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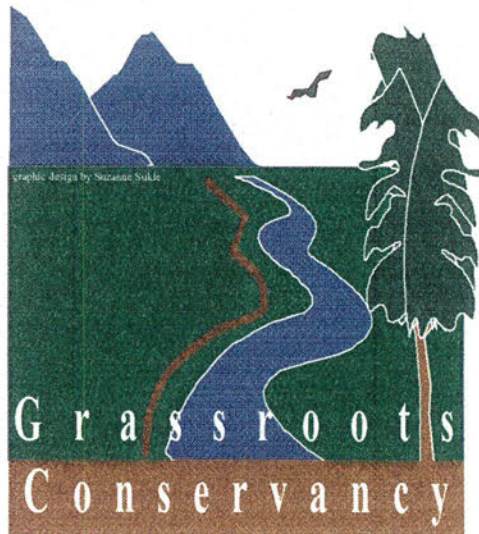
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RIVERWALK



Riverwalk Tree Identification Guide Book

Sponsored by:

Grassroots Conservancy in cooperation with

New River - Highlands Resource Conservation & Development Council

USDA AmeriCorp, Wytheville and Marion, Virginia

This publication is funded by an Urban and Community Forestry Assistance Grant

THE MARION RIVERWALK TREE IDENTIFICATION GUIDEBOOK

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HOW TO USE THIS WORKBOOK

The Marion Riverwalk Tree Identification Guidebook is intended to be used as both a hands-on and classroom aid in the instruction of basic dendrology (study of trees). It is designed to identify designated flora found along the portion of the Middle Fork of the Holston River that runs through downtown Marion, Virginia (the Riverwalk).

While the major purpose of this project is to develop tree identification skills, it also incorporates many other aspects. For example, the Riverwalk project is designed to promote environmental awareness, acting as an exercise in sharpening senses and appreciating nature. It is also intended to promote an understanding of the importance of forest resources and the many ways they relate to the environment.

The main bulk of this publication describes the general characteristics of certain trees found along the Marion Riverwalk. The entries are presented in a similar format, each consisting of the following components, an Identification Picture and Text section:

IDENTIFICATION PICTURE

The upper half of each page contains three pictures: The largest illustration on the left-hand side is an image of the tree itself; beneath it can be found an estimate of each species' average height. The image on the upper right-hand side is an illustration of the fruit or seed of the species in question. The image on the lower right-hand side is an illustration of a typical leaf of the species in question.

TEXT

General Characteristics

Beneath the Picture Identification section is a brief description of some of the tree's general characteristics. Each text entry begins with the tree's common name, which is followed by its scientific Latin equivalent. A short description of the tree's general attributes comes next. This section may include such things as natural habitat, the type of soil or weather it thrives in, and its ornamental and commercial importance.

Growth

This section deals with the tree's overall growth pattern. This portion will include information on such characteristics as the maximum elevation the tree grows at, whether it is a fast or slow grower, its average height and diameter breast height (dbh) and maximum potential life-span. Other pertinent facts, such as how certain trees are in jeopardy from dangers including pollution and disease, will also be included in this section.

Other Features

The final portion of the text section contains a short breakdown of each of the following characteristics: leaves, cones, bark, and twigs. This section will describe the traits of each of these characteristics in detail, giving physical descriptions that will include color, growth pattern, and average size.

Also included are two aids designed to assist in understanding the technical forestry terms used. In the beginning of the Guidebook are various labeled illustrations that give basic examples of general tree, fruit, and leaf types. The Guidebook ends with a dictionary that defines the technical forestry terms used.

BIBLIOGRAPHY

"Important Forest Trees of the Eastern United States."
USDA Forest Service Publication Number FS-466. October 1991.

"Silvics of Forest Trees of the United States."
USDA Forest Service. Agricultural Handbook No. 271.

"Silvics of North America (Hardwoods), Volume 2".
USDA Forest Service. Agriculture Handbook No. 654.

ACKNOWLEDGEMENTS

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Smyth County Vocational School	Urban and Community Forest Assistance Grant Program
New River-Highlands Resource Conservation & Development Council	Community Volunteers

OBJECTIVE (SAMPLE LESSON PLAN)

Students will be able to identify ways in which forestproducts are an important part of our lives.

ACTIVITY

The forest industry provides goods which are important toour daily lives. In turn, the continuing supply of thesegoods depends on efficient management of the forestresources they draw upon. Management policies are in turndetermined by consumer demand for products and services.

Ask students to list at least ten distinctly different products they know of which are made from wood. Invite them to move around the classroom as they look for wood products. After allowing sufficient time for them to discover and think of a number of wood products, create with them a master list. Item by item, discuss, investigating further where necessary:

What would happen if suddenly this product was unavailable.

Whether this product's disappearance would affect any of the essentials necessary for survival as, for example, food and shelter.

What things are truly necessary for survival? Decide.

Whether the product's current use is wasteful. How? (Example: pallets, paper, etc.) If it is, whether the use might be eliminated. Determine the possible impacts if it were.

Suggest a substitute for this forest product. Is the substitute made from a renewable or nonrenewable raw material? What would be the environmental impact of a substitute?

EXTENSIONS

1. Conduct this activity including a walking tour of the school area.
2. Invite students to add input to the list from home,family members, and other people.

VARIATIONS

1. Allow 15 minutes for each student to list ways he or sheuses paper and other forest products within a specifiedtime period, such as a year. Ask students then to draw aline through items on their lists they believe are leastimportant to them and to circle three items they considermost important.

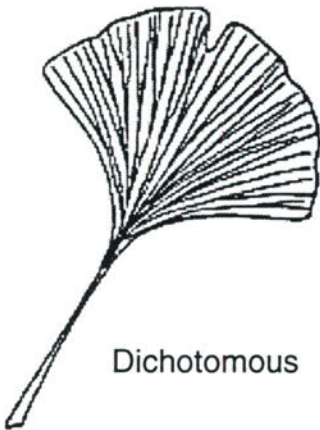
Next to each of the three top priority items, ask students to write down a product or material which couldbe substituted for it. After time for investigation bythe students, lead a discussion on the comparative meritsof the alternatives proposed.



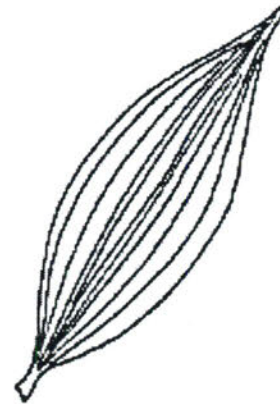
Pinnate



Palmate



Dichotomous



Parallel

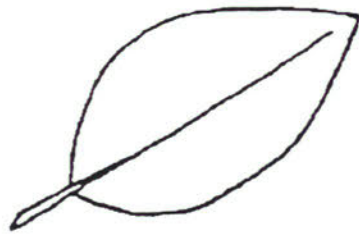
LEAF VENATION

PINNATE venation consists of a prominent central vein (midrib) extends from the base (petiole) to the tip (apex). The vein pattern looks like a fishbone.

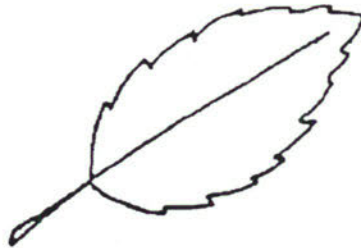
PALMATE venation consists of several main veins of approximately equal size extend from the base (petiole) to the edge (margin).

DICHOTOMOUS veins extend from the base then branch forming a "Y" type pattern. Found exclusively in the Ginkgo.

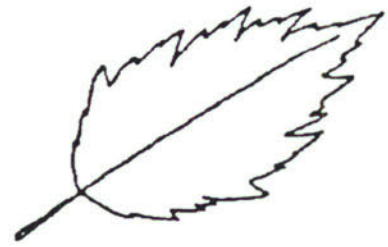
PARALLEL veins run parallel to each other along the long axis of the leaf. Typical of most monocot plants.



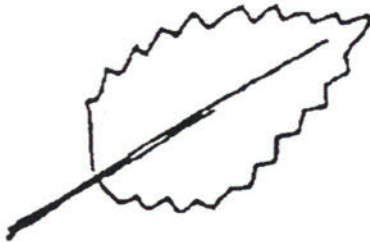
Entire



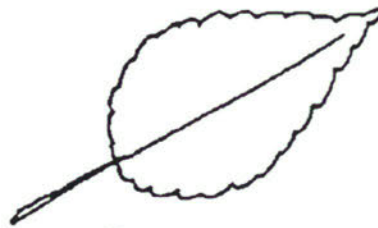
Serrate



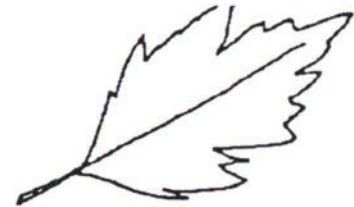
Doubly-Serrate



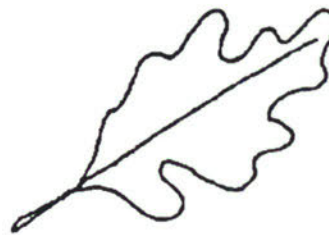
Dentate



Crenate



Incised



Lobed

LEAF MARGINS (EDGES)

ENTIRE - having a smooth margin with no teeth.

SERRATE - sawtoothed with teeth pointing forward.

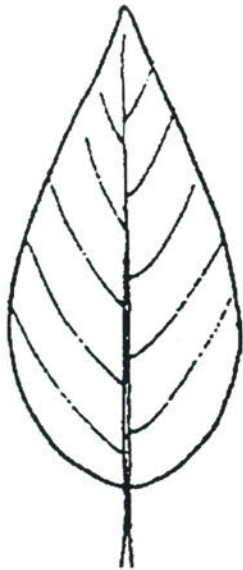
DOUBLY-SERRATE - sawtoothed with small teeth within each large tooth.

DENTATE - marginal teeth along which are perpendicular to the margin and do not point forward.

CRENATE - rounded teeth along the margin.

INCISED - cut by sharp and irregular incisions quite deeply, between toothed and lobed.

LOBED - leaf which is indented about one-fourth to halfway to the midrib.



Ovate



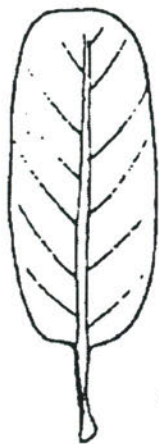
Lanceolate



Cordate



Linear



Oblong



Spatulate

LEAF SHAPES (OUTLINE)

OVATE - oval or egg-shaped and broadest below the middle.

LANCEOLATE - much longer than wide, broadest below the middle and tapering at the tip.

CORDATE - heart-shaped.

LINEAR - long and very narrow.

OBLONG - longer than broad with the sides being nearly parallel.

SPATULATE - spoon-shaped.

DICTIONARY

- Acute - Having an angle less than 90 degrees.
- Acuminate - Long and tapering.
- Adelgid - An insect.
- Apex - The uppermost point.
- Apiculate - Abruptly pointed.
- Attenuated - Long and tapering, or acuminate.
- Bark - The tough exterior covering of a tree or stem.
- Base - The lowest portion of the leaf or needle, nearest to the petiole.
- Bole - The trunk of a tree.
- Bract - A modified leaf subtending a flower.
- Bud - An embryonic axis (leaf) with its appendages.
- Climax - The species that remains on a site after final stage of succession (succession consists of the following stages: bare earth, grass, initial trees, trees that are best suited to the soil and climatic conditions.)
- Close - Tight-interlacing ridges in bark.
- Cluster - An aggregation of flowers, seeds, or nuts.
- Concentric - Having a common center, i.e. rings radiating from the center of an acorn.
- Compound Leaf - Composed of many leaflets forming a leaf on one axis or common stalk.
- Cordate - Heart-shaped.
- Cruciform - Cross-shaped.
- Cuneate - Wedge-shaped, tapering to a narrow, acute base.
- Cupaceous - An acorn or nut, enclosed in a cup-shaped bowl.
- Deciduous - Not persistent; i.e. leaves falling in autumn.
- Dehiscent - A fruit or capsule that naturally bursts open for the discharge of its contents.
- Diameter - Measurement, the length of a straight line through the center of a body, i.e. a tree trunk.
- DBH - Diameter at breast height, always on the uphill side of a tree at 4 1/2 feet above ground level.
- Diaphragm - A body partition of wood tissue located inside the pith, a transverse partition of the twig.
- Dioecious - Having the male and female organs in separate and distinct trees.
- Drupe - A simple one-seeded fleshy fruit, the inner wall is bony (plural - drupaceous).
- Elliptical - Resembles an ellipse with sloping ends.
- Epicormic - Branches growing at an upward angle.
- Evergreen - Foliage that remains green and functional throughout all seasons.
- Exfoliate - Bark cast off in scales, laminae, or strips.
- Fasicle - Bundles or clusters of needles.
- Fissure - Narrow openings or cracks in bark.
- Flower - A shoot of a higher plant that is modified for reproduction and contains short, colored leaves.
- Fruit - The seed-bearing product of a plant.
- Furrowed - Narrow depressions or grooves in bark.
- Glabrous - Smooth, devoid of pubescence or hair.
- Glandular - Consisting of, bearing, pertaining to, or resembling a gland.
- Glaucous - Covered with a white waxy substance or bloom.
- Globose - Spherical or globular shaped.
- Hardwood - The wood of an angiosperm, which yields hard wood.
- Indehiscent - Pertains to fruit that does not open at maturity to release its contents.

Lanceolate - Shaped like a lance, several times longer than broad, widest at a point $\frac{1}{3}$ distance from base.

Leaflet - A single division of a compound leaf.

Lenticel - Visible pores for gas exchange, small, cat-eye shaped patches.

Lenticellate - Has many lenticels, which are convexly shaped.

Linear - Long and narrow, with margins that are parallel or nearly so, many times longer than wide.

Loam - Soil material that is 7-27% clay particles, 28-50% silt particles, and less than 52% sand particles.

Lobes - Any protruding segment of a leaf.

Margin - The outermost area of the leaf surface, the edge.

Monoecious - Having both male and female organs in the same tree.

