Foreword

Trees may be the oldest and largest living things in nature. They are closely associated with our daily lives, yet most of us know little about them and barely can tell one type of tree from another.

Sixteen editions of this handy pocket guide have been printed since John Simcox Holmes, North Carolina's first State Forester, put together the first edition in 1922. Holmes' idea was to provide an easy-to-use reference guide to help people of all ages recognize many of our common forest trees on sight. That goal has not changed.

Although the book has changed little, some uses of wood and general information about the trees have. Carriages and wagons, for example, aren't often made from Shagbark hickory (or anything else) anymore, and Loblolly pine now is used for making tremendous amounts of pine plywood, something unheard of in the 1920's.

Keeping these changes in mind, we revised Common Forest Trees of North Carolina in 1977 and 1995. Much of the narrative material, however, remains just as former State Forester Holmes wrote it in 1922.

Many of the drawings for this revision of the book were provided by William C. Grimm as they appear in his book, The Book of Trees. We have used these drawings and some of Grimm's narrative material with both his permission and that of his publisher, The Stackpole Company. We are grateful to Mr. Grimm and The Stackpole Company for their assistance in making this publication possible. A easy to use map of the trees' ranges is also included with each listing.

The scientific names used in this book follow those used in Checklist of United States Trees (Native and Naturalized), USDA Forest Service Handbook Number 541, published in September 1979. Common names for trees often are confusing, and it is nearly impossible to cite all of the names in use. Only those names generally used in North Carolina are mentioned.

Making exact identification of some species, such as the Lindens and Hawthornes, is difficult. The characteristics used to distinguish between the large number of species in these similar groups of trees are the subject of much debate by modern botanists. Therefore, only the genus or group name is given for such groups of trees in this book.

In using this book, keep in mind:

-- nearly two-thirds of the land area of our state is classified as commercial forest land (land capable of growing usable forest trees);

-- much of this land has had the greater part, if not all, of the merchantable timber cut from it at least twice;

-- there is practically no virgin forest remaining in North Carolina;

-- A significant portion of N.C.'s forest land has previously been cleared for agricultural use and later returned to it's current forested state.

-- the third crop or third forest, which now is growing on the land, has the potential of being more productive than the original forest -- if it is properly managed.

The production of timber products (lumber, posts, pilings, pulpwood, etc.) on private land no longer can be considered as the only management objective. It is to each landowner's advantage to include wildlife conservation, recreational uses and watershed protection in the management of his or her woodlands. To this end, the forest must be protected from wildfire as well as destructive insects and diseases, and harvesting must be done in accordance with good forestry practices.

The Division of Forest Resources, known to most people as the North Carolina Forest Service, hopes this book will create an increased appreciation of our forests and that all North Carolinians will desire to foster, conserve and wisely use our trees.

For more information about forestry, please contact your county forest ranger or the State Forester.

www.dfr.state.nc.us

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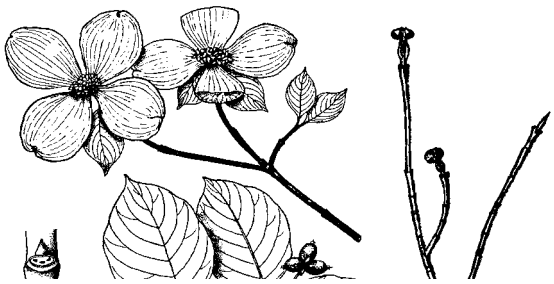


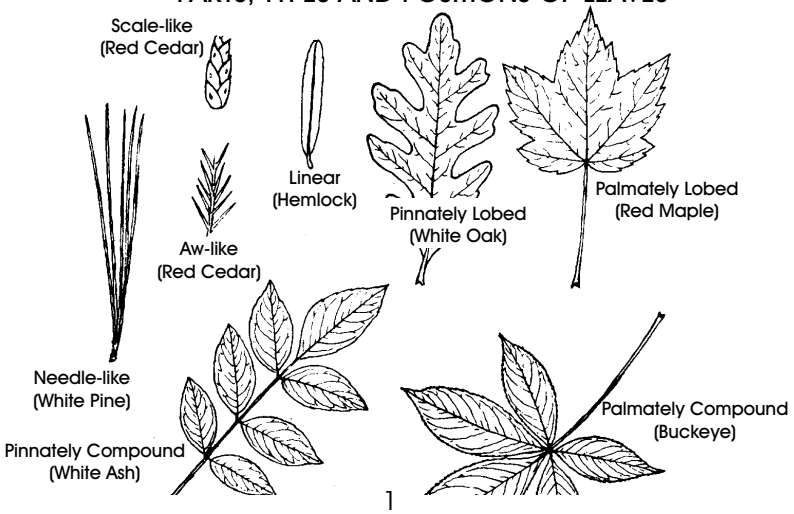
Identification of Trees

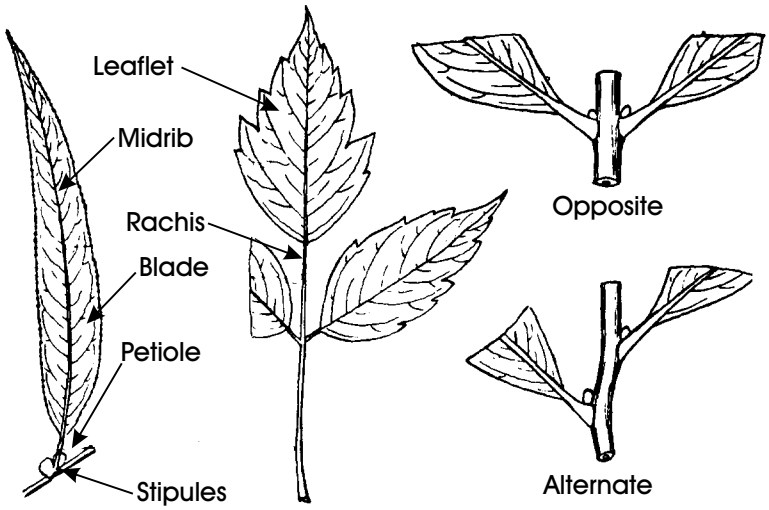
Trees have many characteristics that can be used to identify particular species: overall size and shape; the color, size and shape of leaves; the texture, color and shape of twigs and buds; and the color and texture of bark, fruit and flowers. Growing range is also useful in identifying tree species. Most people use several of these characteristics to identify a specific tree.

During late spring, summer and early fall, the size and shape of leaves are the characteristics most often used to identify a tree. Being able to recognize the different leaf shapes of the various species will help you identify the trees you see. Leaves either are deciduous -- shed annually, like the leaves of maples, elms and ashes -- or evergreen, remaining on the tree for one or more years, like the needles of pines and spruces. Most of the cone-bearing trees -- pines, spruces, firs and hemlocks -- and some broadleaf trees, such as the American holly and live oak, are evergreen.

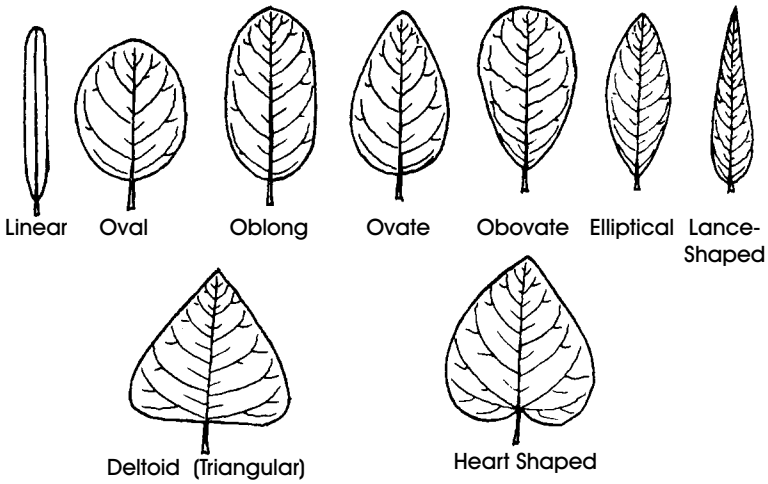
When a tree has shed its leaves, identification can be more difficult. You must then rely on the shape and texture of the bark, twigs and buds, and on any fruit or flower parts remaining on the tree to make an identification. Knowing these characteristics will help you identify trees during the late fall, winter and early spring months. Learning to recognize our trees and how they are influenced by their environment can be a delightful outdoor pastime during all seasons.

PARTS, TYPES AND POSITIONS OF LEAVES

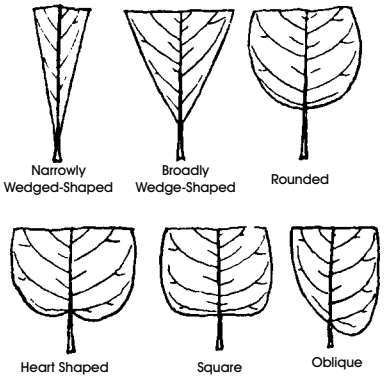




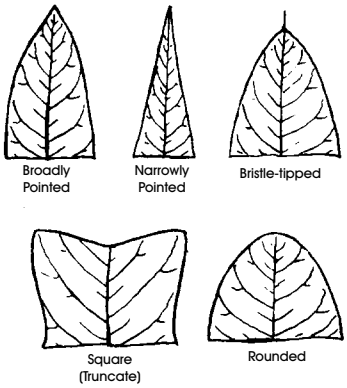
SHAPES OF LEAVES



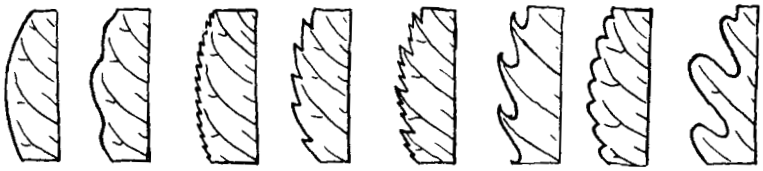
LEAF BASES



LEAF TIPS

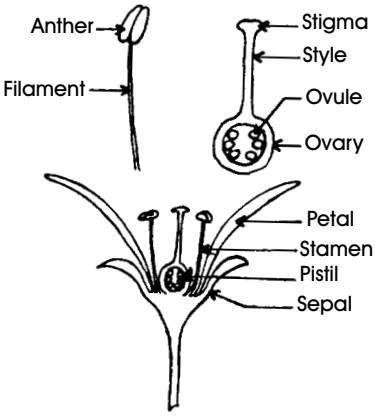


TYPES OF LEAF MARGINS



Entire | Undulate (Wavy) | Finely Serrate | Coarsely Serrate | Doubly-toothed | Incurved Teeth | Bluntly Toothed | Lobed

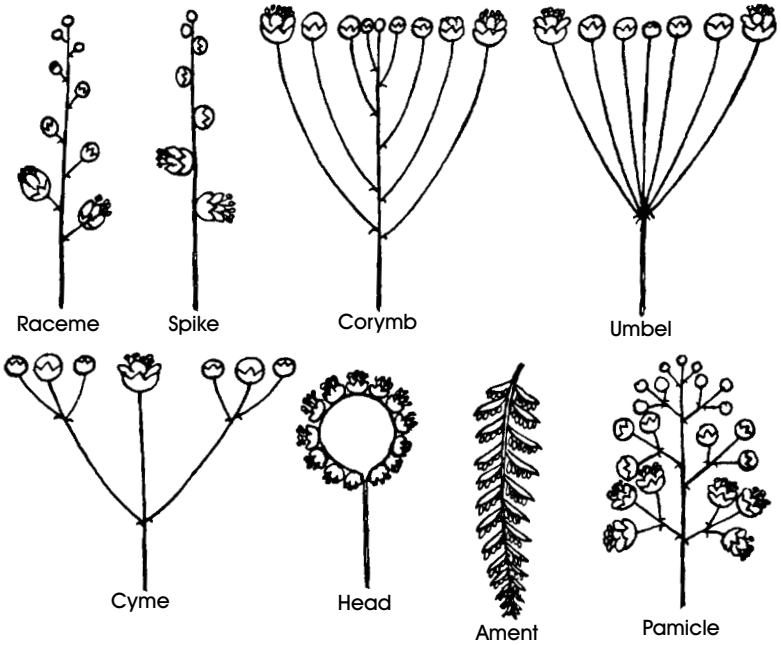
PARTS OF A COMPLETE FLOWER



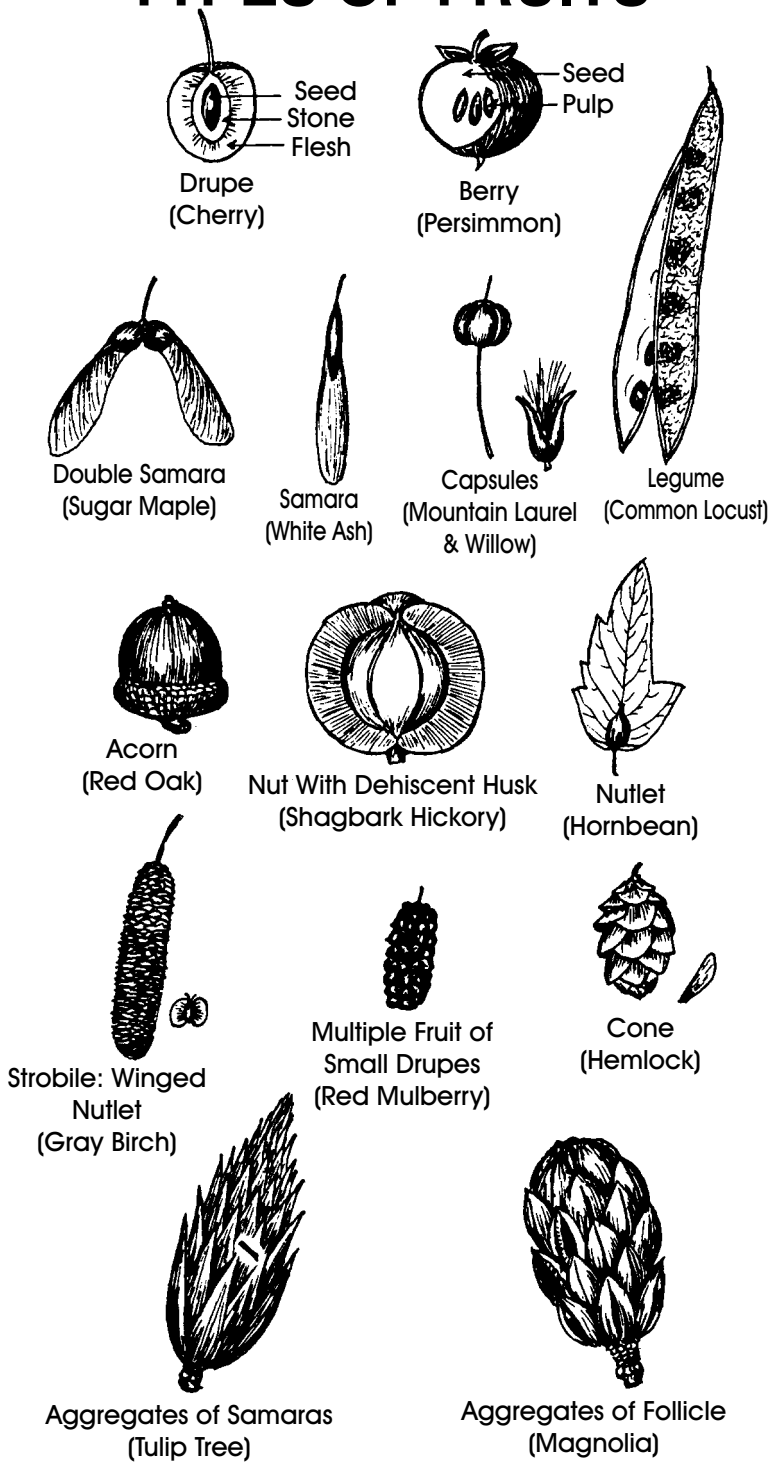
PISTILLATE FLOWER (BEECH)

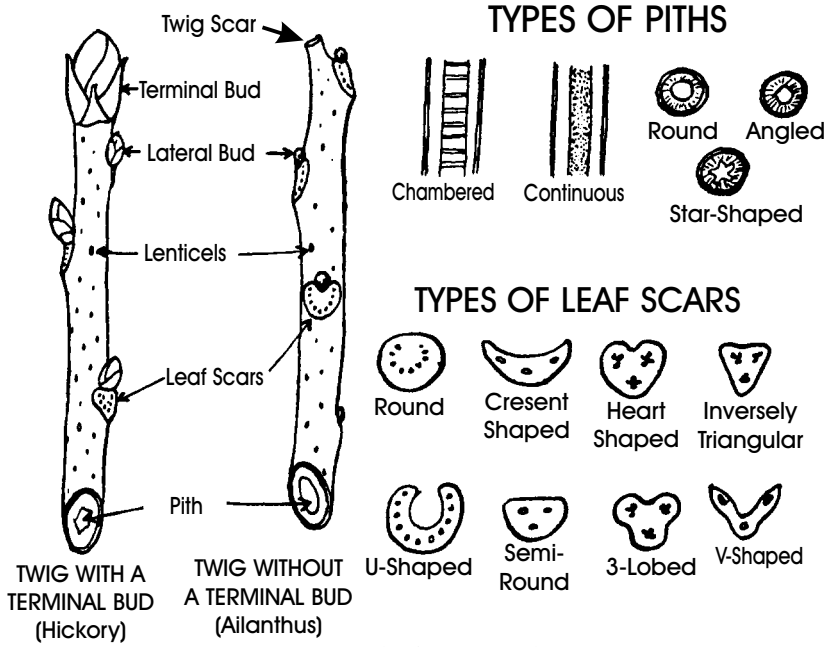
STAMINATE FLOWER (BEECH)

TYPES OF INFLORESCENCES



TYPES OF FRUITS

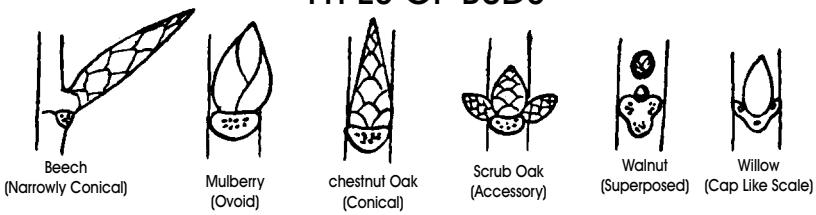


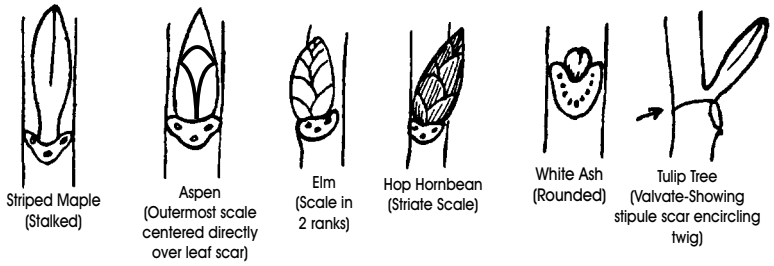


TYPES OF PITHS

TYPES OF LEAF SCARS

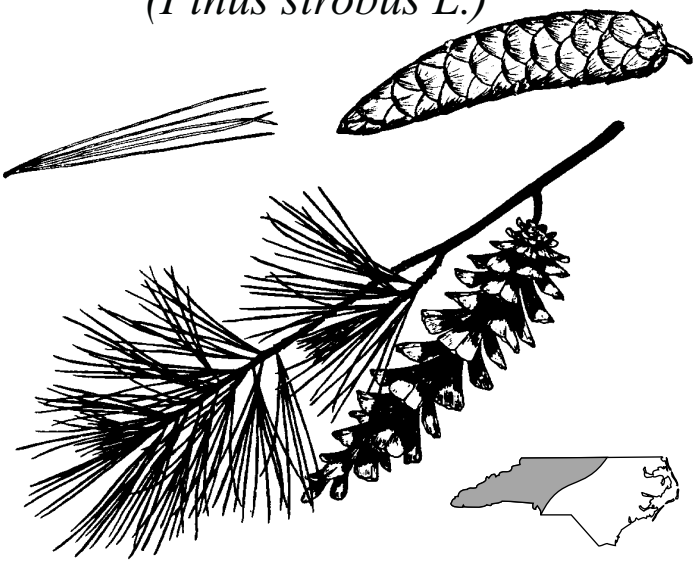
TYPES OF BUDS





Eastern White Pine

(Pinus strobus L.)



White pine grows naturally through the mountains, extending into the adjacent Piedmont region. It grows on high, dry, sandy and rocky ridges but does better on cool, moist, sandy loam soils. White pine reaches its best form in the Johns River area of Burke County.

Eastern white pine **needles** are soft bluish-green, flexible and 3 to 5 inches long. They grow in bundles of five and have 3 to 5 white lines (stomata) on two surfaces of each needle. Needles remain on the tree for two years.

Cones are fully grown in the summer of the second season, opening to discharge seeds during July and August.
Cones are 4 to 8 inches long, curved and stalked, with non-spiny scales.

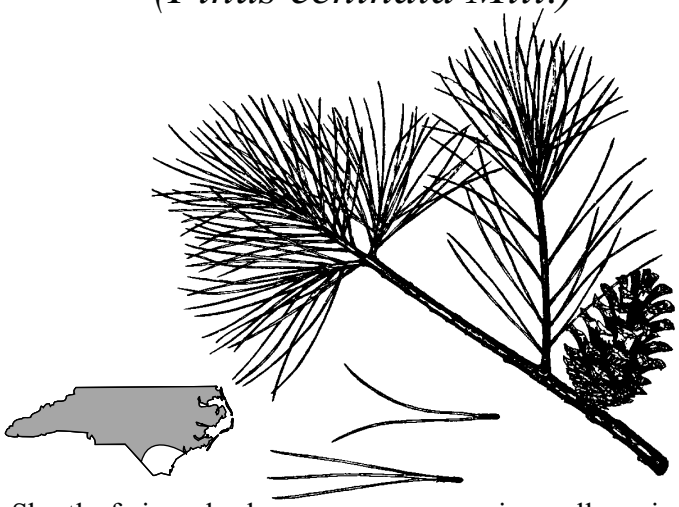
The **bark** on young trunks and branches is thin, smooth, greenish and shiny. On old trunks, the bark is dark gray and is shallow-fissured, with broad and flat-topped longitudinal ridges.

The tree commonly reaches 100 feet in height and four feet in diameter. It has a tall, straight stem and a pyramidal crown. Branches are in definite annual whorls, sweeping upward in graceful curves. Each whorl represents one year's growth.

Eastern white pine is the largest conifer of eastern North America. It is long-lived and has been known to reach heights over 200 feet. Its **wood** is light, straight-grained and easily worked but is not strong. It is used in cabinet making, furniture, interior finishes, wooden ware, matches and lumber. A large part of the winter diet of red squirrels (Boomers) in the southern Appalachians consists of the seed of eastern white pine.

Shortleaf Pine

(Pinus echinata Mill.)



Shortleaf pine, also known as rosemary pine, yellow pine and old-field pine, is widely distributed throughout the South. It can be found in pure or mixed stands from the Coastal Plain to the uplands and lower mountain slopes. In the lower mountains, it grows with hardwoods and four other species of pine: white; pitch; Virginia; and table mountain.

Shortleaf pine **needles** are 3 to 5 inches long, slender, flexible, dark green and grow in clusters of two or three. Needles begin dropping at the end of the second season, with some remaining until the fifth year.

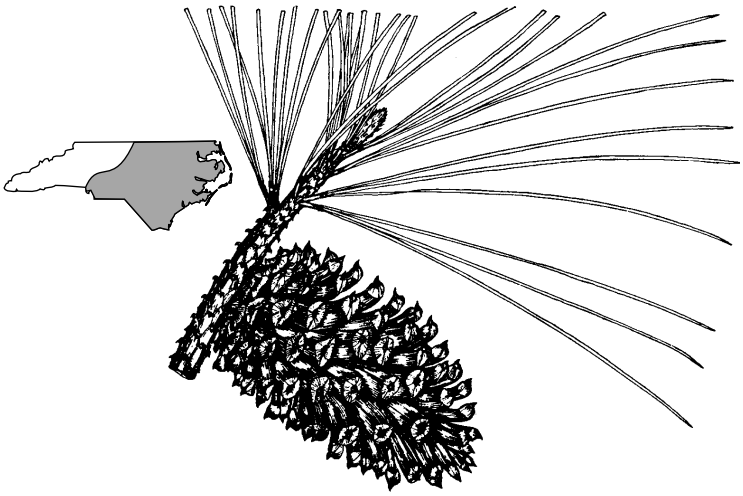
The symmetrical **cones** are ovoid, short stalked, 1 1/2 to 2 1/2 inches long and are armed with a short spine at the tip of each scale. The seed-fall begins in early autumn and continues into the winter. The empty cone remains on the tree for several years.

Mature shortleaf pine **bark** is broken into irregularly shaped plates that are covered with thin, reddish scales -- often thinner and lighter-colored than that of old loblolly pine. Small surface pits or holes in the outer bark scales are a unique feature of this tree.

Shortleaf pine reaches 80 to 100 feet in height on good sites, with diameters of 2 to 3 feet. The comparatively slender branches form a loose pyramidal crown. Seeds are eaten by rodents, wild turkey, squirrels and some songbirds.

The **wood** of older trees is rather heavy and hard, of yellow-brown or orange color and fine-grained. It is less resinous than that of the other important Southern pines. It is used largely for interior and exterior finishing, general construction, veneers, paper pulp and poles.

Loblolly Pine
(Pinus taeda L.)



Loblolly pine is the most important commercial timber tree in North Carolina. It is a fast-growing member of the yellow pine group, which grows in an area extending from the Coastal Plain throughout the eastern Piedmont. Within this area, loblolly is by far the most common pine.

Loblolly pine **needles** occur in clusters of three. They are slender and stiff, 6 to 9 inches long and pale green. They drop during the third season.

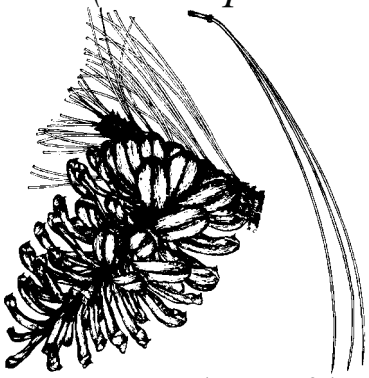
The oblong **cones** are 2 to 6 inches long, light reddish to brown and are armed with a spine at the tip of each scale. Cones drop their seeds in autumn and winter but remain on the tree for another year.

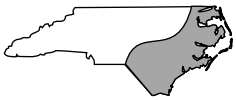
At 60 years, the mature **bark** is thick, bright reddish to brown and is divided by shallow fissures into broad, flat-topped plates covered with thin scales. The **tree** often reaches 90 to 110 feet in height on good sites, with a tall, cylindrical trunk 2 to 3 feet in diameter. The lower, short, thick branches on older trees droop, while the higher branches grow upward. The mature crown usually is compact and round-topped. The resinous wood is coarse-grained, with a marked contrast -- as in the other yellow pines -- between the bands of spring and summer wood.

Loblolly has a wide range of uses, such as lumber, pulpwood, plywood, poles and piling. Because it is useful and grows very quickly, loblolly is the target of much of the forest management in North Carolina -- and in the entire Southeast. It is the most widely planted forest tree, and many thousands of acres of productive loblolly pine plantations are now growing in North Carolina.

Longleaf Pine

(Pinus palustris Mill.)





Prior to European settlement of the state, the longleaf pine forest dominated the eastern North Carolina landscape. Two hundred years of clearing for agriculture, logging without reforestation, hog grazing and ironically, wildfire control has reduced this forest to a mere remnant of its original size.

Young longleaf pine forms one of the most striking features of the southern forest. As a seedling, it resembles a clump of grass. Longleaf begins height-growth at two to 10 years of age, when it forms a handsome plume of sparkling green.

Longleaf pine is appropriately named for its long, drooping, lustrous bright green **needles.** The needles are 8 to 15 inches long in three-leaf clusters that are crowded into dense tufts toward the ends of the stout branches. The large, silvery white, shiny buds (called "candles" when they begin to grow) make longleaf pine easily recognizable among other forest trees.

The longleaf cone is the largest of the southern pine **cones,** at 6 to 10 inches long. Cone scales are tipped with spines. Longleaf cones mature during their second season and drop shortly after releasing their seed in September to November.

