<i>Quercus</i> Species	Comments
<p><i>rubra</i></p> <p><b>Northern red oak</b>, red oak, gray oak, eastern red oak, mountain red oak</p>	<p>On moist soils in eastern North America. Synonymy: <i>Q. borealis</i>, <i>Q. maxima</i>.</p> <p>132 211 M211b 221a 221b M221 M222</p> <p>231 M231 232 251 252 R</p>
<p><i>shumardii</i></p> <p><b>Shumard oak</b>, spotted oak, swamp oak, Schneck oak, Schneck red oak, Shumard red oak, southern red oak, swamp red oak</p>	<p>On well-drained soils in the southern half of central and eastern North America. Synonymy: <i>Q. schneckii</i>.</p> <p>211 221a 221b M221 M222 231 M231</p> <p>232 251 252 313 R</p>
<p><i>texana</i></p> <p><b>Texas red oak</b>, Nuttall oak, red oak, Red River oak, pin oak, striped oak</p>	<p>Distribution on wet clay soils in the southern United States. Synonymy: <i>Q. buckleyi</i>, <i>Q. gravesii</i>, <i>Q. nuttallii</i>, <i>Q. rubra</i> in part, <i>Q. shumardii</i> in part.</p> <p>221b M222 231 M231 232 252 R</p>
<p><i>velutina</i></p> <p><b>Black oak</b>, yellow oak, quercitron oak, yellow-bark oak, smooth-bark oak</p>	<p>Found from dry uplands to rich soils on lower slopes in central and eastern North America. Synonymy: <i>Q. tinctoria</i>.</p> <p>211 M211b 221a 221b M221 M222 231</p> <p>M231 232 251 252 313 R</p>

**Table 2. Native White Oaks**

<i>Quercus</i> Species	Comments
<p><i>alba</i></p> <p><b>White oak</b>, eastern white oak, stave oak, forked-leaf white oak</p>	<p>On deep, well-drained soils in central and eastern North America.</p> <p>211 M211b 221a 221b M221 M222 231</p> <p>M231 232 251 R</p>
<p><i>austrina</i></p> <p><b>Bastard white oak</b>, bluff oak</p>	<p>Well-drained lowland areas and hardwood hummocks in the states of AL, FL, GA, MS, NC, and SC. Synonymy: <i>Q. durandii</i> in part.</p> <p>231 232 R</p>
<p><i>bicolor</i></p> <p><b>Swamp white oak</b>, white oak</p>	<p>Moist soils in northcentral and northeastern forests. Synonymy: <i>Q. platanoides</i>.</p> <p>211 M211b 221a 221b M221 231 232</p> <p>251 R</p>
<p><i>boyntonii</i></p> <p><b>Boynton oak</b></p>	<p>Rare; associated with sandstone outcrops in the states of AL and TX. Listed as ‘endangered’ by IUCN*. Synonymy: <i>Q. stellata</i> in part.</p> <p>232</p>
<p><i>chapmanii</i></p> <p><b>Chapman oak</b>, Chapman white oak, scrub oak</p>	<p>Xerophytic conditions on sand near coastal FL, GA, and SC.</p> <p>231 411</p>

\* (IUCN) International Union for Conservation of Nature and Natural Resources

**Table 2. Native White Oaks (cont.)**

<i>Quercus</i> Species	Comments
<p><i>fusiformis</i></p> <p><b>Texas live oak</b>, scrub live oak, live oak</p>	<p>On loam or sandy gravel in the states of TX and OK, and in Mexico (Coahuila, Nuevo Leon, Tamaulipas). Synonymy: <i>Q. virginiana</i> in part.</p> <p>252 M311 313 314 321 323</p>
<p><i>geminata</i></p> <p><b>Sand live oak</b></p>	<p>Small trees/shrubs on deep sandy soils in the southern United States. Synonymy: <i>Q. virginiana</i> in part.</p> <p>231 411</p>
<p><i>havardii</i></p> <p><b>Havard oak</b>, shin oak, shinnery</p>	<p>Low shrubs on deep sand dunes in the states of NM, OK, and TX.</p> <p>313 314 321 323 331</p>
<p><i>laceyi</i></p> <p><b>Lacey oak</b>, canyon oak, smoky oak, rock oak</p>	<p>On limestone hills, woodlands, and riparian forests in the state of TX and in Mexico (Coahuila, Nuevo Leon, Tamaulipas). Synonymy: <i>Q. breviloba</i>, <i>Q. glaucoides</i>.</p> <p>M311 314 321 323</p>
<p><i>lyrata</i></p> <p><b>Overcup oak</b>, swamp post oak, water white oak, swamp white oak</p>	<p>Wet lowlands in the southern United States. Synonymy: <i>Q. bicolor</i> in part.</p> <p>221a 221b M222 231 232 251 252</p> <p>R</p>

**Table 2. Native White Oaks (cont.)**

<i>Quercus</i> Species	Comments
<p><i>macrocarpa</i></p> <p><b>Bur oak</b>, mossy-cup oak, blue oak, prairie oak, mossy-overcup oak</p>	<p>On limestone or calcareous clay soils in central North America. Synonymy: <i>Q. mandanensis</i>.</p> <p>132 211 M211b 221a 221b M221 M222            232 251 252 313 314 331 332            M333 R</p>
<p><i>margaretta</i></p> <p><b>Sand post oak</b>, dwarf post oak, runner oak, scrubby oak, post oak</p>	<p>Small trees/shrubs on deep sand or gravel in the southeastern United States. Synonymy: <i>Q. minor</i> in part, <i>Q. stellata</i> in part.</p> <p>221b 231 M231 232 252 313 314            R</p>
<p><i>michauxii</i></p> <p><b>Swamp chestnut oak</b>, basket oak, cow oak</p>	<p>On moist alluvial soils from the state of VA to TX. Synonymy: <i>Q. brayi</i>, <i>Q. houstoniana</i>, <i>Q. prinus</i> in part.</p> <p>221a 221b 231 M231 232 252 314            R</p>
<p><i>minima</i></p> <p><b>Dwarf live oak</b>, minimal oak</p>	<p>Found on deep sandy soils in the southeastern United States. Synonymy: <i>Q. virens</i> in part, <i>Q. virginiana</i> in part.</p> <p>231 411 R</p>
<p><i>mohriana</i></p> <p><b>Mohr oak</b>, shin oak, scrub oak</p>	<p>Found on limestone hills in the states of NM, OK, and TX, and in Mexico (Coahuila).</p> <p>313 314 321 323 332</p>

**Table 2. Native White Oaks (cont.)**

<i>Quercus</i> Species	Comments
<p><i>montana</i></p> <p><b>Chestnut oak, rock chestnut oak, mountain chestnut oak, rock oak, tanbark oak</b></p>	<p>Shallow upland soils in eastern North America. Synonymy: <i>Q. prinus</i>.</p> <p style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">211</span> <span style="border: 1px solid black; padding: 2px;">M211b</span> <span style="border: 1px solid black; padding: 2px;">221a</span> <span style="border: 1px solid black; padding: 2px;">221b</span> <span style="border: 1px solid black; padding: 2px;">M221</span> <span style="border: 1px solid black; padding: 2px;">232</span> <span style="border: 1px solid black; padding: 2px;">R</span> </p>
<p><i>muehlenbergii</i></p> <p><b>Chinkapin oak, chestnut oak, yellow chestnut oak, yellow oak, rock chestnut oak, rock oak</b></p>	<p>Limestone soils in central and eastern North America, and in Mexico (Chihuahua, Coahuila, Nuevo Leon, Tamaulipas). Synonymy: <i>Q. acuminata</i>.</p> <p style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">211</span> <span style="border: 1px solid black; padding: 2px;">M211b</span> <span style="border: 1px solid black; padding: 2px;">221a</span> <span style="border: 1px solid black; padding: 2px;">221b</span> <span style="border: 1px solid black; padding: 2px;">M221</span> <span style="border: 1px solid black; padding: 2px;">M222</span> <span style="border: 1px solid black; padding: 2px;">231</span>  <span style="border: 1px solid black; padding: 2px;">M231</span> <span style="border: 1px solid black; padding: 2px;">232</span> <span style="border: 1px solid black; padding: 2px;">251</span> <span style="border: 1px solid black; padding: 2px;">252</span> <span style="border: 1px solid black; padding: 2px;">M311</span> <span style="border: 1px solid black; padding: 2px;">313</span> <span style="border: 1px solid black; padding: 2px;">314</span>  <span style="border: 1px solid black; padding: 2px;">321</span> <span style="border: 1px solid black; padding: 2px;">323</span> <span style="border: 1px solid black; padding: 2px;">331</span> <span style="border: 1px solid black; padding: 2px;">R</span> </p>
<p><i>oglethorpensis</i></p> <p><b>Oglethorpe oak</b></p>	<p>Local distribution on rich soils in the states of SC, LA, MS, and GA. Listed as ‘vulnerable’ by the IUCN*.</p> <p style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">232</span> </p>
<p><i>prinoides</i></p> <p><b>Dwarf chinkapin oak, scrub chestnut oak</b></p>	<p>Small trees/shrubs on dry rocky soils from the mid-central United States to the northeastern United States and Canada.</p> <p style="text-align: center;"> <span style="border: 1px solid black; padding: 2px;">211</span> <span style="border: 1px solid black; padding: 2px;">M211b</span> <span style="border: 1px solid black; padding: 2px;">221a</span> <span style="border: 1px solid black; padding: 2px;">221b</span> <span style="border: 1px solid black; padding: 2px;">M221</span> <span style="border: 1px solid black; padding: 2px;">M222</span> <span style="border: 1px solid black; padding: 2px;">231</span>  <span style="border: 1px solid black; padding: 2px;">M231</span> <span style="border: 1px solid black; padding: 2px;">232</span> <span style="border: 1px solid black; padding: 2px;">251</span> <span style="border: 1px solid black; padding: 2px;">252</span> <span style="border: 1px solid black; padding: 2px;">313</span> <span style="border: 1px solid black; padding: 2px;">331</span> <span style="border: 1px solid black; padding: 2px;">R</span> </p>