Mucilaginous - The inner bark secretes a sticky substance.

Mucronate - Short, narrow, and abrupt tip of leaf (tipped with hairlike tissue) or cone scale (bristly).

Nut - An indehiscent, usually one-celled, one-seeded fruit generally encased partially or wholly in an husk.

Nutlet - An diminutive nut.

Oblanceolate - Inverted lanceolate.

Oblong - Longer than broad.

Obovate - Inverted ovate.

Obovoid - Appearing as an inverted egg.

Obtuse - Blunt.

Orbicular - Circular

Oval - Broadly elliptical, with the width greater than $\frac{1}{2}$ the length.

Ovate - Having the lengthwise outline of an egg, broadest at the base.

Ovoid - Egg-shaped.

Ovuliferous - Many structures that develop into seed after fertilization.

Palmately - Radially disposed lobes from a common point, resembling a hand with the fingers spread.

Pinnate - Resembling a feather, and has similar parts arranged on opposite sides of the axis. Odd or even-pinnate are terms applied to compound leaves having odd or even numbers of leaflets.

Pubescent - Covered with fine hairlike tissue, soft and short.

Racemes - A series of flowers.

Reflexed - Abruptly bent downward.

Samara - A winged fruit.

Serrate - With sharp teeth pointing toward the apex.

Sessile - Without a stalk of any kind.

Shade Tolerance - The relative capacity of a tree to grow when subjected to shade.

Sinuses - A recess, cleft, or gap between two lobes.

Softwood - The wood of a conifer, angiosperm.

Striation - Minute grooves, channels, or lines of color on the bark or on the twigs.

Stomate - Openings for the plant to transpire oxygen or water.

Strobile - A cone featuring imbricated (overlapping) bracts or scales.

Subglobose - Not quite globose in shape, but nearly so.

Suborbicular - Not quite circular in shape, but nearly so.

Tolerance - The relative capacity of an tree to grow when subjected to an unfavorable environment.

Tomentose - Furnished with tomentum, or dense pubescence.

Truncate - Abruptly cut off transversely and forming about an 180 degree angle (base of leaf).

Twig - A small shoot or branch.

White Pine



Spruce



Sugar Maple



American Elm



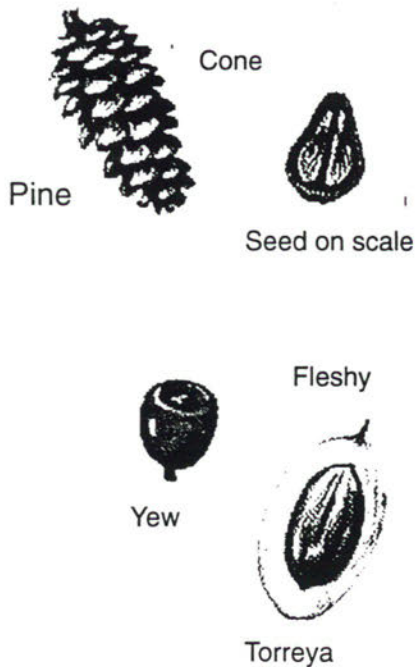
Live Oak



TREE SHAPES

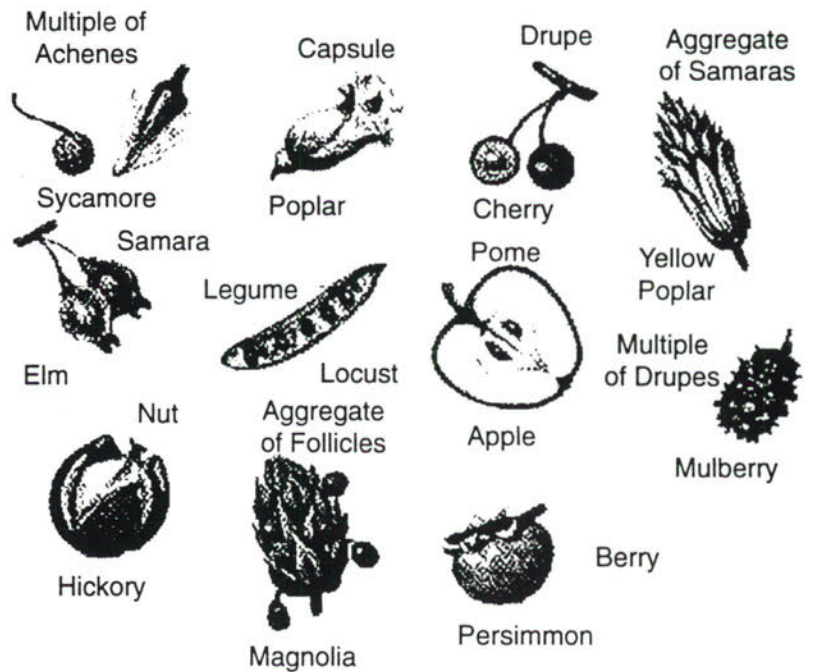
FRUITS

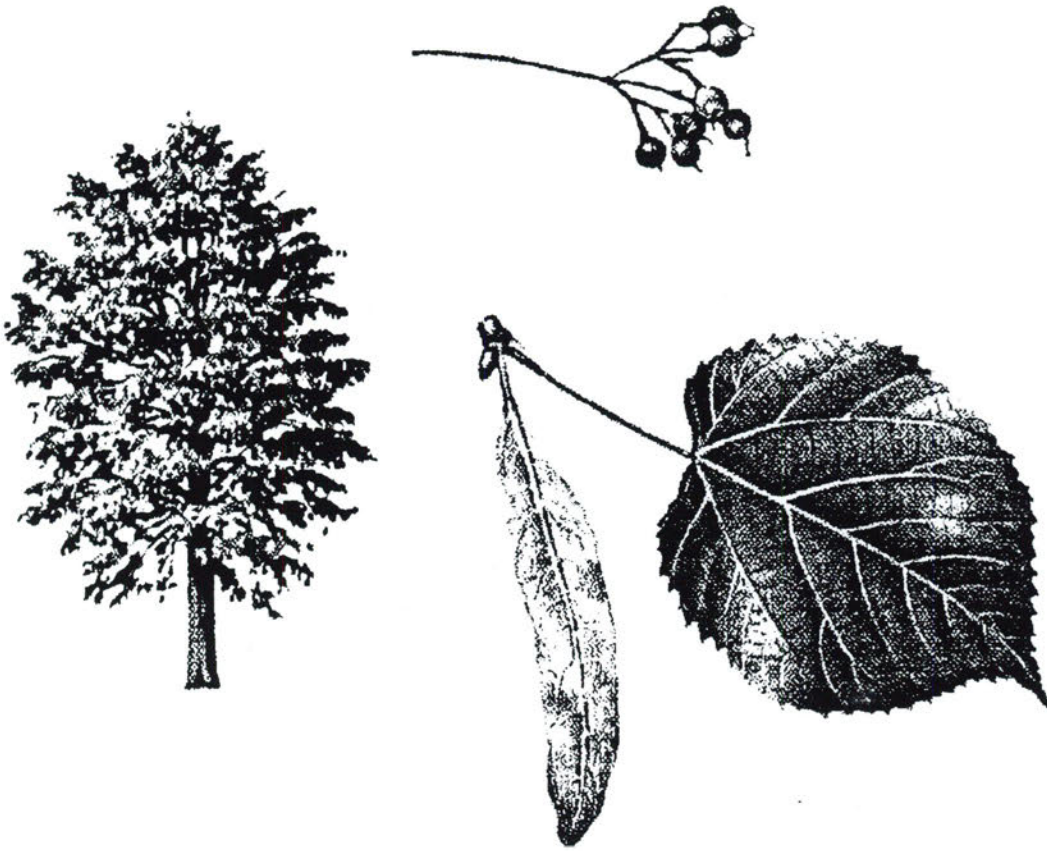
GYMNOSPERMS



ANGIOSPERMS

Examples of simple and compound fruits.





AMERICAN BASSWOOD *Tiliaceae Tilia americana*

Basswood is a large hardwood that is an important timber tree in the Lake States. The light, soft wood is valued by woodcarvers. The inner bark (bast) can be used for weaving baskets and basswood timber produces both furniture umber and veneer. In some regions basswood is known as a "bee tree" because it produces an abundance of nectar for honey production. The seed is eaten by squirrels, mice, and chipmunks.

GROWTH:

Basswood grows best in finer textured soils and is a fast growing tree of the Eastern United States. Basswood attains a maximum height of 140' and a dbh (diameter breast height) of 54". Average heights are from 75'-130' with average dbh ranging from 36-48 inches at maturity. Longevity generally exceeds 200 years. Basswood is shade tolerant. Forest-grown trees develop straight, columnar trunks and narrow crowns; open-grown trees have short trunks and many large branches.

Leaf deciduous, 5-6 inches long, 3-4 inches wide, broadly ovate to suborbicular shape, coarsely serrated margin, apex acuminate, and a unequal cordate base.

Flower pale yellow appears when leaves are nearly full grown, .5" long, attached to a narrow leaflike bract; bract is 4"-5" long.

Fruit .33" diameter, clustered, subglobose, nutlike, tomentose, and a grayish color.

Bark green-grayish on young trees, gray-brown later, breaking up into narrow ridges, and somewhat scaly.

Twig green-reddish color, zigzagging.



AMERICAN BEECH *Fagaceae Fagus grandifolia*

American Beech lumber is used for turnings and steam bending. It wears well and is used for flooring, veneer, and containers. The beech nut is consumed by humans and is an important wildlife food. It is virtually immune to deer browsing. The name beech is of a very ancient origin and may signify book, as early Germanic people inscribed on beech tablets.

GROWTH:

Beech is a slow-growing, common deciduous tree which grows best in loamy, soils of high humus content throughout the Eastern United States. Beech grows from sea level to 6,000 feet in elevation in the Southern Appalachians. Beech trees range from 60-120 feet in height, with an average height of 70 feet. The largest beech is in Michigan, 161 feet tall and 53 inches in diameter. Beech averages around 30" in diameter at maturity. Beech can attain ages of 300 to 400 years. Beech, a climax species, is one of the most shade tolerant of the northern hardwoods. It is virtually immune to deer browsing. Open-grown beech features a short, stocky bole, with a widespreading crown. Forest-grown trees produce a clear, straight, massive trunk with a smaller crown.

Leaf deciduous, 2.5"-6" inches long, 1-2 1/2" inches wide, elliptical to oblong ovate shape, slightly serrated edge, acuminate apex, and a broadly cuneate base, often remain on the tree throughout the winter.

Flower white, appear after leaves unfold.

Fruit edible nut, 1/2-3/4 inch long, triangular cross section, paired or in three's, with a woody, weak, prickly bur.

Bark very smooth, thin, light blue-gray color.

Twig slender, slightly zigzag, light blue-gray, cigar-shaped buds.



BITTERNUT HICKORY *Juglandaceae Carya cordiformis*

Bitternut hickory is a pecan hickory, the only member of the pecan group in the Northern United States. It is used for lumber, pulpwood, charcoal, tool handles, and ladders. The nuts produced are very bitter, and do not constitute a large portion of wildlife diet.

GROWTH:

Bitternut is found throughout the Eastern United States, except for the Coastal Plains. It is a short-lived species, occasionally reaching 200 years. It is a medium-sized tree, averaging 60-90 feet tall, with 12-30 inch diameters. Maximum recorded height is 171' with diameter of 48". Bitternut grows on many sites, with best growth attained on moist mountain valleys.

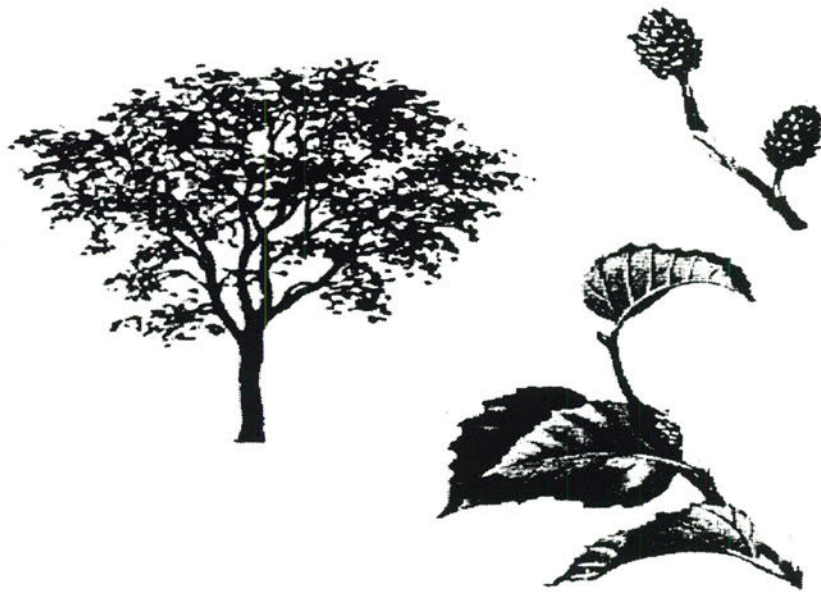
Leaf compound, pinnate, 7"-10" long, with 7-11 sessile leaflets, lanceolate or ovate-lanceolate shaped. Leaflets 3"-6" long, 1"-1.25" long, serrated edges, acuminate apex, and cuneate to unequally rounded base.

Flower imperfect, appears at leafout.

Fruit 1" long, solitary or paired, subglobose, yellowish-green, with a scurfy husk; nut subglobose, gray to reddish brown, and extremely bitter seed.

Bark firm, close, remains smooth for years, eventually develops shallow furrows and interlacing ridges.

Twig gray brown to greenish brown, stout, and lenticellate.



BLACK BIRCH *Betulaceae Betula lenta*

Black, or sweet birch, is a medium-sized tree which used to be the primary source for wintergreen oil. Chewing the inner bark produces a sweet taste. When exposed to air, the lumber darkens to a color resembling mahogany. It was used as a substitute for the expensive tropical wood, hence the common name mahogany. The timber produces lumber and veneer, and the lumber is used for furniture, cabinets, millwork, doors, woodenware, and handles.