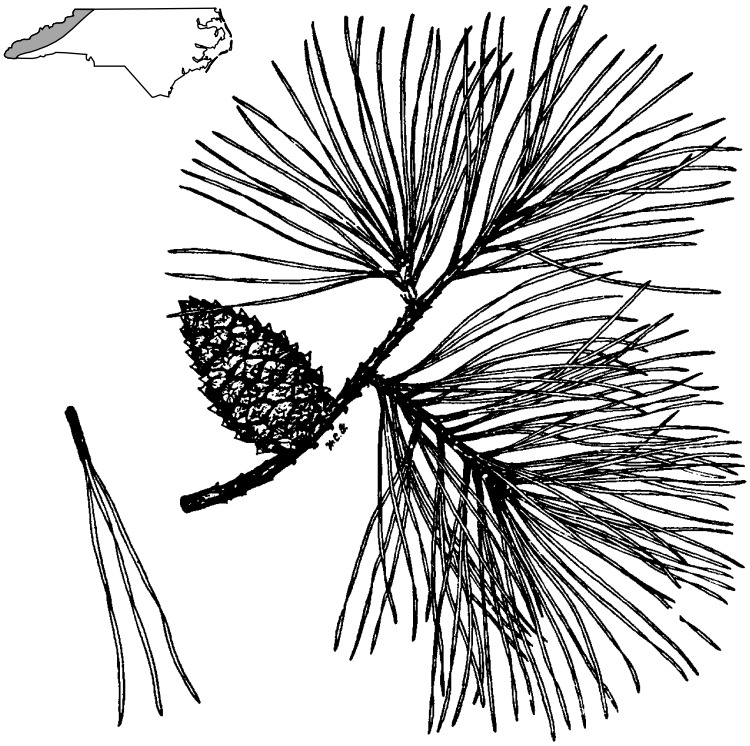
The thick **bark** of mature 70 year old trees is orange-brown or reddish-brown and is separated into large plates with thin scales. The **tree** commonly is 80 to 100 feet tall, with trunk diameter of 2 to 2 1/2 feet.

Longleaf pines grow on a variety of sites, the most favorable being well-drained, sandy soils. Longleaf pine has a tall, straight trunk and an irregular crown made up of stout and heavy gnarled or twisted branches.

Longleaf once was used for commercial production of naval stores (pitch, tar, resin, and turpentine). Today, it primarily is used for poles, piling, lumber and plywood. The heartwood is heavy, hard, strong, tough and durable. The seeds are a favorite source of food for wild turkey, gray and fox squirrels and many other wild animals.

Pitch Pine

(Pinus rigida Mill.)



Pitch pine is also known as hard pine, black pine or yellow pine. It grows on dry ridges and slopes in the mountains and outlying hilly regions at elevations up to about 4,500 feet. The tree usually grows 50 to 60 feet tall, with trunk diameters of 1 to 2 feet. It can be found scattered or in small groups with hardwoods or other pines.

Pitch pine **needles** are 3 to 6 inches long, rigid, dark yellow-green and are marked on three faces by numerous fine white lines (stomata). Needles are in three-leaf clusters. **Cones** are 1 1/4 to 2 3/4 inches long, have scales tipped with curved, rigid spines and remain on the tree for several years.

The **branches** often are thick, contorted and pendulous, giving the tree an irregular, ragged yet picturesque crown. The **bark** is broken into thick, plate-like scales that are yellowish-brown on older trees. Tufts of needles often are found along the trunk.

Pitch pine is used for lumber and pulp, and minor wood products. Wild boar in the southern Appalachians dig out the roots of this pine and eat their bark and soft outside wood.

Virginia Pine
(Pinus virginiana Mill.)

Virginia pine, also known as spruce pine or scrub pine, typically grows in the Piedmont and mountains, up to elevations of 4,500 feet. Pure stands of Virginia Pines are frequently found in old fields where they can seed-in readily on severely eroded and dry soil.

The side branches usually persist or remain on the tree for many years after dying, giving the tree a scrubby, untidy appearance. Virginia pine **needles** are 1 1/2 to 3 inches long, stout, yellow-green and usually twisted. They grow in bundles of two.

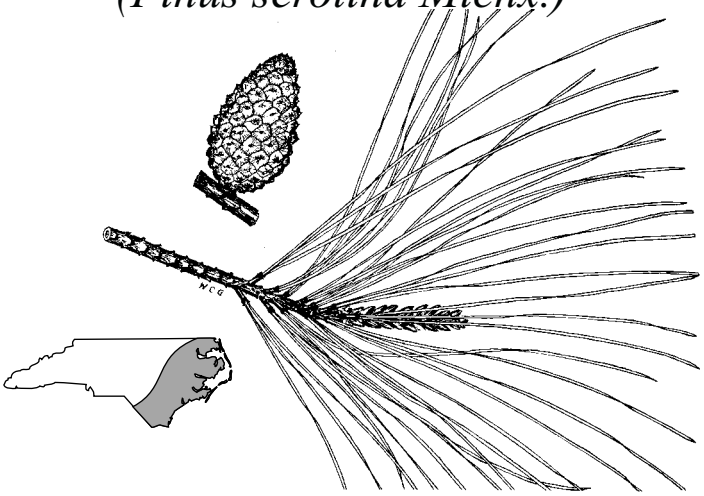
Cones are dark reddish-brown, ovoid (egg-shaped), lustrous, 1 1/2 to 2 3/4 inches long and are armed with a sharp spine at the tip of each scale. They ripen in the fall after two growing seasons and remain on the tree for several years after seed-fall.

Virginia pine is a small tree, 50 to 80 feet tall, with a trunk that rarely reaches more than 8 to 14 inches in diameter. The long, horizontal branches often droop to form an open, ragged, flat-topped crown.

The **bark** is thin, reddish-brown and is broken into shallow plates. Except in the occasional large trees, the **wood** is very knotty because of persistent side branches. The lumber's increasingly used for rough construction, but warps easily with alternate wetting and drying. It has a very long fiber and is an excellent pulping species.

Pond Pine

(Pinus serotina Michx.)



Pond pine is also known as pocosin pine, bay pine or black bark pine. It grows on moist to wet sites in the Coastal Plain area, such as pocosins, and on interstream areas with poor drainage. It also can be found in scattered small stands throughout the eastern Piedmont.

Pond pine **needles** grow in clusters of three (occasionally four) and are slender, dark yellow-green and flexible. They are 6 to 8 inches long and are deciduous in their third and fourth years.

The broad, oval **cones** of the pond pine can be either pointed or rounded at the end. They are 2 to 2 1/2 inches long and are light yellow-brown at maturity. Scales on the cones are flattened, and each is tipped with a slender, mostly deciduous, prickle. Cones remain closed for 1 to 2 years after maturing and stay on the branches for many years.

The **bark** of the mature pond pine is dark reddish-brown and divided by narrow, shallow fissures into small, scaly plates. The **tree** averages 40 to 70 feet in height and 1 to 2 feet in diameter.

The **wood** is resinous and heavy, often coarse grained and is orange-colored, with pale yellowish sapwood. It is used for lumber and pulpwood.

Pond pine is very resistant to fire -- even intense wildfire. It has the ability to sprout after being burned. Its cones may remain on the tree unopened for many years until they are heated by fire. Fire causes the seeds to be released, allowing new trees to grow in the burned area.

Even if its entire crown is consumed by fire, the upper stem of the pond pine will resprout quickly, becoming covered with needles that grow directly from the trunk. This feature often makes pond pine easy to identify.

Table Mountain Pine

(Pinus pungens Lamb.)

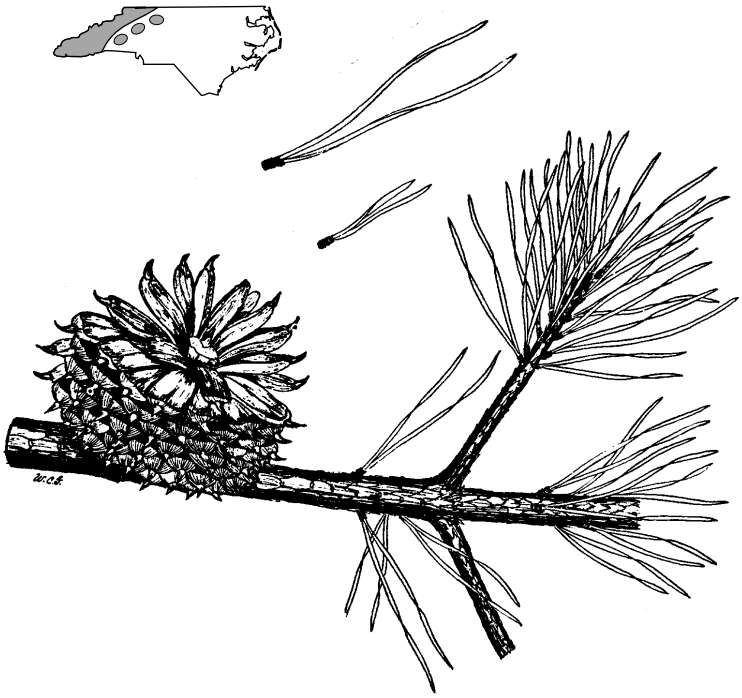


Table mountain pine usually grows along with hardwoods and other pines, or in small pure stands on dry, rocky slopes and ridges in the mountains and upper Piedmont.

The **needles** are rigid, usually twisted, 1 1/2 to 2 1/2 inches long, in fascicles (bundles) of two that are often crowded in clusters. They are dark bluish-green and are deciduous in either the second or third year.

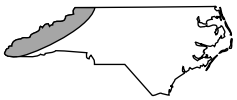
The **cones** of this pine are 2 1/2 to 3 inches long and in clusters of three or four (sometimes more). They are light brown, lustrous when ripe and are armed with a stout, hooked spine at the top of each scale. The cones have a very knobby appearance. They may open and shed seed as soon as they ripen or remain closed on the tree for two to three years or longer.

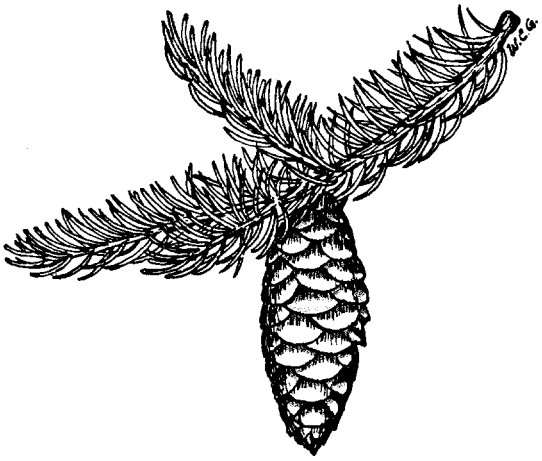
The thick **bark** is separated into irregular plates on the lower part of the trunk; the surface of the plates is covered with thin, loose, darkbrown scales that are tinged with red.

The **tree** commonly is about 30 to 40 feet tall in forest stands, with trunk diameters of 1 to 1 1/2 feet. In the open, the tree has a short trunk and a spreading, irregular crown. The **wood** is light, soft, not strong, resinous and coarse-grained. It is used for rough lumber, pulpwood and fuel wood.

Red Spruce

(Picea rubens Sarg.)





Red spruce is found on the summits and upper slopes of a few of our highest mountains. It grows on well-drained but moist (and usually rocky) soil, at elevations of 4,000 to 6,700 feet. Above 5,000 feet, it naturally combines with the Fraser fir to form dense forests.

Red spruce **leaves** are yellow-green, 1/2 to 5/8 inch long, pointed and shiny. **Cones** are 1 1/4 to 2 inches long, with scales that are smooth-margined. When mature, they are light reddish-brown and lustrous. Cones begin to fall as soon as they ripen, and all are off the tree before the following summer.

The **tree** is narrowly conical in outline, commonly reaching a height of 60 to 80 feet and a diameter of 1 to 2 feet.

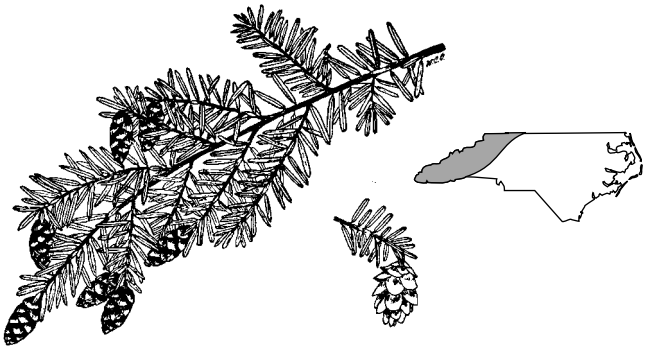
The dark brown to gray **bark** is broken into irregularly shaped scales, with reddish inner bark showing between.

Red spruce **wood** is light, moderately soft, strong and elastic. Its combined elasticity and strength make it well-suited for use in musical instruments. In the early days of flight, it was the preferred species for airplane frame construction. Little, if any, currently is harvested in North Carolina.

Though red spruce is a long-lived tree (400 year-old trees have been found), its continued existence on the high peaks of North Carolina may be questionable because, in part, of air pollution.

Eastern Hemlock

(Tsuga canadensis (L.) Carr.)



Hemlock, sometimes known as hemlock spruce or spruce pine, is common along streams and on cool slopes throughout the mountains and extends somewhat into the adjoining regions.

The flat **needles** are round-tipped, 1/3 to 2/3 inches long and are marked on the lower surface with two pale lines (stomata). The needles are narrow at the base to form short, slender stems that are attached to rounded, dark orange-colored, persistent, woody pads on the twigs. The pendant **cones** grow on short, slender stalks from the tips of branchlets, usually remaining on the tree until the following spring.

Hemlock is remarkably tolerant to shading by larger trees; many remain in the understory of natural stands for 25 to 200 years. It is a long-lived tree -- individual trees more than 500 years old are common.

The **tree** may reach a height of 60 to 100 feet with a trunk diameter of 2 to 4 feet. It often has a broad-based pyramid shape. Ends of branches often are drooping and "feathery." The **bark** on old trunks is dark gray and divided into narrow, deeply furrowed, rounded ridges. The **wood** is light, soft, brittle and difficult to work. It is used for rough or construction lumber and for pulpwood.

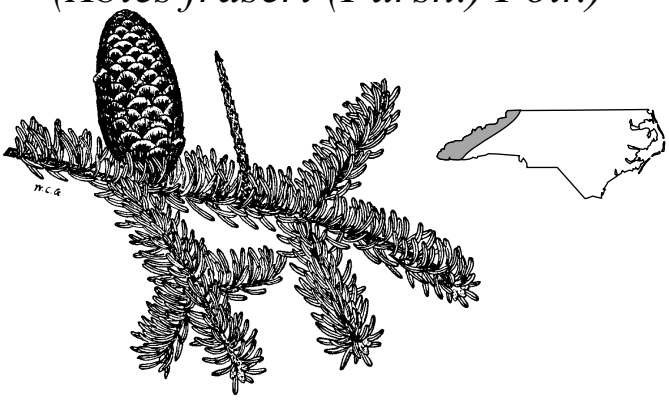
The **Carolina hemlock** *(Tsuga caroliniana Engelm.)* differs from the eastern hemlock in that its **needles** are much more whorled about the twig giving it a rougher less flat appearance than the eastern hemlock.

The **cone** scales of the Carolina hemlock are narrow, and much longer than they are wide. Both the cones and **leaves** are longer than those of eastern hemlock.

Carolina hemlock grows on dry, rocky ridges and cliffs along the Blue Ridge mountains and in northeastern Tennessee. It is a very desirable tree for ornamental planting.

Fraser Fir

(Abies fraseri (Pursh.) Poir.)



Fraser fir, also known as mountain balsam, southern balsam and she-balsam, is found on a few of our highest mountains. It is frequently found with red spruce, from which it can easily be distinguished by its cones and leaves. It grows on moist, cool slopes at elevations of 4,000 to 6,700 feet.

The **leaves** are flat, linear, 1/2 to 1 inches long, with the point rounded and often notched. The leaves are dark green and shiny above and silvery white beneath. The **fruit** is an upright purple cone, 2 to 2 1/2 inches long with yellow-green bracts, or modified leaf that usually is part of a flower.

The cone bracts are one of the main differences between Fraser fir and balsam fir (Abies balsamea (L.) Mill.). The bracts of Fraser fir are longer than the scales, thus exposing the tips of the bracts, which curl downward. Bracts of balsam fir cones are shorter than the scales and therefore are hidden.

The shape of the cone scales are also somewhat different. The seeds have wide wings, and when ripe, they fall together with the scales and bracts of the cone, leaving the hard central axis standing upright on the twig.

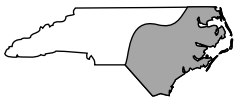
The bark on the younger trees is pale gray, smooth, thin and prominently marked by "blisters" that are filled with resin or balsam. Branches are produced regularly in whorls, giving the tree a pointed pyramid shape, which it retains until old age.

Fraser fir is a medium-sized tree, 40 to 70 feet high and more than one to two feet in diameter. The **wood** is light, soft, not strong and coarse-grained. It is grown extensively for Christmas trees in North Carolina, where it is ranked as the number one Christmas tree by the Christmas tree industry.

An exotic insect, the balsam wooly adelgid (introduced into New England in 1908) was found in Fraser fir stands in 1963. Infestation, which eventually kills the tree, spreads rapidly from peak to peak. It now threatens the existence of the species in its natural state.

Baldcypress

(Taxodium distichum (L.) Rich.)



Cypress, or baldcypress, is found in deep swamps that usually are flooded for long periods of time and on wet stream banks and wet bottomlands.

The **leaves** of the cypress are 1/2 to 3/4 inches long and are arranged in featherlike fashion along two sides of small branchlets, which fall in autumn with the leaves still attached. On rapidly growing leaders, the leaves are scale-like and much shorter, light green and sometimes silvery below.

The **fruit** is a rounded cone, or "ball," about one inch in diameter, consisting of thick, irregular scales. The **bark** is dark reddish brown to silvery brown and is finely divided by many longitudinal fissures.

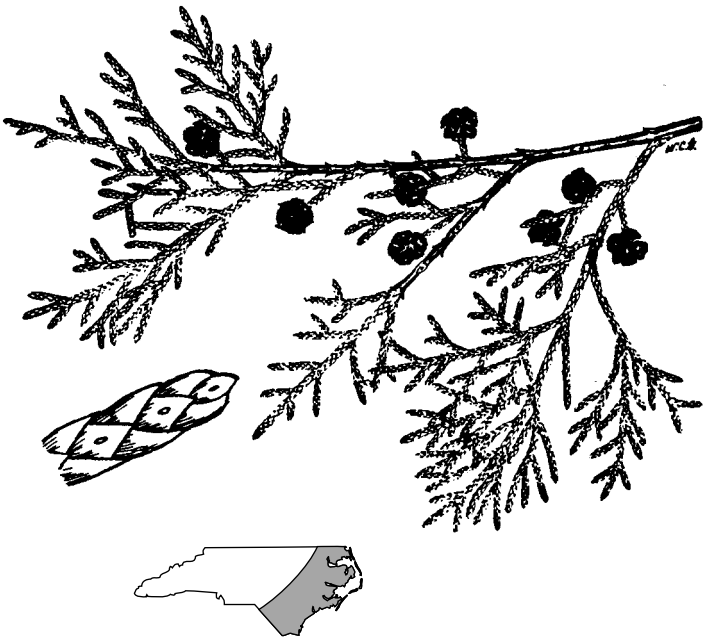
Baldcypress has a straight trunk with numerous ascending branches and a narrow conical crown, which makes the tree very beautiful. The root system frequently produces irregular conical structures, called "knees," that rise from the roots. In old age, the tree generally has a broad, fluted base, a smooth, slowly tapering trunk and a broad, open, flat top with a few heavy branches and many small branchlets. Old-growth trees reach heights of 90 to 120 feet and diameters of 3 to 6 feet.

Baldcypress **wood** is light, soft, easily worked and varies in color from a creamy sapwood to brown heartwood. Because it is particularly resistant to decay, baldcypress is in demand for exterior trim of buildings, greenhouse planking, boatbuilding, shingles, posts, poles and crossties.

Pond Cypress*(Taxodium distichum var. imbricarium (Nutt.)Croom)* Pond cypress differs from baldcypress mainly because its **leaves** are awl-like and fit closely on the twig. The bark of pond cypress is much grayer than that of baldcypress. Pond cypress gets its name from where it most often grows -- in ponds in the flat pinelands. Its other characteristics and uses are similar to baldcypress. Because the foliage of many of these trees closely resembles both that of the pond cypress and baldcypress, some botanists believe there is only one species.

Atlantic White Cedar

(Chamaecyparis thyoides (L.) B.S.P.)



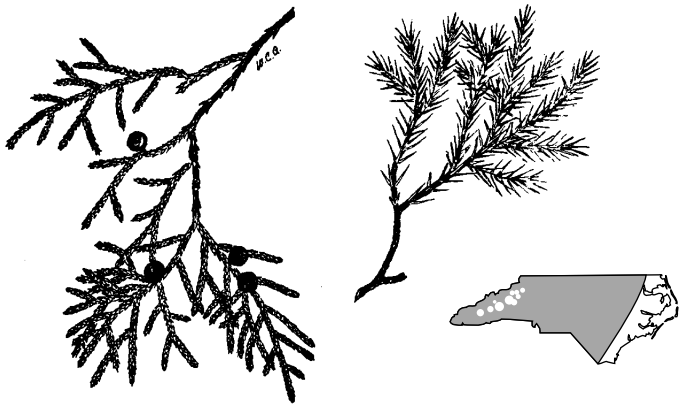
Atlantic white cedar, known locally as juniper, is exclusively a tree of the Coastal Plain. It is found in freshwater bogs, depressions, swamps and along streamsides. Atlantic white cedar grows with baldcypress and swamp hardwoods, but usually is found in pure stands called "glades." The tree reaches 40 to 85 feet in height and about two feet in diameter.

The branchlets are covered with dark blue-green, overlapping scales about 1/8 inches long. The **fruit** is 1/4 inch in diameter, bluish-purple when ripe and has a somewhat crumpled appearance.

The **bark** of the Atlantic white cedar is light reddish-brown and peels off in long, fibrous strips. The **wood** is very durable, fine grained, not strong and is slightly fragrant. It is used for shingles, posts, woodenware, interior finishes and is highly prized for boat construction.

Eastern Red Cedar

(Juniperus virginiana L.)



Eastern red cedar, a very valuable tree, is found in all classes and conditions of soils -- from acidic wetlands to dry, rocky ridges. It seems to thrive on barren soils where few other trees are found. Eastern red cedar is scattered throughout the state, except in the high mountains. It is most commonly found in the Piedmont.

The mature **leaves** average 1/16 inches in length and are opposite. They are smooth, shiny, dark green and glandular. On young foliage, leaves are somewhat needle-like: linear; pointed; and prickly. They occur in whorls of three. The fleshy **fruit** is round, 1/4 to 1/3 inch in diameter and, at maturity, a bluish color with a grayish-white, waxy covering.

The **tree** commonly is 40 to 50 feet tall with a trunk diameter of 1 to 2 feet, but it may grow much larger. The short, slender branches form a compact, pyramidal crown, except on very old trees.

The **bark** is light reddish-brown. It is thin and separates into long, peeling, fibrous strips. The heartwood of the Eastern red cedar is distinctly red, and the sapwood is white. This color combination creates striking effects when the wood is finished as cedar chests, closets and interior woodwork. Red cedar **wood** is aromatic, soft, strong and evenly textured; these qualities make it the best material for pencils. The heartwood is very resistant to decay. It is in great demand for use in fence posts, poles and rustic furniture. Because red cedar repels insects, it is used for cedar chests, closet linings and pet bedding.

Red cedar can cause havoc in apple orchards. The "cedar apples" often found on the twigs of the red cedar are caused by a rust fungus (Gymnosporangium juniperi - virginianae) that has an alternate host in apple trees. The fungus causes dark leaf spots on apple trees.

Black Willow

(Salix nigra Marsh.)

Black willow is common along streams throughout North Carolina, except in the high mountains. Black willow will grow on almost any soil, but its shallow, wide -spreading roots need an abundant and continuous supply of water during the growing season.

Black willow is the largest of the native willow trees, averaging 30 to 50 feet in height and 1 to 2 feet in diameter. Its **leaves** are long (3 to 6 inches) and narrow (1/2 to 3/4 inches wide), pointed and have finely toothed margins. The black willow's twigs are brittle at the junction with the previous year's growth, and can be easily broken away. The **fruit** is a pod bearing hundreds of tiny seeds covered with long, silky down that enables them to be blown long distances.

The **bark** is deeply divided into broad, flat ridges that separate into thick, plate-like scales. On old trees, the bark becomes very shaggy. The bark varies in color from light brown, tinged with orange, to dark brown or nearly black.

Black willow trunks often are twisted, curved or leaning. The wood is soft, light and not strong. Willow **wood** is used in boxes and crates, as core stock in furniture and for woodenware and novelties. Before the development of plastics, black willow also was used for artificial human limbs.

Other Willows

There are a number of other willows that reach small tree size. They have finely toothed leaves that are long and narrow -- but not as long or narrow as black willow leaves. Like black willow, they usually are found along streams, lakes and ponds because seedlings growing from tiny seed require an immediate and constant supply of moisture to survive.

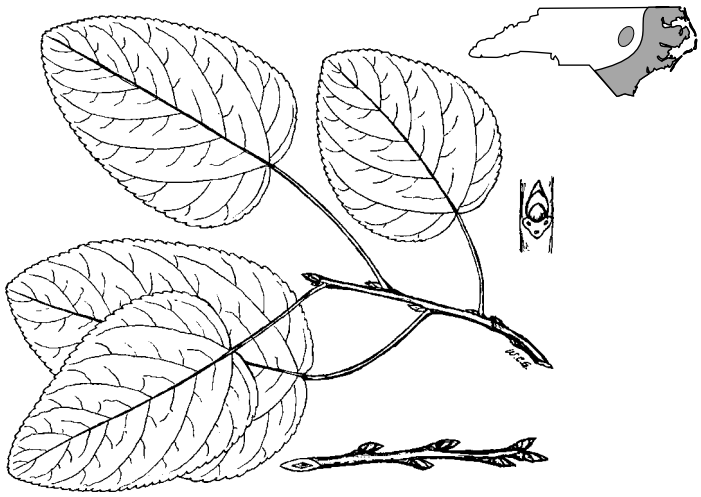
Weeping willow *(Salix babylonica L.)* is a native of eastern Asia that has been planted as an ornamental tree throughout the state. It has escaped and become naturalized along streams and other wet sites. Its long, pendulous **branchlets** and graceful, weeping form make it the easiest willow to recognize.

White willow *(Salix alba L.),* like weeping willow, is not a native of North America. It was introduced from Europe as an ornamental tree, escaped and has become widely naturalized. Its **branchlets** are dark green to brown and often are covered with long, silky hairs. The petiole (see the foreward for an example) of white willow have small swollen discs at the base of the leaf blade called glands, which are not found on the leaves of other willows. The undersurface of white willow leaves, in keeping with the tree's name, is distinctly white or pale gray.

Carolina, or swamp, willow *(Salix caroliniana Michaux.)* grows throughout the Coastal Plain and along rivers and streams into the Piedmont. It may be distinguished from black willow by its **leaves,** which are wider and distinctly whitish on the underside.

Swamp Cottonwood

(Populus heterophylla L.)



This is a tree that grows in low, wet sites. It is typically found on the borders of swamps and rivers in the Atlantic coastal and Mississippi Valley regions. The tiny, cottony seeds, which are carried far by winds, germinate on wet, sandy soils. Swamp cottonwood grows singly or in small patches.

Its **leaves** are broadly oval, 4 to 7 inches long, and 3 to 6 inches wide. They are rounded at the tips and are often heart-shaped at the base. The margins are toothed, but the teeth are quite shallow and rounded. Leaves have a stout, yellow midrib.

The **fruit** resembles that of eastern cottonwood. The tree may reach 70 to 90 feet in height and 2 to 3 feet in diameter on good sites, but it usually is poorly formed. The **wood** is light and soft, and as lumber it requires special attention during drying to prevent serious warping. Cottonwood is used for crates and baskets. It makes excellent pulp for white paper printing.