**Table 2. Native White Oaks (cont.)**

<i>Quercus</i> Species	Comments
<p><i>pungens</i></p> <p><b>Sandpaper oak,</b> pungent oak, scrub live oak, encino oak</p>	<p>Trees/shrubs on dry limestone or igneous slopes in the states of AZ, NM, and TX, and in Mexico (Chihuahua, Coahuila, Nuevo Leon, Tamaulipas). Synonymy: <i>Q. undulata</i> in part.</p> <p>M311 314 321 M321 323 M411</p>
<p><i>similis</i></p> <p><b>Swamp post oak,</b> delta post oak, bot- tomland post oak, Mississippi Valley oak, yellow oak</p>	<p>Found on wet soils in the southeastern United States. Synonymy: <i>Q. ashei</i>, <i>Q. stellata</i> in part.</p> <p>231 232 252 R</p>
<p><i>sinuata</i></p> <p>var. <i>breviloba</i></p> <p>var. <i>sinuata</i></p> <p><b>Bastard oak,</b> Durand oak, Bigelow oak, bastard white oak, bluff oak, Durand white oak, white shin oak, scrub oak, white oak</p>	<p>var. <i>breviloba</i>: Limestone hills and prairies in TX and Mexico (Coahuila, Nuevo Leon, Tamaulipas).</p> <p>252 M311 314 321</p> <p>var. <i>sinuata</i>: Wet and riparian areas in the southeastern United States. Synonymy: <i>Q. annulata</i>, <i>Q. breviloba</i>, <i>Q. durandii</i> in part, <i>Q. obtusifolia</i> in part, <i>Q. san-sabeana</i>.</p> <p>231 232 252 R</p>
<p><i>stellata</i></p> <p><b>Post oak,</b> iron oak</p>	<p>Poor upland sites in the southern United States. Synonymy: <i>Q. minor</i>, <i>Q. obtusiloba</i>.</p> <p>221a 221b M221 M222 231 M231 232</p> <p>251 252 313 314 331 332 R</p>

**Table 2. Native White Oaks (cont.)**

<i>Quercus</i> Species	Comments
<p><i>vaseyana</i></p> <p>Vasey oak, shin oak, scrub oak</p>	<p>Small trees/shrubs on dry limestone slopes in the state of TX, and in northern Mexico (Chihuahua, Coahuila, Nuevo Leon).                      Synonymy: <i>Q. pungens</i> in part, <i>Q. undulata</i> in part.</p> <p>231 314 321</p>
<p><i>virginiana</i></p> <p>Southern live oak, live oak, Virginia live oak, Spanish oak</p>	<p>On loam and clay soils in the southern United States, along the Coastal Plain from TX to VA.</p> <p>231 232 252 314 411 R</p>

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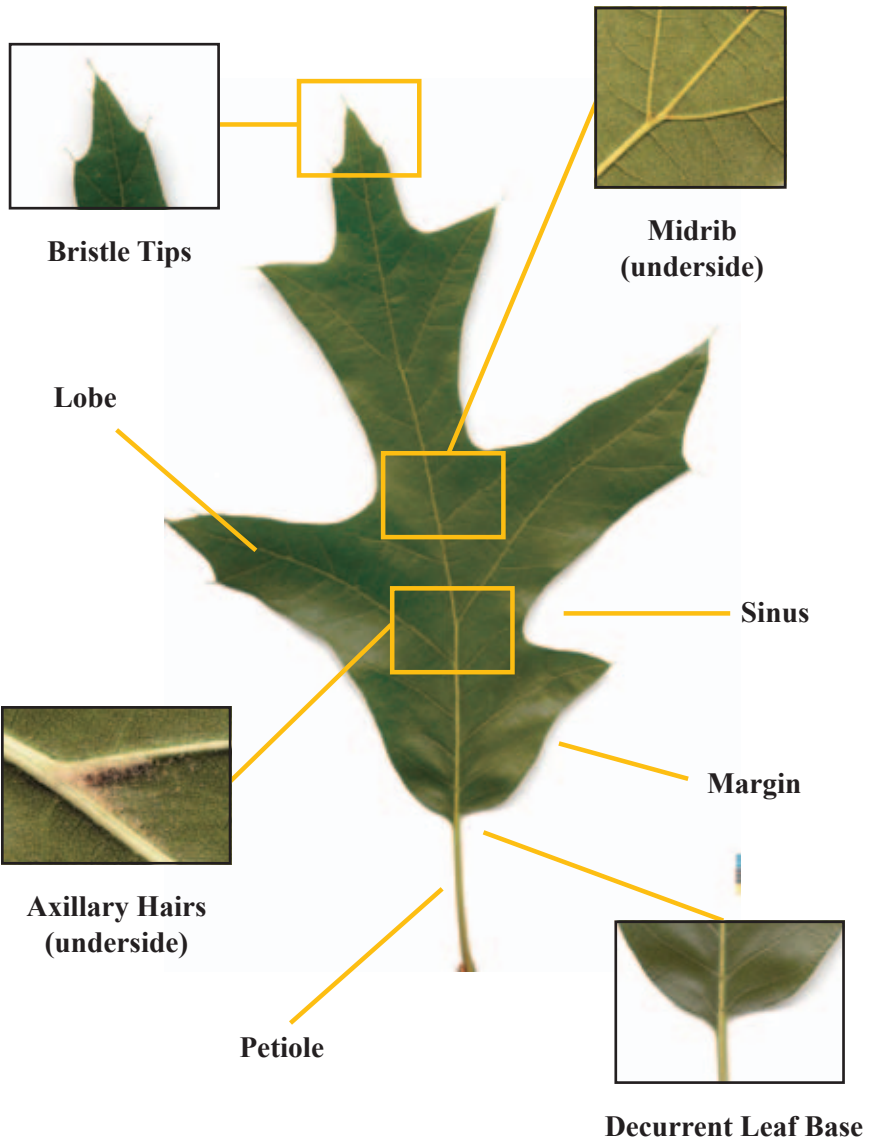
## KEY TO LEAVES OF EASTERN NATIVE OAKS



The “Old Senator,” a southern live oak (*Q. virginiana*) located at St. Augustine, Florida, is reputed to be a witness to the landing of Juan Ponce de Leon in 1513. When Juan stepped ashore to search for the Fountain of Youth, he was credited with the discovery of Florida and the beginning of the European colonization of the North American continent. (Photo, J. Stein)

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## Leaf Characteristics



Illustrated examples of typical leaf characters used for field identification of oak species. Scanned image of southern red oak (*Quercus falcata*).

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## Oak Groups\*

Leaf blade entire, or lobed with shallow or deep sinuses; lobes and apex armed with bristled tip

**Red Oak Group** ..... 123



Leaf blade entire, dentate, sinuate, or lobed with shallow or deep sinuses; lobes and apex without bristled tips, leaves without lobes lack bristle at apex but may have mucronate tip

**White Oak Group**.....136



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\* Characteristics in this key are based upon mature leaves exposed to full sunlight. Oaks normally associated with southwestern species are included in this key if their distributions extended east of the 100<sup>th</sup> meridian.