GROWTH:

Black birch is primarily a tree of the northeastern United States. It grows at sea level in New England to 4,500' in the Southern Appalachians. Black birch is shade intolerant. Forest-grown trees develop a long, fairly clean bole; open-grown trees produce short boles and branches reaching nearly to the ground. Mature trees average 70'-80' tall and 24"-48" in dbh. The largest recorded tree is 80' tall and 60" in dbh.

- Leaf** 1.5"-3" wide, 2.5-5" long, ovate to oblong-ovate shaped, singly or doubly serrate, acute apex and a cordate base.
- Flower** white.
- Fruit** nutlet, obovoid in shape, contained in a oblong-ovoid strobile.
- Bark** brownish black, breaking up into large thin, irregular scaly plates; younger trees reddish brown to nearly black.
- Twig** light reddish brown to nearly black, slender, with horizontal lenticels, and have a strong wintergreen odor and taste.



BLACK CHERRY *Rosaceae Prunus serotina*

Black cherry is the largest and only native cherry commercially important to the timber industry. Cherry is shade tolerant. Large, high quality trees produce veneer and lumber for furniture, plaques novelties, frames, flooring, and paneling. Bark stripped from young trees has purported medicinal properties, and is used in cough medicines, tonics, and sedatives. The fruit is an important wildlife food source and humans use it for jams and jellies. Young black cherry shoots are an important deer browse. Cherry leaves contain a form of cyanide and if foliage wilts, it can kill livestock if eaten by them.

GROWTH:

Cherry grows on all soils, except for the very wettest and driest. It grows from sea level to 5,000' and is found throughout the Eastern United States. Cherry grows fast and maintains a growth advantage over associated species for 60 to 80 years; after this period diameter growth slows. Cherry is a medium-sized tree, averaging 50'-60' tall, and 24"-36" in dbh. Maximum height is 105', with a 48" dbh. It is a relatively short-lived species, but can attain ages over 250 years. Forest-grown trees develop a long and straight bole that is clear and cylindrical, and have a narrow, oblong crown.

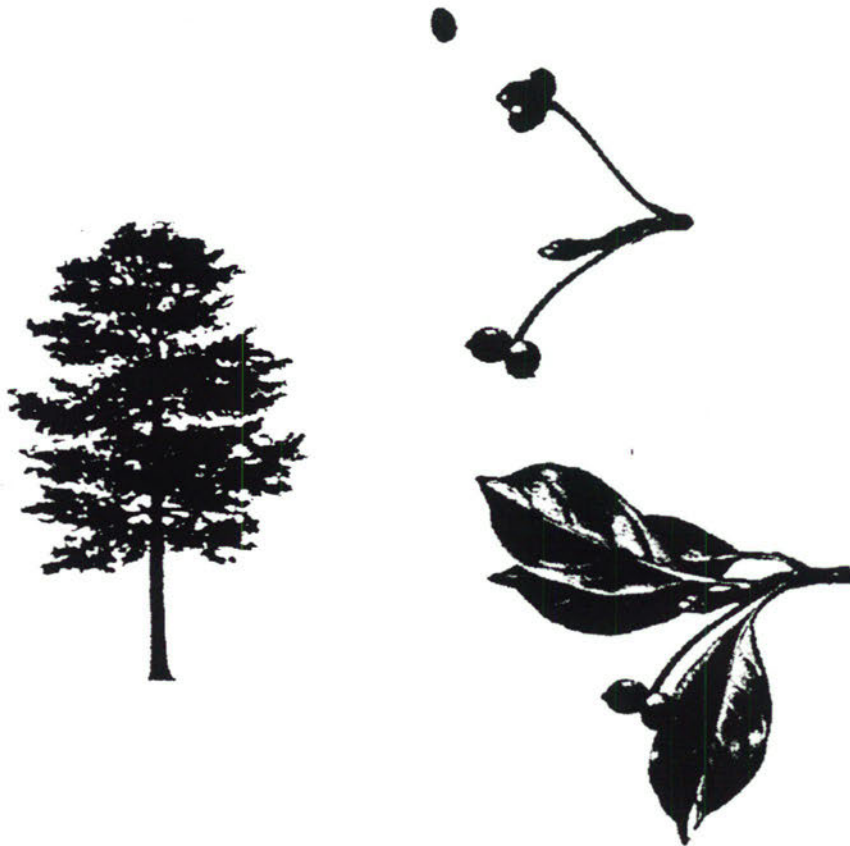
Leaf deciduous, 2"-6" long, 1"-1.5" wide, narrowly ovate to oblong-lanceolate, fairly serrated, cuneate to acuminate base.

Flower white, borne in racemes, appear when leaves are half to nearly full grown.

Fruit .33"-.5" diameter depressed globose, almost black when ripe.

Bark reddish-brown to nearly black on young stems, with conspicuous narrow lenticels; as it ages bark exfoliates in small persistent, platy scales with upturned edges, like burnt potato chips.

Twig slender reddish-brown, have a bitter almond taste, from cyanide.



BLACKGUM *Cornaceae Nyssa sylvatica*

Blackgum lumber is commercially unimportant, but the lumber produced is used for turnings, core stock, pulpwood, pallets, and crossties. Blackgum produces a fruit that is high in crude fat, fiber, and calcium which is very suitable to wildlife. It is a good honey-producing tree and is often planted as an ornamental.

GROWTH:

While blackgum grows on a variety of sites, it grows best on well-drained, light-textured soils. It is a medium-sized tree found throughout the Eastern United States. It grows from sea level to over 3,000' in the Southern Appalachians. Blackgum averages 50'-80' tall and 24"-30" in dbh. Maximum size is 130' and 60" dbh.

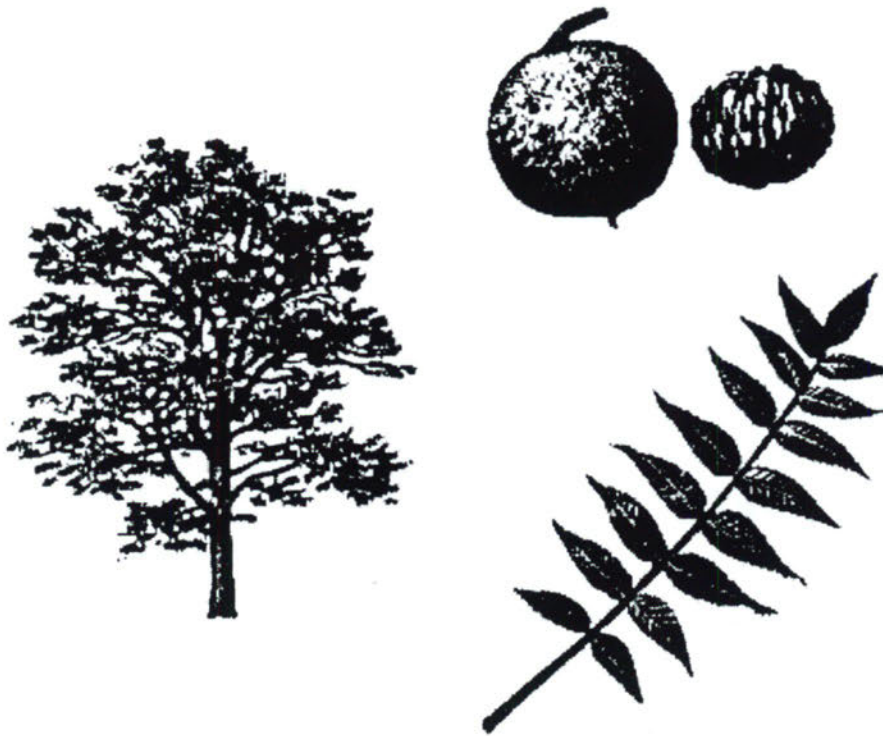
Leaf 2"-3" long, .5"-3" wide ovate to oblong-ovate shaped, acute to acuminate apex, cuneate to rounded base, and sometimes with a purplish tinge.

Flower nondescript shape, reddish color.

Fruit .33"-.66" long cupaceous, dark reddish to purple, and oblong shaped.

Bark blocky, thin, brownish gray, and scaly ridged i.e. "alligator hide" appearance.

Twig alternate, stout, slender, reddish-brown to purple.



BLACK WALNUT *Juglandaceae Juglans nigra*

Black walnut is one of the most commercially important hardwoods for the timber industry. The fine, straight grain of the lumber produces solid furniture, gunstocks and veneer. The nuts are valued for wildlife food and baking. Ground nutshells are used as jet engine cleaners, filler in dynamite, nonslip agents in auto tires, and filter agents for scrubbers in smokestacks. They can also be used to de-burr precision gears in auto transmissions and as ingredients in facial scrubs.

GROWTH:

Black walnut is soil sensitive and grows best on deep, well drained soils. It grows from near sea level to over 4,000' in elevation and is considered a slow-grower in this area. Black walnut ranges from 60'-120' tall, and 24"-36" dbh. Maximum height is 150' tall and a 72" dbh. Black walnut matures on average sites in 150 years and can exceed 250 years. Forest-grown trees develop a tall, well-formed clear bole, with a small, open crown. Open-grown trees develop straight boles and more limbs, but height is less than that of forest-grown trees.

Leaf odd-pinnately compound, 12"-24" long, 15-23 nearly sessile leaflets. Leaflets are 3"-3.5" long, 1"-1.25" wide, ovate-lanceolate shaped, finely serrated, acute apex, and non-equilateral base.

Flower nondescript shape, grayish-brown.

Fruit 1.5"-2" diameter, globose, solitary or in clusters of 2-3, with a thick yellow-green husk.

Bark grayish black to dark brown, deep narrow furrows, which form diamond shapes.

Twig stout, light colored to orange brown, and a chambered pith.



BLACK WILLOW *Salicaceae Salix nigra*

Black willow is the largest and most commercially important willow. The light wood is used for boxes and crates, core stock, turnings, table tops, novelties, charcoal, pulp, and, at one time, was used for artificial limb production.

GROWTH:

Black willow is usually found on moist or wet soils along stream or lake beds throughout the Eastern United States. It is a small to medium-sized tree and is short lived. Maturity is reached in about 55 years and the maximum sound tree age recorded is 70 years. Maximum height is 140' with a dbh of 48". Average height is 45' and dbh is 14". Natural reproduction is limited, since seed must find moist mineral soil. Willow has a broad, irregular crown and a shallow root system.

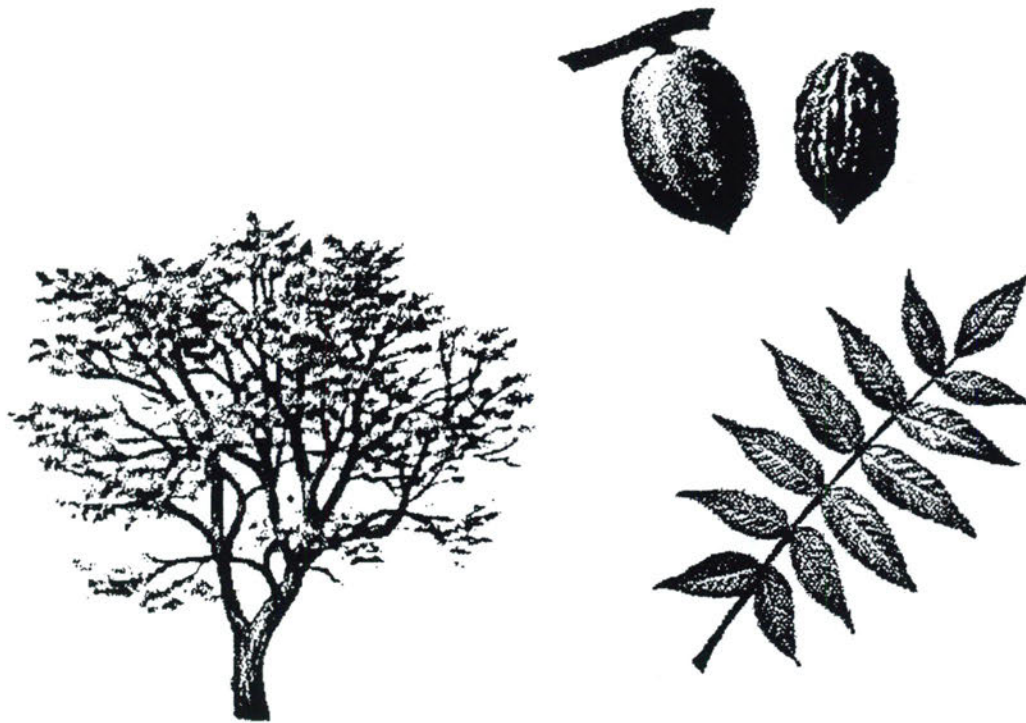
Leaf 3"-6" long, .35"-.75" wide, lanceolate, finely serrated margin, acuminate apex, and an obtuse, rounded base.

Flower off-white, appear on short, leafy twigs, 3-5 long yellow filamentous stamens.

Fruit one-celled capsule, about .25" long, containing many silky haired seeds.

Bark brown to black, deep interlacing fissures, and occasional scaly ridges.

Twig slender, purplish-green to pale orange-brown, rather brittle.