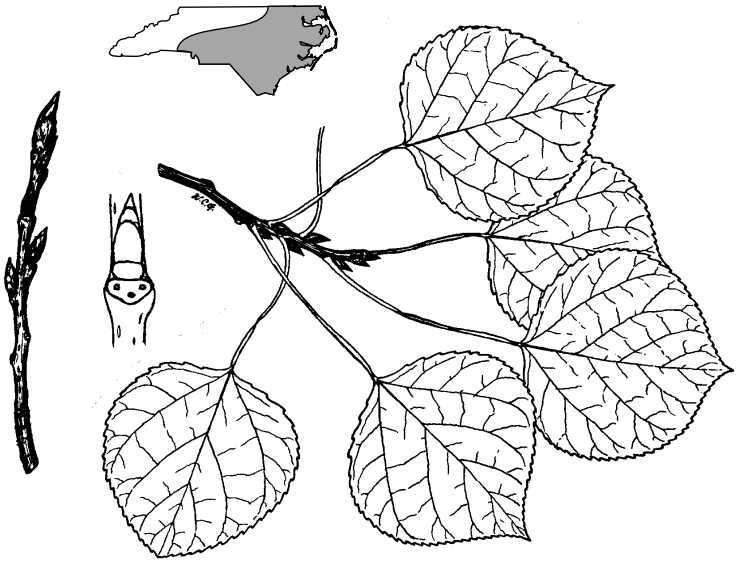
European white poplar

(Populus alba L.) is a native of Europe that has become naturalized. It has prominent light gray **bark** and **leaves** that have few coarse teeth and are white wooly beneath. It often is found near old houses and along roadsides. European white poplar is a very aggressive species that often produces many root suckers around the base of the parent tree.

Lombardy poplar

(P. nigra var. italica M.), another of the true poplars, often is planted as an ornamental tree but is not well-suited for this use because it is very short-lived. This tree is fast-growing and produces a distinctive, tall, narrow crown.

Eastern Cottonwood
(Populus deltoides Bartr. ex Marsh)



Eastern cottonwood grows throughout North Carolina, but most commonly is found along stream banks and in bottomlands. It does not grow naturally in the mountains. The fastest-growing commercial forest species in North America, Eastern cottonwood is one of the tallest trees of eastern forests, reaching heights close to 200 feet and diameters of 4 to 6 feet. The average height ranges from 80 to 100 feet and 3 to 4 feet in diameter. The **tree** grows best on moist, well-drained soils. It does not often develop into a well-shaped tree if it is more than 15 to 50 feet above the level of the streams in the area.

Eastern cottonwood **leaves** are roughly triangular. They have a toothed edge that are pointed. The leaves are 3 to 6 inches long and 4 to 5 inches wide, paler below than above and have a flattened stem.

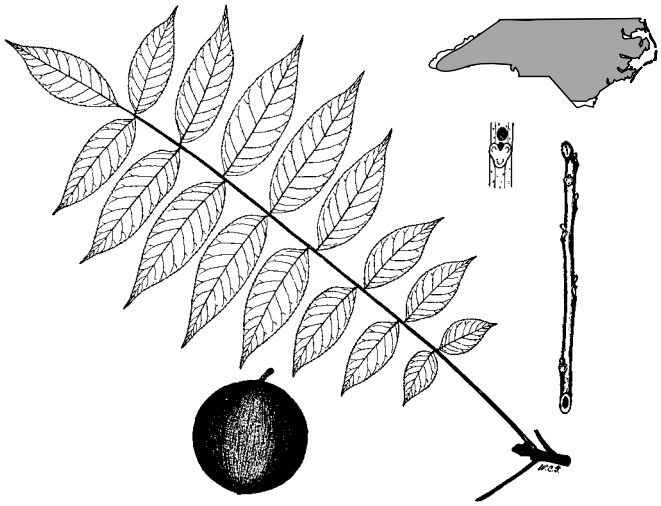
The fruit consists of many green, ovoid capsules that are clustered along short stems that hang from the branches in long, narrow groups. Seeds are released from the capsules when ripe. They drift in the breeze, each one suspended from a tuft of white "cottony" hairs.

Bark on young trees and on upper stems of older trees is smooth and greenish. Bark of older trees are dark gray, heavily furrowed and ridged.

The **wood** is soft and lightweight. It often warps during drying but is used for baskets and crates and sometimes as a substitute for yellow poplar and linden. It is used to make the highest grade of glossy magazine paper for printing pictures.

Black Walnut

(Juglans nigra L.)



This extremely valuable forest tree only grows well on rich bottomlands, in moist, fertile coves and on lower slopes throughout the state. Its survival, growth and quality on less fertile sites is not good.

Black walnut **leaves** are alternate, pinnately compound (see foreward for an example), 12 to 24 inches long, with 15 to 23 sharply oval, finely toothed, long-pointed leaflets 3 to 3 1/2 inches long. The pith of new branches is chambered, with thin, buff-colored diaphragms (which are thin, papery crosswalls) defining the chambers, or voids. Leaves turn a bright, clear yellow in autumn.

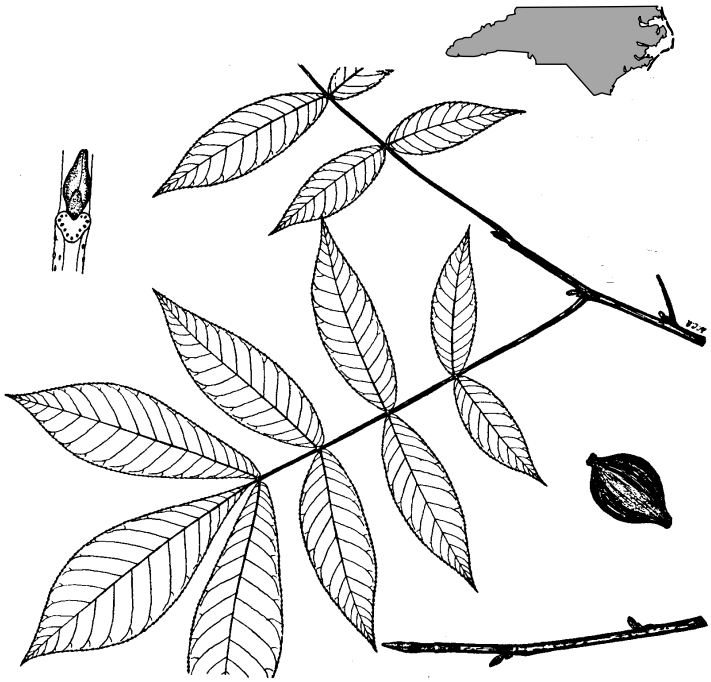
The **fruit** is attached singly or in pairs and is globular in shape with a pointed apex. The fruit is 1 1/2 to 2 inches in diameter and has a thick, yellow-green fibrous husk. The hard, woody nut is dark brown, oval to oblong, 1 to 1 1/2 inches in diameter and is deeply divided on the outer surface into irregular ridges. The meat of the nut is sweet and edible and is a favorite food for squirrels.

The **bark** is thick, dark brown to black and is divided by deep fissures into rounded ridges. The **tree** reaches 50 to 90 feet in height and 2 to 3 feet in diameter.

The **heartwood** is of superior quality and value. It is heavy, hard and strong, has a rich chocolate-brown color, and it warps or checks little when drying. Once dry, it is dimensionally stable. These attributes, along with the wood's receptiveness to a high polish, make it highly prized for a great variety of uses, including furniture, cabinetwork and gun stocks. Walnut is the most valuable of our hardwoods.

Bitternut Hickory

(Carya cordiformis (Wangenh.) K. Koch.)



Bitternut hickory is a tall, slender tree with a broad pyramid-shaped crown. It is found throughout the state on moist, rich soils.

Its **leaves** are 6 to 10 inches long with seven to nine long, oval, toothed leaflets that are dark yellow-green above and lighter below.

The 4-ribbed **nut** is about an inch long, roughly spherical, with a thin shell. The meat of the nut is very bitter. The husk is four-winged from the tip to about the middle and is covered with yellowish-green, scruffy hairs. The **bark** on the trunk is granite-gray and faintly tinged with yellow. It is less rough than most of the hickories, yet it is broken into narrow, plate-like scales.

At all seasons, the bitternut hickory can be identified from all other native trees by its bright, scaly, yellow, long buds. On bottomlands, it develops into a tree of 50 to 70 feet or more, with a straight trunk 1 to 2 1/2 feet in diameter. The **wood** is hard, strong and heavy with a reddish brown heartwood. It is said to be somewhat inferior to the other hickories, but is used for the same purposes: tool handles; furniture; interior paneling; and sporting goods.

Pecan

(Carya illinoensis (Wangenheim) K. Koch)

Pecan, although not native to North Carolina, has been widely planted throughout the state during the past 200 years and has begun to reproduce naturally. It is the largest of all hickories and has reached 180 feet in height. Though its wood is widely used in furniture, the pecan is noted for its sweet and tasty nut.

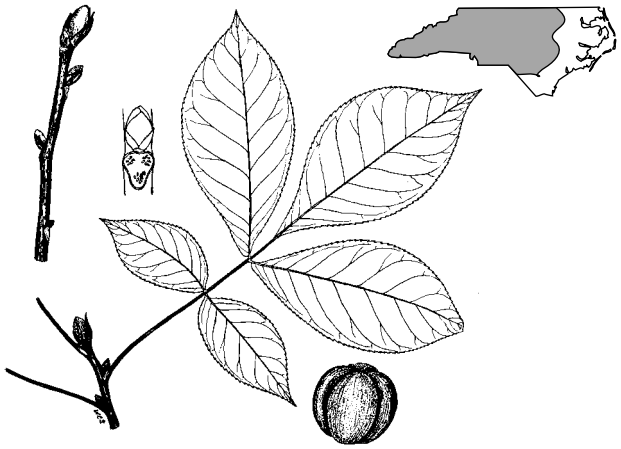
Pecan **leaves** are 12 to 20 inches long, with 9 to 17 toothed leaflets. Each leaf is 4 to 8 inches long; 1 to 3 inches wide and appear dark yellow green above and paler below. The mature **fruit** is a 4-ribbed, dark brown, ellipsoidal husk (the familiar smooth, reddish-brown pecan). The **bark** on mature trees are light brown to gray. It is composed of low, scaly ridges separated by very narrow, shallow fissures.

Water hickory or bitter pecan

(Carya aquatcia (Michx.f.) Nutt.) is common in the Coastal Plain, where it is found on wet, poorly drained sites. It is similar to pecan, differing mainly in its **nut,** which usually is obovoid, flat tened, smaller, and far less edible than pecan. Without the fruit, it often is difficult to distinguish water hickory from pecan.

Shagbark Hickory

(Carya Ovata (Mill.) K. Koch.)



Shagbark hickory, often referred to as scaly or shell-bark hickory, thrives best on rich, damp soil and is common along streams and on moist hillsides throughout the state. It usually grows, as a minor component, in association with oaks, other hickories and mixed hardwoods.

The terminal bud is brownish gray and covered with three to four loose-fitting pubescent scales. Shagbark hickory **leaves** are 8 to 14 inches long with five (rarely seven) leaflets that are tapered, oval, smooth and finelytoothed. The terminal leaflet is largest, being 5 to 7 inches long and 2 to 3 inches wide. The nut, attached singly or in pairs, is roughly oblong, 1 to 2 1/2 inches long. The nut is thin-shelled and is covered with a thick, 4-part husk that splits to the base of the nut when ripe. The meat of the nut is sweet.

Shagbark hickory is named for its light gray **bark** that separates into thick plates a foot or more long. The plates curl outward at both ends. Older trees develop a distinctive shaggy trunk.

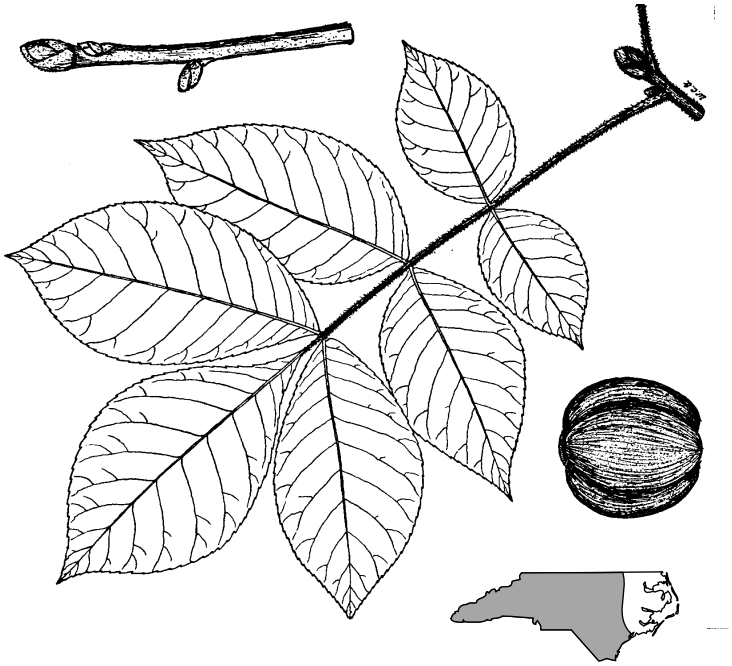
The **tree** grows on a variety of sites and soils and may reach heights of 120 feet or more. It commonly grows 60 to 80 feet tall, 1 to 2 1/2 feet in diameter, and usually has good form.

The **wood** is heavy, hard, tough and very strong. It is used largely in the manufacture of tool handles and furniture. For fuel, the hickories are among the best of our native trees.

Carolina or southern shagbark hickory
(Carya carolinae-septentrionalis (Ashe) Engl. and Graebn.) is very common in the Piedmont and resembles shagbark. It can be distinguished by its slender, hairless, shiny dark brown (almost black) twigs and its similarly colored, slender, cylindrical and hairless terminal buds.

Mockernut Hickory

(Carya tomentosa Nutt.)



Mockernut hickory is sometimes referred to as white, whiteheart or big-bud hickory. It is common on well-drained soils throughout the state. The tree occasionally reaches 100 feet in height and 3 feet in diameter, but it averages 50 to 70 feet tall and 1 to 2 feet in diameter.

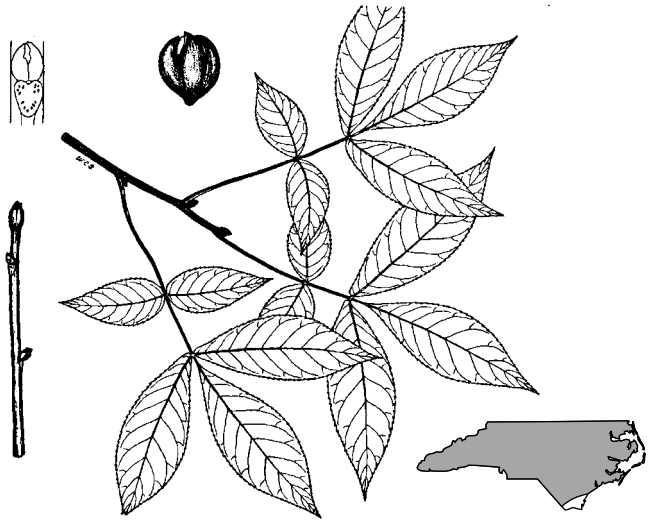
Mockernut hickory **leaves** are 8 to 12 inches long with seven to nine (rarely five) thin, sharp-pointed, finely toothed leaflets that are dark green above and a hairy orange-brown below. The **nut** is roundish to oval, 1 1/2 to 2 inches long, with a thick reddish-brown husk that splits almost to the base of the nut when ripe. The meat of the nut is sweet and is enclosed in a very thick shell.

The **bark** is dark gray to black, hard, closely and deeply furrowed, often appearing cross-furrowed or netted. The winter buds are large, 1/2 to 3/4 inch long, spherical or broadly egg-shaped and covered with downy, hard scales. New shoots are short, stout and more or less covered with a downy growth.

The **wood** is heavy, hard, tough and strong; it is white except for its comparatively small, dark brown heart -- hence the name white hickory. Mockernut hickory is used for tool handles and in sporting goods. This and the other hickories are very desirable as both forest and shade trees.

Pignut Hickory

(Carya glabra (Mill.) Sweet)



Pignut hickory is a medium to large upland tree, usually found on drier soils in the center of the state and less frequently elsewhere. The **tree** reaches heights of between 50 and 75 feet tall, with a trunk diameter of 1 to 3 feet.

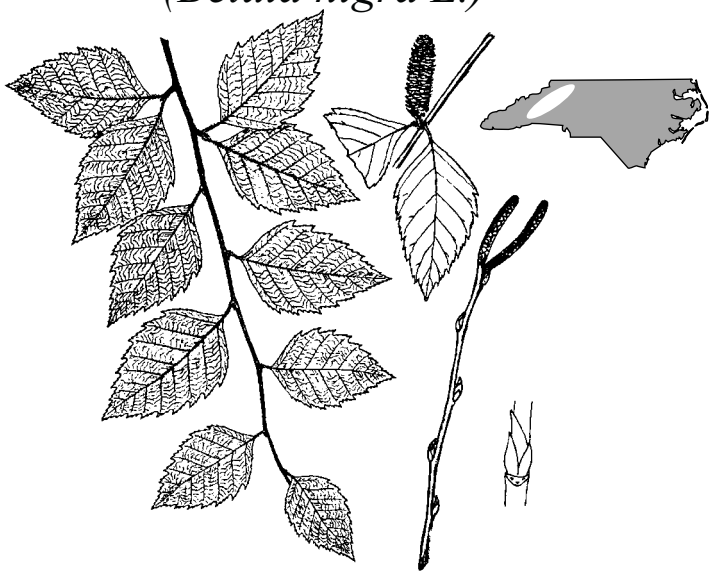
Its **leaves** are 8 to 12 inches long with five (rarely 7) finely toothed, sharp-pointed, tapering leaflets. The **fruit** is not ribbed and is globular to pear-shaped. The fruit is 1 1/2 inches long and is enclosed in a thin husk that remains closed or opens only part way down the nut. The nutmeat is small and sweet.

The spreading, often drooping, branches form a tall, narrow head. As the **tree** matures, the dark gray bark becomes deeply fissured and separates into scaly ridges that form into rough diamond patterns. The **wood** is heavy, hard, strong and flexible.

The **red hickory** *(Carya ovalis Wangenh Sarg.)* differs from pignut hickory in that its **fruit** is round and its bark frequently separates into narrow, short plates or minute scales. It grows on upland sites with black, red and white oaks.

The **sand hickory** *(Carya pallida (Ashe) Engl. & Graebn)* is found on sandy Piedmont soils and grows sparingly in the mountains and Coastal Plain. It has pale, delicate foliage. The **leaves** are woolly or hairy underneath and, when young, are covered with silvery scales. The husks are thicker than those of the pignut.

River Birch
(Betula nigra L.)



River birch, or red birch as it sometimes is called, is the only native birch found at low elevations in the South. It is commonly found, as its name implies, along waterways, inhabiting deep, rich soils throughout the state, except in the higher mountains.

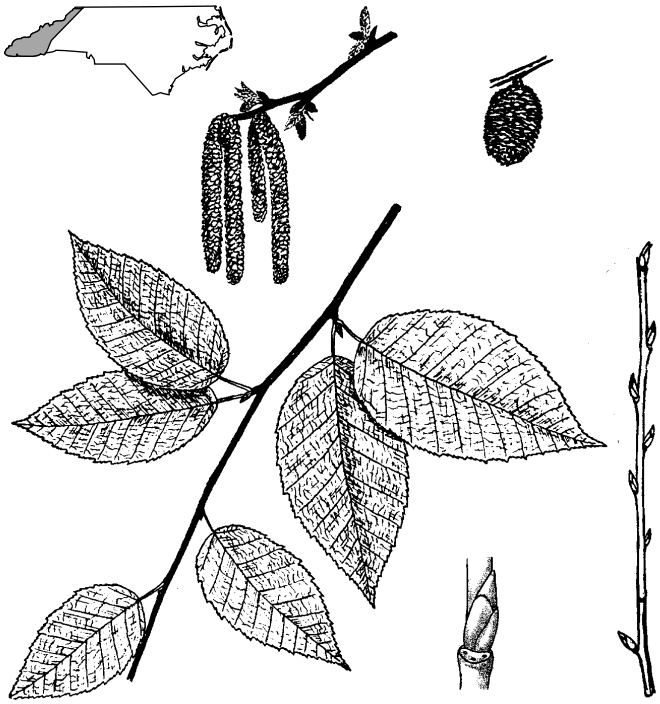
River birch **leaves** are roughly oval, pointed, 1 1/2 to 3 inches long, with double-toothed margins. It is commonly found on banks of streams, near ponds and near swamps. It will grow to heights of 70 to 80 feet and diameters of 1 to 3 feet. The crown is irregular and picturesque and is divided where the arching limbs spread from the main trunk.

The **fruit,** a strobile, is cylindrical, 1 to 1 1/2 inches long and 1/2 inch thick. It grows erect (see the foreward for a drawing of a strobile). River birch is the only birch that produces mature fruit in the spring.

The **bark** provides a ready means of distinguishing this tree. It varies from reddish brown to cinnamon-red in color and peels back in tough papery layers. These layers persist on the trunk, presenting a ragged and distinctive appearance. Unlike the bark of other birches, the thin, papery layers usually are covered with a gray powder. On older trees, the bark on the main trunk becomes thick, deeply furrowed and reddish-brown.

The **wood** is quite hard and is used in the manufacturing of furniture and other products, where its close-grained properties make it valuable. However, if river birch develops while arching out over a stream, its wood is not acceptable for use in furniture and other products requiring a smooth finish.

Yellow Birch
(Betula alleghaniensis Britton)



Yellow birch is confined to cool, high mountain slopes, generally at elevations above 3,000 feet. It grows at slightly higher elevations than black birch, from which Yellow birch usually can be distinguished by its **bark.**

Yellow birch is named for its bark, which has a yellowish-bronze color and peels into long, ragged, horizontal strips. The bark of mature trees breaks up into reddish-brown plates.

Leaves are 3 to 5 inches long, pointed, sharply toothed and are a roughly oblong-oval shape. The **fruit** is an oval, erect strobile 1 to 1 1/2 inches long and about 3/4 inch thick.

The twigs are light brown and shiny. They are slightly aromatic -- but less so than those of the black birch. The pungent smell of wintergreen associated with crushed twigs is a simple way to identify both yellow and sweet birch.

Yellow birch averages 60 to 80 feet in height and, on better sites, may grow to 100 feet tall and 1 to 3 feet in diameter.

The light brown **wood** is heavy, strong, hard and close-grained. It is used for flooring, woodenware, furniture and veneers and is considered superior to the black birch. The tree furnishes browse for deer, and its buds and catkins (scaly, bracted spikes of usually unisexual flowers) are food for grouse and other wildlife.

Sweet Birch
(Betula lenta L.)

Sweet birch, also known as black birch or cherry birch, occurs only in the highlands and mountains of our state. This tree develops best in mountain coves and on rich slopes, where it reaches an average height of 50 to 60 feet and a diameter of 2 to 3 feet.

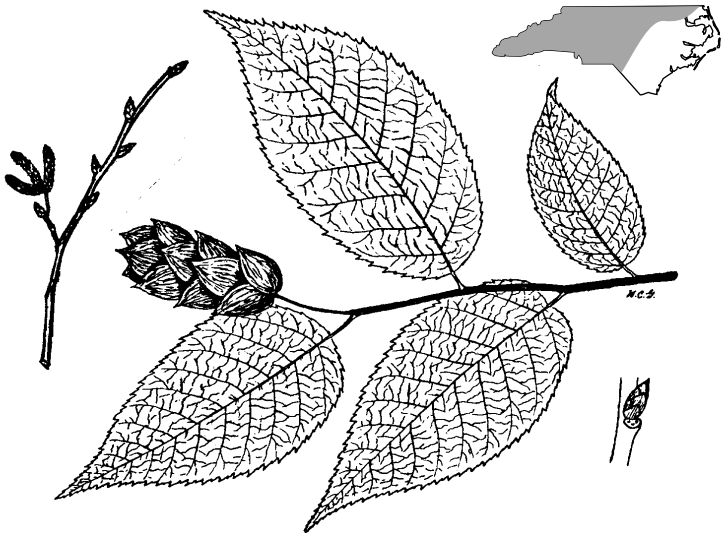
Sweet birch **leaves** are oval to oblong, 2 1/2 to 5 inches long and are sharply toothed. Stems of the leaves are hairy, and tufts of hair occur in the axils of the veins on the undersides of the leaves.

The **fruit** is oblong, erect, scaly, about 1 to 1 1/2 inches long and 1/2 inch thick. The **bark** of the trunk is reddish-brown, with prominent horizontal lenticels (a lenticel is a small opening in the bark of a twig; the opening usually is surrounded by rough, corky tissue) and becomes almost black with maturity. On mature trees, the bark is dull and breaks into large irregular, but not papery, plates.

The small branches and twigs, also dark in color, are shiny and very aromatic. The **wood** is hard, heavy and close-grained. It is used in furniture manufacturing, often being sold as "mahogany," and for interior trimming. Aromatic oils and flavorings (wintergreen) are obtained from the wood, bark and sap of this tree. Sweet birch is considered inferior to yellow birch for manufac turing purposes but is considered one of the best for firewood because of its wintergreen odor.

Eastern Hop Hornbeam

(Ostrya virginiana (Mill.) K. Koch.)



Eastern hop hornbeam also is known as ironwood or leverwood. The tree gets it common name from the hardness of its wood and its hop-like fruit. The tree is small and slender with a generally round-topped tree that ranges from 20 to 30 feet high and 7 to 10 inches in diameter. The top consists of long slender branches that commonly droop toward the ends.

Eastern hop hornbeam is found mostly as a scattered tree throughout the upland and mountain regions. Some larger specimens are found on deep, well-drained soils in mixed stands of bottomland hardwoods.

The **bark** is light brown or reddish-brown and is finely divided into thin scales that peel away from the trunk. The **leaves** are simple, alternate, generally oblong with narrowed tips and sharply toothed along the margin (sometimes doubly toothed)and they range in length from 2 to 4 inches long.

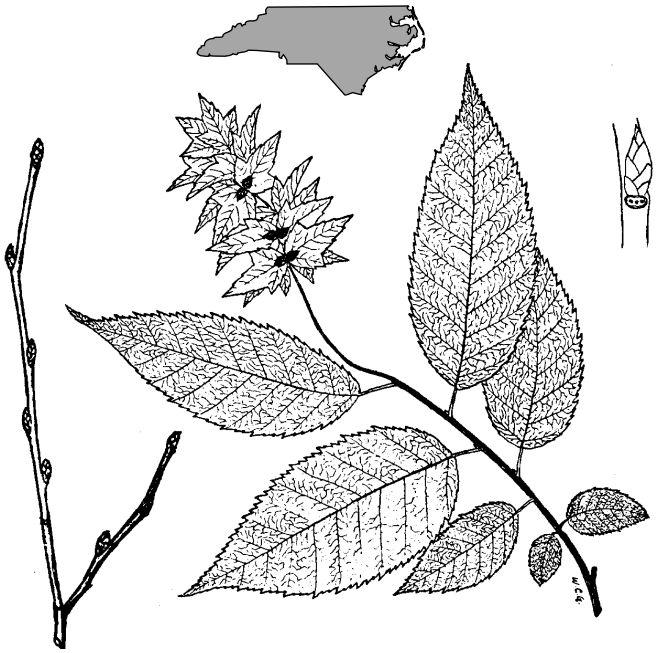
There are two kinds of **flowers** on the same tree: the male, in drooping catkins (scaly, bracted spikes) which form the previous summer; and the female, in erect catkins on the newly formed twigs.

The **fruit** consists of a nutlet enclosed in an oval, flattened, papery sac (attached in cone-like clusters). It makes good food for wildlife.

The **wood** is strong, hard and durable; it is light brown to white, with thick, pale sapwood. Eastern hop hornbeam often is used for tool handles, mallets and other small articles. A row of young hop hornbeams can be pruned to develop into an attractive hedge.

Hornbeam

(Carpinus caroliniana Walt.)



Hornbeam also is called ironwood, blue beech and, occasionally, water beech or muscle wood. It is a small, slow-growing, bushy tree with a spreading top of slender, crooked or drooping branches. It is found along streams and in low ground throughout the state. It usually is 20 to 30 feet tall and 8 to 12 inches in diameter, although it sometimes grows larger. The trunk is fluted, with irregular ridges extending up and down the tree; hence, the "muscle wood" name.

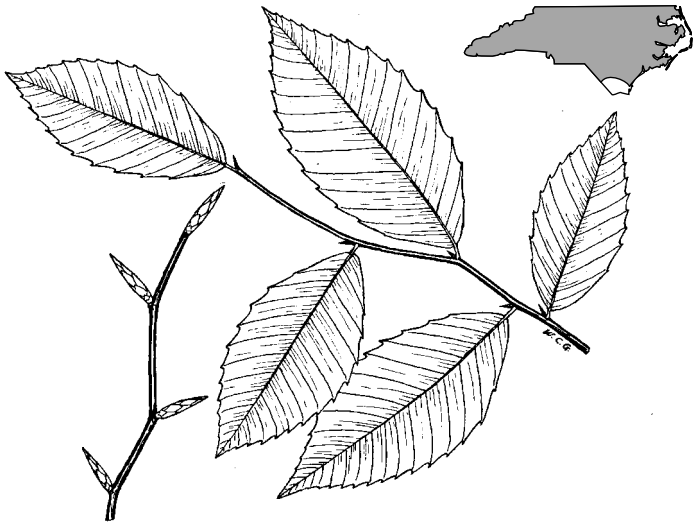
The **bark** is light brownish-gray to dark bluish-gray, and sometimes marked with dark bands extending horizontally on the trunk.