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## Red Oaks

1 Leaf petiole less than  $\frac{3}{8}$  inch long.....2

Leaf petiole greater than  $\frac{3}{8}$  inch long.....17

2(1) Leaf blade more than 4 times longer than wide (shape lanceolate or narrowly elliptical).....3



Leaf blade less than 4 times longer than wide (shape ovate, obovate, spatulate, broadly elliptical) .....5



3(2) Petiole sparse to densely pubescent .....4

Petiole lacks pubescence; leaf margin entire; shiny light green above; pale green and may have grayish pubescence beneath ..... *Q. phellos*



4(3) Leaf lustrous blue-green with raised veins above; dense woolly pubescence with reddish axillary tufts of hair beneath ..... *Q. incana*



Leaf dark green with impressed veins above; uniform woolly pubescence, lacks axillary tufts of hair beneath; leaf blade slightly convex and usually revolute ..... *Q. pumila*



## Red Oaks

5(2) Leaf blade widest beyond midleaf .....6



Leaf blade widest at or below midleaf .....13



6(5) Leaf petiole lacks pubescences .....7

Leaf petiole pubescent.....10

7(6) Leaf margin entire and may curl under,  
lacks prominent lobes.....8

Leaf margin flat with 2-5 prominent lobes; sinuses extending one-third or more to midvein; smooth leaf surface except for axillary tufts of hair beneath ..... *Q. georgiana*



8(7) Leaf shape obovate.....9

Leaf shape spatulate, base cuneate; may have 2-3 shallow lobes beyond midleaf; smooth leaf blade with axillary tufts of hair beneath ..... *Q. nigra*



## Red Oaks

9(8) Leaf blade smooth, convex, somewhat revolute; dark green above; light green, smooth, axillary tufts of hair beneath; some leaves have scruffy yellow bloom beneath ..... *Q. myrtifolia*



Leaf blade rugose to smooth, convex, strongly revolute; scattered hairs along the midrib above; yellow scruffy pubescence, lacks axillary tufts of hair beneath ..... *Q. inopina*



10(6) Leaf blade convex above, margin entire and curled under; no apparent lobes ..... 11



Leaf blade flat and broadly triangular; 2-5 lobes with shallow sinuses ..... 12



11(10) Leaf blade may have yellow scruffy pubescence, axillary tufts of hair beneath; margin somewhat revolute ..... *Q. myrtifolia*



Leaf blade with yellow scruffy pubescence beneath, lacks axillary tufts of hair; margin strongly revolute ..... *Q. inopina*



## Red Oaks

12(10) Leaf blade longer than wide; pubescent with axillary tufts of hair beneath ..... *Q. arkansana*



Leaf blade wider than long; scruffy or sparse pubescence beneath, lacks axillary tufts of hair ..... *Q. marilandica*



13(5) Leaf blade without lobes; usually 3 times longer than wide .....14

Leaf blade with lobes; less than 2 times longer than wide .....16

14(13) Leaf petiole lacks pubescence (smooth).....15

Leaf petiole pubescent; leaf blade densely pubescent with axillary tufts of hair beneath ..... *Q. incana*



15(14) Leaf blade thin, apex obtuse or rounded; found on moist soil ..... *Q. laurifolia*



Leaf blade thick and leathery, apex acute or acuminate; found on dry soil ..... *Q. hemisphaerica*



## Red Oaks

16(13) Leaf blade ovate or broadly elliptical and almost as wide as long; 3-7 lobes with deep sinuses; apical lobe elongated, one-third to one-half length of the leaf with 1-3 acute teeth; leaf often looks like a turkey's foot..... *Q. laevis*



Leaf blade broadly elliptical and longer than wide; 3-5 lobes with deep sinuses; apical lobe less than one-fourth length of leaf..... *Q. georgiana*



17(1) Leaf blade entire or lobed with sinuses less than one-third distance to the midrib .....18



Leaf blade lobed with sinuses greater than one-third distance to the midrib.....25



18(17) Leaf longer than wide.....19

Leaf usually as wide as long, circular in outline; resembles a maple leaf..... *Q. acerifolia*



## Red Oaks

19(18) Leaf blade 1-2 times longer than wide;  
shallow or prominent sinuses present.....20

Leaf blade 3 times longer than wide;  
margin entire without lobes and slightly  
wavy; apex acute or obtuse and ending  
in a bristled tip; uniformly pubescent  
beneath ..... *Q. imbricaria*



20(19) Leaf base acute to truncate .....21



Leaf base rounded .....23



21(20) Leaf apex acute.....22



Leaf apex obtuse tapering to a blunt  
or rounded point; leaf blade shiny  
green above; pale green with  
axillary tufts of hair beneath..... *Q. georgiana*



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## Red Oaks

- 22(21) Leaf petiole smooth with reddish coloration; leaf blade dull green above; smooth with minute axillary tufts of hair beneath..... *Q. rubra*



- Leaf petiole pubescent; leaf blade shiny dark green above; pale green and smooth beneath..... *Q. ilicifolia*



- 23(20) Leaf apex obtuse to rounded; widest part of leaf blade near apex gives leaf a somewhat triangular outline .....24

- Leaf apex acute; widest part of leaf near midleaf..... *Q. falcata*



- 24(23) Leaf blade longer than wide; yellow-green above; pubescent with axillary tufts of hair beneath..... *Q. arkansana*



- Leaf blade generally as wide as long; yellow-green above; dense reddish-brown scruffy pubescence, lacking axillary hairs beneath ..... *Q. marilandica*



## Red Oaks

25(17) Leaf base acute or rounded (U-shaped).....26



Leaf base obtuse or truncate.....30



26(25) Leaf apex blunt, rounded, or obtuse.....27

Leaf apex acute.....28

27(26) Leaf petiole lacks pubescence (smooth) ..... *Q. georgiana*



Leaf petiole pubescent..... *Q. arkansana*



28(26) Leaf blade dark green above; lacks axillary tufts of hair beneath.....29

Leaf blade is a light green above; pale green with axillary tufts of hair beneath ..... *Q. laevis*



## Red Oaks

29(28) Leaf blade shiny dark green above; pale rusty pubescence beneath; 3-5 lobes with the terminal lobe longer than lateral lobes..... *Q. falcata*



Leaf blade shiny dark green above; pale gray pubescence beneath; 5-11 lobes with terminal lobe shorter than lateral lobes..... *Q. pagoda*



30(25) Leaf blade uniformly pubescent beneath .....31

Leaf blade usually smooth without uniform pubescence beneath, may have scattered hairs especially along the midvein .....33

31(30) Leaf base cuneate to truncate .....32

Leaf base rounded; terminal lobe one-third to one-half length of leaf; lobes near base are usually opposite and gives the appearance of a turkey's foot..... *Q. falcata*



## Red Oaks

- 32(31) Terminal lobe longer than basal lobe; leaf margin has 3-5 lobes with 5-14 bristled tips; angle of sinuses between terminal and lateral lobes approximates 90°; leaf petiole pubescent,  $\frac{3}{8}$  - 1 inch long.....***Q. ilicifolia***



- Terminal lobe is equal to or less than basal lobe; leaf margin has 5-11 lobes with 10-25 bristled tips; angle of sinuses between all major lobes is less than 90°; leaf petiole smooth or occasionally may be pubescent,  $\frac{3}{4}$  - 2 inches long .....***Q. pagoda***



- 33(30) Leaf blade longer than wide .....**34**

- Leaf blade wider than long; resembles maple leaf.....***Q. acerifolia***



- 34(33) Leaf blade with sinuses extending more than half the distance to midrib .....**35**

- Leaf blade with sinuses extending less than half the distance to midrib ..... ***Q. rubra***



## Red Oaks

35(34) Leaf blade with minute axillary tufts of hair (visible with magnification).....**36**

Leaf blade with conspicuous axillary hair tufts (visible without magnification) .....**37**

36(35) Mature leaf less than 4 inches in length; distally expanded lobes, sinuses C-shaped between major lobes; petiole yellow in color ..... *Q. buckleyi*



Mature leaf 4 ¾ - 8 inches in length; sinuses U-shaped between major lobes; petiole usually reddish in color..... *Q. rubra*



37(35) Leaf base acute to obtuse .....**38**



Leaf base obtuse to truncate .....**39**



## Red Oaks

38(37) Leaf apex acute; falcate terminal lobe longer than lateral lobes and one-half length of leaf blade; often looks like a turkey's foot..... *Q. laevis*



Leaf apex obtuse to rounded; terminal lobe less than one-third length of leaf blade ..... *Q. georgiana*



39(37) Leaf blade with margin of basal lobes somewhat recurved; middle lobes have a tendency to be at right angle to midrib .....40



Leaf blade with margin of basal lobes straight (not recurved); middle lobes slightly angled toward apex, lobes usually expanded distally .....42



40(39) Leaf with terminal lobe less than length of middle lobes; sinuses U-shaped below midleaf.....41



Leaf with terminal lobe equal to or longer than middle lobes; sinuses C-shaped below midleaf, lobes distally expanded with multiple bristled tips; shiny green above; pale with tufts of hair along midvein beneath ..... *Q. ellipsoidalis*



## Red Oaks

41(40) Leaf with terminal lobe approximately one-third length of middle lobes; deep sinuses with lobes nearly at right angles to midrib; shiny bright green above; pale beneath..... *Q. palustris*



Leaf with terminal lobe one-half to two-thirds length of middle lobes; deep sinuses with lobes slightly angled toward apex; dark green above; pale beneath..... *Q. texana*



42(39) Leaf petiole one-third to one-half length of leaf blade.....43

Leaf petiole less than one-third length of leaf blade; shiny dark green above, pale beneath; secondary veins raised on both surfaces..... *Q. shumardii*



43(42) Leaf shiny light green above; smooth with axillary tufts of hair beneath; lobes distally expanded ..... *Q. coccinea*



Leaf shiny dark green above; scruffy pubescence with axillary tufts of hair beneath, pubescence shed in late summer; lobes without distal expansion; stout petiole twisted to allow leaf to hang perpendicular to the ground..... *Q. velutina*



## White Oaks

1 Leaf margin entire, sinuate, or with wide-angled teeth pointed outward from edge of the leaf (dentate); sinuses less than one-third distance to midrib .....2