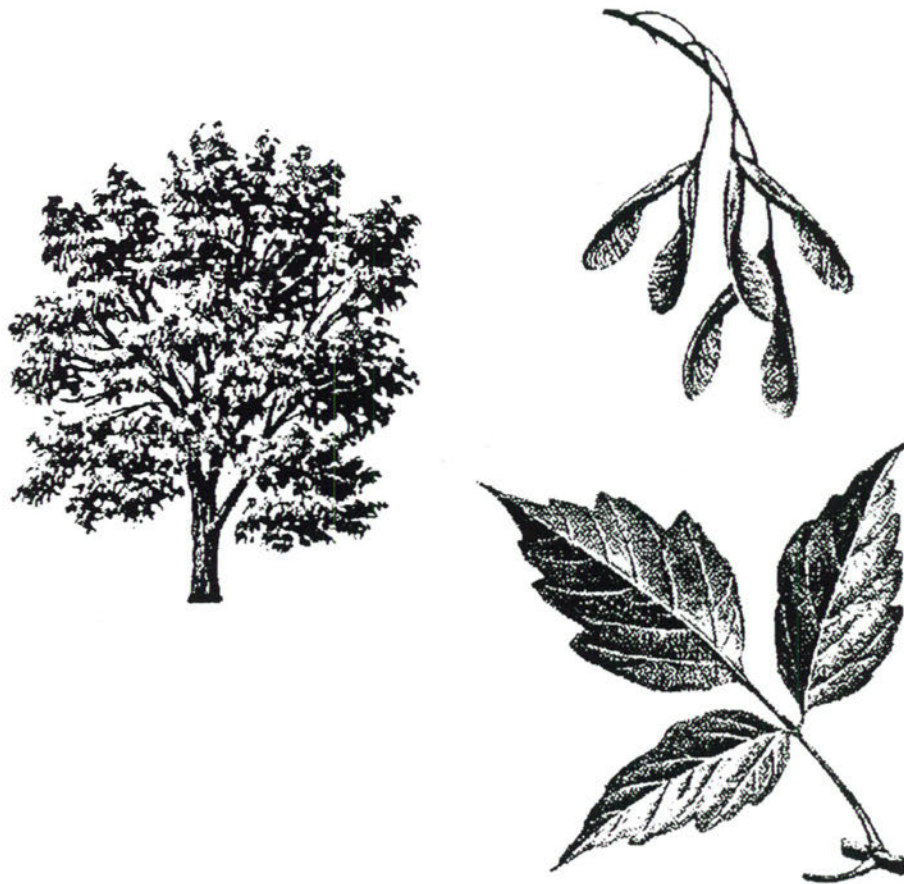
BUTTERNUT *Juglandaceae Juglans cinera*

Butternut, also known as white walnut, is more valued for its nuts than for its lumber, which is soft, coarse-grained, and easy to work. Butternut lumber is used for cabinets, furniture, toys, and novelties. Currently, butternut is being devastated by a fungus which kills the tree.

GROWTH:

Butternut is a medium to small-sized tree that grows rapidly on hillsides and streambanks throughout the Eastern United States. It is a dominant tree in only a few areas. It seldom lives longer than 75 years. It ranges from the Piedmont up to 4,500' in the Virginias. Mature trees average 40'-60' tall and 12"-24" in dbh. Maximum reported size is 110' tall and 36" dbh.

- Leaf** odd-pinnately compound, 15"-30" long, small, brownish, 11-17 leaflets; leaflets 3"-4", 1.25"-2" wide, oblong-lanceolate, serrate margin, acute to acuminate apex, and a rounded base.
- Fruit** 1.5"-2.5" long, oblong-ovoid, 2-5 clustered or solitary, semi-fleshy, indehiscent husk, sticky to the touch; nut is sweet and very oily.
- Bark** light gray to whitish, divided by fissures, separated into broad, flat ridges.
- Twig** stout, greenish-gray to reddish-brown, pith is chambered with thick dark brown diaphragms.



BOXELDER *Aceraceae Acer negundo*

Boxelder is one of the most widespread and best known maples. It is not a good lumber species, but it is good for erosion control. Its greatest value is for shelterbelt and street plantings in the Midwest.

GROWTH:

Boxelder is a small to medium-sized tree found throughout the Central and Eastern United States. It reaches an average height of 60' and dbh of 36". Maximum reported size is 75' tall and a 72" dbh. It is a short-lived species, attaining an average age of 60 years but will rarely live to 100.

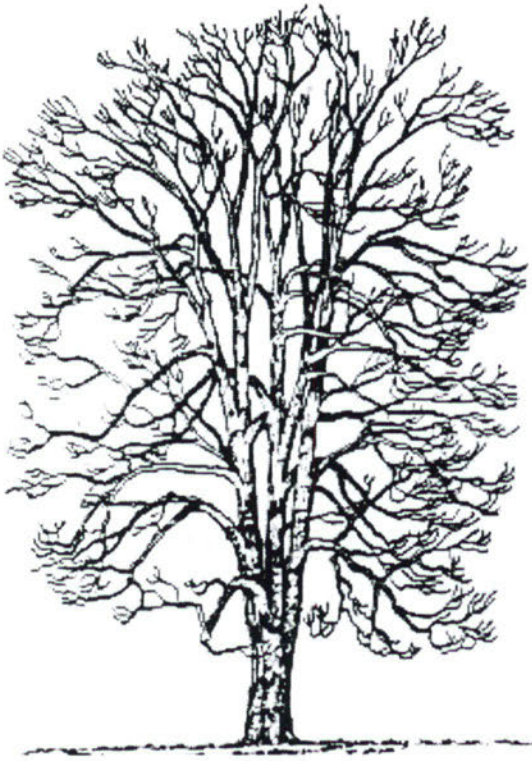
Leaf pinnately compound with 3-7 leaflets, the only maple with a palmately compound leaf. Leaflets are very variable, coarsely serrate, lobed or occasionally divided, acuminate apex, and a rounded or cuneate base.

Flower yellow-green, apetalous, and drooping racemes.

Fruit v-shaped double samaras, borne on slender stems, 1"-1.5" long.

Bark thin, light brown, with narrow rounded ridges separated by fissures that deepen with age.

Twig stout, purplish green, lustrous, and lenticellate.



YELLOW BUCKEYE *Hippocastanaceae Aesculus octandra*

Yellow buckeye is the largest of the buckeyes. It is widely planted as an ornamental. Its wood is very soft, thus it makes poor lumber. The seed and shoots contain a poison harmful to animals.

GROWTH:

Yellow buckeye is a rapid grower and can be found in an area ranging from 800' to 6,100' in elevation throughout the Eastern United States. It is a medium-sized tree, averaging 60'-90' tall and 24"-36" in dbh. The largest buckeye is in Kentucky, 140' and 49" in dbh. It is a long-lived species and reaches maturity in 60 to 80 years.

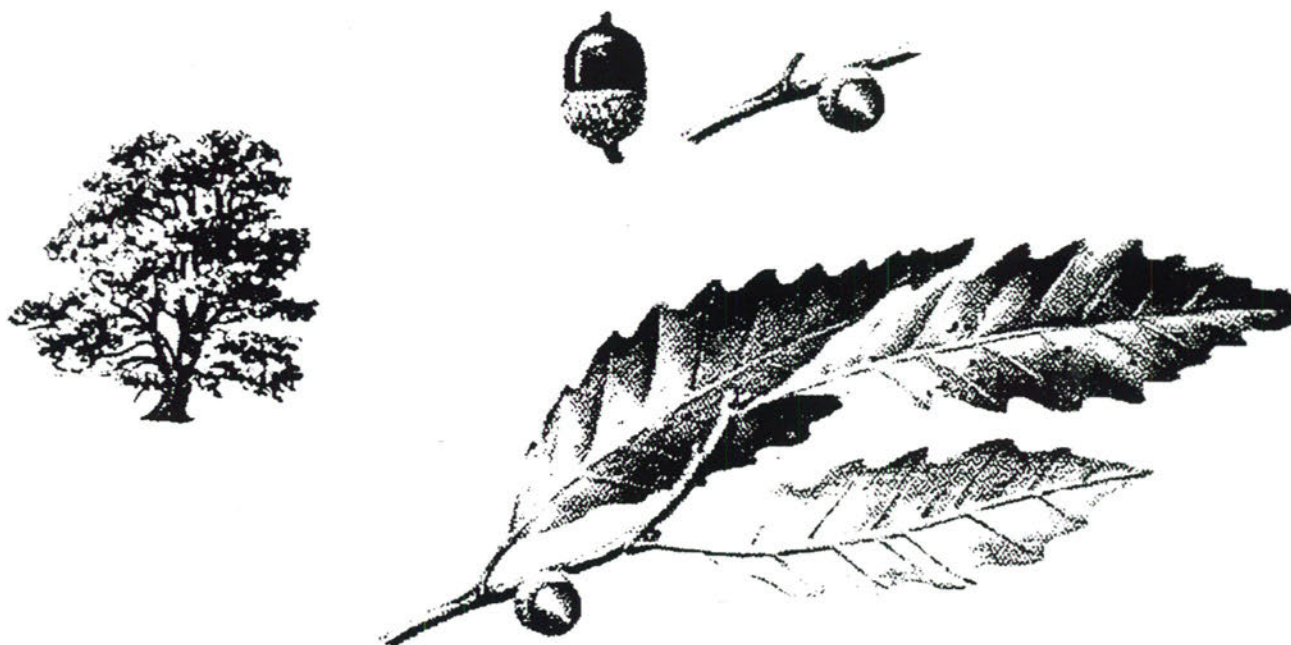
Leaf palmately 5-foliolate, with nearly elliptical leaflets, 5-7 leaflets; leaflets serrate, 4"-6", 1.5"-2"-5" wide, obovate and pointed.

Flower yellow, bell shaped, and borne upright.

Fruit leathery capsules, about 2" diameter, seeds 1"-1.5" in diameter, dark brown to nearly black, and capsules contain 1-5 seeds.

Bark grayish to brown, breaks up into fine scales and fissures.

Twig stout, leaf scars large, scars arranged in v-pattern.



CHINKAPIN OAK *Fagaceae Quercus muehlenbergii*

Chinkapin oak timber is seldom commercially important. Its lumber is similar to white oak and it is an excellent fuel wood. The sweet acorns are eaten by several mammals and birds.

GROWTH:

Chinkapin oak is usually found as scattered individuals on limestone sites throughout the Eastern and Central United States and the Gulf Coast. Growth characteristics have not been extensively studied, but it appears to be a bit slower growing than white oak. It attains heights of 60'-80', and a dbh of 24"-36" at maturity. Open-grown trees produce a short bole with a broad crown; forest-grown trees produce a straight columnar bole with a dense rounded crown and fairly small branches.

Leaf 2"-3" wide, 4"-6" long, deciduous, obovate to oblong-lanceolate shaped, coarsely serrate with glandular-tipped teeth.

Flower nondescript.

Fruit .5" long, thin bowl-shaped cup, chestnut brown nut.

Bark ashy gray, flaky.

Twig orange-brown, slender.



FLOWERING DOGWOOD *Cornaceae Cornus florida*

Dogwood is a small tree and is one of America's most popular ornamentals. The white bracts, which people confuse for flowers, produce a great spring show. The red berries are poisonous to humans but are an essential wildlife food. The wood is not large enough for commercial timber use but is used in some novelties. Clearly, dogwood's greatest commercial value is as an ornamental.

GROWTH:

Dogwood is an understory species, usually found on moist slopes or light-textured soils throughout the Eastern United States. The maximum size recorded is 55' tall and 19" in dbh. Average heights are 30'-40' tall and 3"-16" in dbh. A dogwood's thin bark makes it susceptible to fire. Currently, dogwoods are dying at or above 2,000 feet in elevation due to dogwood anthracnose, a fungus which is spread by birds and the rain.

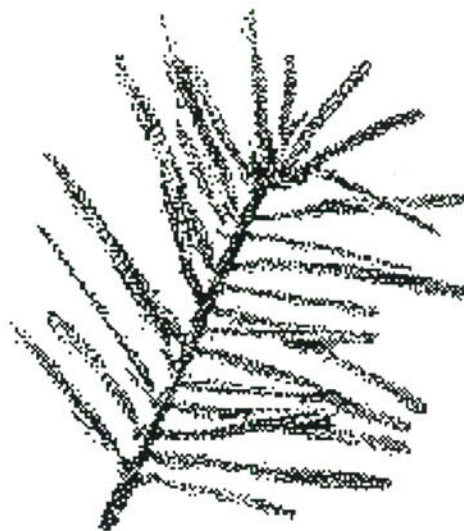
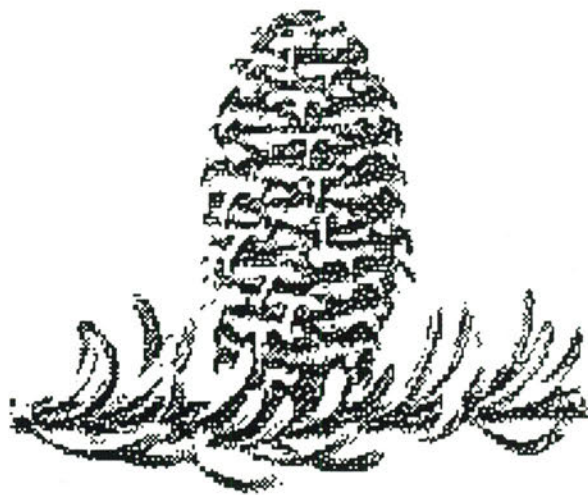
Leaf opposite, oval.

Flower four very conspicuous petal-like, white notched bracts.

Fruit bright red drupe, in clusters.

Bark dark gray to nearly black, broken up into small blocks.

Twig slender, somewhat angled, and purplish.



FRASER FIR *Pinaceae Abies fraseri*

Fraser fir is a tree of the highest mountains of Tennessee, North Carolina, and southern Virginia. It is a cold climate tree, requiring abundant moisture for development. The tree has little, if any, lumber importance, but is of great commercial importance for Christmas tree production.

GROWTH:

Fraser fir occurs naturally at and above 3,500' elevation and grows on the highest peaks of the Southern Appalachians. It is a medium to small-sized tree 40'-60' tall and 12"-18" in dbh. Fraser is a short-lived species, around 80-90 years, although it may exceed 150 years. Currently, pollution and the balsam wooly adelgid are devastating the Fraser fir.

- Leaf** linear, flattened leaves, .8"-1.5" long, blunt or notched at the tip, silvery bands on the underside, dark shiny green above.
- Cone** 2"-3.5" long, oblong-cylindric, upright, green tinged with some purple, bracts are larger than scales, ovuliferous bracts and strongly reflexed.
- Bark** .5" thick, dull green younger, later with grayish patches, smooth except for resin blisters, eventually breaking up into small reddish-brown, irregular, scaly plates.
- Twig** characteristic crucifix shape, crucifix lateral.



TREE-OF-HEAVEN *Simaroubaceae Ailanthus altissima*

The name "tree-of-heaven" originated in China where it was said that when the wind blows through the cluster-borne samaras they emit a pleasant, gentle sound. Tree-of-Heaven is extremely tolerant of exhaust gases and various pollutants of cities.