The **leaves** are simple, alternate, oval, long-pointed, doubly toothed along the margin and 2 to 3 inches in length. They resemble black or sweet birch leaves but are smaller. The **flowers** are attached separately on the same tree in scaly, bracted spikes called catkins. The male catkin is about l 1/2 inches long; the female about three fourths of an inch, with small, leaf-like, three-lobed green scales.

The **fruit** is a nutlet about 1/3 inch long, and is a very good food source for a variety of wildlife. It falls attached to a leaf-like scale, which acts as a wing to aid its distribution by the wind.

Hornbeam wood is tough, closed-grained, heavy and strong. It sometimes is used for levers, tool handles, wooden cogs, mallets and wedges.

American Beech
(Fagus grandifolia Ehrh.)



Beech is found throughout the state, however, it grows best in moist mountain coves. Beech is widely found scattered with oaks and hickories on rich, well-drained bottoms. In the mountains, it sometimes grows in dense, unmixed stands or in association with sugar maple, yellow birch and other hardwoods.

The American beech has oblong-ovate pointed **leaves,** 2 to 6 inches long that are mostly grouped toward the ends of the branches on short branchlets. Leaf margins have small teeth that curve inward. Leaves turn bright yellow in autumn, and later turn light tan. The leaves often remain on the tree until spring.

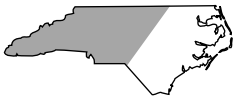
The distinctive buds are 3/4 to 1 inch long, slender and sharp-pointed. Twigs are slender and zigzagged. The edible **nuts** are triangular in shape and about 3/4 inch long. They are attached in groups of 2 or 3 and have prickly husks that often remain on the tree after the nuts have fallen (after first frost, September to November). The nuts are an excellent food for many wild birds and animals, but good seed crops occur erratically.

The American beech tree generally grows to about 60 to 80 feet in height and 2 to 3 feet in diameter. The crown is broad and rounded. The trunk usually is short; its bark is light gray and very smooth. People frequently scar this tree by carving letters and words in its bark.

The **wood** of the beech is very hard, strong and tough, though it will not last long if exposed to weather or in the soil. The wood is used to some extent for furniture, flooring, carpenters' tools, novelty wares and food containers. It also has a high fuel value. American beech is an extremely important source of mast (food) for a wide variety of wildlife.

American Chestnut

(Castanea dentata (Marsh.) Borkh.)



The chestnut blight (caused by a fungus, *Endothia parasitica)* practically has destroyed the American chestnut throughout its range. This is an irreplaceable loss to some landowners in the mountains, where as much as 1/3 of the timber in some areas was chestnut. The blight was introduced about 1906 and within a few decades covered the entire range of the chestnut. The trees were fast-growing, long-lived and sprouted profusely from the stump when cut. During the past 70 years, many of the old stumps repeatedly have grown sprouts.

Occasionally, the sprouts grow to 15 or 20 feet and produce a few fruits, but the blight kills the sprouts repeatedly.

This stump-sprouting gives hope that the species eventually may become immune to the blight; however, most pathologists believe the chestnut is doomed and that the only hope is to produce resistant hybrids.

Many of the better sites previously occupied by chestnut now contain yellow poplar (Liriodendron tulipifera), a species that is very valuable.

In the Southern states, the chestnut was native to the foothills and mountains. It was one of our most useful trees and, as such, was called the "farmer's best friend."

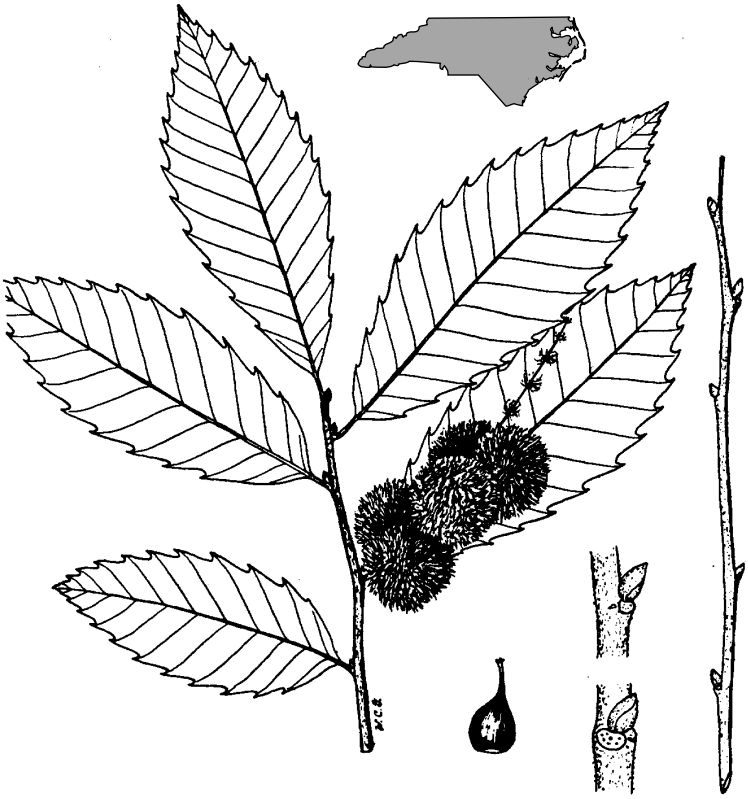
Chestnut's long, pointed **leaves** are quite distinctive; they are simple and alternate, dark green in color and average 5 to 8 inches in length. They have coarse teeth, each of which bears a slender spine. Both male and female **flowers** are found on the same tree. The long, slender, whitish catkins (scaly, bracted spikes) open in mid-summer.

The **fruit** of the chestnut is a prickly burr, that opens at the first frost (or earlier) and drops two or three shiny, large, brown, sweet, edible nuts. These nuts make excellent wildlife food. Chestnut bark breaks into light gray, broad, flat ridges that often form a spiral around the trunk.

The **wood** is much like oak -- coarse-grained but lacks the distinct rays of oak, and very resistant to decay. It is so resistant that wood from some larger trees dead for more than 50 years still may be used.

Chinkapin

(Castanea pumila Mill.)



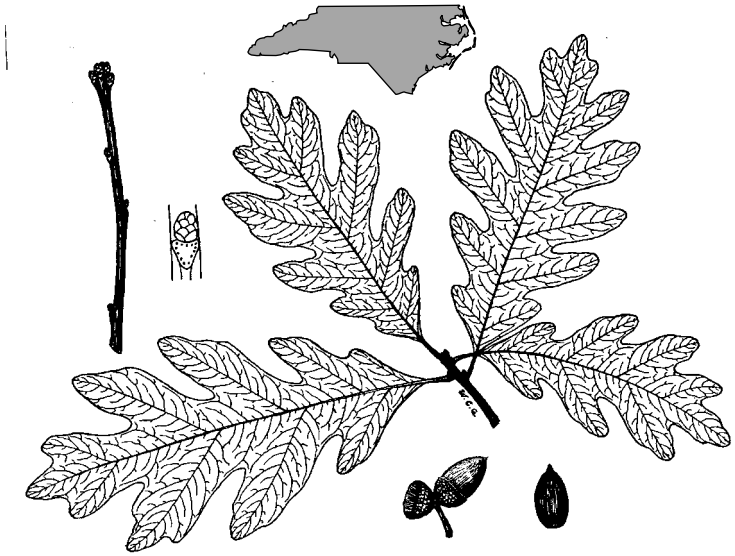
Chinkapin usually grows on rich in organic matter. It can be found from sand ridges and swamp margins of the coast to 4500 feet elevations in the mountains. Al though it is a member of the same family as the American chestnut, Chinkapin is highly resistant to the blight that destroyed the great stands of American chestnut.

Chinkapin **leaves** are 3 to 5 inches long and 1 1/2 to 2 inches wide. They are bright yellow-green on the upper surface and silvery on the lower surface. The **fruit** is a small burr, 1 to 1 1/2 inches in diameter, containing a single, dark chestnut-brown, shiny kernel that is sweet and edible.

The **bark** is 1/2 to 1 inch thick, light brown tinged with red. It is slightly furrowed and broken on the surface into loose, plate-like scales.

Chinkapin trees usually are small. They grow sometimes 15 to 30 feet in height with a trunk diameter of up to 1 1/2 feet. The **wood** is light, hard, strong, coarse-grained and dark brown. It is used for fence posts, rails and railway ties. The sweet nuts are a valuable source of food for a wide variety of wildlife.

White Oak
(Quercus alba L.)



Within its natural range, the eastern half of the United States, the white oak is one of the most important timber trees. In North Carolina, it is abundant in the Piedmont and lower mountains but it is also found in the Coastal Plain.

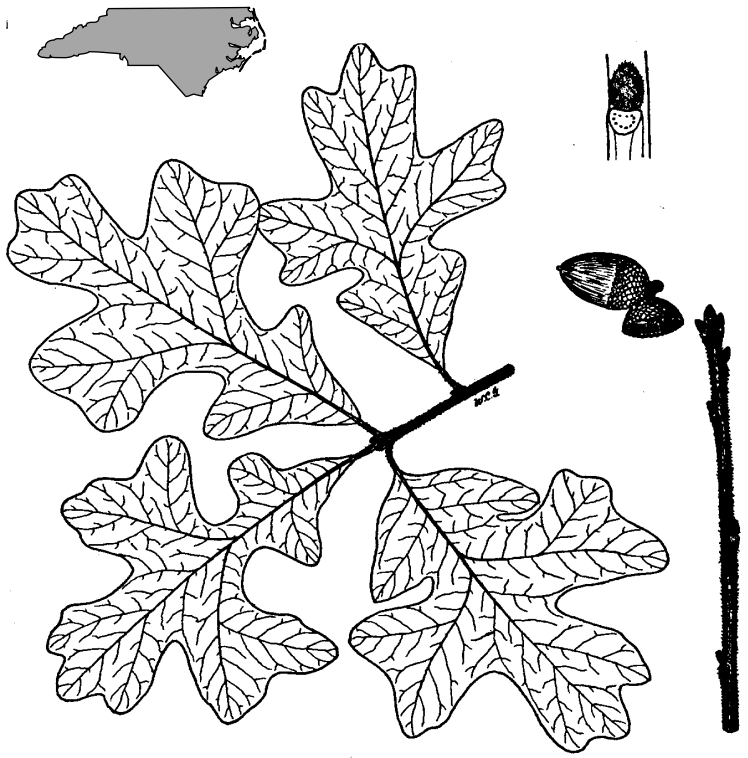
White oak **leaves** are 5 to 9 inches long with seven to nine rounded lobes. The depth of the sinuses separating the lobes varies, in some cases almost reaching the midrib. The base of the leaf narrows abruptly to become wedge-shaped at the stem. The **acorn** is about 3/4 inch long and, when mature, is a light chestnut-brown. About one-fourth of the acorn is enclosed in a bowl-shaped cup covered with rough scales that join at their bases to form small knobs.

The thin **bark** is light, ash gray in color and is covered with loose scales or broad plates. These scales, which are found on the upper stem and branches, are useful in identifying the white oak.

White oak trees reach 80 to 100 feet in height and 3 to 4 feet in diameter. In the open, the tree develops a rounded spreading crown; in forest stands, it has a tall, clear stem and smaller crown. Growth is good on all but the driest shallow soils, but it is best on deep, well-drained, loamy soils.

The light brown **wood** is useful and valuable. It is heavy, strong, hard, close-grained and durable. It has many uses, including construction, shipbuilding, tight cooperage, furniture, tools, interior finish, flooring and fuel. Even though it grows rather slowly, white oak is valuable for forest, highway and ornamental planting.

Post Oak
(Quercus stellata Wangenh.)



Post oak can be found throughout the state. While it will grow in the mountains at elevations as high as 2,500 feet, it is most abundant on the poorer and drier soils of the Piedmont. It grows slowly and commonly reaches a height of 40 to 50 feet and a diameter of 1 to 2 feet.

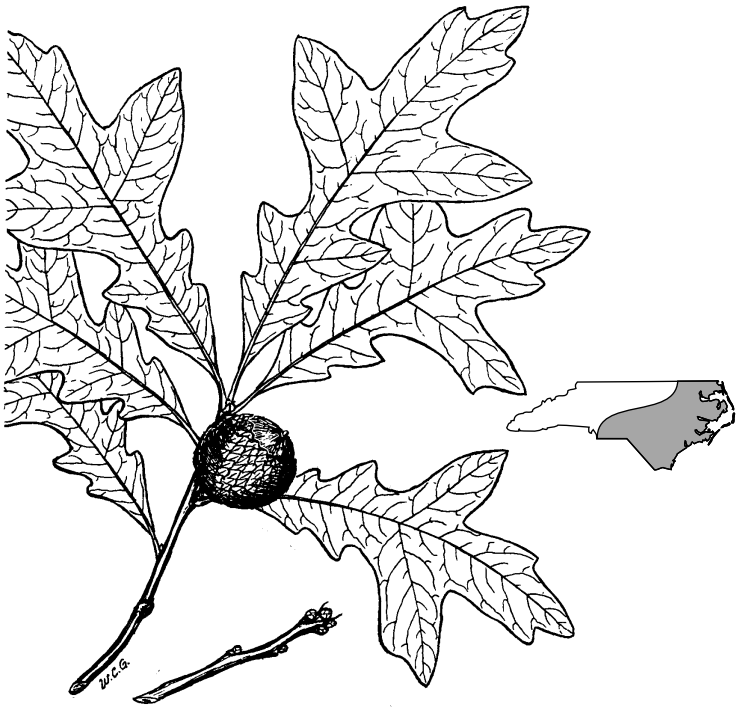
Its **leaves** are 4 to 6 inches long and are deeply divided into five lobes by broad sinuses. The central-lateral lobes are roughly square on the ends, giving the leaf a cross-like appearance. The oval **acorn,** 1/2 to 3/4 inch long, is about one-third covered by the bowl- a saucer-shaped scaly cup.

Post oak **bark** is rougher and darker than the white oak and is broken into much smaller scales. Horizontal cross-breaks in the ridges of the trunk's bark are a characteristic of this tree.

Post oak often has stout branches that spread to form a dense, round-topped crown. The branches and upper stem often are twisted and gnarled. The **heartwood** is very heavy, hard, close-grained and is resistant to decay. Because it is one of the white oaks, post oak lumber is sold and used the same way as white oak is.

Overcup Oak

(Quercus lyrata Walt.)



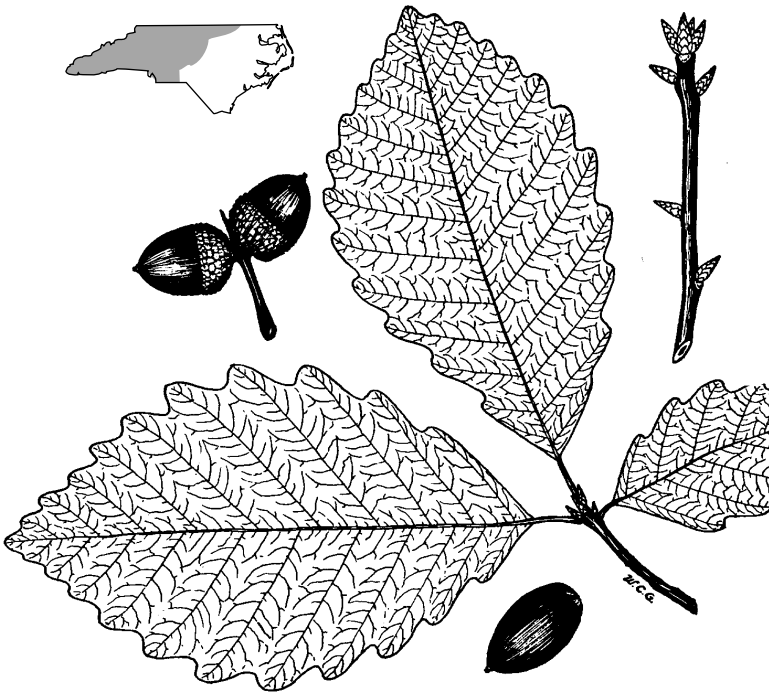
Overcup oak, sometimes known as Swamp post oak, is only found in river bottoms and rich low grounds of the Coastal Plain but is not abundant anywhere in North Carolina. It is found inland in North Carolina from the coast to Anson, Chatham, Guilford, Orange and Nash counties.

Overcup oak **leaves** are 6 to 10 inches long and separated into five to nine rounded lobes by deep or shallow sinuses. The leaves vary in the shape, number and size of the lobe, but they all gradually narrow to the base, making this end of the leaf wedge-shaped.

The overcup oak **acorn** is 1/2 to 1 inch long with a somewhat flattened spherical shape, usually broader at the base than long, and entirely or almost entirely covered by a scaly cup (hence the common name, Overcup oak). The red-tinged gray **bark** is rough and flaky.

While overcup oak can grow to 60 to 80 feet in height and 2 to 3 feet in diameter, it usually will be smaller. The form and quality of the **tree** vary greatly throughout its range, but often it will be short and crooked. The **wood** is heavy, hard, strong and durable and is used for the same purposes as white oak.

Chestnut Oak
(Quercus prinus L.)



Chestnut oak acquired its name from its leaf, which resembles the chestnut leaf. Its ability to grow on rocky mountain ridges also has given it the name of rock oak or mountain oak. Although it is common throughout the mountains on dry, rocky soils, it grows best in well-drained coves and bottomlands.

Chestnut oak **leaves** are 4 to 8 inches long. They are roughly oval but are often wider near the apex and are roughly round-toothed. Undersides of leaves often are hairy.

The shiny **acorn** is oval and 1 to 1 1/2 inches long. The cup is thin and covered with fused scales.

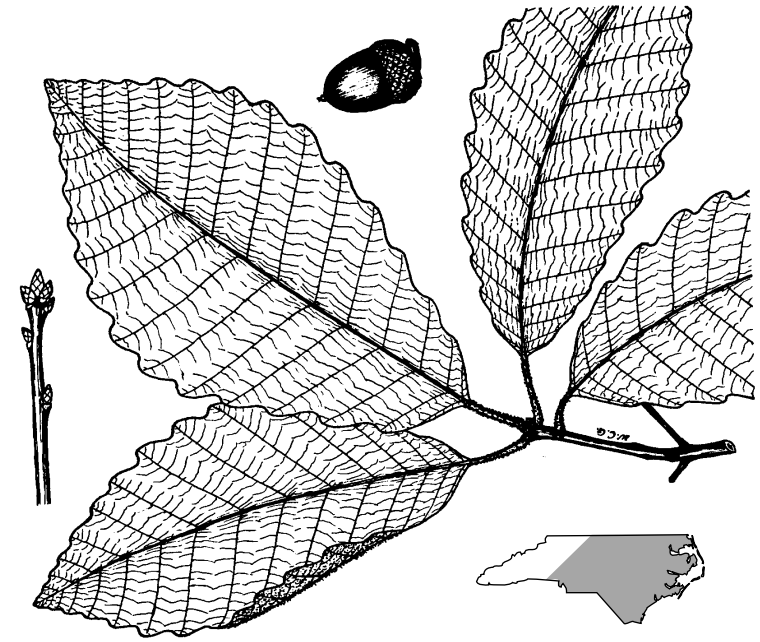
The **bark** is dark reddish-brown, thick and deeply divided into broad, rounded ridges.

The **tree** averages from 50 to 70 feet tall, with diameters between 2 and 3 feet. Like most white oaks, chestnut oak grows slowly on almost all sites. Chestnut oak tends to form pure, open stands on the poorer sites of hillsides and mountain slopes but usually is mixed with other species such as hickories, other oaks and pitch pine (or shortleaf pine on better sites).

The **wood** is generally similar to that of the other upland white oaks: heavy, hard, strong and resistant to decay. It is used extensively for railroad crossties, heavy timber for bridges, and other rough construction.

Swamp Chestnut Oak

(Quercus michauxii Nutt.)



Swamp chestnut oak also is known as basket oak or cow oak. This tree is most abundant in the bottomlands of the Piedmont and Coastal Plain. Although it is widely found on the best, well-drained, loamy, first bottom ridges; it is found principally on well-drained, silty clay and loamy terraces and on alluvial sites in the bottomlands of both large and small streams.

Swamp chestnut oak **leaves** are roughly oval, 6 to 8 inches long; 3 to 5 inches wide. When new, they usually are coated on the underside with thick silvery white fuzz. Leaf margins are coarsely toothed.

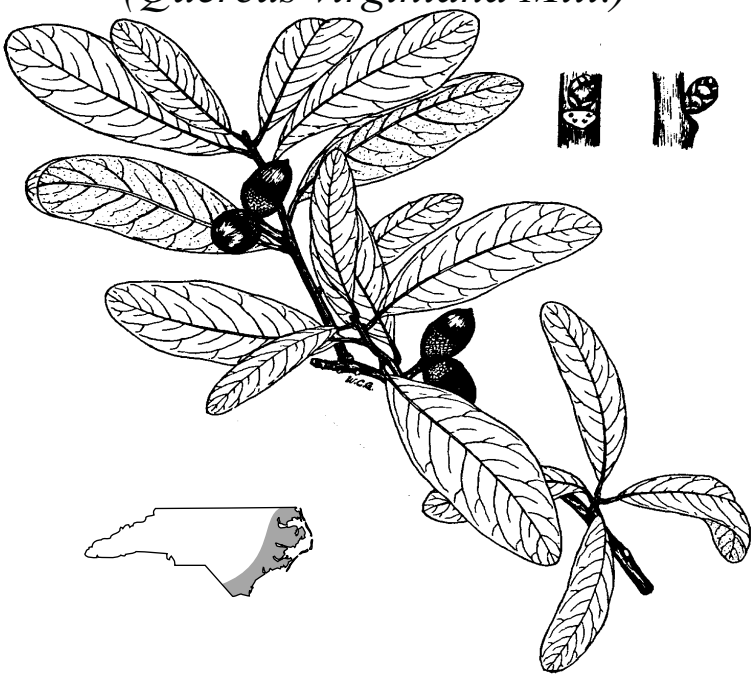
The **acorn** is 1 to 1 1/2 inches long, ovoid and 1/3-covered by a thick cup that has rough, wedge-shaped scales. The **bark** is a very light gray; on the upper stems and limbs of old trees, it is broken into broad flakes or divided into strips.

The **tree** usually grows 60 to 80 feet tall and 2 to 3 feet in diameter. The trunk often is free of branches for 50 to 60 feet. Stout branches grow upward at sharp angles to form a round-topped crown.

Swamp chestnut oak **wood** is hard, tough, very strong and heavy. Its other name, "basket oak," refers to the long, thin strips of wood that are split from this tree and used to make baskets. Swamp chestnut oak is also used for barrels, construction, flooring, tools and as white oak lumber. Its tendency to both warp and crack makes it very difficult to kiln-dry.

Live Oak

(Quercus virginiana Mill.)



Live oak is found from southeastern Virginia through the lower Coastal Plain of North Carolina and southward, but it is plentiful only south of Cape Hatteras. It is a tree with a wide-spreading crown and gnarled branches which are often covered with Spanish moss, making it one of the most characteristic trees of the coastal region. Live oak, as the name implies, is evergreen and also is long-lived.

Live oak **leaves** are quite small (2 to 5 inches long), oval with rounded ends and have margins that are mostly smooth but may be slightly toothed.

The dark brown to nearly black **acorn** is 3/4 to 1 inch long and usually attached on long stalks in clusters of three to five. The cup, which is scaly, encloses about a third of the fruit, tapering rapidly to the stem.

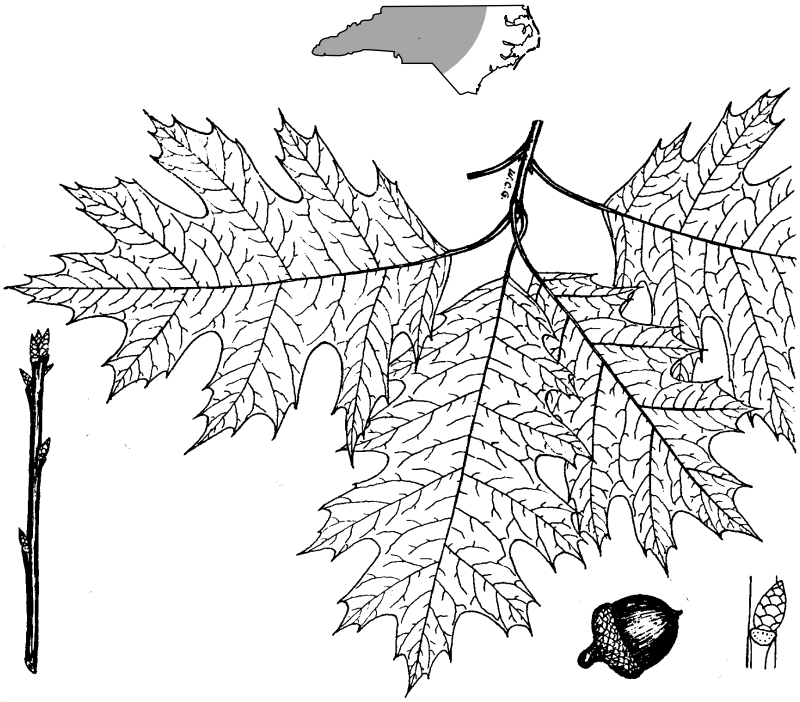
The **bark** on the trunk and large branches is dark brown tinged with red and is slightly furrowed.

The tree seldom grows to more than 50 feet in height, but it may have a crown span of 100 feet or more. Open-grown trees may have trunk diameters of 6 to 7 feet.

Live oak **wood** is extremely difficult to saw and dry. It was once prized for blocks and ribs on sailing ships, and it is now one of the most desirable trees for roadside and ornamental planting along the coast. Live oak acorns are a dependable and highly desirable food for a wide variety of wildlife.

Northern Red Oak

(Quercus rubra L.)



Northern red oak is found throughout the Piedmont and mountain areas of the state. It is most common and of best quality in fertile mountain coves, with better growth on the north and east slopes. Red oak grows best on most well-drained loams in association with other oaks, basswood, white ash and black cherry.

Its **leaves** are 5 to 8 inches long and have seven to 11 lobes. Each lobe usually is three-toothed, sharply pointed and has bristles on the points. Northern red oak leaves are deciduous, turning red before they fall in autumn.

The **bark** on young stems is smooth and gray; on older trees, it is thick and broken by shallow fissures into regular, flat, smooth-surfaced plates or flat ridges.

The **tree** averages 70 to 90 feet in height and 2 to 3 feet in diameter. The **acorns** usually are 1/2 to 1 inch long with a flat, shallow cup at the base. The crown of the tree usually is rounded and comparatively narrow.

The **wood** is hard, strong, coarse-grained, with light reddish-brown heartwood and thin light-colored sapwood. Northern red oak is one of our most valuable hardwood trees. Its wood is used for interior finish, construction, furniture, flooring and crossties.

Southern Red Oak

(Quercus falcata Michx.)

Southern red oak also is known as spanish oak or red oak. It is found on higher ridges of the Coastal Plain and throughout the Piedmont. It seldom is found above 2,000 feet elevation. Its habitat often is dry hills of poor, sandy or gravelly soils. Occasionally, this tree is found along streams in fertile bottoms, where it reaches its largest size.

Southern red oak trees usually grow to a height of 60 to 80 feet and a diameter of 2 to 3 feet; however, heights of over 100 feet are not uncommon. Its large spreading branches form a broad, round, open top. The **bark** is rough, though not deeply furrowed, and varies from light gray on younger trees to dark gray or almost black on older ones.

Leaves are of two different types: (1) irregularly shaped lobes that are mostly narrow and bristle tipped, with the central lobe often being the longest; or (2) pear-shaped with three rounded lobes at the outer end.

The **leaves** are dark lustrous green above and tan and downy beneath. This contrast is strikingly visible in a wind or rainstorm. They average 5 to 9 inches long and 4 to 5 inches wide.

The **flowers** appear in April while the leaves are unfolding. The **fruit** ripens during the second year. The small rounded acorn, about 1/2 inch long, is set in a thin, saucer-shaped cup that tapers to a short stem.

The **wood** is heavy, hard, strong and coarse-grained and is less subject to defects than most other red oaks in the Piedmont. It is used for rough lumber and for furniture, chairs, tables, etc. It is a desirable timber tree, especially on poorer, drier soils.