Leaf margin with well-defined lobes; one or more sinuses extending more than one-third distance to midrib .....23



2(1) Leaf blade with regular or irregular dentate margin; a tooth for each parallel secondary vein reaching the leaf edge.....3



Leaf blade with margin entire; irregularly toothed (1-5 on each side), scalloped, or 3-lobed on distal half of leaf .....14



3(2) Leaf base cuneate to acute.....4



Leaf base truncate or obtuse to rounded.....9



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## White Oaks

4(3) Leaf margin with more than 6  
dentate (teeth) on each side .....5

Leaf margin with 5 or less dentate  
(teeth) on each side.....6

5(4) Width of leaf blade less than  
half its length, base cuneate; leaf  
leathery, shiny dark green above;  
glaucous pubescence (rubs off)  
beneath ..... *Q. prinoides*



Width of leaf blade greater than  
half its length, base cuneate to  
acute; shiny dark green above;  
white velvety pubescence  
beneath ..... *Q. bicolor*



6(4) Petiole less than ¼ inch long.....7

Petiole more than ¼ inch long;  
leaf margin minutely revolute,  
usually 3-5 irregular or shallow lobes  
beyond midleaf (often 3-lobed); shiny  
dark green with few hairs above;  
grayish pubescence with minute  
stellate hairs beneath ..... *Q. boyntonii*



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## White Oaks

7(6) Leaf apex acute to obtuse .....8

Leaf apex rounded; mature leaves smooth beneath with some hair retained along the midvein; juvenile leaves may be uniformly covered with stellate hairs beneath ..... *Q. austrina*



8(7) Leaf blade narrowly lanceolate to oblong, may be slightly convex,  $\frac{3}{4}$  -  $2\frac{3}{8}$  inches long; leaves may be dimorphic; mature sun-leaves shiny, dark bluish-green above, dense stellate hairs mixed with minute appressed hairs beneath; shady-leaf margins coarsely toothed with shallow sinuses, mucronate-tipped teeth ..... *Q. vaseyana*



Leaf blade obovate to oblanceolate,  $\frac{3}{4}$  -  $4\frac{3}{4}$  inches long; leaves may be dimorphic with sunny exposure producing an entire margin, mature leaves shiny, light to dark green above, with whitish bloom of densely stellate with minute appressed hairs beneath; shady-leaf margins coarsely toothed with shallow sinuses, mucronate-tipped teeth, and flat, wavy, or minutely revolute ..... *Q. minima*



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## White Oaks

9(3) Mature leaf blade less than  
4 inches long.....10

Mature leaf blade more than  
4 inches long.....12

10(9) Upper leaf surface feels smooth  
to the touch.....11

Upper leaf surface feels rough  
(sandpapery) to the touch .....*Q. pungens*



11(10) Leaf blade shiny, light green above;  
dense gray to yellowish-brown  
tomentulose or stellate pubescent  
hairs beneath; leaf thick and  
leathery .....*Q. havardii*



Leaf blade shiny, dark bluish-green  
above, densely stellate with minute  
appressed hairs beneath .....*Q. vaseyana*



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## White Oaks

12(9) Leaf blade with rounded base.....13

Leaf blade with obtuse to truncate base, dentate with sharp teeth; shiny yellowish-green to dark green above; silvery-white glaucous pubescence (rubs off) or light green with minute hairs beneath.....*Q. muehlenbergii*



13(12) Leaf blade with minute sparse hairs beneath except for tufts of hair along midvein; margin dentate with rounded teeth ..... *Q. montana*



Leaf blade with light green or yellowish velvety pubescence beneath; margin dentate with sharp teeth..... *Q. michauxii*



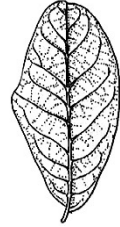
14(2) Leaf blade with rounded base.....15

Leaf blade with cuneate to acute base .....17

## White Oaks

15(14) Leaf blade bluish-green; margin entire or with irregular shallow lobes.....16

Leaf blade yellowish-green; margin minutely revolute, 1-5 rounded irregular lobes beyond midleaf; glossy above, matted glandular and waxy hair beneath ..... *Q. chapmanii*



16(15) Leaf petiole 1/8 - 1/4 inch long; leaf blade thin and obovate or elliptic, 1 1/2 - 3 1/2 inches long, apex broadly rounded; juvenile leaves glaucous with whitish stellate hair beneath; mature leaves become smooth..... *Q. laceyi*



Leaf petiole 1/4 - 3/8 inch long; leaf blade thick and leathery, oblong or elliptic, 1 1/4 - 2 inches long, apex acute or rounded; shiny or dull bluish-green above; gray or white pubescence with raised secondary veins beneath ..... *Q. mohriana*



17(14) Leaf blade convex above.....18

Leaf blade flat.....19

## White Oaks

- 18(17) Leaf margin strongly revolute; dull or shiny dark green above, pale pubescence beneath ..... *Q. geminata*



- Leaf margin slightly revolute; dull or shiny dark green above, yellowish-green velvety pubescence beneath ..... *Q. oglethorpensis*



- 19(17) Leaf apex rounded and broadly triangular .....20

- Leaf apex acute or obtuse-rounded .....21

- 20(19) Leaf blade 1  $\frac{3}{8}$  - 2  $\frac{3}{8}$  inches long with sinuate parallel sides; associated with limestone outcrops..... *Q. sinuata* var. *breviloba*



- Leaf blade 2 - 4  $\frac{3}{4}$  inches long with entire to sinuate margin; usually found in moist riparian habitats ..... *Q. sinuata* var. *sinuata*



## White Oaks

21(19) Leaf blade obovate to oblanceolate .....22

Leaf blade lanceolate, 1  $\frac{3}{8}$  - 3  $\frac{1}{2}$  inches long, margin minutely revolute or flat; shiny light to dark green above; pale pubescent bloom (rubs off) beneath ..... *Q. fusiformis*



22(21) Leaf blade 1  $\frac{3}{8}$  - 3  $\frac{1}{2}$  inches long, margin entire (juvenile leaves coarsely toothed with shallow sinuses); mature tree grows to 49 feet ..... *Q. virginiana*



Leaf blade  $\frac{3}{4}$  - 4  $\frac{3}{4}$  inches long, margin entire or toothed; mature shrub less than 5 feet tall ..... *Q. minima*



23(1) Leaf bluish-green above .....24

Leaf green, yellowish-green, or grayish-green above .....25

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## White Oaks

- 24(23) Leaf apex acute (rarely obtuse);  
leaf narrowly lanceolate to  
oblong, margin coarsely toothed  
with mucronate tips; may be  
slightly convex above;  
pubescent beneath .....*Q. vaseyana*



- Leaf apex broadly rounded; leaf  
obovate, margin entire with  
rounded lobes; mature leaf smooth  
beneath (expanding leaves glaucous  
on both surfaces; this bloom  
sheds with age) ..... *Q. laceyi*



- 25(23) Mature leaves smooth beneath .....26

- Mature leaves conspicuously  
hairy beneath .....28

- 26(25) Leaf petiole more than ¼ inch long.....27

- Leaf petiole less than ¼ inch  
long.....*Q. austrina*



## White Oaks

27(26) Leaf blade with narrow sinuses, mouth of sinus less than half its length, lobes with rounded tips; apex rounded ..... *Q. alba*



Leaf blade with wide sinuses, mouth of sinus more than half its length, lobes appear angular or spatulate with acute to obtuse tips; apex obtuse to rounded ..... *Q. lyrata*



28(25) Leaf petiole less than 1/2 inch long ..... 29

Leaf petiole more than 1/2 inch long; dark green to dull gray-green above ..... *Q. macrocarpa*



29(28) Leaf margin flat, edge not revolute ..... 30

Leaf margin minutely revolute; 3-5 irregular lobes beyond midleaf; base cuneate to acute ..... *Q. boyntonii*



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## White Oaks

30(29) Leaf with upper surface rough (sandpapery) to the touch .....31

Leaf with upper surface smooth to the touch .....32

31(30) Leaf apex acute or obtuse with spine; coarsely toothed with some sinuses extending one-third to midrib .....*Q. pungens*



Leaf apex broadly rounded; lobes rounded or spatulate, lobes at midleaf usually form right angles to midrib in cross-shaped pattern, blade thick and stiff.....*Q. stellata*



32(30) Leaf blade width equal to or greater than half its length .....33

Leaf blade width equal to or less than one-third its length; shiny light green above, dense gray to tawny tomentulose or stellate hairs beneath .....*Q. havardii*



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## White Oaks

- 33(32) Leaf width greatest at midleaf, generally cruciform in shape; glossy dark green above; light green pubescence (feels velvety to the touch) beneath ..... *Q. margaretta*



- Leaf width greatest in apical one-third, 3-lobed beyond midleaf, rarely cruciform in shape; glossy light to dark green above; grayish-green and sparsely glandular with sparse stellate hairs beneath..... *Q. similis*



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## GLOSSARY

**Acorn.** A single nut, circular in cross section with a scaly cup attached at the base.

**Acuminate.** The leaf tip is narrowed abruptly into a tapering point.

**Acute.** Either the leaf tip or the leaf blade ends in an angle less than 90° and the tip is not prolonged into a point.