GROWTH:

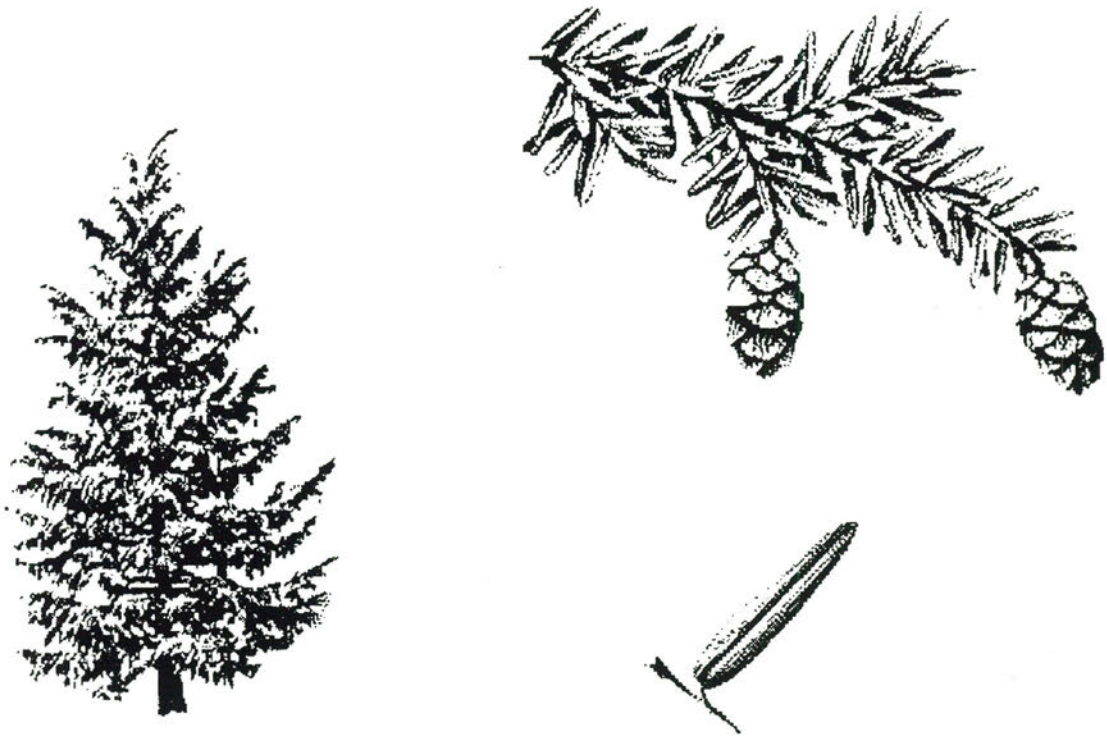
Tree-of-Heaven is native to Eastern Asia and has become naturalized across the United States. It grows on nearly all sites, with a maximum height of 90' and 40" dbh. Average heights are 56'-70' and 20"-30" in dbh. It is a rapid growing and seeding tree, and presents a reforestation problem. Tree-of-Heaven will pioneer and dominate sites, out competing many native species.

Leaf alternate, pinnately compound, 1-3" long, with 13 to 41 ovate-lanceolate leaflets; leaflets 3-5" long, glandular toothed at base, when crushed emit a pungent, foul odor.

Flower yellowish-green, appears mid-April to July, produces three times more male than female flowers; male flowers emit a foul odor, which has decreased its ornamental value.

Bark gray, somewhat smooth, white striations on inner bark.

Twig stout, terminal buds almost absent.



EASTERN HEMLOCK *Pinaceae Tsuga canadensis*

Hemlock is valued as an ornamental and is tolerant of air pollution. However, the insect wooly adelgid is currently ravaging the hemlock. The hemlock is not commercially important to the timber industry; however, the lumber is insect resistant and used for log cabins, fencing, and siding. Hemlock is an extremely long-lived species. The oldest recorded specimen lived 988 years.

GROWTH:

Hemlock is a slow-growing, medium to large-sized tree which is found in cool, moist areas. It is an extremely long-lived species. Open-grown trees develop a dense, pyramidal crown, with the lower branches often touching the ground. Forest-grown trees form a better bole, less branching, and a thick, dense crown. Hemlock is extremely shade tolerant. It grows from sea level in New England up to 5,000' in the Southern Appalachians. Average heights are 60'-80' and 24"-36" in dbh. Maximum height recorded is 160' and 84" in dbh. The oldest recorded specimen lived 988 years.

Leaf .33-.66 inches long, flattened needles, linear and tapering from base to apex, dark yellow-green, and slightly rounded.

Cone .5"-.75" long, oblong-ovoid, smooth margin scales.

Bark on young trees, flaky or scaly, later with wide, flat ridges; on older trees bark is heavily and deeply furrowed.



AMERICAN HOLLY *Aquifoliaceae Ilex opaca*

Holly is one of the most valuable and popular ornamental trees in the eastern United States. Its foliage and berries are valued for Christmas decorations. Though very few trees are timber-sized, the almost white wood is used for speciality items, such as cabinet inlays, novelties, wood engravings, carvings, and scroll work. The berries are a valuable wildlife food and the nectar makes excellent honey.

GROWTH:

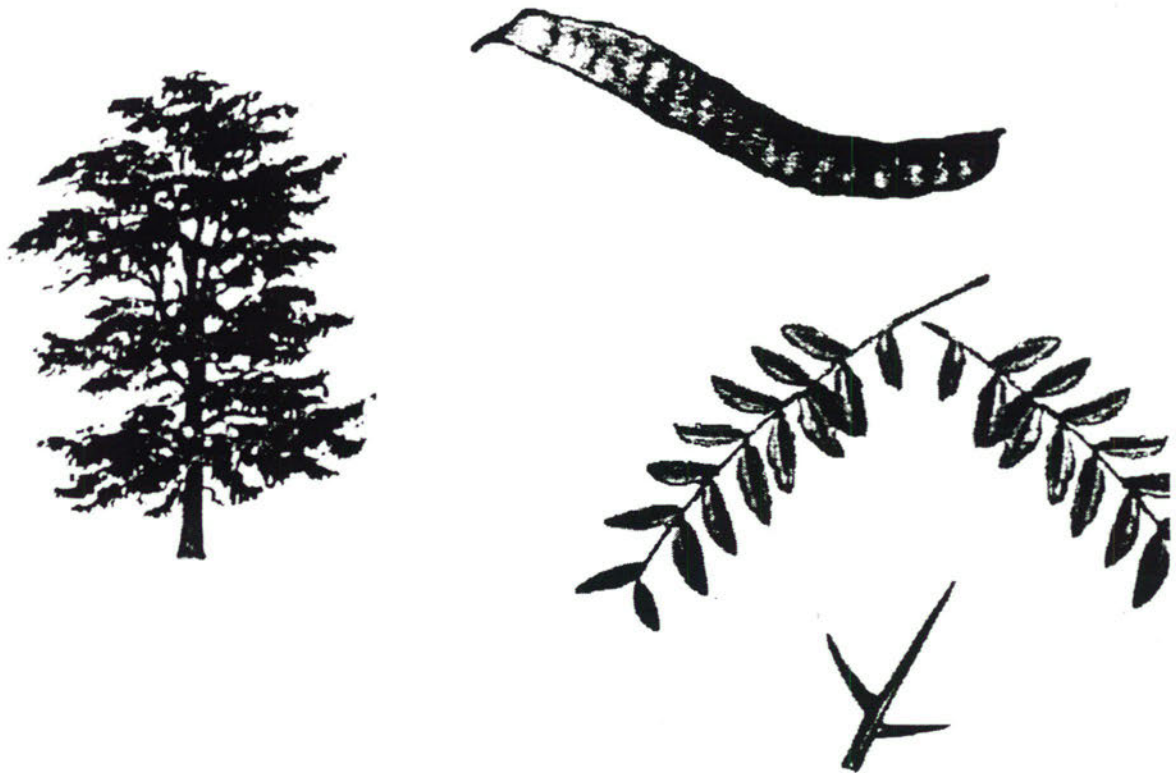
Holly grows best in deep, moist bottomlands but will grow on dry, gravelly soil throughout the Eastern United States. It is never a dominant tree due to its fire intolerance and slow growth. Holly is shade tolerant and grows from sea level to 3,000'. The oldest holly recorded is 144 years old. Size averages 40'-50' tall and 12"-36" in dbh. The largest holly is in South Carolina, 99' tall and 31" dbh.

Leaf persistent, leathery, elliptical, and spiny-toothed; 2"-4" long, 1"-2" wide and sharp-pointed teeth.

Flower greenish-white, borne on separate male and female trees (monoecious).

Fruit poisonous, red, fleshy, drupaceous, and contains a few nutlets, found only on female trees.

Bark gray, warty, and very thin.



HONEY LOCUST *Leguminosae Gleditsia tricanthos*

Honey locust is a minor species and rarely a major component of a forest. The wood is hard, strong, very heavy, stiff, and has a high shock resistance. Honey locust wood is used for fence posts, general construction, and furniture. Because of its scarcity, it is not marketed in large quantities.

GROWTH:

Honey locust is found throughout the Eastern United States. It develops a strong taproot and a profusely branched root system, which makes the species great for soil stabilization. Growth is rapid and maturity is reached in about 120 years. It is most commonly found on riverbank soils and below elevations of 2,500', but can grow in elevations up to 5,000'. Honey locust averages 70'-80' tall and 12"-36" in dbh, and the maximum size recorded is 140' tall and a 72" dbh. The crown is broad and flat topped.

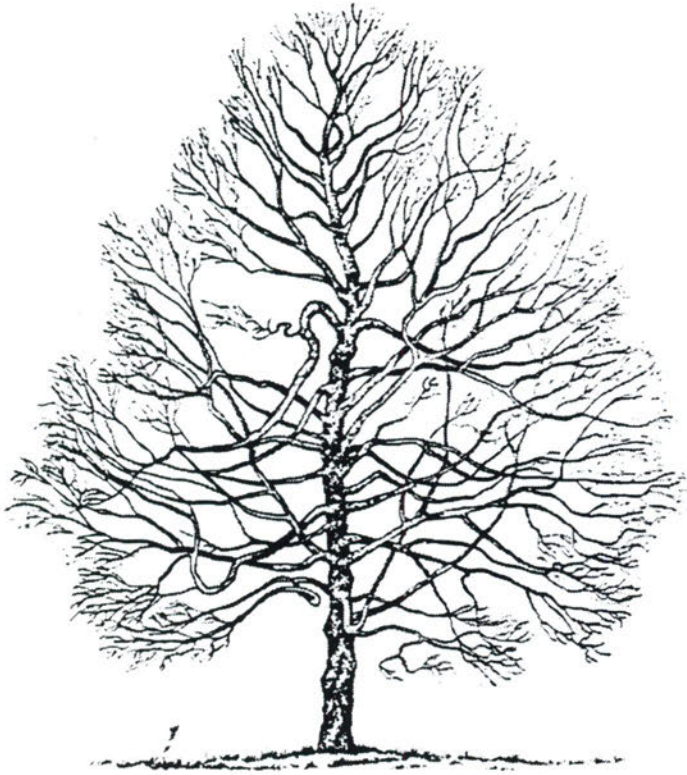
Leaf 7"-8" long, pinnately compound, often bipinnately compound. Leaflets 1"-1.5" long, oval, shiny dark green above and dull yellow below.

Flower greenish-white.

Fruit dark-brown, flat pod 12"-18" long. Seeds are oval, and pods twist into corkscrew shapes before falling off in autumn.

Bark dark brown or gray, divided into narrow flat plates. Often with clusters of thorns.

Twig stout, zigzag, greenish to reddish brown, lustrous, with 3-branched thorns, 2"-3" long.



EASTERN HOPHORNBEAM *Betulaceae Ostrya virginiana*

Eastern Hophornbeam, also known as Ironwood, is a small, short-lived species scattered in the understory of hardwood forests. It is not commercially important or large enough for lumber production, but the wood is very hard, rough, and dense. Buds and catkins are important winter food for grouse, wild turkey, and deer.

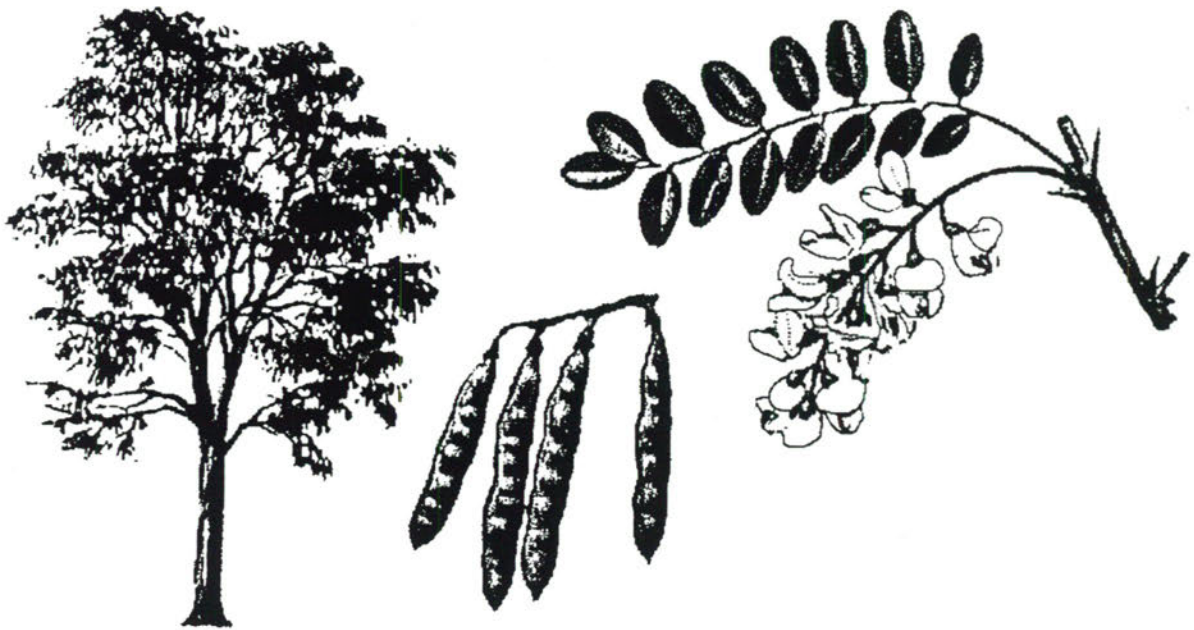
GROWTH: Eastern Hophornbeam typically grows on moist sites throughout the Eastern United States. It is normally less than 12" dbh and 40' tall. The largest tree is 36" dbh and 73' tall. Eastern Hophornbeam rarely reaches 150 years old.