Cherrybark Oak

(Quercus pagoda Raf.)

Cherrybark oak also is known as swamp red oak, swamp spanish oak or bottomland oak. The cherrybark oak is widely distributed on the best sites in first bottoms and on well-drained terraces and alluvial sites of the Coastal Plain and lower Piedmont. It seldom is found on wet or swampy soils.

The **tree** can become much larger and better formed than the Southern red oak and often reaches heights of 100 to 130 feet and 3 to 5 feet in diameter.

The **leaves** have shallow sinuses between the five to 11 lobes, which are 5 to 7 inches long, and 3 1/2 to 4 inches wide. They are more pointed at the base and whiter beneath than those of the Southern red oak.

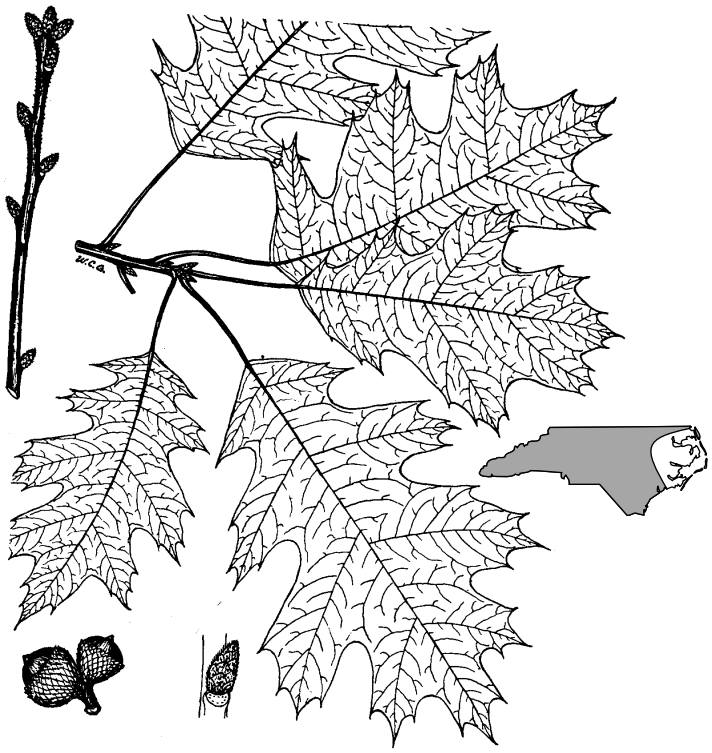
The dark gray or blackish, scaly mature **bark** somewhat resembles that of the wild black cherry and is responsible for the tree's common name of cherrybark oak. The **flowers** appear in April while the leaves are unfolding.

The **fruit** ripens the second year. The small rounded acorn, about 1/2 inch long, is set in a thin saucer-shaped cup that tapers to a short stem.

The **wood** is heavy, hard, strong, coarse-grained and is less subject to defects than most other red oaks. Cherrybark oak probably is the best timber oak along the rivers of the Coastal Plains. It is used for lumber, veneer and furniture.

Black Oak

(Quercus velutina Lam.)



Black oak may be found throughout the state on dry plains and ridges but seldom on rich ground. It often grows in upland hardwood stands in the Appalachian foothills.

Black oak **leaves** vary in form, generally with seven lobes (sometimes five), sometimes being divided nearly to the midrib by rounded sinuses. Lobes are toothed and usually taper from a broad base. In early spring, the unfolding leaves are a deep red, turning silvery, then green, within a few days.

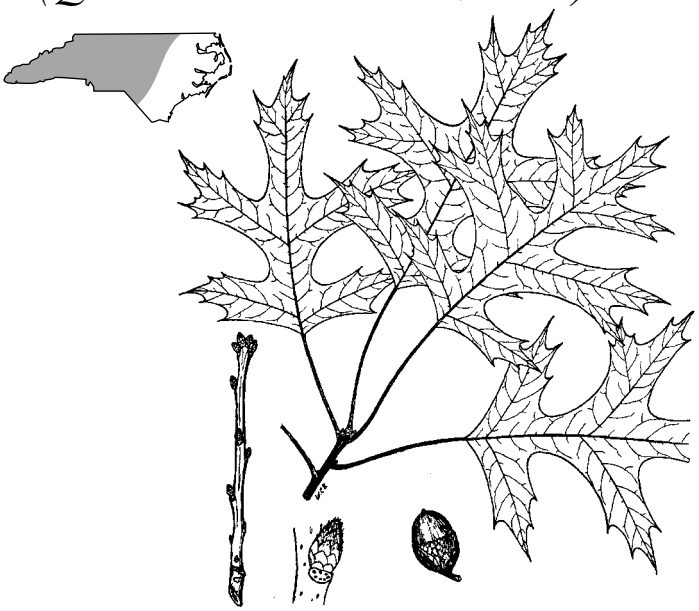
The **acorn** is oval or rounded, 1/2 to 3/4 inch long, and is enclosed for about half its length in a deep, scaly, bowl-shaped cup. The **tree** reaches 50 to 80 feet in height, and 3 feet or more in diameter.

Bark on the trunks of old black oak trees usually is thick, black and deeply divided into broad, rounded ridges. The inner bark is bright orange or yellow; in all other oaks, it is pink. The crown usually is rounded.

The **wood** is hard, heavy, strong, coarse-grained and cracks easily. It is bright red-brown with a thin outer edge of paler sapwood. It is sold as red oak and used for the same purposes as red oak.

Scarlet Oak

(Quercus coccinea Muench.)



Scarlet Oak is usually found growing on dry, rocky upland soils throughout the upper Piedmont and the lower mountains. Although it often is abundant, the quality of scarlet oak lumber usually is poor; therefore, it rarely is used.

Its **leaves** are 4 to 7 inches long and 3 to 5 inches wide. They have five to nine pointed lobes deeply separated by wide sinuses that reach almost to the midrib. Lobes are toothed and pointed. In fall, the leaves turn a deep and shiny scarlet.

The oval **acorn** is 1/2 to 1 inch long. It is enclosed 1/2 to 1/3 of its length in a deep, bowl-like cup. The exposed end of the acorn often is marked with concentric, circular rings.

The **bark** on young stems is smooth and gray. On old trunks and branches, it is divided into ridges, but the ridges are not as rough as those of the black oak and not as flat-topped as those of the northern red oak. Mature bark often is spotted with gray. The inner bark is reddish.

Scarlet oak grows 60 to 80 feet high with a diameter of 1 to 2 feet and has comparatively small branches that spread to form a narrow, open, irregular crown. Scarlet oak tends to retain a number of small, dead branches. This is useful for identifying the tree.

Scarlet oak **wood** is heavy, hard, strong and coarse-grained. The lumber is sold as red oak and has the same uses, though it is somewhat inferior in quality. Scarlet oak is used considerably in ornamental planting.

Turkey Oak

(Quercus laevis Walt.)

Turkey oak commonly occurs in the understory of longleaf pine forests, on infertile, sandy soils. Because of its small size, poor form and rugged appearance on these sites, it frequently is considered a "weed" tree.

The **leaves** are 5 to 10 inches long and 4 to 6 inches wide, usually with five long, narrow, often curved, bristle -toothed and bristle-pointed lobes. The upper surface is a shiny yellowish-green, while the undersurface is paler and smooth except for tufts of red hairs in the axis of the veins.

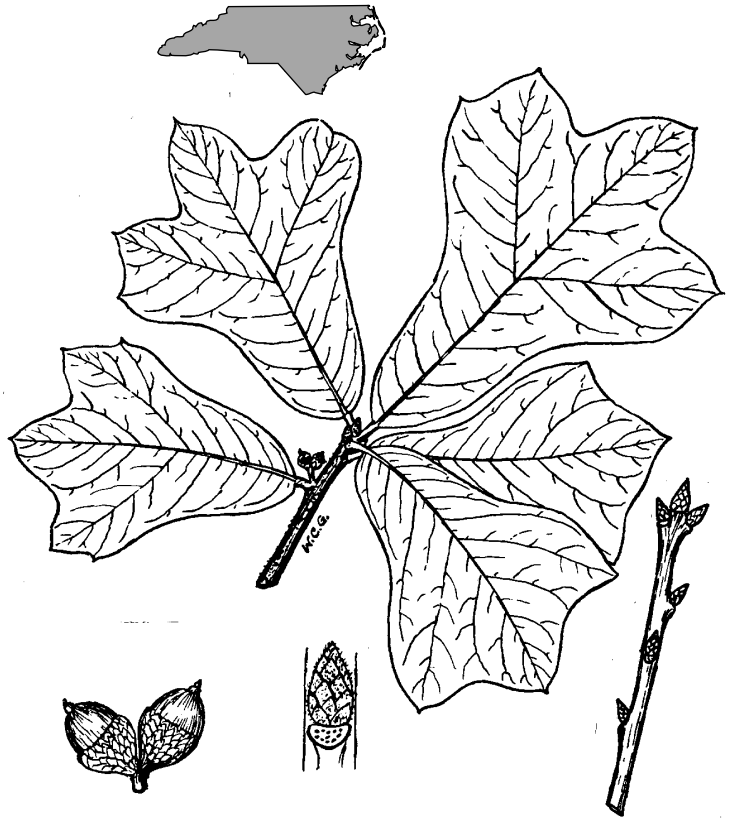
The **acorns** are about an inch long, ovoid, brown and wooly at the top, with bowl-shaped, scaled cups enclosing about one-third of the nut. The dark gray or blackish **bark** is irregularly fissured and scaly.

The turkey oak is a small **tree,** usually not more than 20 to 30 feet in height and 1 to 2 feet in diameter. The crown is irregular and rather open. The tree has little commercial value. The **wood** is used locally for fuel and rough construction.

Turkey oak is easily "top-killed" by forest fire, but it sprouts vigorously from its roots. The number of turkey oaks in the Sandhills of North Carolina has gradually increased with the decrease of forest fires.

Blackjack Oak

(Quercus marilandica Muench.)



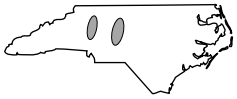
The presence of blackjack oak is said to indicate poor soil. This tree most commonly is found on poorly drained, heavy clay soils or on dry gravel or sandy upland soils where few other forest trees thrive. It is found in all parts of the state except the high mountain regions.

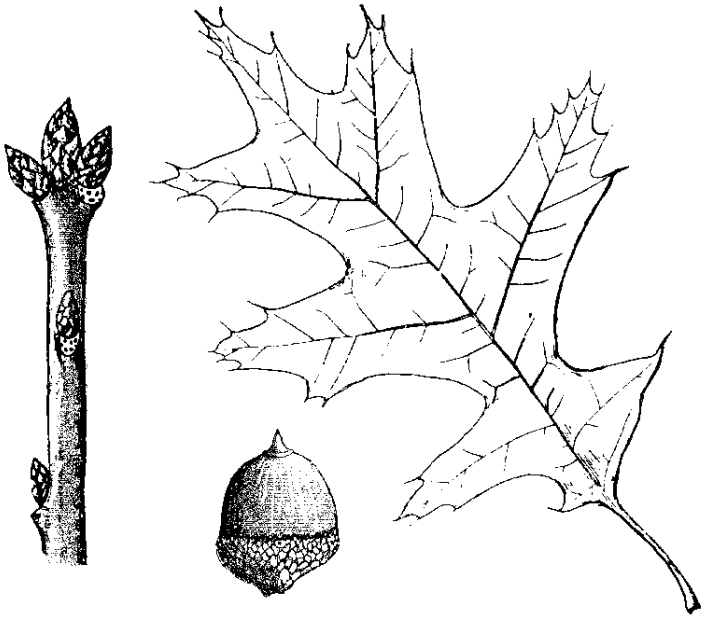
Blackjack oak **leaves** are 4 to 8 inches long and leathery; the underneath surfaces are brownish or orangish and are quite hairy. The leaves have many shapes but commonly are much broader at the end than at the base. These are three ill-defined large lobes at the apex. They often are described as "bell-shaped."

Its **acorns** are less than an inch long. They are oblong and about half-covered by thick, scaly cups. Blackjack oak **bark** is rough, very dark (often nearly black) and broken into small, hard rectangular blocks. Small, stiff dead branches are commonly present.

These trees rarely grow larger than 20 to 30 feet tall. They are scraggly and not very valuable as a timber species. The **wood** makes excellent charcoal and is used commercially for this product.

Pin Oak
(Quercus palustris Muench.)



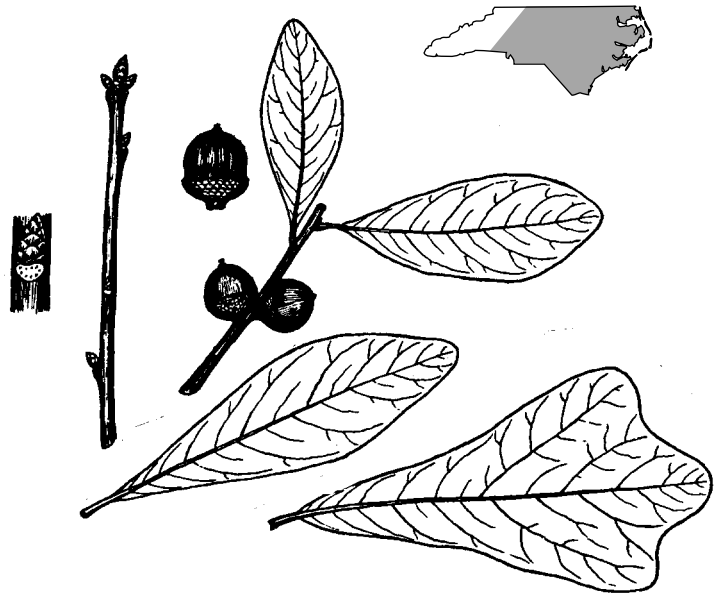


The range of pin oak extends from southern New England to Oklahoma. This tree is quite common in the midwest, where it is usually found on wet, clay flats. While it grows naturally in North Carolina in only two isolated areas of the Piedmont, it has been widely planted throughout the state as an ornamental tree.

Pin oak **leaves** are 3 to 5 inches long and 2 to 5 inches wide. There usually are five lobes (occasionally seven to nine) that are separated by variable, but often wide, sinuses extending nearly to the midrib.

The **acorn** is small, 3/8 to 5/8 inch long, hemispherical and light brown. It is enclosed at the base by a thin, saucer-like cup. The **bark** is smooth and gray-brown until the tree is mature, when a pattern of narrow, dark gray, flat-topped ridges are separated by very shallow fissures.

Water Oak
(Quercus nigra L.)



Water oak grows naturally along the borders of swamps and streams and on rich bottomlands from the Coastal Plain into the foothills of the mountains. It often is planted along streets and in parks as a shade tree.

Water oak **leaves** are small (2 to 4 inches long) and are considerably broader at the tip than at the base. Leaves vary in shape but usually show three indistinct lobes. They are deciduous, but they remain on the tree into early winter.

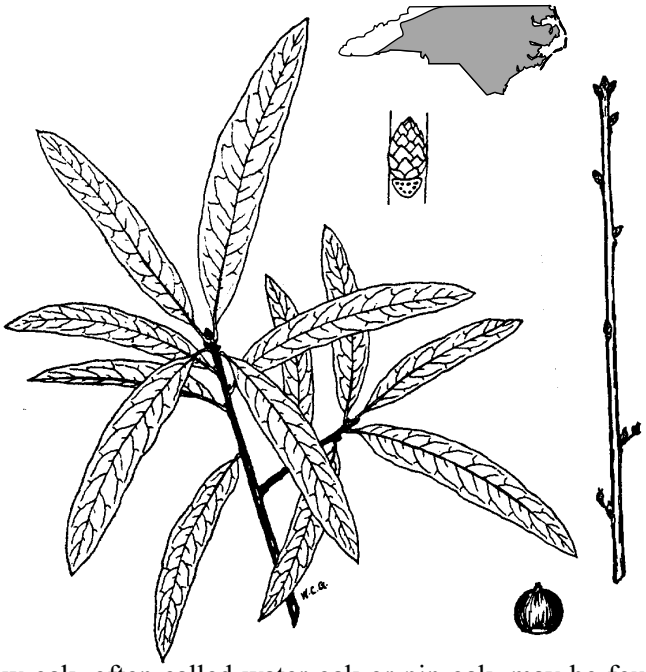
The **acorn** is small (usually 1/2 inch or less long) and almost black. The **bark,** at first, is smooth and brown but becomes gray-black with rough scaly ridges with age.

The water oak can be most readily distinguished from the willow oak -- a close but longer-lived relative -- by the differences in the shapes and sizes of their leaves.

On good sites, the **tree** has a slender, straight trunk and reaches a height of 50 to 80 feet or more with a diameter of 2 to 3 feet. Water oak is easily damaged or killed by fire.

The **wood** is not considered good for finished lumber, because it cracks and splits excessively when drying. However, it is used for rough construction lumber and uses such as support beams, where strength is most important.

Willow Oak
(Quercus phellos L.)



Willow oak, often called water oak or pin oak, may be found statewide except on higher slopes or in the mountains. It is more commonly found in lowlands and along the borders of rivers and swamps but often grows on rich, sandy uplands. The best quality trees grow on bottomland soils where they frequently become 80 to 100 feet tall and reach diameters of 3 feet or more. Willow oak is a beautiful and long-lived tree. It is widely planted for roadsides, lawns and parks.

Willow oak is named for its willow-like **leaves.** The leaves are 2 to 5 inches long, narrow, smoothed-edged and tipped with bristle points. The light yellowish-brown or greenish-brown **acorns** are small (1/2-inch long) with a thin, flat, scaly cup.

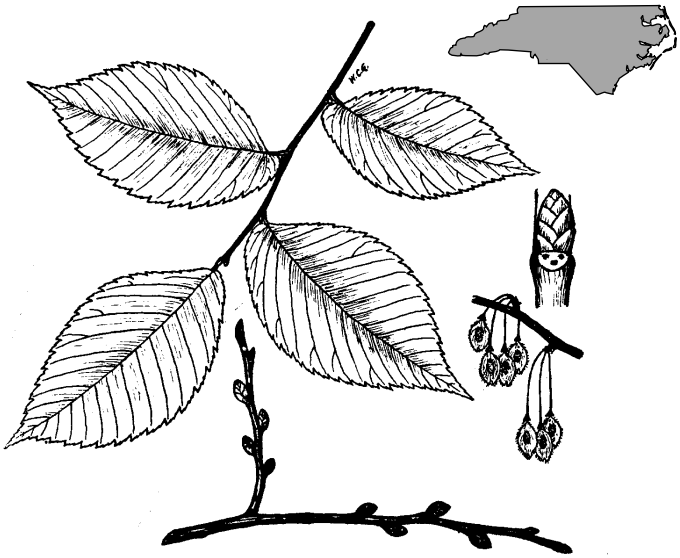
Willow oak may be almost evergreen in the southernmost portions of its range.

The young **bark** generally is smooth and reddish brown. As it ages, it becomes almost black and is slightly roughened and divided by narrow ridges. The small branches spread into an attractive crown that is comparatively narrow and often conical with a round-topped head.

The **wood** is sold as red oak. It is heavy, strong, rather coarse-grained, light brown tinged with red and is not durable when exposed to the weather. Its lumber is used locally for crossties, rough construction where great strength is required and in general construction.

American Elm

(Ulmus americana L.)



This famous shade tree of New England, which is seriously threatened by the imported Dutch Elm disease, is found throughout North Carolina. It is most common on bottomlands and other fertile, moist soils.

American elm **leaves** are oval, and have a long, slightly curved point. Leaves are rough-textured and 4 to 6 inches long. They are rounded at the base on one side of the midrib but are shorter and almost straight on the other side. Leaf margins are sharply toothed.

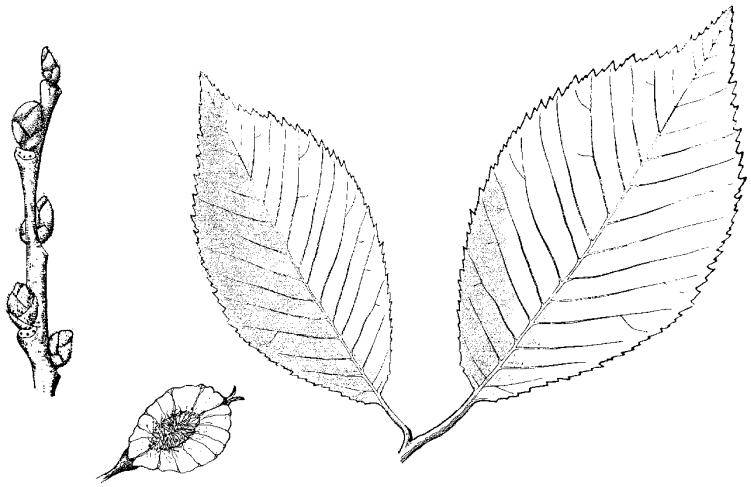
The twigs are brown and usually smooth, and the buds are also brown. The **fruit** is clustered on long stems. The small seed is encased in a flattened, papery, wing-like covering that is oblong and deeply notched at its peak.

The **bark** is dark gray and divided into irregular, flat-topped, thick ridges. It generally is firm, but on old trees tends to come off in flakes. An incision into the inner bark will show alternate layers of brown and white.

In dense forest stands, the **tree** will have a fairly narrow crown and a long, clear bole. Open-grown trees usually fork near the ground and develop arching crowns. The characteristic "urn" shape of the elms makes it easy to identify them even from a distance.

American elm reaches an average height of 75 to 100 feet and has a diameter of 2 to 5 feet. Old trees are sometimes enlarged at the base by large buttresses. The **wood** is heavy, hard, strong, tough and difficult to split.

Slippery Elm
(Ulmus rubra Muhl)



This large elm grows throughout North Carolina. While it grows best on moist, rich bottomlands, it also is found on drier, upland soils. It is uncommon above elevations of 1,800 feet. Slippery elm is less susceptible to Dutch Elm disease than the American elm.

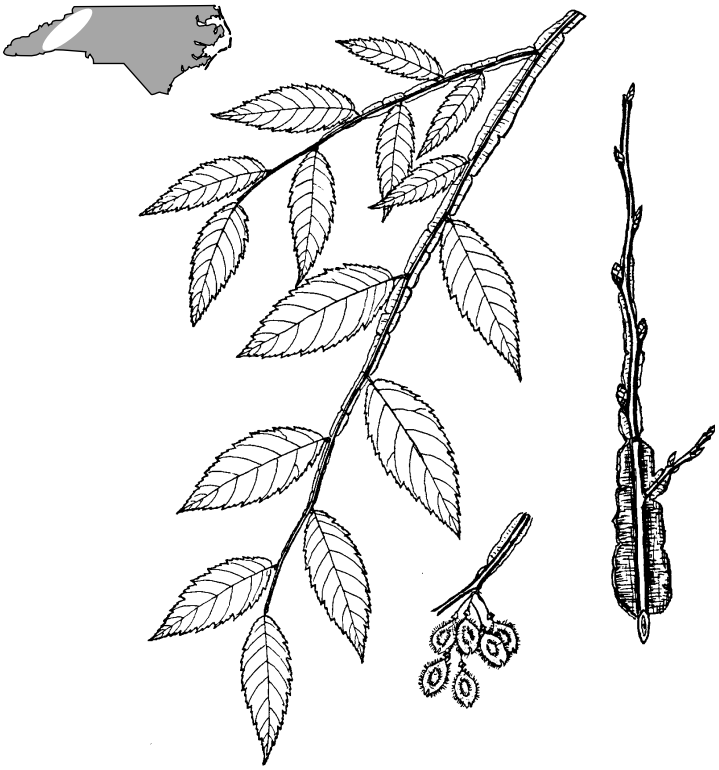
Its **leaves** are broader, more rounded and much rougher on the upper surface than those of the very similar American elm. One-year-old twigs are ashy gray and rough; the buds are nearly black. These characteristics also distinguish Slippery elm from American elm.

Slippery elm **fruit** is similar to that of American elm but is larger and much less notched at the tip.

Slippery elm is a medium-sized tree, 60 to 70 feet tall and up to 2 1/2 feet in diameter. This elm takes its common name from its inner **bark** which is very slick or slippery. Its twigs may be chewed to reduce thirst, and its inner bark, when steeped in water, is a long-used remedy for sore throats and fevers.

Winged Elm

(Ulmus alata Michx.)



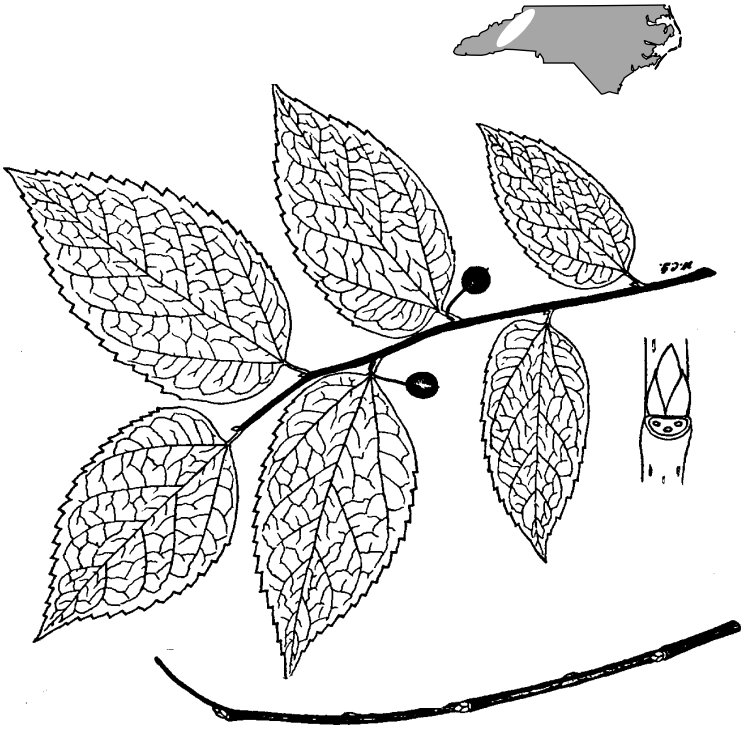
Winged elm, sometimes called cork elm, takes its common name from the corky "wings" often present on its twigs. On vigorously growing trees, these thin wings may be as much as a 1/2 inch wide. Winged elm is scattered over the state, except in the mountains. Winged elm usually is found on dry, gravelly uplands but also grows in moist, alluvial soils. Although it grows most rapidly in moist conditions, it is one of the best trees for planting along roadsides in dry, poor locations.

Leaves are 1 1/2 to 3 1/2 inches long, oblong-oval, pointed, rough-textured and coarsely toothed on the margins. The **fruit** is about 1/3 inch long, each tipped at the end with two long, curving bristles (awns). The orange-red fruits (samaras) are covered with light-colored fuzz. The **bark** is light brown, divided into irregular flat ridges and fissures.

This elm is a medium-sized tree of 40 to 50 feet in height and 1 to 2 feet in diameter. When open-grown, it has a short bole, with branches arching upward to form an open, rounded crown. Forest-grown trees often are tall and straight.

The heavy **wood** is hard and strong. It is used in the furniture industry and for crates and boxes.

Hackberry
(Celtis occidentalis L.)



Hackberry can be sparsely found throughout the state, except in the high mountains. It is most abundant and reaches its greatest size in rich alluvial lands in the lower part of the state, but it can survive and grow on most types of soil, from the poorest to the richest. The tree commonly grows to 30 to 40 feet in height and 1 to 2 feet in diameter. On the best sites, it may reach a height of 130 feet and a diameter of 4 feet or more.

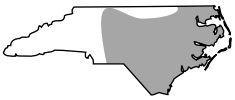
Hackberry **leaves** are asymmetrically oval, 2 1/2 to 3 1/2 inches long with sharply toothed margins. (They are often entire, or smooth-margined, below the middle.) They have curved, pointed tips. The globular **fruit** is borne singly on stems 1/2 to 3/4 inch long. It ripens in September but often remains on the tree over the winter. The fruit is dark purple and about 1/3-inch in diameter.

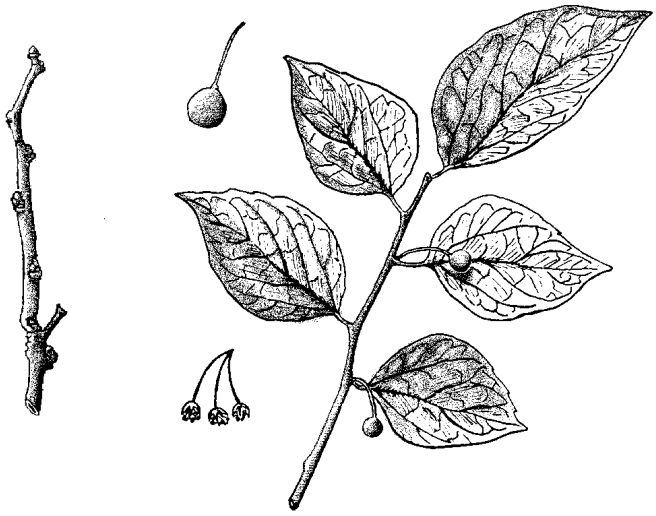
Hackberry **bark** is grayish and generally smooth, with characteristic corky warts or ridges. In some instances, the bark is smooth enough on the limbs to resemble that of the beech.