**Allelopathy.** Organic chemicals released by one plant that have a detrimental effect on the germination, growth, or metabolism of a different plant.

**Annual.** Acorns that mature in one growing season.

**Apex.** Tip, terminal end, or the narrowed and pointed end.

**Appressed.** Lying close and flat against.

**Ascocarps.** Sexual fruiting bodies of ascomycete fungi.

**Attenuate.** Leaf blade tapering to a long slender point.

**Awn.** A small pointed process or slender bristle.

**Axillary.** Situated in or growing from the angle formed by the junction of a vein and the midrib of a leaf.

**Biennial.** Acorns that mature in two growing seasons.

**Bristle-tipped.** The leaf tip and lobes are prolonged into a long slender bristle.

**Ciliate.** Margin fringed with short hairs.

**Cordate.** Heart-shaped with the base rounded and notched where the blade is attached to the petiole.

**Cuneate.** The leaf base is shaped like a wedge with straight sides tapering down to a point on the petiole.

**Cup.** Basal covering of an acorn.

**Decurrent.** Leaf blade extends down the petiole.

**Dentate.** The leaf margin has wide-angled teeth pointing outward.

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**Distal.** Far from the point of attachment.

**Elliptical.** Leaf shaped like an ellipse with both the tip and base sloped uniformly.

**Entire.** Leaf margin is a smooth, even line with no indentations.

**Glabrous.** Smooth, not pubescent or hairy.

**Glandular.** Bearing glands.

**Glaucous.** Surface is covered with a whitish bloom that rubs off.

**Lanceolate.** Leaf shape is several times longer than wide and broadest below the middle, shaped like a spear point.

**Lateral.** Relating to the side.

**Lenticel.** Lens-shaped corky growths on young bark.

**Lobe.** The division of a leaf blade.

**Margin.** The edge of a leaf.

**Midrib.** The central vein or associated area of the leaf.

**Mucronate.** Lobe tip ends abruptly in a short, small point.

**Nut.** In the text, it is a general reference to the acorn, the 1-seeded nut of an oak (see acorn).

**Ob lanceolate.** Leaf shape is somewhat lanceolate but is widest above the middle and tapering toward the petiole.

**Oblong.** Longer than broad with rounded ends and sides nearly parallel.

**Obovate.** Leaf shape is broadly egg-shaped and widest above the middle.

**Obtuse.** The leaf tip tapers abruptly to a blunt or rounded point forming an angle greater than 90°.

**Ovate.** Egg-shaped in outline; broad end at the base with the tip acute or rounded.

**Peduncle.** Stalk supporting one or more acorns.

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**Petiole.** Slender stem-like structure that supports the leaf blade.

**Pith.** Center of a stem.

**Pubescent.** Covered with fine soft short hairs.

**Revolute.** Edge of leaf is slightly rolled or turned under.

**Rhizomatous.** Thickened subterraneous stem producing shoots above and roots below.

**Rounded.** The leaf tip or leaf base makes a full arc in outline, U-shaped base.

**Rugose.** Wrinkled.

**Sessile.** Without a stalk or petiole.

**Sinuate.** The margin bends in a strong wavy line without producing a sinus.

**Sinus.** The space between two lobes of a leaf.

**Spatulate.** Leaf shape is broad and rounded above the middle but with the sides wedge-shaped and tapering toward the petiole.

**Stellate.** Resembling a star in shape or cross section.

**Tomentulose.** Slightly pubescent with matted (woolly) hair.

**Tomentum.** Densely pubescent.

**Tooth.** An edge or lobe of a leaf blade divided into toothlike projections, usually ending in a slender bristle.

**Truncate.** Leaf base almost forms a straight line at right angles to the midrib.

**Vein.** A rib-like thickened tissue in the leaf blade.

**Woolly.** Covered with long matted hairs.

**Xerophytic.** Structurally adapted for survival with a limited supply of water.

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## INDEX OF COMMON NAMES

Recognized or preferred common names are in bold. Common names may be shared by different species in various locations and are prioritized on a regional basis. If preferred usage has been applied to other species, they are referenced. Page numbers in bold refer to the species description.

- Arkansas oak**, 10, 109  
Arkansas water oak, see  
    **Arkansas oak**, 10, 109  
barren oak, see **blackjack oak**,  
    **58**, 111  
basket oak, see **swamp chestnut**  
    **oak**, 60, 116  
**bastard oak**, 94, 118  
**bastard white oak**, 12, 114 (also  
    see **bastard oak**, 94)  
**bear oak**, 38, 110  
Bigelow oak, see **bastard oak**,  
    **94**, 118  
**black oak**, 102, 113 (also see  
    **blackjack oak**, 58; **northern**  
    **pin oak**, 24; **scarlet oak**, 22;  
    and **willow oak**, 80)  
**blackjack oak**, 58, 111  
blue oak, see **bur oak**, 54, 116  
**bluejack oak**, 42, 110  
blue Japanese oak, 4  
bluff oak, see **bastard oak**, 94,  
    118 and **bastard white oak**,  
    **12**, 114  
bottomland post oak, see **swamp**  
    **post oak**, 92, 118  
bottomland red oak, see  
    **cherrybark oak**, 76, 112  
**Boynton oak**, 16, 114  
**Buckley oak**, 18, 109  
**bur oak**, 5, 54, 116, 161  
canyon oak, see **Lacey oak**, 46,  
    115  
Catesby oak, see **turkey oak**, 48,  
    111  
**Chapman oak**, 20, 114  
Chapman white oak, see  
    **Chapman oak**, 20, 114  
**cherrybark oak**, 76, 112  
**chestnut oak**, 66, 117 (also see  
    **chinkapin oak**, 68)  
Chinese evergreen oak, 4  
**chinkapin oak**, 68, 117  
cinnamon oak, see **bluejack oak**,  
    42, 110  
Coastal Plain scrub oak, see  
    **turkey oak**, 48, 111  
cow oak, see **swamp chestnut**  
    **oak**, 60, 116  
Darlington oak, see **laurel oak**,  
    **36**, 110 and **swamp laurel**  
    **oak**, 50, 111  
delta post oak, see **swamp post**  
    **oak**, 92, 118  
diamond-leaf oak, see **swamp**  
    **laurel oak**, 50, 111
-

- 
- Durand oak, see **bastard oak**, **94**, 118
- Durand white oak, see **bastard oak**, **94**, 118
- durmast oak, 4
- dwarf chinkapin oak**, **82**, 117
- dwarf live oak**, **62**, 116
- dwarf post oak, see **sand post oak**, **56**, 116
- eastern red oak, see **northern red oak**, **88**, 113
- eastern white oak, see **white oak**, **8**, 114
- Elliott oak, see **cherrybark oak**, **76**, 112
- encino oak, see **sandpaper oak**, **86**, 118
- English oak, 4
- European turkey oak, 4
- Florida oak**, **44**, 111
- forked-leaf white oak, see **white oak**, **8**, 114
- Georgia oak**, **32**, 110
- gray oak, see **northern red oak**, **88**, 113
- Havard oak**, **34**, 115
- Hill's oak, see **northern pin oak**, **24**, 109
- iron oak, see **post oak**, **96**, 118
- jack oak, see **northern pin oak**, **24**, 109 and **blackjack oak**, **58**, 111
- Lacey oak**, **46**, 115
- laurel oak**, **36**, 110 (also see **shingle oak**, **40** and **swamp laurel oak**, **50**)
- laurel-leaf oak, see **swamp laurel oak**, **50**, 111
- live oak, see **southern live oak**, **104**, 119 and **Texas live oak**, **28**, 115
- maple-leaf oak**, **6**, 109
- minimal oak, see **dwarf live oak**, **62**, 116
- Mississippi Valley oak, see **swamp post oak**, **92**, 118
- Mohr oak**, **64**, 116
- mossy-cup oak, see **bur oak**, **54**, 116
- mossy-overcup oak, see **bur oak**, **54**, 116
- mountain chestnut oak, see **chestnut oak**, **66**, 117
- mountain red oak, see **northern red oak**, **88**, 113
- myrtle oak**, **70**, 111
- northern pin oak**, **24**, 109
- northern red oak**, **88**, 113
- Nuttall oak, see **Texas red oak**, **98**, 113
- obtuse oak, see **swamp laurel oak**, **50**, 111
- Oglethorpe oak**, **74**, 117
- oriental oak, 4
- overcup oak**, **52**, 115
- peach oak, see **willow oak**, **80**, 112
-

---

**pin oak**, 78, 112 (also see **Texas red oak**, 98; **water oak**, 72; and **willow oak**, 80)

possum oak, see **water oak**, 72, 112

**post oak**, 96, 118 (also see **sand post oak**, 56)

prairie oak, see **bur oak**, 54, 116

pungent oak, see **sandpaper oak**, 86, 118

quercitron oak, see **black oak**, 102, 113

red oak, see **cherrybark oak**, 76, 112; **northern red oak**, 88, 113; **scarlet oak**, 22, 109; **Texas red oak**, 98, 113; and **water oak**, 72, 112