Leaf 3"-5" long, 1"-3" wide, elliptical, serrated, acuminate apex, and a cordate base.

Fruit .5"-.75" seed, is covered by a crushable bag.

Bark strappy or fibrous, breaks off into long flakes.

Twig slender, with bud scales.



BLACK LOCUST *Leguminosae Robinia pseudoacacia*

Black locust is not commercially important to the timber industry, but it is useful as an ornamental, shelterbelt tree, and for land reclamation. It is a nitrogen fixer and provides wildlife cover. It is also good deer browse. Locust is used for railroad ties, fence posts, mine timbers, boxes, crates, and on fuel plantations. It is very important for reclamation of mine spoils.

GROWTH:

Locust grows best on moist, rich, loamy soils; however it will grow on most poor sites. It is found throughout the Eastern United States. It has rapid juvenile growth and is a medium-sized tree. Average height is 40'-60' and 12"-30" dbh. Maximum height is 100' with a 60" dbh. Young locust can grow two to four feet per year. It is a short-lived species. Locust is shade intolerant. Open-grown trees develop short-bole and it may separate into several stems. Forest-grown trees produce clear, straight boles with an irregular crown.

Leaf pinnately compound, 8"-14" long, with 7 to 19 subopposite or alternate leaflets. Leaflets are 1.5"-2", .5"-.75" wide, elliptical to ovate-oblong, apex mucronate, and possess a rounded base.

Flower white, fragrant, about 1" long.

Bark reddish brown to nearly black, deeply furrowed to rounded and interlacing ridges.

Twig reddish brown, angular.



RED MULBERRY *Moraceae Morus rubra*

Red mulberry wood has little timber importance, but its abundant fruits are eaten by humans, birds, and mammals. The fruits can be made into jellies, jams, pies, wine, and drinks. A possible combination of three different leaf types can be found on the red mulberry.

GROWTH:

Mulberry is a rapid-growing and widespread tree in the Eastern United States. It grows on a variety of soils under 3,000' in elevation. Best growth is on well-drained, moist soils along sheltered coves or streams. It is a short-lived species, rarely reaching 200 years of age. Heights range from 15'-70' and diameters from 4"-30".

Leaf 3"-5", 2"-3" wide, suborbicular, 2-3 or more deep lobes or unlobed leaves, pubescent, coarse marginal teeth, and turn yellow in the fall.

Flower nondescript.

Fruit multiple drupes, oblong, dark purple, edible, 1"-1.3" long.

Bark on mature trees dark reddish-brown and with scaly plates.



AMERICAN HORNBEAM *Betulaceae Carpinus caroliniana*

American hornbeam, also known as musclewood, has little commercial timber value because of its small size. The seeds, buds, and catkins are an important food source for gray squirrels, song birds, turkeys, hares, and deer.

GROWTH:

American Hornbeam is a small, slow-growing, short-lived tree found in the understory of eastern hardwood forests. It grows best on rich, wet sites, but can tolerate many different sites. It grows from sea level to 3,000' in the Great Smoky Mountains. Average heights range from 15-35 feet and average diameters 5-10 inches. The largest on record, at 65' tall and 27" dbh, is found in New York State.

Leaf elliptical, 2"-4" long, 1"-2" wide, doubly serrate.

Fruit Three-lobed, leafy bracts clustered (bracts 3"-6" long), with a small nut.

Bark smooth, dark bluish gray, looks like muscles.



OSAGE ORANGE *Moraceae Morus nigra*

Osage orange is planted for hedges, wind breaks, and as an ornamental. The wood, which is a very distinct bright orange, is used for bowls and when boiled produces a yellow dye. Osage orange lumber is commercially unimportant.

GROWTH:

Osage orange is native to Arkansas, Oklahoma, and northeastern Texas and has naturalized to this area. It can attain 50' in height and 12"-14" in dbh. Little research has been done on growth rates.

Leaf 3"-5", 2"-3" wide, entire, deciduous, oblong-lanceolate to ovate, narrow, pointed apex, dark green above and shiny below, and turn bright yellow in the fall.

Flower nondescript.

Fruit peculiar, spherical, and multiple green drupes, 4"-5" diameter, and when crushed exudes a bitter milky juice.

Bark on mature trees bark breaks into broad, rounded, scaly ridges.

Twig armed with sharp, one inch long thorns.



RED MAPLE *Aceraceae Acer rubrum*

Red maple is one of the first trees to flower in the spring, producing small red buds. Red maple is known as "soft maple" in the lumber industry and better grades are used for furniture and turnings. The brilliant fall color makes it a popular ornamental tree. Red maple sprouts are heavily browsed by deer and the seeds and buds are an important wildlife source.

GROWTH:

Red maple is a medium-sized tree that inhabits the entire Eastern United States. It grows on diverse sites, from sea level to 4,000' in elevation. Average heights are 50'-80' and 12"-30" in dbh. The largest living red maple is 125' and 96" in dbh. Red maple is a fast growing, short-lived species, reaching maturity in 70-80 years and rarely exceeding 150 years. Forest-grown trees produce a long, fairly clear bole and a rounded or irregular crown. Open-grown trees produce a short, stocky bole with diffuse branching. A pioneer species, it is considered more shade tolerant than other successional species or species of intermediate shade tolerance.

Leaf 2"-6" diameter, orbicular, palmately 3-5 lobed, acute sinuses, serrate, acuminate apex and rounded base.

Flower perfect, red, appear in early spring.

Fruit double samaras, born in clusters, .75" long.

Bark at maturity gray, broken up into long, narrow, scaly plates; on young trees smooth, and light gray.

Twig slender, dark red, lustrous, and odorless.



NORTHERN RED OAK *Fagaceae Quercus rubra*

Northern red oak is common in the east and is currently the most valuable hardwood. Northern red oak is used extensively for veneers, flooring, cabinets, furniture and frames. It is also planted extensively as an ornamental. Its acorns are a valuable wildlife food source.

GROWTH:

Northern red oak is a medium to large-sized tree found throughout the Eastern United States ranging from 65-98' tall and 24-36" in diameter. The largest tree recorded is 160' tall and 96" in diameter. It grows best on lower and middle slopes with northerly or easterly aspects. Red oak prefers soils with a humus layer and a loamy texture. It grows from the coastal plain to 5,500' (Southern Appalachians). Forest-grown trees develop a tall, straight bole and large crowns. Open-grown trees tend to have short boles and wide spreading crowns. Red oak can attain ages of up to 500 years.

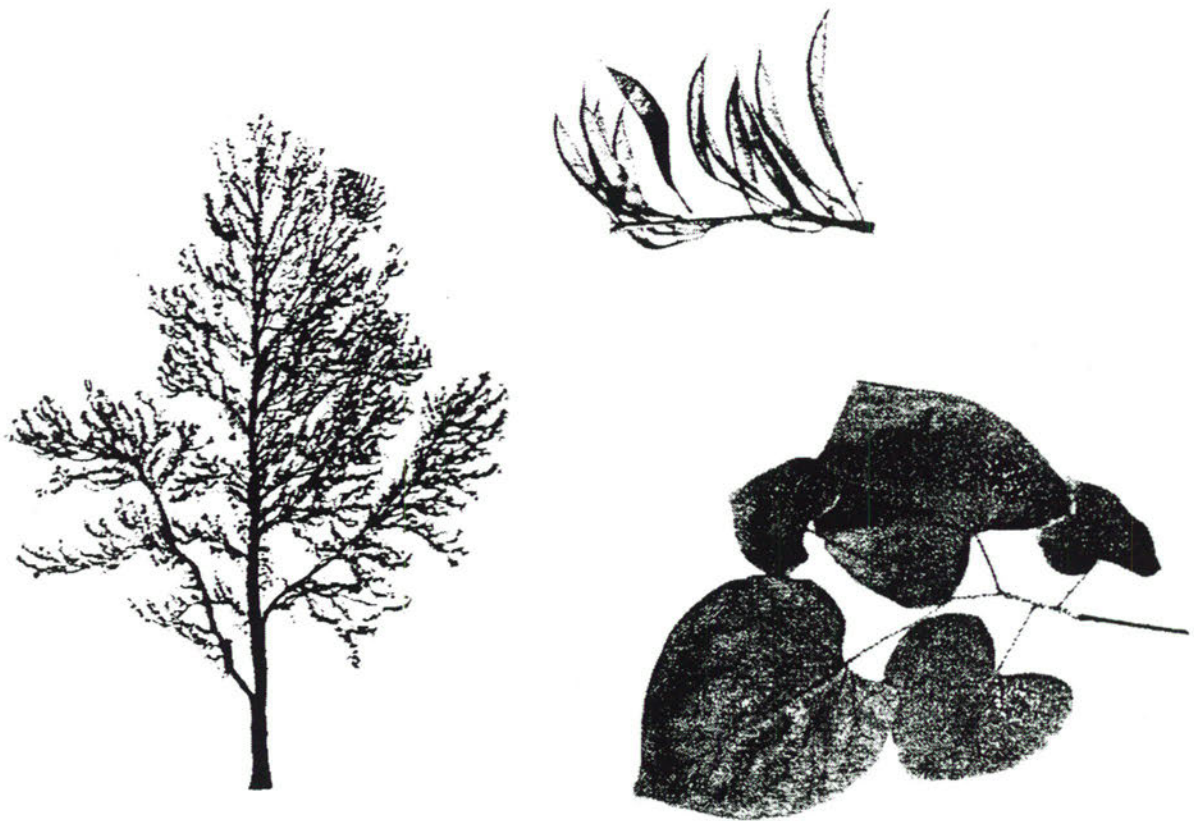
Leaf deciduous, oblong-obovate, 5"-8" long, 4"-5" wide, margins are 7-11 toothed lobes separated by regular sinuses extending halfway to midrib, acuminate apex, and obtuse to broadly cuneate base.

Flower imperfect, greenish-brown, appear at leafout, on new or old leaves.

Fruit nut is .75"-1" long, usually subglobose and enclosed at the base in a flat, thick cup.

Bark smooth when young, later broken up into wide, flat-topped ridges, separated by shallow fissures and brown to nearly black.

Twig green to reddish brown, stout, and glabrous.



EASTERN REDBUD *Leguminosae Cercis canadensis*

Redbud is small and not commercially important to the timber industry. It is widely planted as an ornamental. The flowers encourage honey production and wildlife feed on the seeds. Redbud is valued for its beautiful lavender flowers that bloom before other trees develop leaves.

GROWTH:

Redbud grows on almost all sites, except in flood prone areas. It grows from sea level to Appalachian Mountain mid-slopes. Usually it is less than 30' tall, with a broad rounded crown.

Leaf 3"-5" diameter, broadly ovate to cordate, acute apex, and smooth margins.

Flower conspicuous, lavender to bright pink, appear before leafout.

Fruit pinkish, flattened pod, 2.5"-3.5" long.

Bark reddish-brown, somewhat scaly.

Twig red to black, grow in clusters.



RED SPRUCE *Pinaceae Picea rubens*

Red Spruce is a long-lived evergreen tree. Once an important lumber tree, but it is used today predominantly as an ornamental. Red Spruce is being decimated by air pollution, acid rain, and the spruce budworm.

GROWTH:

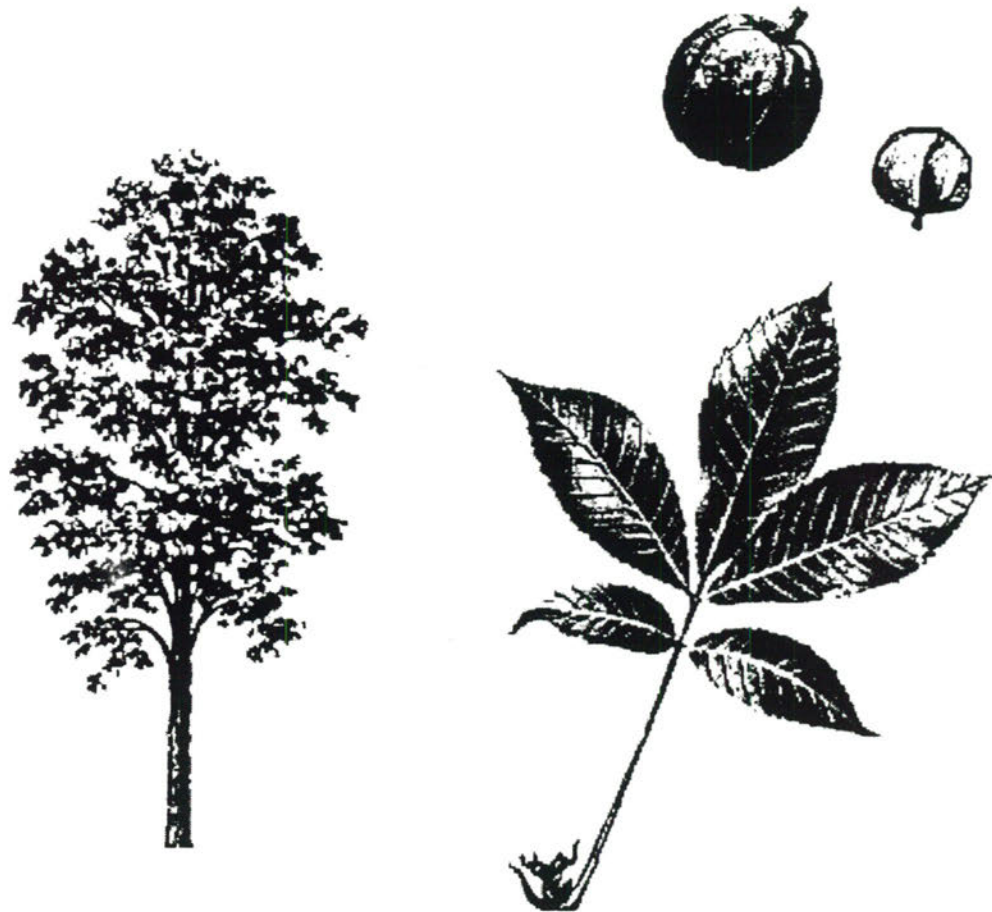
Red Spruce grows throughout the Eastern United States, but reaches maximum development in the Southern Appalachians. It is a shade tolerant tree which frequents high mountain tops. It needs a cold climate and abundant moisture to thrive. They are medium-sized and long-lived. Able to live 400 years, red spruce rarely reaches maturity before 200 years of age. Open-grown trees develop a broadly conical crown with branches nearly to the ground. Forest-grown trees are tall and produce a cylindrical bole. Average heights are 60'-75' and 12"-24" in dbh. The largest recorded tree was 162' and 57" in dbh.