The **wood** is heavy, rather soft and weak. It decays quickly when exposed to moisture. Hackberry wood is used in furniture, for baskets and crates, and in some athletic equipment.

Sugarberry

Celtis laevigata Willd.)





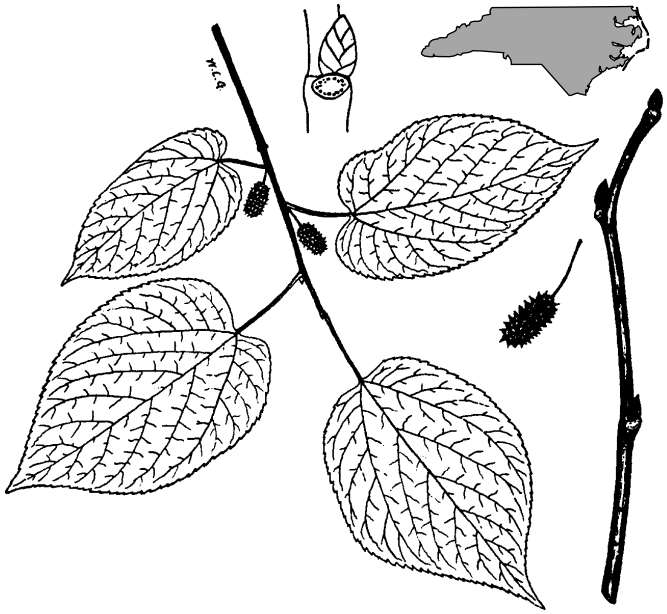
Sugarberry is a medium-sized tree native to the Coastal Plain and eastern Piedmont. It typically is a lowland tree, while in contrast, the very similar hackberry grows more frequently on uplands. When mature, Sugarberry reaches a height of about 80 feet and a diameter of about 18 inches.

Its **leaves** are asymmetrical with smooth margins. The **fruit,** which ripens in September, is round and attached singly on a stalk. The fruit turns orange-red to yellow when it is ripe. The **bark** is pale gray and is covered with prominent, warty protrusions.

The **wood** is not strong and is quite coarse-grained. It is used mostly in the manufacturing of furniture.

Red Mulberry

(Morus rubra L.)



Red mulberry grows throughout North Carolina. It grows best on the rich, red soils of the lower and middle sections of the state but is not abundant in any region. It commonly is called mulberry, because there are no other native mulberry species.

Red mulberry **leaves** are alternate, thin, rounded or somewhat heart-shaped, toothed, pointed, 3 to 5 inches long, rough-hairy above and soft-hairy beneath. Leaves from juvenile tissue (early branches) are mitten-shaped or variously lobed (two to three lobes), while leaves from mature tissue (older, or upper-crown branches) are not lobed.

The **fruit** resembles that of blackberry. Fruits are red when immature, turning deep purple when ripe, usually during late June or July. Berries are 1 to 1 1/2 inches long, sweet, juicy and edible.

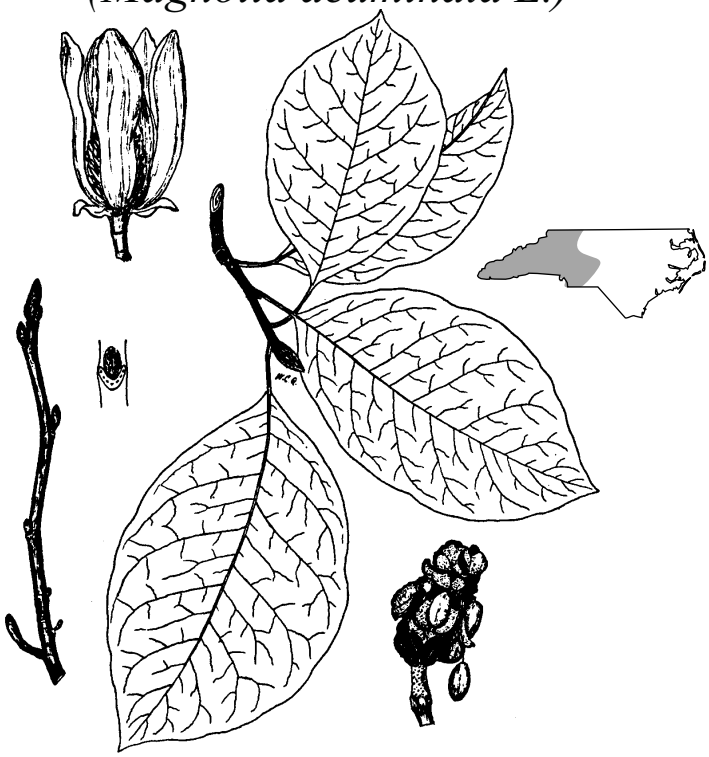
The red mulberry is a small tree, usually 20 to 30 feet tall, with trunk diameters rarely larger than 2 feet. It usually has a short trunk and a dense, spreading crown.

The **bark** is dark brown with a reddish tinge. It is scaly, with the tips of the scales curling and peeling off. The dark brown wood is light and soft and, although it is not strong, it is quite durable.

Red mulbury is used for fencing and barrels. Red mulberry is a small, rather scarce tree, and therefore is not considered as an important commercial tree. The berry is a favorite food for gray squirrels, wild turkeys and many songbirds.

Cucumber Tree

(Magnolia acuminata L.)



Cucumber trees are found scattered among other hardwood trees throughout the richer, cooler slopes and coves of North Carolina's mountains. They also extend somewhat into nearby regions.

Cucumber tree **leaves** have an oblong-oval shape and smooth margins that often are wavy. The leaf ends are sharp-pointed. The leaves are deciduous, 6 to 10 inches long, 3 to 6 inches wide, shiny yellowish-green on the upper surfaces and paler below.

The terminal buds are 1/2 to 3/4 inch long, pale greenish and densely covered with silvery gray, silky hairs. Cucumber tree **fruit** is a 2 to 3-inch long aggregate. It is bright red when immature, turning brownish as it matures. Each section of the fruit contains one to two ovoid-shaped red seeds that hang from the pod on slender stems when ripe.

The flowers are bell-shaped, 2 to 3 inches long, and green to greenish-yellow. The cucumber tree often has a pyramidal crown, small branches and a straight trunk. The **tree** grows to heights of 70 to 80 feet and has diameters of 2 to 4 feet.

The **bark** of the cucumber tree is brownish gray, furrowed and quite scaly. The **wood** is light and soft; it is not strong but is durable. It is used for the same purposes as yellow poplar.

Sweetbay

(Magnolia virginiana L.)

Sweetbay, often called swamp magnolia or white bay, commonly grows on low, or wet lands in the Coastal Plain and less often in the eastern portion of the Piedmont region. It is often the most common tree in bays and wet pocosin. Sweetbay sprouts up quickly after fires, sometimes forming thickets. It often is cultivated as a garden plant in the United States and in Europe.

Sweetbay **leaves** are oblong and 4 to 6 inches long, with smooth margins. The leaves are blunt-pointed. They are shiny bright green on the upper surfaces, pale or whitish on the lower surfaces and have conspicuous midribs and veins. When crushed, the leaves and twigs have a strong pleasant, spicy odor.

The creamy white **flowers** are cup-shaped, 2 to 3 inches across and fragrant. The oblong, aggregate **fruit** is dark red and about 2 inches long. The tree may reach 60 feet in height on the best sites but usually is a slender tree that grows 20 to 30 feet high.

Sweetbay leaves remain on the tree throughout the winter in the South, and fall when the new leaves appear in spring. In northern parts of its range, sweetbay is deciduous.

Sweetbay **wood** is soft. It is used commercially for some minor products such as handles, novelty woodenware and occasionally as core stock for furniture. When large enough to be sawn into lumber, Sweetbay is sold as magnolia.

Southern Magnolia

(Magnolia grandiflora L.)

Southern magnolia, sometimes known as bullbay, is a medium-sized tree usually less than 80 feet tall and 3 feet in diameter. It is native to the bottomlands of the central and southern Coastal Plain. However, it is not tolerant of prolonged flooding, and its presence in natural stands is an indication of better drained alluvial terraces. Southern magnolia has been widely planted as an ornamental or landscape tree across the state. It is the only evergreen magnolia.

Southern magnolia's leathery, persistent **leaves,** with their shiny, dark green surface and rusty, woolly lower surface, make identifying this tree easy. The mature foliage is from 3 to 8 inches long and 2 to 3 inches wide. The large (6 to 8 inches wide), fragrant **flowers** have six to 12 creamy white petals. They are among the most showy of all tree flowers.

Southern magnolia is very shade-tolerant, and under natural conditions, it is usually an understory tree with a clear, straight trunk. When grown as an ornamental, it maintains its heavily leaved limbs almost to the ground.

The **wood** is light, soft and pale cream or tan colored with a very indistinctive grain. When used commercially as lumber, it's usually used as a veneer, furniture parts, pulp for paper or in flake and chip boards.

Fraser Magnolia

(Magnolia fraseri Walt.)

Fraser magnolia, also known as mountain magnolia, is a small tree (30 to 40 feet high) with a straight, leaning or divided trunk that is 1 to 1 1/2 feet in diameter. The tree has wide-spreading and rather brittle branches. Fraser magnolia is found in rich coves and on cool slopes of the southern Appalachian mountains from elevations of 2,000 to 4,000 feet.

The **bark** is usually smooth and grayish brown. The terminal winter buds are smooth, purple and 1 1/2 to 2 inches long.

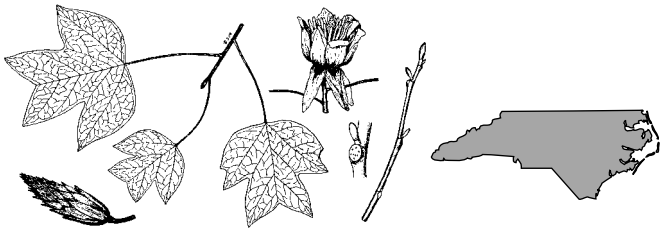
The 10 to 12-inch oblong **leaves** are distinctive; the lower end narrows and is "auriculate" (having lobes like ears) at the base. The pale, yellow **flowers** are 10 to 12 inches in diameter. They are "perfect," which means they have stamens and pistils in the same flower.

At maturity, the **fruit** is red and shaped like a cucumber. It is 4 to 5 inches long and bears many scarlet seeds, each in a carpel, or cell, on which is a long, stiff point.

The **wood** is light, weak and easily worked. It occasionally is used for lumber or pulpwood -- but only in places where practically all species are being cut. The tree occasionally is planted for ornamental purposes, but it is said to be less hardy than the other magnolias.

Yellow Poplar

(Liriodendron tulipifera L.)



Yellow poplar, or tulip tree, is named for its greenish-yellow heartwood and its attractive tulip-like flowers. The heartwood does not develop until the tree obtains considerable diameter, usually 2 feet or more. Loggers refer to a young yellow poplar as "white poplar" because heartwood color has not yet formed.

Yellow poplar is one of the largest and most valuable hardwood trees in the United States.

Yellow poplar can be found throughout the state but grows best in deep moist soils along streams and in lower mountain coves. It commonly reaches a height of 90 to 110 feet and a trunk diameter of from 2 to 5 feet. The tree has been known to reach heights of nearly 200 feet, with a straight, clear trunk 8 to 10 feet in diameter. Some trees may be free of branches for as high as 80 to 100 feet from the ground.

The crown has a compact, pyramidal shape, and often tapers sharply to the top.

Yellow poplar **bark** is light gray and becomes thick and deeply furrowed on older trees. **Flowers** are tulip-like, and 1 1/2 to 2 inches across. The petals are yellowish-green and conspicuously marked with reddish-orange bands near the base. The fruit is a cone-like aggregate, 2 1/2 to 3 inches long, that breaks up as it matures in September and October.

Yellow poplar **leaves** are easily recognized, because they are composed of four large lobes. They are 5 to 6 inches long. They are about as broad as they are long. The two outer lobes often flattened into a squarish end. In autumn, the leaves of the yellow poplar turn from green to bright yellow and stand out from leaves of other trees.

The terminal buds are about 1/2 inch long, flattened and valvate, opening like a duck's bill. Sprouts and buds are one of the main foods of deer, and squirrels eat yellow poplar seeds in early fall and again in mid-winter.

The **wood** is light, soft and easily worked. It is light yellow or brown, with wide cream-colored sapwood. Yellow poplar is extensively cut into lumber for interior and exterior trim, veneers, flake and chip boards, turnery and other high-grade uses.

Sassafras

(Sassafras albidum (Nutt.) Ness.)

Sassafras is common throughout the state, except in the higher mountains. Sassafras **leaves** are 4 to 6 inches long with three distinct leaf forms. They may be entire (not lobed), or two- to three-lobed on the same tree or branch. In autumn, leaves turn yellow, orange or crimson.

The **fruit** ripens in September and October. It is a dark blue drupe with a thin, fleshy covering on the hard seed. Each fruit grows on a stalk 1 1/2 to 2 inches long.

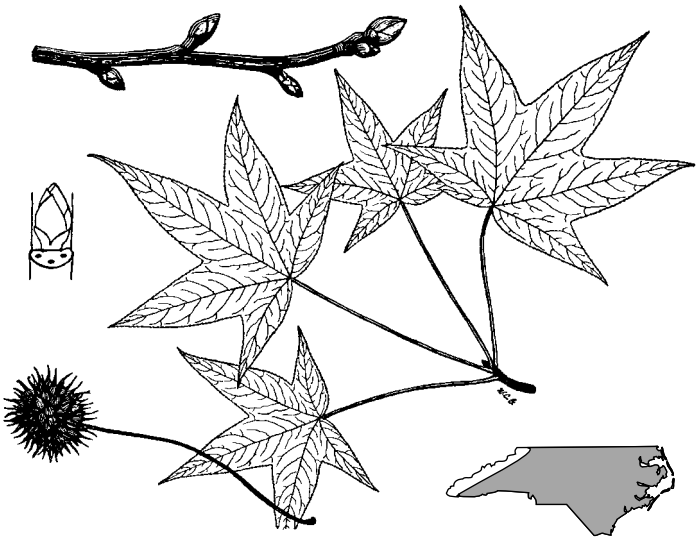
Roots, twigs and bark of sassafras have a pleasant, spicy scent, and contain oil of sassafras, which is used as a flavoring. In the early spring, the tender roots can be peeled and brewed to make sassafras tea.

The **bark** of the trunk is thick, red-brown and deeply furrowed. The bark of the twigs is bright green.

Sassafras is a small tree that often grows 20 to 40 feet tall and 1 to 2 feet in diameter. It sprouts readily from stump and roots and can survive fire. The **wood** is soft, weak and brittle. It has a limited use for fence posts. Deer, turkey, bear and many species of birds eat the fruit in early fall.

Sweetgum

(Liquidambar styraciflua L.)



Sweetgum, also known as redgum, is a large, valuable forest tree. Except for the high mountains, sweetgum grows on rich river bottoms, in swamps that frequently flood and on drier uplands throughout the state. This tree grows best on rich bottomlands and reaches heights of 120 feet and diameters of 4 feet or more. On most sites, the tree averages 60 to 80 feet in height and 2 to 3 feet in diameter.

Sweetgum is easily recognized by its star-shaped **leaves,** which are composed of five (occasionally seven) deeply separated, pointed lobes. Its broad leaves have long petioles (stems), and toothed margins. The leaves are palmately veined and 5 to 7 inches long. The leaves turn deep red to maroon in autumn.

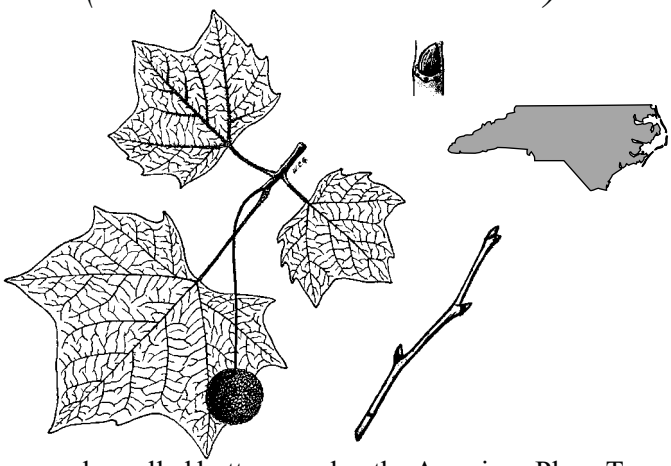
The **fruit** is a globose head and is composed of many beak-shaped capsules, which contain two tiny seeds. The fruit which persists through the winter is 1 to 1 1/2 inches in diameter, and is on a stalk. The bark is light gray and roughened by corky scales. As the tree matures, the **bark** becomes deeply furrowed. After the second year, the twigs may develop two to four corky projections of the bark, giving them a winged appearance.

The **wood** is heavy, moderately hard, close-grained and, on exposure, is not durable. Red gum may get its name from its reddish-brown heartwood, which is not present to any appreciable extent in logs smaller than 16 inches in diameter.

The wood is used for furniture, interior finish, paper pulp, veneers and baskets of all kinds. The heartwood once was in furniture, sometimes as imitation mahogany or circassian walnut. It is used widely today in flake and strand boards.

American Sycamore

(Platanus occidentalis L.)



Sycamore, also called buttonwood or the American Plane Tree, is considered one of the largest hardwood trees in North America -- especially in diameter. It may be found throughout the state but is most abundant and grows to its largest size along streams and on rich bottomlands.

American sycamore is easily recognized because of its multi-colored, mottled **bark.** The bark on young branches is brownish. As the branch grows, this outer bark peels away in irregular patches to expose smooth inner bark, which may be green or olive but most often is white. The resulting patchy pattern of bark in the branches and upper crown is conspicuous and is characteristic of this tree. In mature trees, bark on the lower trunk is entirely brown and consists of small scales.

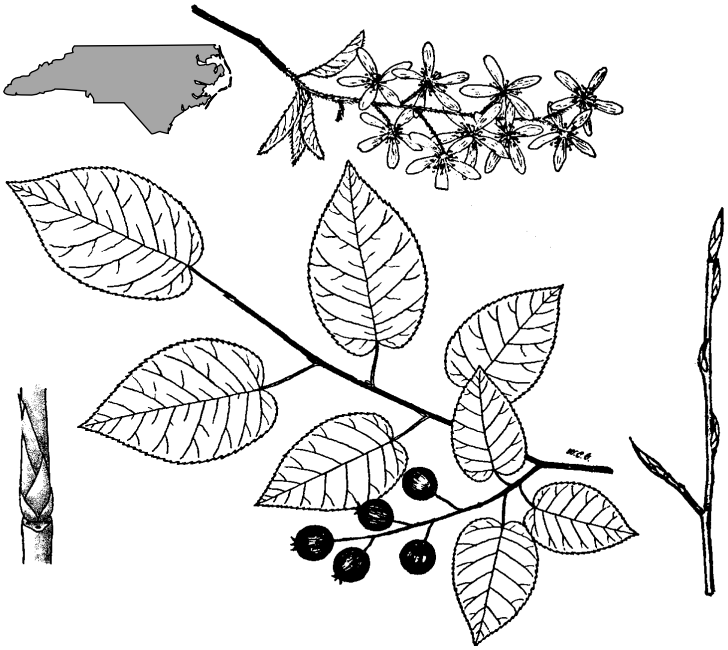
On preferred fertile sites, the **tree** grows fast, reaching heights of 100 feet or more (occasionally 150 feet) and trunk diameters of 10 feet or more. The average height ranges from 80 to 110 feet; the diameter from 3 to 8 feet.

The **leaves** usually are three- to four-lobed and are divided by broad, shallow sinuses. Leaves are 4 to 7 inches long and broad, with palmate veining and toothed edges. Twigs grow in a zigzag pattern. They are encircled by a toothed stipule at the base of each leaf, where the large, pointed bud is attached. The petiole of the leaf completely encloses the bud -- a distinctive feature of American sycamore.

The **fruit** is a ball, about 1 inch in diameter, that breaks up when ripe to disperse small, elongated seeds surrounded by many fine hairs which permit them to be carried afar on the wind. The **wood** is hard and moderately strong but decays rapidly in the ground. It is used for chopping blocks, tobacco boxes, furniture, interior finish and products such as chip board and flake board.

Serviceberry

(Amelanchier arborea (Michx. f.) Fern.)



Serviceberry also is known as service-tree or shadbush. In North Carolina, it is called "sarvis." It is found throughout the state but develops best on mountain slopes. The common name of shadbush was given to the tree by early settlers, who associated its blooming with April shad runs. It is a small tree, 2 to 50 feet high and 1/2 to 1 1/2 feet in diameter, with a rather narrow, rounded top. Often, it is little more than a shrub.

The thin, ashy gray **bark** is smooth on the branches and upper part of the stem and breaks into shallow fissures on the short trunk. The **leaves** are alternate, slender-stalked, ovate, pointed, finely toothed, 2 to 4 inches long and purplish-brown until nearly mature. When mature, the leaves become light green. Young leaves are covered with scattered silky hairs.

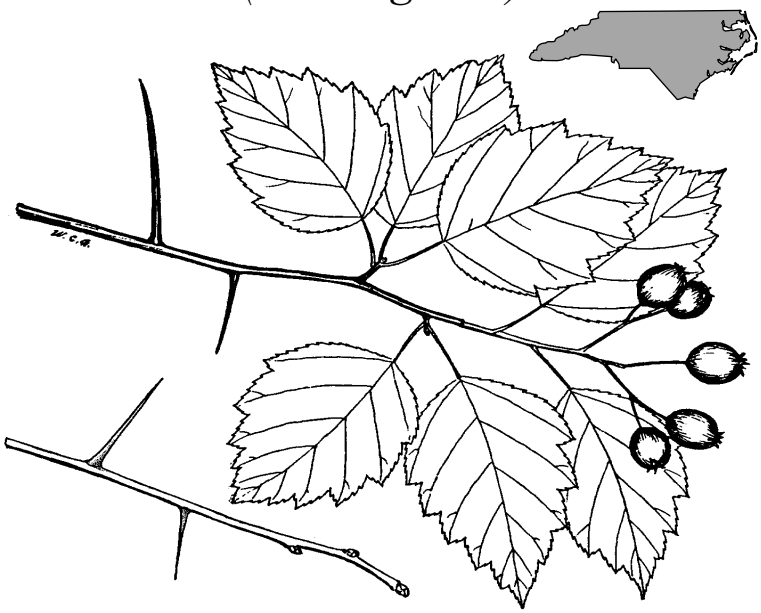
The terminal buds are long and pointed but are smaller than those of beech. The white **flowers** appear in standing or drooping clusters in early spring -- before or with the leaves -- making the tree noticeable in the leafless or budding forest.

The **fruit** is sweet, edible, rounded, one-third to one-half an inch in diameter and dark purple to black when ripe -- in early June. Most birds and animals of the forest eat the serviceberry fruit.

The **wood** is heavy, extremely hard, strong, close-grained and dark brown. It occasionally is used for furniture and turnery. Serviceberry is a desirable ornamental tree.

The Hawthorns

(Crataegus L.)



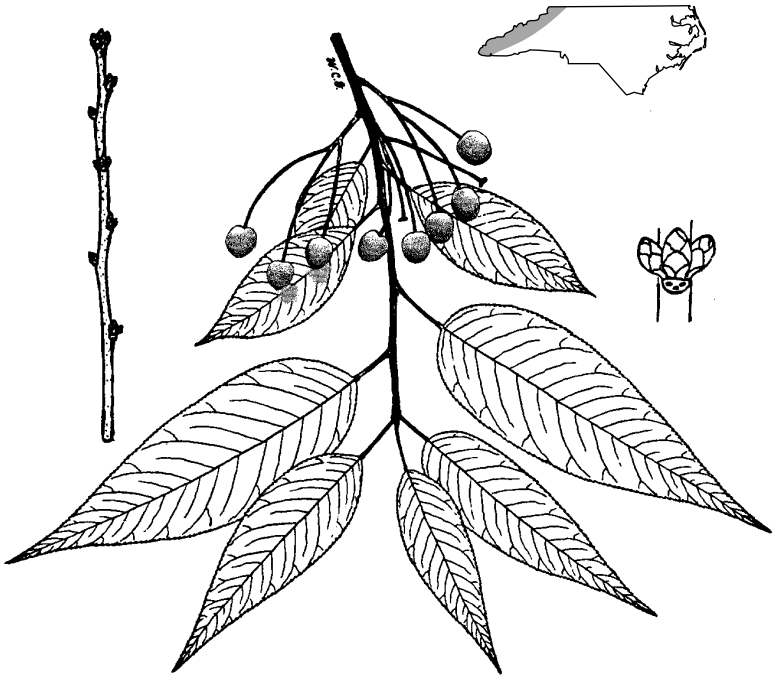
Hawthorns, or thornapples, represent many different species and varieties distributed over the state. Even experts have difficulty in distinguishing between the many species of hawthorns. The various species are all shrubs or small trees that grow throughout the state, from the low swamps and river bottoms of the east to the high mountain ridges of the west. Most hawthorns have long, straight thorns and bear white blossoms and red or yellow **fruit.** Some species are planted as ornamental trees, but otherwise the group has little commercial value. The **bark** generally is thin and gray. On the old stems, it breaks up into thin, narrow scales.

Hawthorn **leaves** are simple, alternate, mostly oval or wedge-shaped, notched on the edges and are usually from 2 to 3 inches long. Hawthorn flowers are white. Some have a pleasant scent, and others have a slightly unpleasant odor. They appear in early spring.

The **fruit** varies from globular to oblong, from 1/4 to 3/4 inch in diameter. Some have a pulpy, sweet, edible flesh that surrounds from one to five bony seeds. The fruit of most hawthorn species ripens in the fall, and one or two varieties yield a fruit that is prized for making jelly.

The **wood** is strong, tough, heavy and hard but rarely is used for any purpose. Many species of birds are attracted to these trees and bushes, largely because of the fruit and the protection offered for nesting.

Pin Cherry
(Prunus pensylvanica L. f.)



Pin cherry, also known as wild red cherry, fire cherry and bird cherry, commonly develops in clearings, along fence rows and along roadsides in the mountains.

The **leaves** are oblong, measuring 3 to 5 inches long and 3/4 to 1 1/4 inches in width. The margins are finely and sharply toothed and rather thin. The leaves are lustrous yellowish-green on both surfaces, but are slightly paler on the underside.

The **fruits** are light red drupes about 1/4 inch in diameter, with a thin, very sour flesh. They are attached in small, lateral, umbel-like clusters and ripen during July and August.

The **bark** of the young trunks and branches is lustrous and bright reddish-brown. It is conspicuously marked with horizon tally elongated lenticels (small openings, usually surrounded by rough, corky tissue in the bark of a twig) and frequently peels off in horizontal strips. The green inner bark is pungent and very bitter.

The **tree** is short-lived and small, occasionally reaching a height of 30 feet and a diameter of up to 1 foot. The wood has little commercial value. Many species of wild birds, including the wild grouse, eat the fruits. Almost all of its seeds are spread by birds.

Black Cherry

(Prunus serotina Ehrh.)

Black cherry, often called wild cherry, grows in all parts of the state but it grows best in the high mountains. It does not grow well on sites that are swampy or dry. Black cherry **leaves** are 2 to 6 inches long and 3/4 to 1 1/2 inch wide. They are narrowly oval or oblong and are pointed. Leaf edges are finely toothed with incurvate teeth. The base of the midrib is covered with rusty colored pubescence.

The white **flowers** bloom when the leaves are about half-grown, occurring on stems 4 to 6 inches long. As the **fruit** develops, the flower stalks, or racemes, gradually droop as the cherries reach full size (1/3 to 1/2 inch diameter). The cherries are dark red when they are fully developed and turn black with dark purple flesh as they ripen. They are food for wild animals and birds.