Red River oak, see **Texas red oak**, 98, 113

rock oak, see **chestnut oak**, 66, 117; **chinkapin oak**, 68, 117; and **Lacey oak**, 46, 115

rock chestnut oak, see **chestnut oak**, 66, 117 and **chinkapin oak**, 68, 117

**runner oak**, 84, 112 (also see **sand post oak**, 56)

running oak, see **runner oak**, 84, 112

**sand live oak**, 30, 115

**sand post oak**, 56, 116

sandjack oak, see **bluejack oak**, 42, 110

**sandpaper oak**, 86, 118

sawtooth oak, 4

scalybark oak, see **cherrybark oak**, 76, 112

**scarlet oak**, 3, 22, 109

Schneck oak, see **Shumard oak**, 90, 113

Schneck red oak, see **Shumard oak**, 90, 113

scrub oak, see **bastard oak**, 94, 118; **bear oak**, 38, 110; **Chapman oak**, 20, 114; **Mohr oak**, 64, 116; **myrtle oak**, 70, 111; **turkey oak**, 48, 111; and **Vasey oak**, 100, 119

scrub chestnut oak, see **dwarf chinkapin oak**, 82, 117

scrub live oak, see **sandpaper oak**, 86, 118 and **Texas live oak**, 28, 115

scrubby oak, see **sand post oak**, 56, 116

shin oak, see **bluejack oak**, 42, 110; **Havard oak**, 34, 115; **Mohr oak**, 64, 116; and **Vasey oak**, 100, 119

**shingle oak**, 40, 110

shinnery, see **Havard oak**, 34, 115

**Shumard oak**, 90, 113

Shumard red oak, see **Shumard oak**, 90, 113

smoky oak, see **Lacey oak**, 46, 115

smooth-bark oak, see **black oak**, 102, 113

---

- 
- southern live oak**, 104, 108, 119, 120
- southern red oak**, 26, 49, 110, 121 (also see **Shumard oak**, 90)
- Spanish oak, see **Buckley oak**, 18, 109; **pin oak**, 78, 112; **scarlet oak**, 22, 109; **southern live oak**, 104, 119; and **southern red oak**, 26, 110
- spotted oak, see **Buckley oak**, 18, 109; **Shumard oak**, 90, 113; and **water oak**, 72, 112
- stave oak, see **white oak**, 8, 114
- striped oak, see **Texas red oak**, 98, 113
- swamp oak, see **pin oak**, 78, 112 and **Shumard oak**, 90, 113
- swamp chestnut oak**, 60, 116
- swamp laurel oak**, 50, 111
- swamp post oak**, 92, 118 (also see **overcup oak**, 52)
- swamp red oak, see **cherrybark oak**, 76, 112; **Shumard oak**, 90, 113; and **southern red oak**, 26, 110
- swamp Spanish oak, see **cherrybark oak**, 76, 112 and **pin oak**, 78, 112
- swamp white oak**, 14, 114 (also see **overcup oak**, 52)
- swamp willow oak, see **willow oak**, 80, 112
- tanbark oak, see **chestnut oak**, 66, 117
- Texas live oak**, 28, 115
- Texas red oak**, 19, 98, 113 (also see **Buckley oak**, 18)
- turkey oak**, 48, 111 (also see **bluejack oak**, 42)
- turkey-foot oak, see **southern red oak**, 26, 110 and **turkey oak**, 48, 111
- upland willow oak, see **bluejack oak**, 42, 110
- Vasey oak**, 100, 119
- Virginia live oak, see **southern live oak**, 104, 119
- water oak**, 72, 112 (also see **Arkansas oak**, 10; **pin oak**, 78; **southern red oak**, 26; and **swamp laurel oak**, 50)
- water white oak, see **overcup oak**, 52, 115
- white oak**, 8, 97, 114 (also see **bastard oak**, 94 and **swamp white oak**, 14)
- white shin oak, see **bastard oak**, 94, 118
- willow oak**, 80, 112
- yellow oak, see **black oak**, 102, 113; **chinkapin oak**, 68, 117; and **swamp post oak**, 92, 118
- yellow-bark oak, see **black oak**, 102, 113
- yellow chestnut oak, see **chinkapin oak**, 68, 117
-

---

## INDEX OF SCIENTIFIC NAMES

Latin names in bold follow the taxonomy in the *Flora of North America* (Jensen 1997). Synonyms are listed and cross referenced to the standardized names. Page numbers in bold refer to the species description.

- Q. acerifolia***, 6, 109  
*Q. acuminata*, 117; see  
    ***Q. muehlenbergii***, 68  
*Q. acutissima*, 4  
***Q. alba***, 8, 46, 114  
*Q. annulata*, 118; see ***Q. sinuata***  
    var. ***breviloba***, 94  
***Q. arkansana***, 10, 109  
*Q. ashei*, 116, 118; see  
    ***Q. similis***, 92  
***Q. austrina***, 12, 114  
***Q. bicolor***, 14, 114  
*Q. bicolor* var. *lyrata*, 115; see  
    ***Q. lyrata***, 52  
*Q. borealis*, 89, 113; see  
    ***Q. rubra***, 88  
***Q. boyntonii***, 16, 114  
*Q. brayi*, 116; see  
    ***Q. michauxii***, 60  
*Q. breviloba*, 118; see ***Q. sinuata***  
    var. ***breviloba***, 94  
*Q. breviloba* subsp. *laceyi*, 115;  
    see ***Q. laceyi***, 46  
***Q. buckleyi***, 18, 99, 109  
*Q. caput-rivuli*, 109; see  
    ***Q. arkansana***, 10  
*Q. catesbaei*, 111; see  
    ***Q. laevis***, 48  
*Q. cerris*, 4  
***Q. chapmanii***, 20, 114  
*Q. cinerea*, 110; see  
    ***Q. incana***, 42  
***Q. coccinea***, 3, 22, 109  
*Q. digitata*, 110; see  
    ***Q. falcata***, 26  
*Q. durandii*, 118; see  
    ***Q. sinuata***, 94  
*Q. durandii* var. *austrina*, 114; see  
    ***Q. austrina***, 12  
*Q. durandii* var. *breviloba*, 118;  
    see ***Q. sinuata*** var. ***breviloba***,  
    94  
*Q. durandii* var. *san-sabeana*,  
    118; see ***Q. sinuata*** var.  
    ***breviloba***, 94  
***Q. ellipsoidalis***, 24, 109  
***Q. falcata***, 1, 26, 49, 110, 121  
*Q. falcata* var. *leucophylla*, 112;  
    see ***Q. pagoda***, 76  
*Q. falcata* var. *pagodifolia*, 112;  
    see ***Q. pagoda***, 76  
***Q. fusiformis***, 3, 28, 115  
***Q. geminata***, 30, 71, 115  
***Q. georgiana***, 32, 110  
*Q. glauca*, 4  
*Q. glaucoides*, 115; see ***Q. laceyi***,  
    46
-