Leaf needles are .5"-.6" long, linear, four-sided, shiny, yellow-green with a blunt or acute apex.

Cone 1.25"-2" long, ovoid-oblong, chestnut brown at maturity, rigid on the branch, and with scales that are rounded on the margin.

Bark .25"-.5" thick, forms irregular gray to reddish-brown scales.

Twig orange-brown and pubescent.



SHAGBARK HICKORY *Juglandaceae Carya ovata*

Shagbark hickory is probably the most distinctive of all hickories because of its loose-plated, shaggy bark. The bark texture makes it an interesting ornamental landscape tree. The nuts are edible for humans as well as wildlife. The lumber produced is used for tool handles, flooring, ladders and some furniture. Shagbark is also used as firewood and for charcoal production.

GROWTH:

Found throughout most of the Eastern United States, the shagbark occupies many sites from the coastal plains up to 3,000' in the Blue Ridge Mountains. Shagbark is a medium-sized tree, averaging 70'-80' tall and 12"-24" in dbh. Maximum height is 130' with a 48" dbh. It is considered a fast-growing hickory, but a slow grower compared with associated hardwoods. Shagbark can attain ages of over 300 years. Forest-grown trees produce a clear straight cylindrical bole, with a tendency to fork at half to two-thirds of tree height. Open-grown trees produce a short bole and oblong crown.

Leaf odd-pinnately compound, 10"-14" long, with 5 leaflets ovate-lanceolate to obovate, sessile leaflets, leaflets 5"-8", 2"-3" wide, finely serrated, acute apex and a cuneate base.

Flower brownish, appear at leafout, imperfect, monoecious, and in clusters.

Fruit 1"-2.5" diameter, solitary or paired, subglobose, depressed apex, nut brownish to pinkish white, with a reddish brown to nearly black husk.

Bark gray, smooth on young trees, breaking up into thin plates, and curving away from trunk, producing the shaggy appearance.

Twig gray-brown to reddish brown, stout, somewhat pubescent, and lenticellate.



SILVER MAPLE *Aceraceae Acer saccharinum*

Silver maple lumber produced is sold as soft maple. Silver maple is often planted as a ornamental, and it produces the largest seed in the maple family. The seed is a important wildlife food. The buds are a vital food supply for squirrels in the winter months and late spring. Silver maple is also planted as a windbreak in the mid-west.

GROWTH:

Silver maple is a medium-sized tree that grows rapidly and can live 130 years. It averages 60'-100' tall and 24"-48" in dbh. Maximum recorded size is 120' and 84" in dbh. Forest-grown trees often divide into several stems and produce a wide spread crown. Open-grown trees often produce the same figure. Silver maple grows from sea level to the lower slopes of the Appalachians. It grows best along streams and swamps.

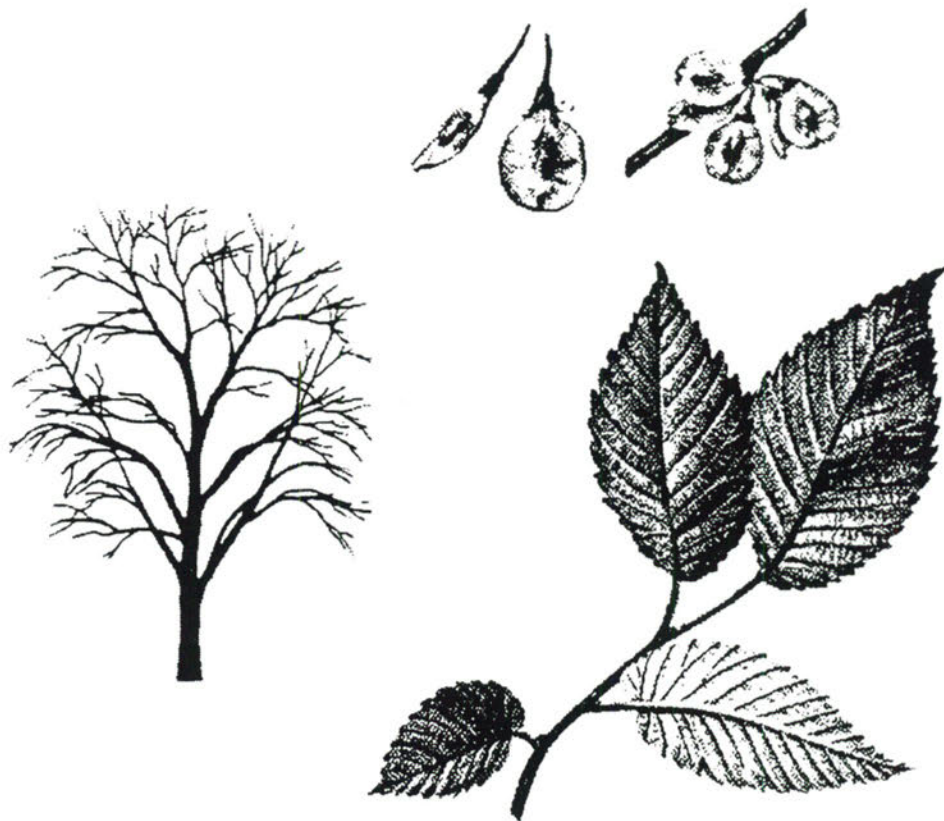
Leaf 6"-7" diameter, orbicular, deep palmately 5-lobed, serrate, and silvery below, hence the name "silver maple".

Flower off-white.

Fruit large, 1.5"-2" long, double samaras.

Bark silvery gray on young trees, breaks up into long, thin scaly plates as it matures.

Twig similar to red maple, except more reddish brown.



SLIPPERY ELM *Ulmaceae Ulmus rubra*

This elm is not an important lumber producer, although the wood is strong and hard. The elm is browsed by wildlife and the seeds are a wildlife food source. Lumber produced is used for furniture, paneling, and containers. From the pioneer days through today, the inner bark has been chewed to quench thirst and boiled to produce a sore throat and fever remedy. Slippery elm (like American elm) is susceptible to Dutch elm disease.

GROWTH:

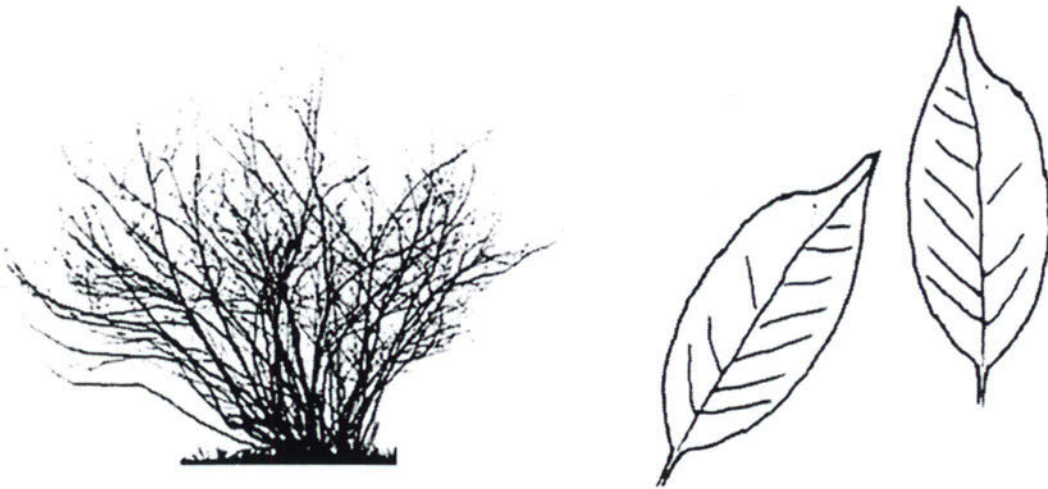
Slippery elm is a rapid growing, medium-sized tree that can live to be 200 years old. Found throughout the Eastern United States, its average height is 60'-70' feet and 18"-30" diameters. Maximum height is 135' with a 84" dbh. Elm grows best on moist, rich, soils of the lower slopes, streambanks, river terraces, and bottom land. Slippery elm is one of the more shade tolerant species and a mineral soil seedbed is best for seed germination.

Leaf 5"-7" long, 2"-3" wide, elliptical to obovate, or oval in shape, the leaf is often creased along the midrib, coarsely serrated margin, acuminate apex, non-equilateral base.

Flower reddish-white, vernal, appear before leafout.

Fruit mature when leaves are half expanded, .75" long, suborbicular shaped.

Bark dark reddish brown, bark fissures nearly parallel, scaly or with vertical plates, the inner bark is mucilaginous and has a light, aromatic flavor.



SPICEBUSH *Lauraceae Lindera benzoin*

Spicebush has no commercial importance as lumber; however, it is occasionally used as an ornamental. When the leaves are rubbed together they emit a pleasant fragrance, and they can be used for tea. The seeds provide food for wildlife.

GROWTH:

Spicebush grows mostly on moist, riverbank soils and is a common shrub of the Eastern United States. It is a short-lived species. Heights average between 5-15' and 1-4" in diameter.

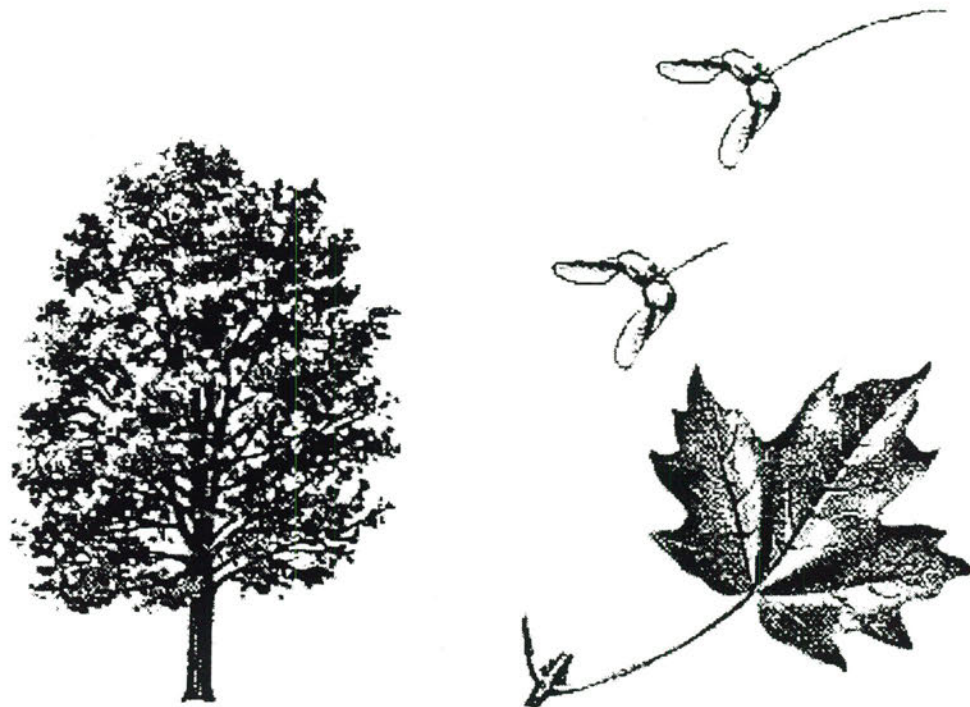
Leaf deciduous, alternate, 2"-5" long, .5"-1.25" wide, and aromatic.

Flower off-white.

Fruit a berry or drupe.

Bark thin and smooth, later breaking into ridges.

Twig very thin, alternate, grayish-brown.



SUGAR MAPLE *Aceraceae Acer saccharum*

Sugar maple is one of the largest and more important of the hardwoods in the northeastern states. Sugar maple is the principal source of maple sugar (it takes roughly 34 gallons of sap to produce one gallon of maple syrup). Other products of sawtimber are furniture, flooring, cabinetry, and bowling alley lanes and pins. Young growth is an important deer browse.

GROWTH:

Sugar maple grows best on moist, rich, well-drained soils throughout the Eastern United States. It grows from 100' (northern range) to 5,500' in the Southern Appalachians. Sugar maple can attain ages of 300-400 years. Height ranges 60'-129' at maturity, with average height of 80'. Average diameters are 18-30 inches, with 24" the mean. Maximum reported height is 135' with a 72" diameter. Sugar maple is shade tolerant. Open-grown trees produce an ovoid crown, with branches nearly to the ground. Forest-grown trees develop a clear, straight, full bole with a narrow crown.