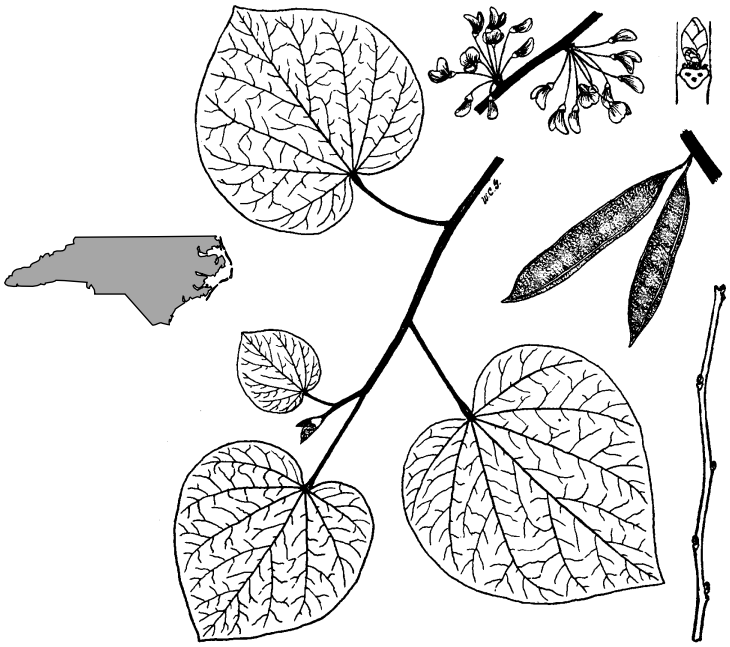
Black cherry is the largest of the native cherries of the United States -- and the only one of commercial value. The **tree** reaches 60 to 100 feet or more in height and 1 to 5 feet in diameter. Forest-grown trees have long, limb-free trunks with little taper; open-grown trees have short trunks with many branches and irregular-spreading crowns.

The **bark** on the branches and trunks of young trees is thin, satiny, reddish brown, with horizontal markings made up of patches or rows of lenticels (lenticels are small openings in the bark of twigs; they are usually surrounded by rough, corky tissue.). Bark on older black cherry trees consists of small scaly plates with slightly upraised edges. Leaves and twigs have a very strong odor of bitter almonds. This characteristic helps to identify the cherry when it is growing with sweet birch or hop hornbeam.

The **wood** is reddish-brown with yellowish sapwood. It is moderately heavy, hard, strong, and fine-grained. Black cherry is valuable for its lustre and color and is used for furniture, interior finish, tools and tool handles. With the exception of black walnut, cherry lumber is more valuable than any other tree of the eastern United States.

Redbud

(Cercis canadensis L.)



The Redbud, sometimes called Judas tree from its oriental relative of that name, is a small tree that grows beneath taller trees. It also grows on the borders of fields, on hillsides and in valleys throughout the state. It is most abundant in the Piedmont and least abundant in the mountains. The **tree** ordinarily reaches a height of 15 to 30 feet and a diameter of 6 to 10 inches. Its stout branches usually form a wide, flat head.

Redbud **bark** is dark gray to black. It is smooth when young and later develops into long, narrow plates that separate into thin scales.

The **leaves** are alternate, heart-shaped, smooth-margined, 3 to 5 inches long and wide. They are glossy green, turning to a bright clear yellow in autumn.

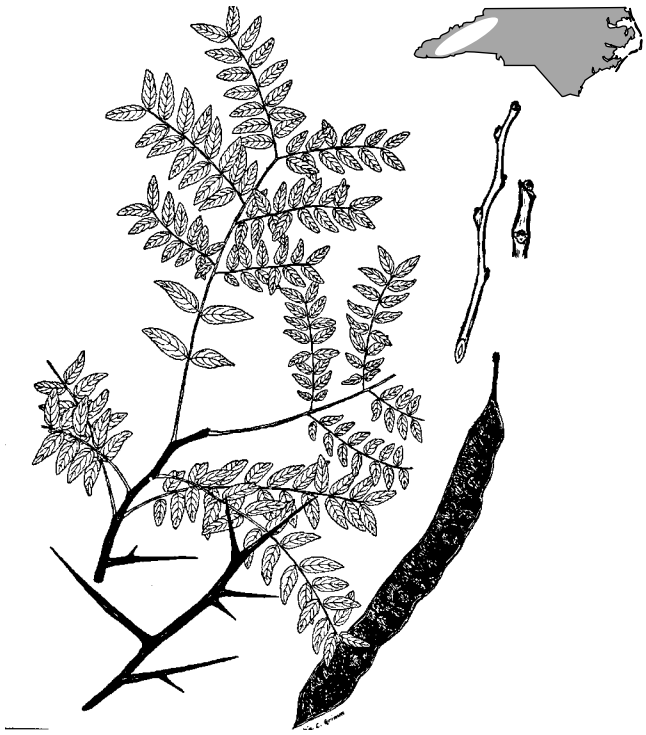
The conspicuous, bright purplish-red, pea-shaped **flowers** grow in clusters along the twigs and small branches and appear before or with the leaves in early spring. Redbud flowers in full bloom can make a drive through the country quite memorable.

The **fruit** is an oblong, flattened, many-seeded pod, that is 2 to 4 inches long. It is reddish during the summer and often hangs on the tree most of the winter.

The **wood** is heavy, hard, not strong and rich, dark brown in color. It has little commercial value. Redbud is cultivated as an ornamental tree.

Honeylocust

(Gleditsia triacanthos L.)



Honeylocust is found scattered throughout the state, except in the high mountains. It grows under a wide variety of soil and moisture conditions. It sometimes grows in the forest, but more commonly grows beside roads and fields.

Honeylocust **leaves** are 7 to 8 inches long, pinnately compound and often bipinnately compound (see forward for drawings of pinnately and bipinnately compound leaves). Leaflets are oval, 1 to 1/2 inches long and are a shiny dark green above and dull yellow-green below. Bipinnate leaves have four to seven pairs of pinnae, each with 15 to 30 leaflets. Branches and trunk are armed with stout, rigid, three-forked spines that are 2 to 3 inches long.

The **fruit** is a flat, dark brown pod 12 to 18 inches long, containing oval seeds. Pods twist into corkscrew shapes before falling in autumn or early winter. **Trees** typically reach heights of 50 to 80 feet, with trunk diameters of 2 to 3 feet. The crown is broad and flat-topped.

Honeylocust **bark** is dark brown or gray and is divided into narrow, flat plates. The **wood** is coarse-grained, hard, strong and moderately resistant to decay. It is used for fenceposts and crossties. It should not be confused with the much darker and very durable wood of the black locust.

Black Locust

(Robinia pseudoacacia L.)

Black Locust, often called yellow locust, is native only to the mountains. However it has been widely planted across the state and is now naturalized on all soils and moisture conditions, except saturated soils. It is found as a forest tree only in the mountains. In other sections of the state, it usually grows in thickets on clay banks or waste places, or singularly along fence rows.

Black Locust **leaves** are pinnately compound and 8 to 14 inches long. Each leaf is made up of seven to 19 oval alternate leaflets on the long, slender rachis or central stem. Margins of leaflets are smooth. The whitish **flowers** are very fragrant and hang in clusters on long stems.

Black Locust **fruit** is in the form of brown flat pods, each bearing four to eight kidney-shaped, dark orange-brown seeds. Most pods persist on the tree through the winter.

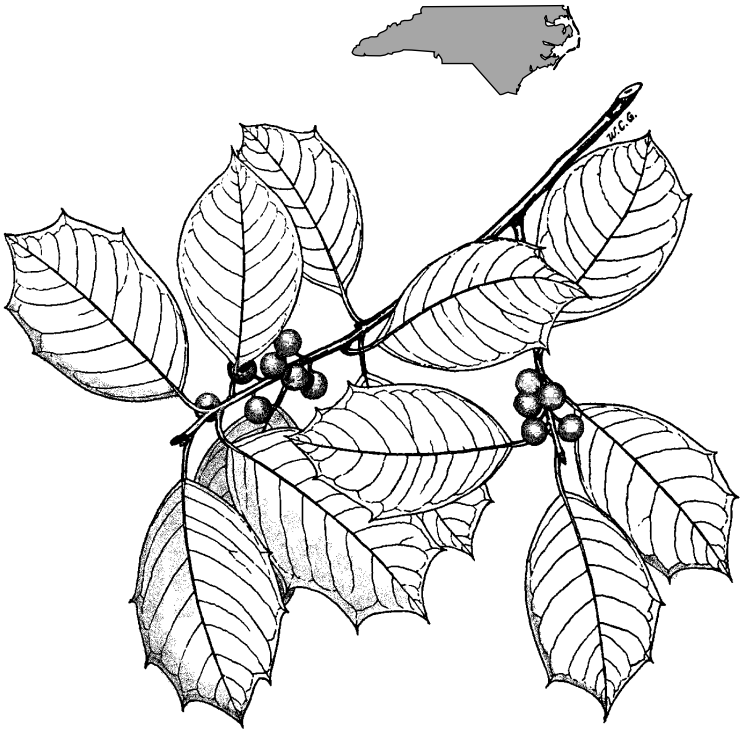
The **tree** grows on a variety of soils and is the most successful species for use in reclaiming spoil banks from mining operations. It may reach heights of 70 to 80 feet and diameters of 3 to 4 feet, but more frequently is 30 to 70 feet tall and 1 to 2 feet in diameter.

Twigs bear paired spines, 1/2 to 1 inch long, that arise adjacent to each leaf scar. The thick **bark** is deeply furrowed, dark brown and scaly. Sprouts and seedlings are important food for cottontail rabbits and other browsing animals in winter, especially when snow accumulates. Many birds also eat black locust seeds.

The Locust borer attacks many locust trees when they are only a few years old, resulting in deformed and weakened trunks. The **wood** is yellow, coarse-grained, very heavy, very hard, strong and very resistant to decay. It is used extensively for fence posts, poles, split rails, insulator pins, decking and in other places where hard, strong, decay-resistant wood is needed.

American Holly

(Ilex opaca Ait.)



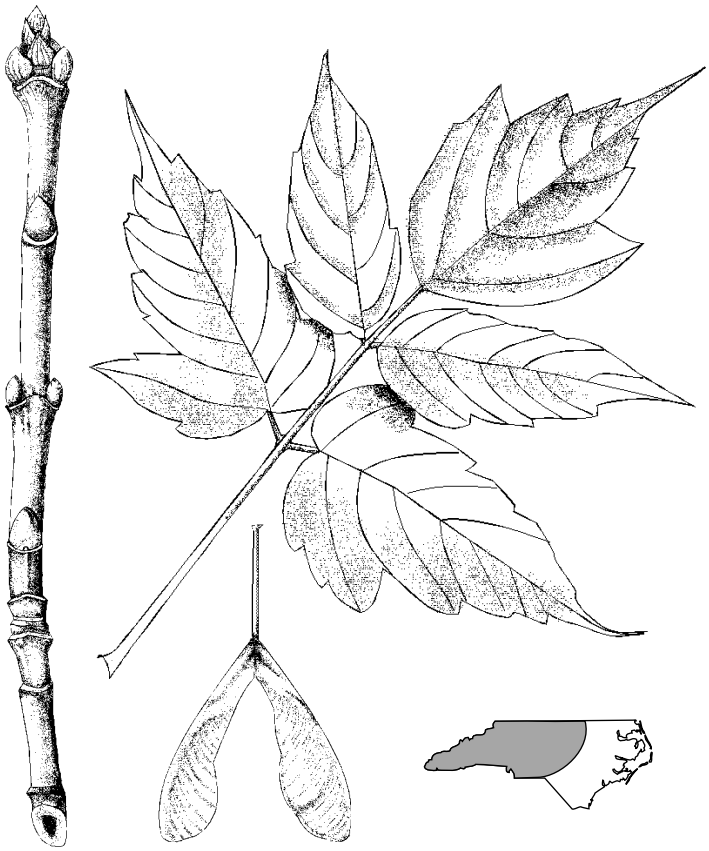
American Holly, sometimes called Christmas holly, occurs sparingly throughout the state, from coastal floodplains to 4,500 foot elevations in the mountains. It grows best on a rich, moist soil but also is found in higher and drier conditions.

It has spiny, wavy-edged, glossy, dark green **leaves,** which (along with its bright red berries) make it highly valued for Christmas decorations. The leaves are green through the winter; each leaf stays on the tree for three years. They are 2 to 4 inches long, with prominent midribs and veins.

The spherical **fruit,** produced only on female trees, ripens in the late autumn and remains on the tree over the winter. Each bright red, fleshy berry is attached to a short stalk.

The **bark** is light gray and roughened by wart-like growths. The **tree** usually reaches 15 to 40 feet in height and 1 to 2 feet in diameter. The **wood** is light and tough but is not strong. It is close-grained and bone-colored, which makes it valuable for various kinds of interior finishing and for inlays in joiner-cabinet work. The bitter-tasting berries are food for songbirds, deer, wild turkeys and a wide variety of other animals.

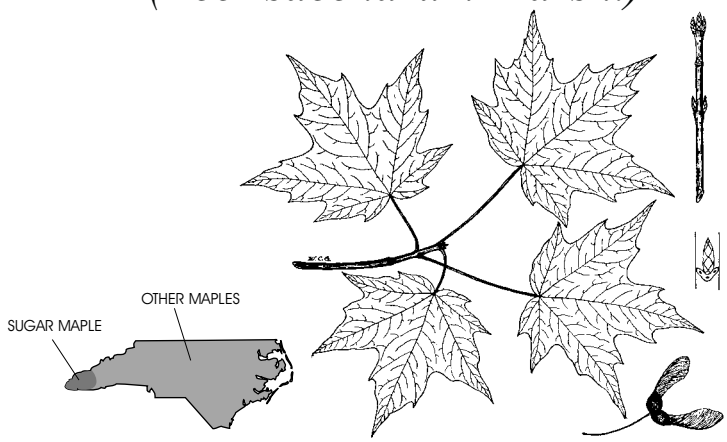
Boxelder
(Acer negundo L.)



Boxelder is a maple. Its range is the greatest of all the maples. It is found from Alberta, Canada, to the southern Rocky Mountains to New York to Florida. In North Carolina, boxelder commonly grows from the upper Coastal Plain and westward.

The boxelder's opposite **leaves,** unlike other maples, are pinnately compound with three to seven (sometimes nine) leaflets which vary greatly in size and shape. They are coarsely serrate and may have one or two lobes. Current twigs are lustrous green. Terminal buds are almost white and are quite hairy. While its three leaflets can resemble those of poison ivy, boxelder **bark** is similar to that of an ash tree, composed of marrow-brown, rounded, interlocking ridges. The **fruit** is similar to that of red maple, but the wings are nearly twice as long. It grows quickly but is short-lived. The branches are brittle and break easily, and the tree usually has a poor form. Boxelder has little value, except as high quality pulp for paper-making.

Sugar Maple
(Acer saccharum Marsh.)



Sugar Maple, or hard maple, is common only on the cool slopes of our higher mountains. It generally is a slow-growing tree but grows faster in the open. Its foliage provides heavy shade.

Sugar maple **leaves** are opposite, palmately lobed and veined and have five lobes (in rare cases, three lobes) that are separated by rounded, shallow sinuses. Leaves are 3 to 5 inches in both length and width. They are heart-shaped, with sparse, large, pointed teeth on the margins. In autumn, sugar maple leaves are exceptionally colorful, turning brilliant shades of red and yellow.

Sugar maple **flowers** are yellow, and grow on long, slender stems in clusters up to 3 inches long. They appear with leaves in spring.

The **fruit,** a U-shaped pair of winged seeds, ripens in the fall. The **bark** of mature trees is thick, light gray to brown and is broken by vertical furrows into plate-like scales. The sap is used to make maple syrup and maple sugar.

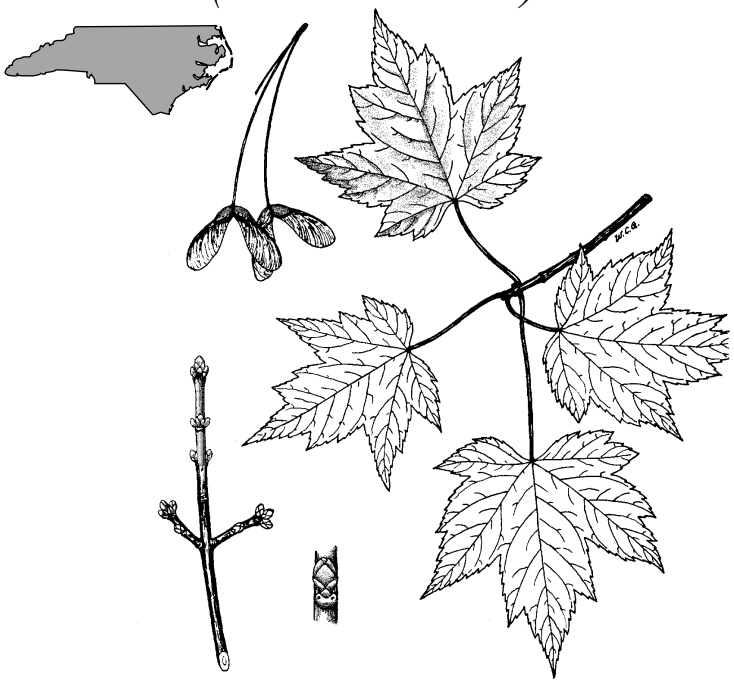
The pale brown or pink **wood** is hard, heavy, strong and close-grained. It is known commercially as hard maple and is used in the manufacture of flooring, furniture and a great variety of novelties such as toys, coat-hangers, and turnery.

Chalk maple, black maple and Florida maple are varieties of sugar maple that grow in North Carolina and have been described as three separate species.

Black maple grows in the mountains; chalk maple grows in the Piedmont; and Florida maple grows in the Piedmont and Coastal Plain. The leaves of each of these trees are smaller than those of sugar maple; all typically are three-lobed, with few, if any, serrations.

Red Maple

(Acer rubrum L.)



Red maple, also called swamp maple or soft maple, is widely distributed throughout the state.

Under ideal conditions, the **tree** may reach 115 feet in height and 6 feet in diameter. It commonly grows 40 to 70 feet tall, with diameters of 1 1/2 to 2 1/2 feet.

Red maple **leaves** are three- to five-lobed and have coarsely toothed margins. The leaves are 2 to 6 inches long and are somewhat broader than long. They turn brilliant scarlet, orange or bright yellow in autumn. The twigs are slender, dark red and shiny. The polygamous **flowers** grow in short-stemmed clusters in springtime, before the leaves appear.

The paired, winged **fruit** is reddish and V-shaped. It ripens in the late spring or early summer on drooping stems that are 3 to 4 inches long. The fruit, along with the buds, are a primary food source for gray squirrels in late winter and early spring. Sprouts are a favorite food of deer.

On young trunks, the **bark** is smooth and light gray. On old trunks, the bark is thick, dark gray and separated by vertical ridges into large, plate-like scales.

The light cream colored **wood,** which is known commercially as soft maple, is heavy, close-grained and rather weak. It is used in the manufacture of furniture, turnery and woodenware and as pulpwood.

Yellow Buckeye

(Aesculus octandra Marsh.)

Yellow buckeye (also called sweet buckeye or commonly, buckeye,) flourishes in rich coves of the southern Appalachians. It is only found outside the mountains in rich bottoms and moist uplands as a small tree and shrub.

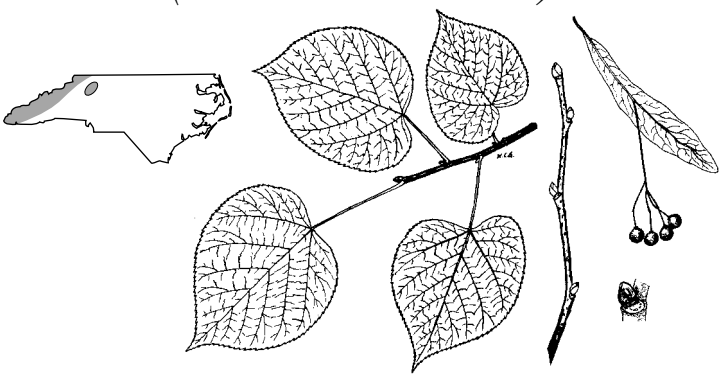
Yellow buckeye **leaves** are opposite, palmately compound with five (sometimes seven) broad-oval, pointed leaflets 4 to 6 inches long. Leaflet margins are coarsely toothed. Leaves turn yellowish-brown in early autumn. **Flowers** are pale yellow and appear in erect panicles 5 to 6 inches long in April and May.

The **fruit** is a smooth-surfaced capsule 2 to 3 inches long, bearing one to two large, brown, shiny nuts 1 1/2 to 2 inches wide. Seeds contain a poisonous substance known as aesculin.

Occasionally, the **tree** will grow to 90 feet in height (commonly to 40 to 60 feet), with a tall, clean trunk 2 to 3 feet in diameter. It is the largest of the native buckeyes and is one of the first trees to leaf in spring. The **bark** is grayish brown, scaly and divided by shallow fissures. The **wood** is light, soft and close-grained. It is used for pulpwood, woodenware and sometimes for lumber.

American Basswood

(Tilia americana L.)



The American basswood also is known as American linden, white-wood, linn or beetree. The basswood grows chiefly in the mountains, where it is a common and valuable timber tree. It reaches heights of 70 to 80 feet or more and diameters of 2 to 3 feet. American basswood grows best in coves or bottomland sites where the soils are deep, moist and fertile, but it often is found on rocky slopes.

The **bark** on young trees ranges from green to grayish green, later breaking up into narrow ridges. The twigs are green to red and grow in a zigzag fashion.

The **leaves** are heart-shaped, uneven at the base, 3 to 6 inches long, thin and saw-toothed. The surfaces range from smooth on top and bottom to densely hairy on the lower surface.

American basswood **flowers** are yellowish-white and hang in drooping clusters that open in early summer. The flower stem is attached to the middle of a long, narrow, leaf -like bract. The flowers are very fragrant and bees use them to make choice-grade honey.

The **fruits** are hard and rounded, and they are about the size of a pea. They hang suspended in clusters from a stalk that is attached to a paper-thin, strap-shaped bract. Each fruit contains two seeds and is covered with a thick, reddish-brown fuzz. It remains attached in clusters to the leafy bract, which later acts as wing when it is carried away by the wind.

The light cream colored **wood** is lightweight, soft, tough but not durable. American basswood is used in the manufacture of pulp, woodenware, furniture, trunk frames, and many other products.

Carolina basswood grows rarely on well-drained soils in the Piedmont and southern Coastal Plain. Its **leaves** are somewhat smaller than those of American basswood, and they are densely covered with grayish or brownish hairs.

Loblolly-Bay

(Gordonia lasianthus (L.) Ellis.)

This medium-size evergreen tree, sometimes known locally as red bay, is found in Carolina bays, pocosins and on other wet sites in the Coastal Plain and, more particularly, in the southern Tidewater region of the state. It is a comparatively short-lived tree and rarely exceeds 70 feet in height and 20 inches in diameter. It has a narrow, compact crown of spreading branches.

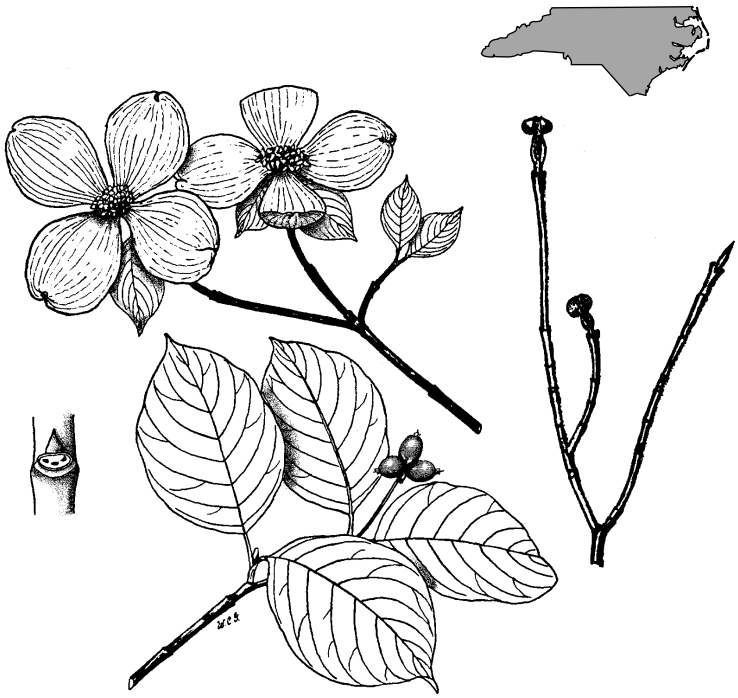
Loblolly bay **leaves** are 4 to 6 inches long and 1 to 2 inches wide. They are leathery, dark green, smooth and shiny. The leaves are broader near their outer ends and toothed or wavy on their margins. They turn scarlet in the fall and drop gradually during the next year.

The **flowers** are fragrant, white and about 2 to 3 inches across. Blossoms appear over a period of several weeks in mid-summer. They are attached singly on long, stout, red flower stalks that spring from the axils of the leaves. The petals are rounded and silky on their lower sides.

The **fruit** is oval, pointed, hard or woody. It has a downy coat and is about 3/4 inch long and 1/2 inch in diameter. It splits into five cells, or parts, each bearing from two to eight winged, four-sided seeds. The pink **wood** is soft and light. It sometimes is used in cabinet-making or for pulpwood.

Flowering Dogwood

(Cornus florida L.)



Flowering dogwood is named and admired for the white drifts of flowers it adds to the woodlands in early spring. It grows throughout the state, usually under the larger forest trees. Dogwood has the distinction of being the state flower. It is a small tree, usually 10 to 20 feet tall and 4 to 6 inches in diameter. Occasionally it will reach 40 feet in height, with a trunk diameter of 12 to 18 inches.

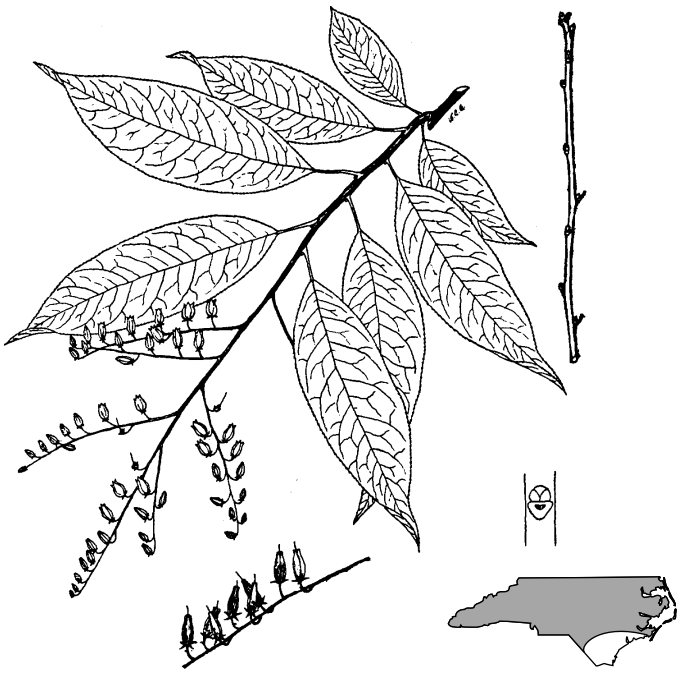
What most people think of as the "flowers" of dogwood actually are 4 large, white (sometimes pink,) petal-like bracts that are notched at the end. The true **flower** is an inconspicuous, greenish-white or yellowish, compact head in the center of the showy bracts. The bright red, oval **fruit** (a drupe) is borne in tight clusters. It ripens in October.

The **leaves** are opposite and 3 to 5 inches long. The veins curve like a bow and tend to parallel the margin of the leaves. The **bark** of flowering dogwood is dark red-brown, dividing into small scaly blocks on older trees.

The brown to red **wood** is hard, heavy, strong and very close-grained. It is used for textile shuttles and spools and for handles and mallets.

Sourwood

(Oxydendrum arboreum (L.) DC.)



Sourwood is found scattered throughout the state on both rich and poor soils but is least abundant in the low alluvial parts of the state. It is a small tree, 8 to 12 inches in diameter and 30 to 40 feet tall, but rarely taller.

The **bark** is thin, light gray and divided into narrow shallow ridges. On the strong, straight, first-year shoots, sourwood bark often is bright red. The twigs lack terminal buds.

Sourwood **leaves** are 3 to 6 inches long, simple, alternate, very acidic to the taste (oxalic acid). They are often rough with solitary, stiff hairs. The leaves are a shiny green on the upper surface and usually turn a deep crimson in the fall.