- 
- Q. gravesii*, 99, 113; see  
***Q. texana*, 98**
- Q. havardii*, 2, **34**, 115
- Q. hemisphaerica*, **36**, 110
- Q. houstoniana*, 116; see  
***Q. michauxii*, 60**
- Q. ilicifolia*, 1, **38**, 110
- Q. imbricaria*, 1, **40**, 110
- Q. incana*, **42**, 71, 110
- Q. inopina*, **44**, 111
- Q. laceyi*, 3, **46**, 115
- Q. laevis*, **48**, 71, 111
- Q. laurifolia*, **50**, 111
- Q. leucophylla*, 112; see  
***Q. pagoda*, 76**
- Q. lyrata*, **52**, 115
- Q. macrocarpa*, 5, **54**, 116, 161
- Q. mandanensis*, 116; see  
***Q. macrocarpa*, 54**
- Q. margaretta*, **56**, 71, 116
- Q. marilandica*, 33, **58**, 71, 111
- Q. marilandica* var. *asheri*, 59;  
see ***Q. marilandica*, 58**
- Q. maxima*, 113; see ***Q. rubra*, 88**
- Q. michauxii*, **60**, 93, 116
- Q. minima*, 2, **62**, 116
- Q. minor*, 118; see ***Q. stellata*, 96**
- Q. minor* var. *margaretta*, 116;  
see ***Q. margaretta*, 56**
- Q. mohriana*, 3, **64**, 116
- Q. montana*, 33, **66**, 117
- Q. muehlenbergii*, 1, 3, **68**, 117
- Q. myrsinifolia*, 4
- Q. myrtifolia*, 70**, 111
- Q. nana*, 110; see ***Q. ilicifolia*, 38**  
or ***Q. nigra*, 72**
- Q. nigra*, 13, 72**, 112
- Q. nuttallii*, 99; see ***Q. texana*, 98**
- Q. obtusa*, 111; see  
***Q. laurifolia*, 50**
- Q. obtusifolia* var. *breviloba*, 118;  
see ***Q. sinuata* var. *breviloba*,  
94**
- Q. obtusiloba*, 118; see  
***Q. stellata*, 96**
- Q. oglethorpensis*, 74**, 117
- Q. pagoda*, 76**, 93, 112
- Q. pagodifolia*, 112; see  
***Q. pagoda*, 76**
- Q. palustris*, 78**, 112
- Q. petraea*, 4
- Q. phellos*, 80**, 112
- Q. platanoides*, 114; see  
***Q. bicolor*, 14**
- Q. prinoides*, 69, 82**, 117
- Q. prinus*, 67, 116, 117; see  
***Q. michauxii*, 60** or  
***Q. montana*, 66**
- Q. pumila*, 84**, 112
- Q. pungens*, 3, 86**, 118
- Q. pungens* var. *vaseyana*, 119;  
see ***Q. vaseyana*, 100**
- Q. rhombica*, 111; see  
***Q. laurifolia*, 50**
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- Q. robur*, 4  
***Q. rubra***, 1, 23, **88**, 99, 113  
*Q. rubra* var. *borealis*, 89, 113;  
see ***Q. rubra***, **88**  
*Q. rubra* var. *buckleyi*, 109; see  
***Q. buckleyi***, **18**  
*Q. rubra* var. *texana*, 113; see  
***Q. texana***, **98**  
*Q. san-sabeana*, 118; see  
***Q. sinuata*** var. *breviloba*, **94**  
*Q. schneckii*, 113; see  
***Q. shumardii***, **90**  
***Q. shumardii***, **90**, 93, 99, 113  
*Q. shumardii* var. *acerifolia*, 109;  
see ***Q. acerifolia***, **6**  
*Q. shumardii* var. *buckleyi*, 109;  
see ***Q. buckleyi***, **18**  
*Q. shumardii* var. *texana*, 113; see  
***Q. texana***, **98**  
***Q. similis***, **92**, 118  
***Q. sinuata***, 3, 13, **94**, 118  
*Q. sinuata* var. *breviloba*, 95; see  
***Q. sinuata***, **94**  
*Q. sinuata* var. *sinuata*, 95; see  
***Q. sinuata***, **94**  
***Q. stellata***, 33, **96**, 118  
*Q. stellata* var. *boyntonii*, 114; see  
***Q. boyntonii***, **16**  
*Q. stellata* var. *margaretta*, 116;  
see ***Q. margaretta***, **56**  
*Q. stellata* var. *paludosa*, 118; see  
***Q. similis***, **92**  
***Q. texana***, 19, **98**, 113; see  
***Q. buckleyi***, 109  
*Q. tinctoria*, 113; see  
***Q. velutina***, **102**  
*Q. uliginosa*, 112; see  
***Q. nigra***, **72**  
*Q. undulata* var. *pungens*, 118;  
see ***Q. pungens***, **86**  
*Q. undulata* var. *vaseyana*, 119;  
see ***Q. vaseyana***, **100**  
*Q. variabilis*, 4  
***Q. vaseyana***, 2, 3, **100**, 119  
***Q. velutina***, 23, **102**, 113  
*Q. virens* var. *dentate*, 116; see  
***Q. minima***, **62**  
***Q. virginiana***, 71, **104**, 108, 119,  
120  
*Q. virginiana* var. *dentate*, 116;  
see ***Q. minima***, **62**  
*Q. virginiana* var. *fusiformis*, 115;  
see ***Q. fusiformis***, **28**  
*Q. virginiana* var. *geminata*, 115;  
see ***Q. geminata***, **30**  
*Q. virginiana* var. *minima*, 116;  
see ***Q. minima***, **62**
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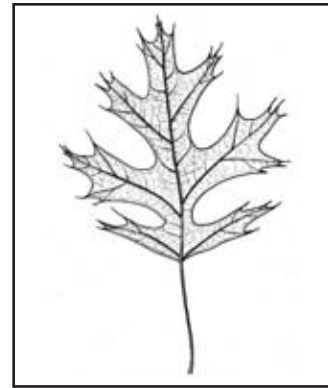
# Notes

## REFERENCE CHARTS FOR RED AND WHITE OAK LEAVES\*

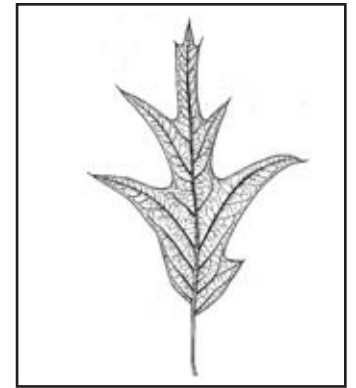


Bur oak (*Q. macrocarpa*) “burial trees” were frequently used for above ground burial by Plains tribes. Aerial burial was believed to assist the soul in its journey to the afterlife. (Photo, David F. Barry, Denver Public Library Old West Collection)

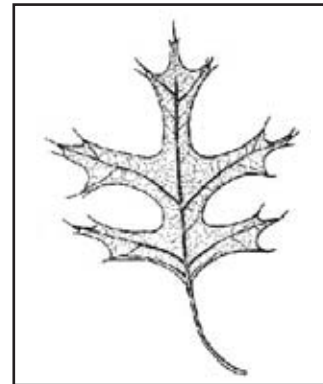
\*Bracketed numbers on the following pages are page references for each species description.



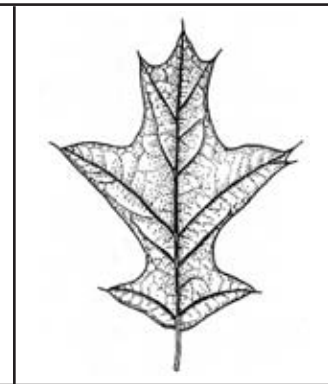
*Q. coccinea* [22]



*Q. falcata* [26]



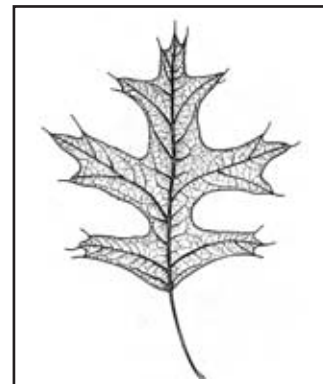
*Q. ellipsoidalis* [24]



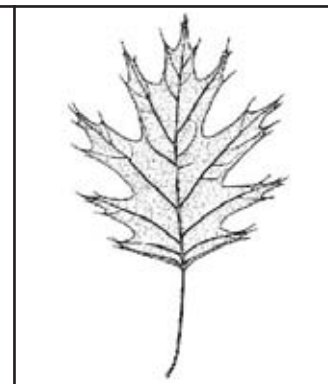
*Q. ilicifolia* [38]



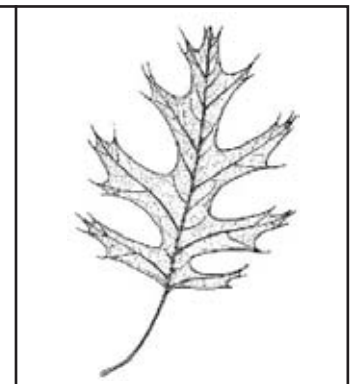
*Q. imbricaria* [40]



*Q. palustris* [78]



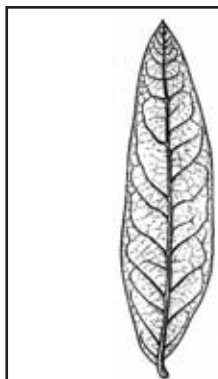
*Q. rubra* [88]



*Q. velutina* [102]

**Common in Eastern Deciduous Forests**

# Red Oaks



*Q. hemisphaerica* [36]



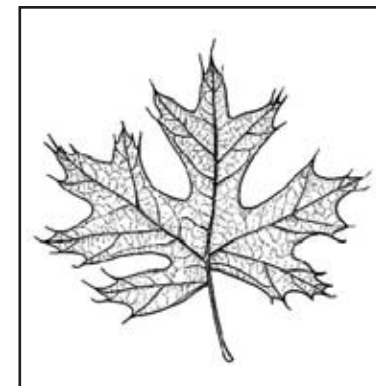
*Q. incana* [42]



*Q. laevis* [48]



*Q. laurifolia* [50]



*Q. acerifolia* [6]



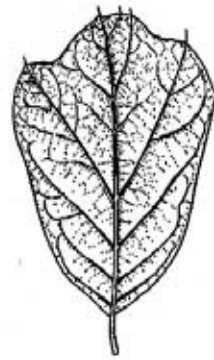
*Q. marilandica* [58]



*Q. nigra* [72]



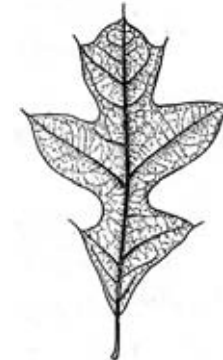
*Q. pagoda* [76]



*Q. arkansana* [10]



*Q. buckleyi* [18]



*Q. georgiana* [32]



*Q. phellos* [80]



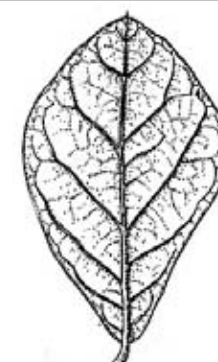
*Q. pumila* [84]