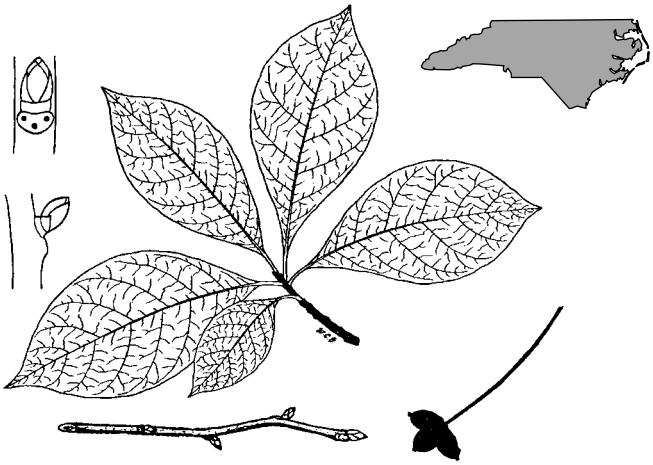
The **flowers,** which appear in early summer, are small, white or cream-colored and are borne in panicles of 5 to 10 inches long on the ends of the twigs. (See the foreward for an illustration of panicles.) Bees use the flower's nectar to make rich-colored honey which is widely enjoyed throughout the state.

Sourwood **fruit** is a conical, dry capsule, 1/3 to 1/2 inch long that contains many small seeds. These capsules hang in drooping clusters sometimes a foot long, often persisting late into the fall.

The **wood** is heavy, hard, very close-grained and compact. It is brown, sometimes tinged with red. Sourwood is seldom considered a commercial wood. It is sometimes used for turnery, handles, pulp and other items.

Blackgum

(Nyssa sylvatica Marsh.)



Blackgum, often called black tupelo, grows throughout the state in many types of soils and conditions of soil moisture. Occasionally in the lowlands, it grows along swamp margins. In the hills and mountains, it grows on dry slopes with oaks and hickories.

The slender limbs grow at right angles to the trunk. Blackgum **leaves** are alternate, roughly oval with short, blunt points. The leaves are smooth-margined, 2 to 5 inches long and 1/2 to 3 inches wide. In early autumn, the leaves turn bright scarlet, often making the first showy display of fall colors in southeastern forests.

The **fruit** is round, dark blue, about 1/2 inch in diameter and is clustered on stalks up to 1 1/2 inches long. Thin, bitter-smelling flesh surrounds the small, ribbed seed. The bark on younger trees is furrowed between flat ridges and gradually develops into quadrangular blocks that are dense, hard and nearly black -- much like the bark of persimmon.

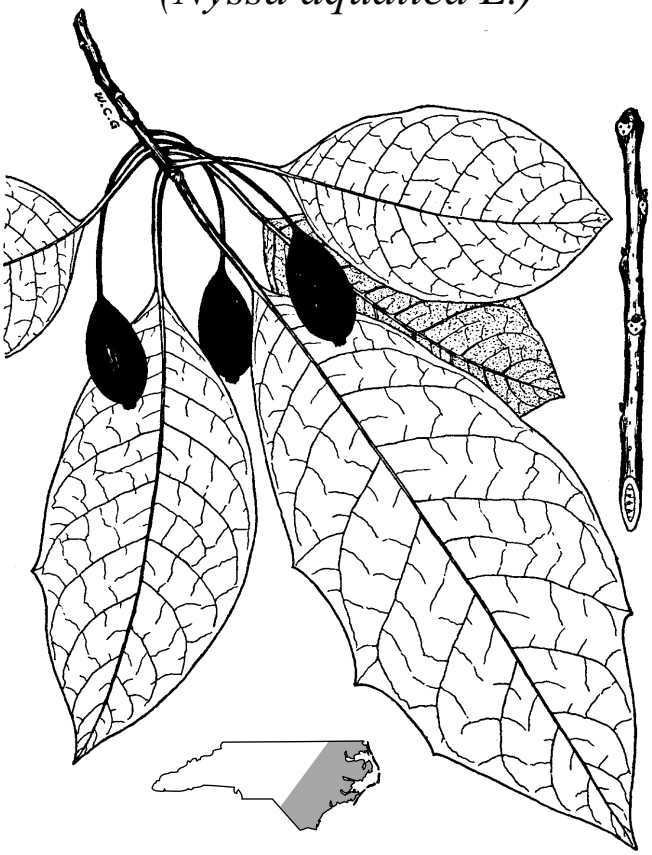
Blackgum is usually a medium-sized **tree,** 30 to 40 feet tall and 1 to 2 feet in diameter. It occasionally reaches 100 feet in height and 4 to 5 feet in diameter. In open stands, the crown often is flat and spreading; in dense stands, it is narrow and conical.

The **wood** is very tough, cross-grained, hard to work and warps easily. It is used for crate and basket veneers, crossties, rough floors and pulpwood.

A variety of blackgum, the **swamp tupelo** (Nyssa sylvatica van biflora) is the true swamp species, often growing with cypress in year-round swamps. It is similar to blackgum, but its **leaves** are narrower and its seed is more deeply ridged.

Water Tupelo

(Nyssa aquatica L.)



Water tupelo also is known as tupelo gum. It inhabits only those deep river swamps or coastal swamps that usually are flooded during much of the year. The water tupelo's commonly enlarged or swollen base, its large hanging fruit or "plum" and the brittleness of its twigs distinguish it from the blackgum.

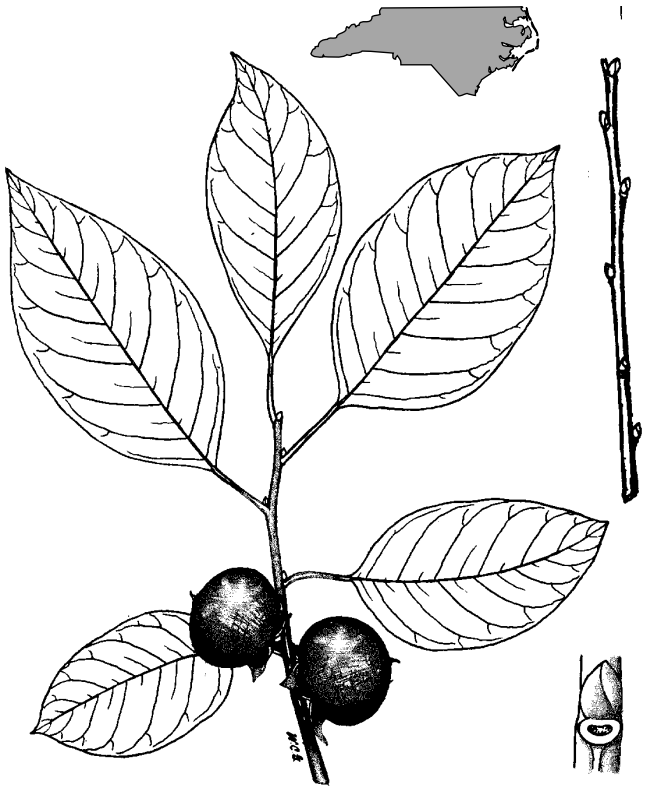
Leaves of the water tupelo are oblong and long-pointed at the end, 5 to 7 inches long and 2 to 4 inches wide. Leaves are entire, or they may have one or more large teeth. The dark purple, oblong fruit is about one inch long. The **fruit** has a tough skin and thin layer of flesh over the seed. It grows on slender, drooping stalks 3 to 4 inches long. The **bark** of the trunk is thin, dark brown and is furrowed up and down the trunk.

The water tupelo **tree** averages 80 to 100 feet in height and 3 to 4 feet in diameter. In a forest stand, water tupelo develops a long, but somewhat crooked, clean trunk above its buttressed base. The crown usually is narrow, oblong or pyramidal.

The **wood** is light, soft and close-grained but is not strong. It is used for furniture, veneer and pulpwood.

Common Persimmon

(Diospyros virginiana L.)



Persimmon, often called "simmon," is found throughout the state, except in the higher mountains.

The broadly oblong, pointed **leaves** are 4 to 6 inches long and 2 to 3 inches wide. The leaf has a smooth margin and a broad, flat midrib, with small, conspicuous dark veins on the underside.

Male and female **flowers** grow on separate trees. Male flowers grow in two- to three-flowered clusters, while the female flower is solitary. The **fruit,** edible when ripe, is a berry 1 to 2 inches in diameter. It is a rich reddish-purple and contains several flattened oblong seeds about 1/2 inch long. The fruit is eaten by humans as well as by opossums, raccoons, deer, fox, hogs and many birds.

The characteristic **bark** pattern of persimmon is easily recognized, being dark colored and deeply divided into thick, small, square plates. Persimmon heartwood is dark brown to black. The sapwood is cream colored to light brown or gray. Persimmon **wood** is very hard and shock-resistant. It is used for spindles, shuttles, golf club heads and some furniture.

Carolina Silverbell

(Halesia carolina L.)

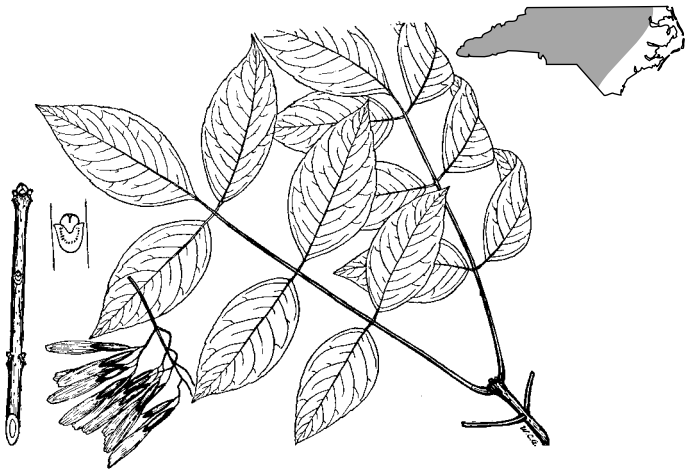
This tree grows best in the Great Smoky Mountains but extends throughout the mountain region and the upper piedmont. The tree rarely reaches heights greater than 80 feet and diameters 2 feet. It only grows large enough for commercial use in the most favorable locations. Carolina Silverbell commonly is found along upper water courses as an understory tree. It occasionally is planted as an ornamental tree.

Leaves are simple, alternate, oval, pointed, thin and finely toothed. They vary in length from 3 to 5 inches. The bark ranges in color from very light gray in young trees to a very dark reddish brown in old trees. It separates into scales and strips as the tree grows older.

The **flowers** are white (sometimes tinged with pink) and nearly an inch long. They appear in early spring with the unfolding of the leaves. Carolina Silverbell, which is also known as the snowdrop tree, may get its name from its pendant, bell-like flowers.

The **fruit** is 1 to 2 inches long and nearly an inch wide, with a corky, four-winged covering. The solitary seed is a bony stone. The **heartwood** is soft and light cherry-colored streaked with white; the sapwood is white or creamy. When large enough, it is cut for lumber and used as a substitute for cherry.

White Ash
(Fraxinus americana L.)



White Ash is found throughout the state except in the lower coastal areas. It grows best in the rich moist soils of mountains coves and river bottomlands. In the east, it grows with swamp chestnut, willow, cherrybark oak, loblolly pine and sweetgum. In the west, it grows with yellow poplar, black cherry, basswood, oaks and extends into the beech -birch-maple forests at elevations of 4,000 to 5,000 feet.

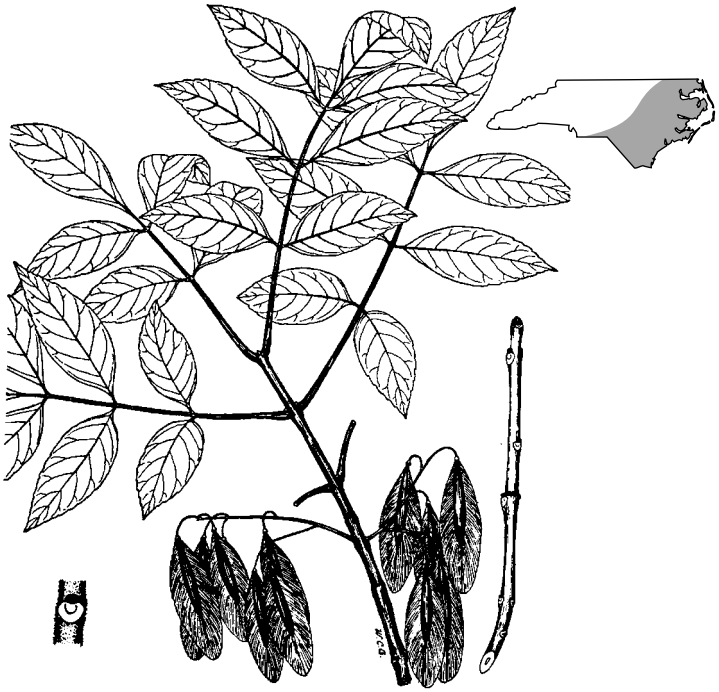
The **leaves** are 8 to 12 inches long, opposite, with five to nine (usually seven) oblong leaflets, 3 to 5 inches long, that have smooth or finely toothed margins. Upper surfaces of leaves are dark green and smooth; undersides are pale light green to whitish. White ash twigs are stout, somewhat flattened at the point of leaf origin. The leaf scars are broadly crescent shaped to semi-oval, with a distinct notch in the upper margin that contains the leaf bud. The dioecious **flowers** (male flowers occurring on one tree, female flowers on another) grow in compact panicles. They open before the leaves in the late spring. The **fruit** is 1 to 2 inches long and grows in crowded clusters 6 to 8 inches long.

The **tree** may grow to 120 feet but commonly is 70 to 80 feet tall, with trunk diameters averaging 2 to 3 feet. The ashy gray to brown bark is deeply divided by narrow ridges into net-like patterns.

The **wood** of the white ash is extremely valuable because of its toughness, elasticity and aesthetically pleasing grain. It is preferred to all other native woods for small tool handles, agricultural tools and athletic equipment such as baseball bats and oars. It also is used extensively for furniture and interior finish.

Carolina Ash

(Fraxinus caroliniana Mill.)



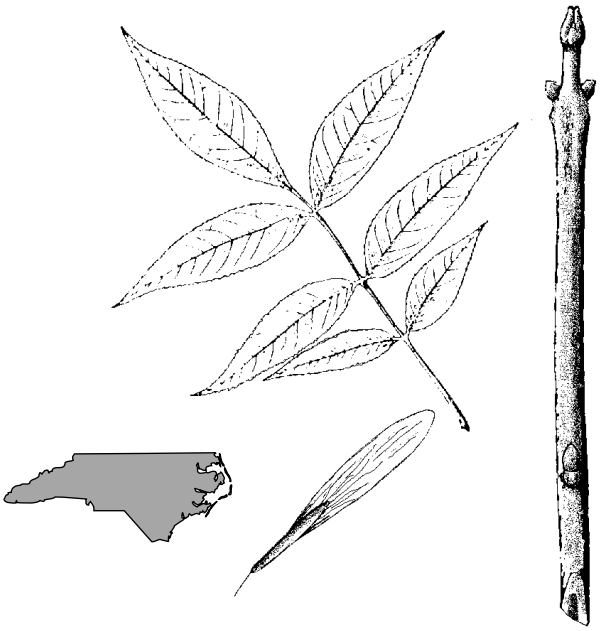
Carolina ash, or Carolina water ash, is a rather small tree that grows only in the deeper swamps along river bottoms in the Coastal Plain, although it has been found in this state as far west as Wake and Anson counties.

The **leaves** are from 7 to 12 inches long, with five to nine leaflets (usually seven). They are oval or oblong, coarsely toothed along the margin (sometimes only remotely toothed), green on top, thick and firm. They are relatively short and broad -- 2 to 5 inches long and 2 to 3 inches wide. Carolina ash **flowers** generally are similar to those of the other ash species. There are two kinds of flowers and they grow on separate trees. They are very small and appear in compound clusters with or before the leaves appear. The male flowers are in a dense mass; the female in a more open cluster, or panicle.

The **fruit** is completely winged (sometimes three-winged) around a narrow, pointed, short, compressed or flattened body that contains the seed. The wing often is 2 inches long by about 3/4 inch wide and often is bright violet.

Carolina ash seldom grows more than 25 feet tall and 6 to 8 inches in diameter. The **wood** of the Carolina ash is light, soft, weak and close-grained. It is yellow -white, with a wide band of lighter-colored sapwood. It is not used for any specific purpose.

Green Ash
(Fraxinus pennsylvanica Marsh.)



Green ash, also called red ash, is the most widely distributed of the ashes. It is a common tree along rivers and low grounds in the Piedmont and lower North Carolina mountains.

Trees with young twigs, undersides of leaves and leaf stalks covered with soft, silky hairs are known as red ash, while the trees with smooth leaves and twigs are called green ash.

The **bark** is a 1/2 inch or more thick. It is brown tinged with red and is slightly furrowed or ridged.

The compound **leaves,** oppositely attached on the twigs, are 6 to 9 inches long and have 7 to 9 entire, or obscurely toothed, leaflets. They are green on top and lighter green on the bottom. Sometimes, in the case of the smooth form, they are a yellow-green on both sides. The leaf scars are semi-round, usually with a straight upper margin and seldom are lightly notched. The dormant leaf bud is positioned above the leaf scar.

The **flowers** are small, with the male and female flowers growing on different trees.

The **fruit** is a long and very narrow samara, flat and winged, 1 to 2 1/2 inches long and 1/4 to 1/3 inch wide, with the wing portion extending well past the middle of the seed-bearing part.

The **wood** is heavy, hard, rather strong, brittle and coarse-grained. It is light-brown, with a rather broad layer of lighter sapwood. It is valuable and used for the same purposes as the white ash.

SMALL TREES

Some 200 species of small trees and shrubs occasionally reach tree size and form. We can't describe all of them here, but most are listed in the following table. A detailed description of these species may be found in any dendrology textbook or more comprehensive tree identification handbook.

Key to table abbreviations:

T.- Tree
Sh. - Shrub

Lg. -Large
Med. - Medium
Sm. - Small

Pied. - Piedmont Region
Mts. - Mountain Region
C.P. - Coastal Plain Region
Tide. - Tidewater Region

N. - North
S. - South
E. - East
W. - West

LESS IMPORTANT TREES OF NORTH CAROLINA

Common Name	Scientific Name	Size	Regional Distribution	Occurrence
American Mountain Ash	*Sorbus americana*	Sm.T.or Sh	Highest Mts.	Uncommon
American Plum	*Prunus americana*	Sm.T.	General	Scattered
Bigleaf Magnolia	*Magnolia macrophylla*	Sm.T.	Mts & Pied	Very Rare
Bigtooth Aspen	*Populus grandidentata*	Med.T.	Mts.	Very Rare
Biltmore Crab Apple	*Malus glabrata*	Sm.T.	Mts.	Uncommon
Blackhaw	*Viburnum prunifolium*	Sm.T.	Pied. & Mts.	Common
Black Maple	*Acer nigrum*	Med. T.	Mts.	Rare
Flatwoods Plum	*Prunus umbellata*	Med. T....S.	Pied.	Very Rare
Alternate Leaf Dogwood	*Cornus alternifolia*	Sm.T.or Sh	Mts.	Common
Bluejack Oak	*Quercus incana*	Sm.T.	C.P.	Common
Buckthorn	*Bumelia lycioides*	Sm.T.	S.C.P.& S. Pied.	Rare
Cabbage Palmetto	*Sabal palmetto*	Med.T.	Smith Is.	Rare
Carolina Basswood	*Tilia caroliniana*	Med.T.	S.E.Tide.	Rare
Carolina Laurelcherry	*Prunus caroliniana*	Sm.T.	Tide.	Not Rare
Chickasaw Plum	*Prunus angustifolia*	Sm.T.	Pied. & C.P.	Common
Chinese Chestnut	*Castanea mollisima*	Med.T.	Introduced Statewide	
Chinkapin Oak	*Quercus muehlenbergii*	Med.T.	Mts.	Rare
Clammy Locust	*Robinia viscosa*	Sm.T.or Sh.	High Mts.	Rare
Coastal Plain Willow	*Salix carolinana*	Sm.T.	Tide	Rare
Common Chokecherry	*Prunus virginiana*	Sm.T.or Sh.	Low Mts.	Rare
Dahoon Holly	*Ilex cassine*	Sm.T.	Tide.	Uncommon
Deciduous Holly	*Ilex decidua*	Sm.T. or Sh.	Tide.	Common

Common Name	Scientific Name	Size	Regional Distribution	Occurrence
Eastern Arborvitae	*Thuja occidentalis*	Med.T.	Mts.	Very Rare
Florida Basswood	*Tilia floridana*	Lg.T.	Mts.	Rare
Florida Chinkapin	*Castanea alnifolia var. floridana*	Sm.T.orSh.	C.P.	Rare
Fringetree	*Chionanthus virginicus*	Sm.T.orSh.	General	Common
Georgia Hackberry	*Celtis tenuifolia*	Sm.T.or Sh.	Pied.	Uncommon
Great Rhododendron	*Rhododendron maximum*	Sm.T.or Sh.	Mts.	Abundant
Hercules-Club	*Zanthoxylum clavatoherculis*	Sm.T.or Sh.	Tide.	Common
Horse Sugar	*Symplocos tinctoria*	Sm.T.or Sh.	General	Common
Laurel Oak	*Quercus laurifolia*	Lg.T.	Tide	Uncommon
May Hawthorn	*Crataegus aestivalis*	Sm.T.....S	Tide	Rare
Mountain Holly	*Ilex montana*	Sm.T.or Sh.	High Mts.	Common
Mountain Laurel	*Kalmia latifolia*	Sm.T.or Sh.	Mts. & W. Pied.	Common
Mountain Maple	*Acer spicatum*	Sm. T.or Sh.	High Mts.	Common
Mountain Stewartia	*Stewartia ovata*	Sm.T.or Sh.	Pied. & Mts.	Rare
Myrtle-leaved Holly	*Ilex myrtifolia*	Sm. T. or Sh.	Tide.	Not Rare
Pawpaw	*Asimina triloba*	Sm.T.or Sh.	Pied.	Common
Water Elm	*Planera aquatica*	Sm.T.	S.C.P.	Very Rare
Poison Sumac	*Toxicodendron vernix*	Sm.T.or Sh.	General	Common
Prickly Ash	*Aralia spinosa*	Sm. T. or Sh.	General	Uncommon
Pumpkin Ash	*Fraxinus profunda*	Med.T.	C.P.	Not common
Pussy Willow	*Salix discolor*	Sm.T.or Sh.	Mts.	Rare
Redbay	*Persea borbonia*	Sm.T.or Sh.	Tide.	Rare

Common Name	Scientific Name	Size	Regional Distribution	Occurrence
Red Buckeye	*Aesculus pavia*	Sm.T.or Sh. S	Tide	Rare
Red Titi	*Cyrilla racemiflora*	Sm.T.or Sh.	C.P	Common
Rose Rhododendron	*Rhododendron catawbiense*	Sm.T.or Sh.	Mts & W.Pied.	Common
Rusty Blackhaw	*Viburnum rufidulum*	Sm T.	C.P. &.Pied.	Common
Sand Hickory	*Carya pallida*	Med.T.	C.P. & Pied.	Common
Sandhill Hawthorn	*Crataegus collina*	Sm.T.	Pied.	Common
Scrubby Post Oak	*Quercus stellata var.margaretta*	Sm.T.	C.P.	Common
Serviceberry	*Amelanchier arborea*	Sm.T or Sh.	Mts. & Pied.	Uncommon
Shellbark Hickory	*Carya laciniosa*	Lg.T.	Mts. & Pied.	Rare
Shingle Oak	*Quercus imbricaria*	Med.T.	Mts.	Rare
Shumard Oak	*Quercus shumardii*	Lg. T.	Pied.	Uncommon
Slash pine	*Pinus elliottii*	Lg. T.	Pied & C.P.	Very Rare
Silver Maple	*Acer saccharinum*	Lg. T.	Mts.	Uncommon
Smooth Sumac	*Rhus glabra*	Sm.T.or Sh.	General	Common
Southern Crab Apple	*Malus angustifolia*	Sm.T.	General	Common
Southern Red Cedar	*Juniperus silicicola*	Med. T.	SE C.P.	Common
Sparkleberry	*Vaccinium arboreum*	Sm.T.	General	Common
Staghorn Sumac	*Rhus typhina*	Sm.T.or Sh.	Mts.	Common
Stewartia	*Stewartia malacodendron*	Sm.T.or Sh.	Tide.	Rare
Striped Maple	*Acer pensylvanicum*	Sm.T.	High Mts.	Common
Swampbay	*Persea burbonia var. pubescens*	Sm.T.or Sh.	C.P.	Common

Common Name	Scientific Name	Size	Regional Distribution	Occurrence
Swamp White Oak	*Quercus bicolor*	Med.T. N.	Pied	Very Rare
Sweet Crab Apple	*Malus coronaria*	Sm.T.	Mts.	Common
Umbrella Tree	*Magnolia tripetala*	Sm.T.	Pied.	Common
Washington Hawthorn	*Cratanegus phanopyrum*	Sm.T.	Mts.	Common
Waxmyrtle to Southern Bayberry	*Myrica cerifera*	Sm.T.or Sh.	Tide.	Common
White Basswood	*Tilia heterophylla*	Lg.T.	Mts. & W. Pied.	Common
Devilwood	*Osmanthus americanus*	Sm.T.or Sh.	Tide	Uncommon
Winged Sumac	*Rhus copallina*	Sm.T.or Sh.	General	Common
Witch Hazel	*Hamamelis virginiana*	Sm.T.or Sh.	General	Common
Yaupon	*Ilex vomitoria*	Sm.T.or Sh.	Tide	Common
Yellowwood	*Cladrastis lutea*	Sm.T.	High Mts.	Rare

GLOSSARY

Alluvial: Soil composed of sand, clay or silt which has been dispersed by water

Alternate: Leaves arranged singly along a twig or a shoot, and not in whorls or opposite pairs

Bole: The main stem or trunk of a tree

Branchlet: A small branch

Bract: A modified leaf which is part of a flower

Carolina Bay: A large, elliptical land form surrounded by a low, sandy rim

Catkin: An elongated flower cluster

Chip Board: A wide panel created by gluing together chips of wood in a mold

Compound Leaves: Leaves made up of several lobes

Deciduous: Trees which loose their leaves seasonally or at some stage of development

Downy: Covered with short, straight, soft hairs

Entire: Leaf margins which do not have teeth or lobes

Escaped: Spread from cultivation and now growing and reproducing without aid from man

Fissures: Linear splits or cracks

Flake Board: A wide panel created by gluing together thin flakes of wood in a mold

Furrowed: Deeply grooved; often used to describe tree bark

Globular: Globe-shaped

Humus: Dark brown or black partially decomposed organic matter

Incurvate: Inwardly curved

Leader: The central or primary stem of a branch or tree

Leaf Margin: The outer edge of a leaf

Loam: Soil composed of sand, clay and organic matter

Lobe: A protruding segment of an organ

Opposite: Sets of leaves arranged along a twig or shoot in pairs, with one on each side and not alternate or in whorls

Obovoid: Egg-shaped fruit with the narrow end attached to the stem

Ovoid: A three dimensional, egg shaped object (fruit)

Palmately veined: Leaf veins spreading out from a common point

Panicles: Multi-branched flower clusters

Perfect flowers: Flowers possessing both the male and female reproductive organs

Petiole: The stalk of a leaf
Pinnae: One of the divisions of a pinnately compound leaf
Pinnate: Compound leaves arranged on opposite sides of an axis or rachis
Pocosin: A raised area of wetland
Polygamous: Having both perfect and unisexual (flowers possessing one reproductive organ) flowers
Rachis: The axis or central line of a leaf or flower
Resin: Semisolid or viscous substance produced by some species of trees
Simple leaves: Leaves which consist of a single blade, as opposed to compound leaves
Sinus: A recess, cleft or gap between two lobes
Stipule: A leafy appendage at the base of a petiole or nearby on the twig or stalk
Stomata: A very small pore which allows water and air to enter and exit a leaf
Strand board: A wide panel created by gluing together slivers of wood in a mold
Terminal buds: Buds found on the end of a twig
Turnery: Wooden products created on a lathe
Understory: Trees, shrubs and other plants located beneath and in the shade of larger trees
Whorl: An arrangement of similar anatomical parts (such as leaves) in a circle around a point on an axis

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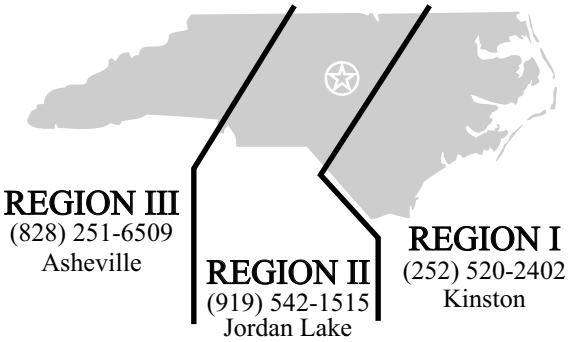

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