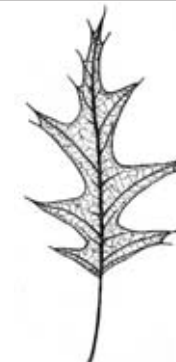
*Q. shumardii* [90]



*Q. inopina* [44]



*Q. myrtifolia* [70]



*Q. texana* [98]

**Common in Southeastern and Coastal Plain Mixed Forests**

**Uncommon with Restricted Distributions**

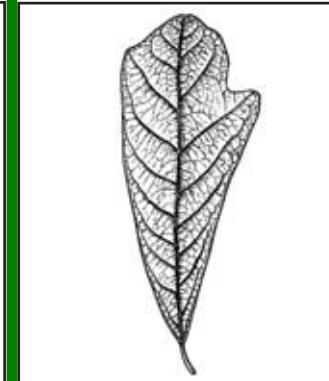
# White Oaks



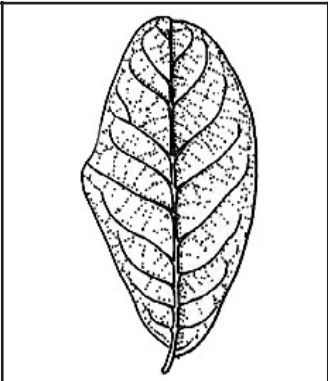
*Q. alba* [8]



*Q. bicolor* [14]



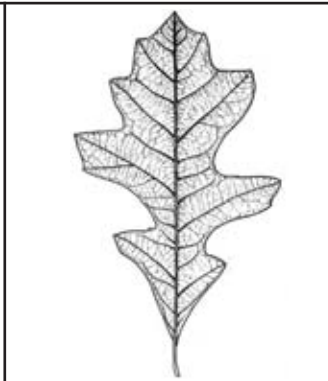
*Q. austrina* [12]



*Q. chapmanii* [20]



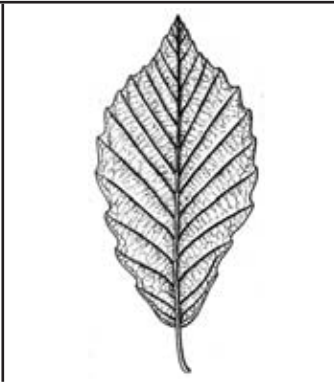
*Q. geminata* [30]



*Q. lyrata* [52]



*Q. macrocarpa* [54]



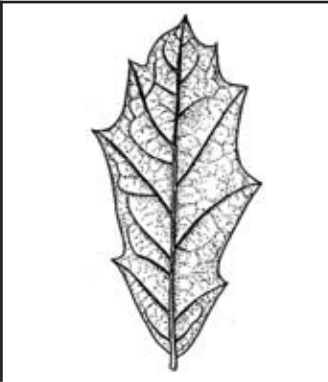
*Q. montana* [66]



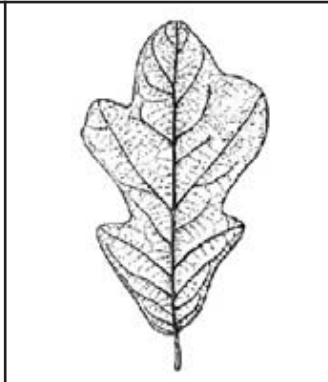
*Q. margaretta* [56]



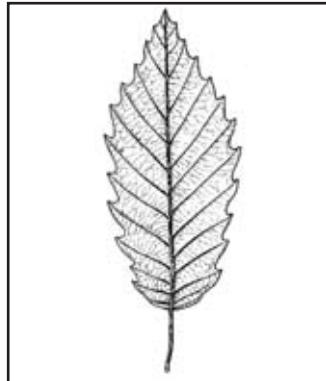
*Q. michauxii* [60]



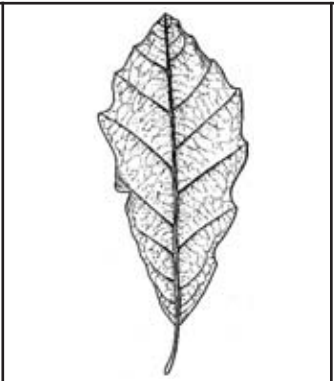
*Q. minima* [62]



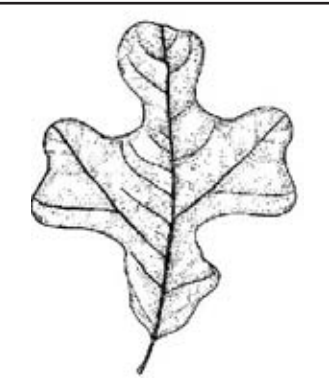
*Q. similis* [92]



*Q. muehlenbergii* [68]



*Q. prinoides* [82]



*Q. stellata* [96]



*Q. sinuata* var. *sinuata* [94]

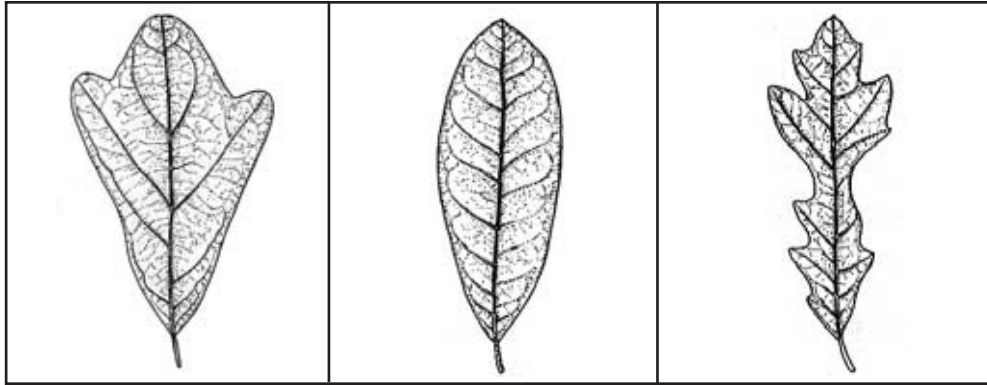


*Q. virginiana* [104]

Common in Eastern Deciduous Forests

Common in Southeastern and Coastal Plain Mixed Forests

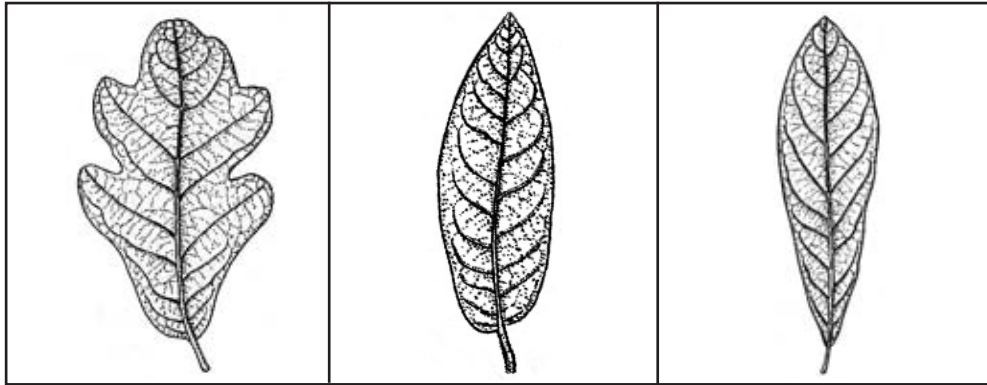
Remove



*Q. boyntonii* [16]

*Q. fusiformis* [28]

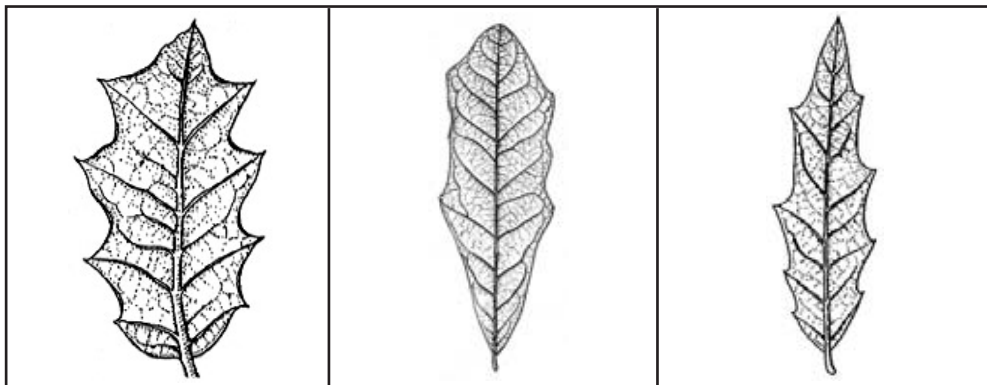
*Q. havardii* [34]



*Q. laceyi* [46]

*Q. mohriana* [64]

*Q. oglethorpensis* [74]



*Q. pungens* [86]

*Q. sinuata* var. *breviloba* [94]

*Q. vaseyana* [100]

**Uncommon with Restricted Distributions**

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