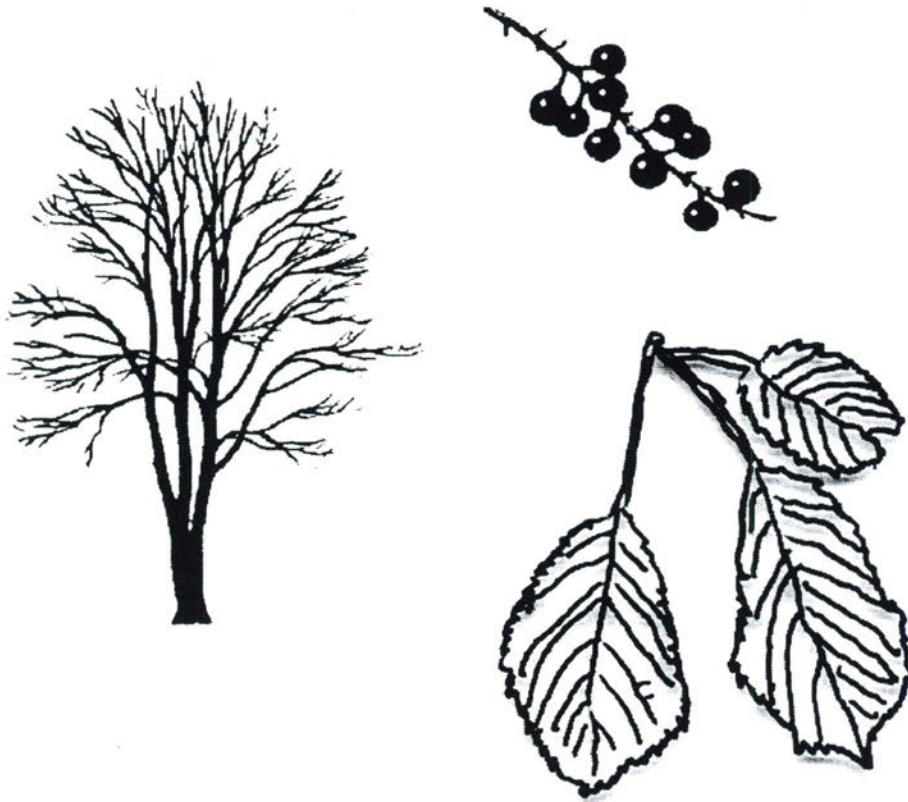
Leaf 3"-5" inches diameter, orbicular, palmately 5-lobed, acuminate apex, and a cordate base.

Flower appear with leaves, and are bright yellow.

Fruit autumnal, horseshoe shaped double samaras, about 1" long.

Bark gray, deeply furrowed on older trees, with long irregular thick plates or ridges.

Twig slender, thin, brownish with light colored lenticels.



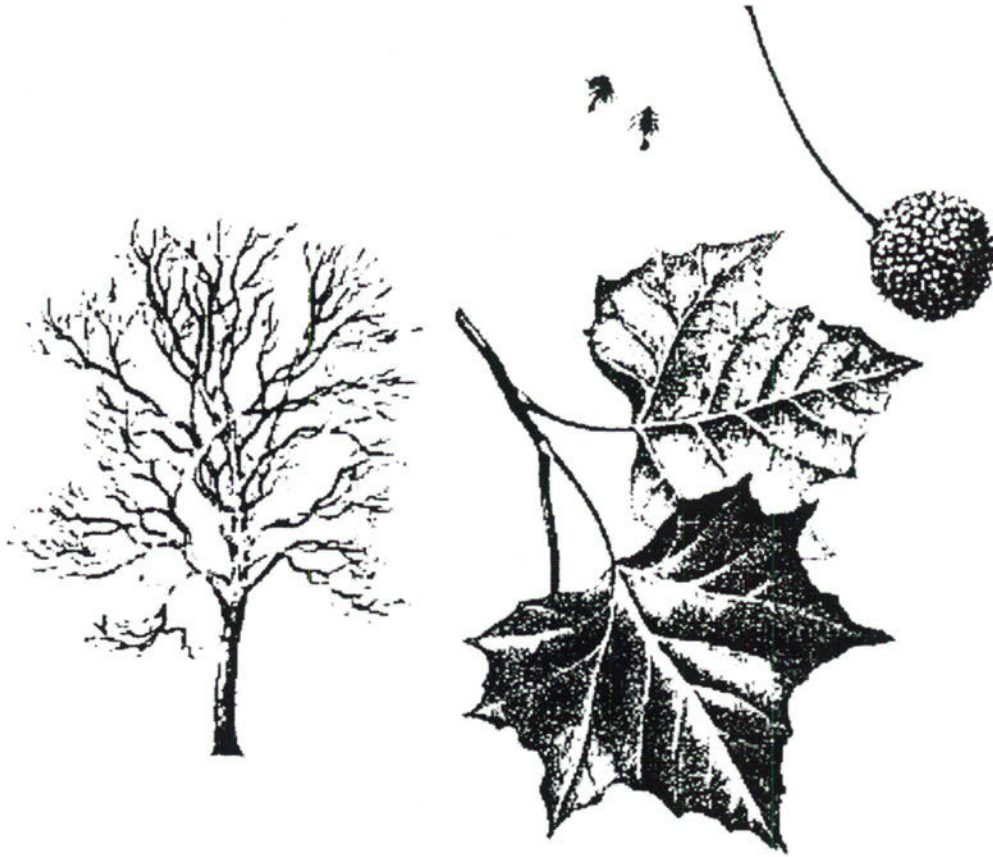
SWEET CHERRY *Rosaceae Prunus avium*

Sweet cherry, as the name implies, is widely domesticated into several subspecies for commercial cherry production. Though it is not remotely close to being an important lumber producer, the lumber produced is sold as black cherry.

GROWTH:

Sweet cherry is an imported species from Eurasia that has become naturalized in some areas. Sweet cherry is similar to black cherry in soil preference. Height and diameter growth are generally less than black cherry. Longevity is also shorter than black cherry.

- Leaf** coarsely doubly serrate, obovate to oblong-lanceolate, 1.5"-5" long, .75"-1" wide, acuminate apex, cuneate base, dark green above, and pubescent below.
- Flower** white, pink, or a combination of both.
- Fruit** thin, fleshy, 1-seeded drupe, and tasty.
- Bark** smooth, light-gray to nearly black, and broken up by conspicuous horizontal lenticels.
- Twig** slender, usually bitter to taste, and red to brown.



SYCAMORE *Platanaceae Platanus occidentalis*

Sycamores are one of the most distinctive and largest hardwood trees in the eastern states. It is prized for fuel wood and ornamental value. Sycamores are also planted on "biomass" farms for woodchips and fuel wood production. The lumber is used for core stock, pulp, and crossties. When sycamore lumber is planed, the lumber fuzzes out and becomes undesirable.

GROWTH:

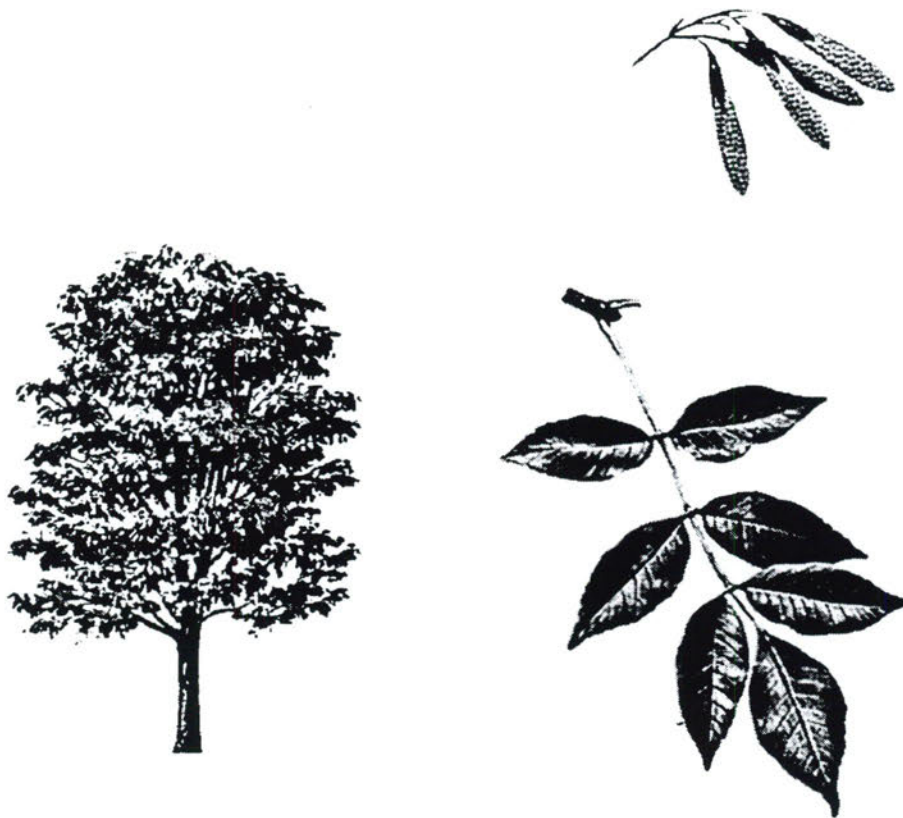
Sycamores grow fast and can live up to 600 years throughout the Eastern and Central United States. It is common on riverbank soils and is usually a pioneer species. They grow from sea level up to 3,000' in the Southern Appalachians. Forest-grown trees produce a long, slightly tapered bole, may be clear of branches for 80', and have a small crown. Open-grown trees have a large, irregular crown that may spread up to 100' in diameter, and a short, massive trunk. The bark is mottled and its distinctive coloring distinguishes it from its associates. Sycamores commonly attain a height of 100' and a dbh of 36"-96". An Indiana tree is 168" tall and has a 126" diameter.

Leaf alternate, deciduous, palmately 3-7 lobed.

Fruit a globose head of multiple elongated obovoid achenes, 1"-1.25" diameter, and usually stays on tree during the winter months.

Bark brownish on young trees, soon becoming a mottled brown and white, exfoliated, which exposes the lighter creamy-white inner layers; on older trees lower bark is entirely brown and scaly.

Twig moderately slender, dark orange-brown, and zigzagged.



WHITE ASH *Oleaceae Fraxinus americana*

White ash is the most common and commercially important native ash for lumber use. The timber produces high quality veneer and lumber, which is used for baseball bats, oars, handles, desks, furniture, and flooring. The seeds provide food for many species of birds.

GROWTH:

White ash grows from near sea level to 3,500' throughout the Eastern United States. Height averages 70'-90' and 24"-36" dbh. Maximum recorded height is 125' with a 84" dbh. Forest-grown trees produce a long, straight, clear, and cylindrical bole. Open-grown trees have a shorter bole with more limbs and an open crown. White ash grows on a variety of soils, but grows best on riverbank soils.

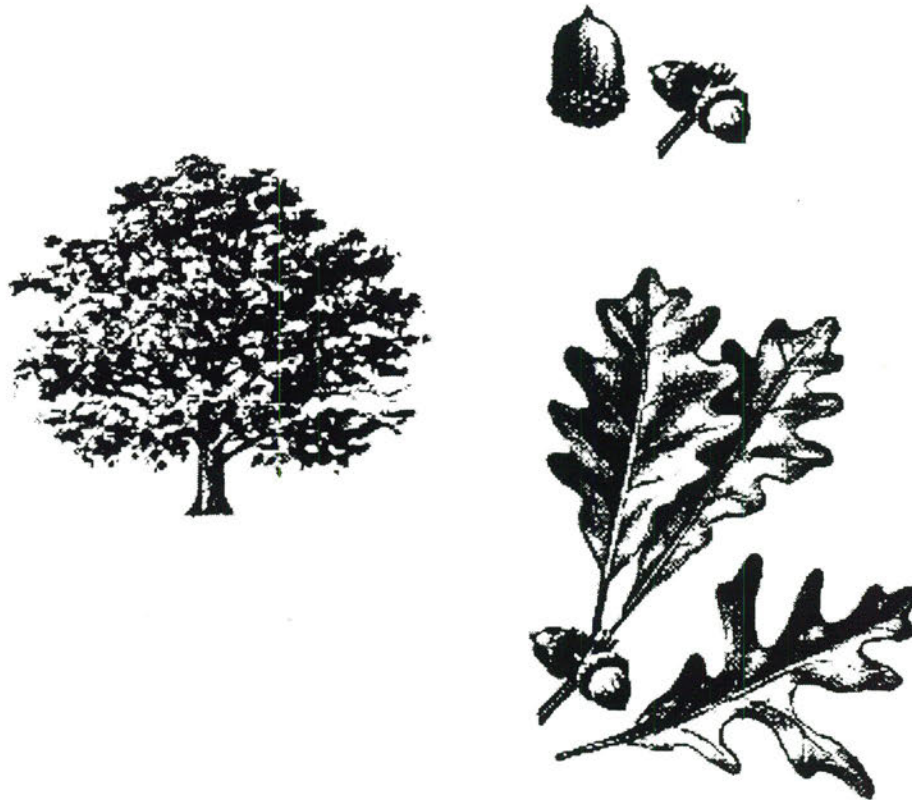
Leaf opposite, odd-pinnately compound, 8"-12" long with 5-9 leaflets; leaflets 3"-5", 1.5"-3" wide, ovate to oblong-lanceolate shaped, acute to acuminate apex, acute to rounded base, and a serrate margin.

Flower brownish, nondescript shape.

Fruit 1"-2" long, lanceolate too blanceolate samara.

Bark ashy gray, close, diamond shaped areas separated by narrow interlacing ridges; on young trees bark has orangish tinge.

Twig stout, conspicuously thick, glabrous, dark green to gray-green.



WHITE OAK *Fagaceae Quercus alba*

White oak is the most important lumber producer of the white oak group. White oak timber produces veneer, lumber for flooring, paneling, barrel staves, cabinetry, crafts, furniture, and crossties. Acorns produced are valuable, but are inconsistent sources of wildlife food. Over 180 different birds and mammals consume acorns as food. White oak twigs and reproductive growth are browsed by deer.

GROWTH:

White oak grows widespread throughout Eastern North America. It is a relatively slow-growing tree and can attain an age of up to 600 years. White oak grows well on all sites except for driest and shallowest soils. It grows from sea level to over 5,000' in the Southern Appalachians. White oak is a large, long lived tree often 80'-100' tall and 36"-48" in dbh. Maximum size is 170' tall and a 84" dbh. Open-grown white oak produces a short, stocky bole with a widespreading crown. Forest-grown trees develop a tall, straight trunk with a compact crown. White oak is intermediate in shade tolerance.

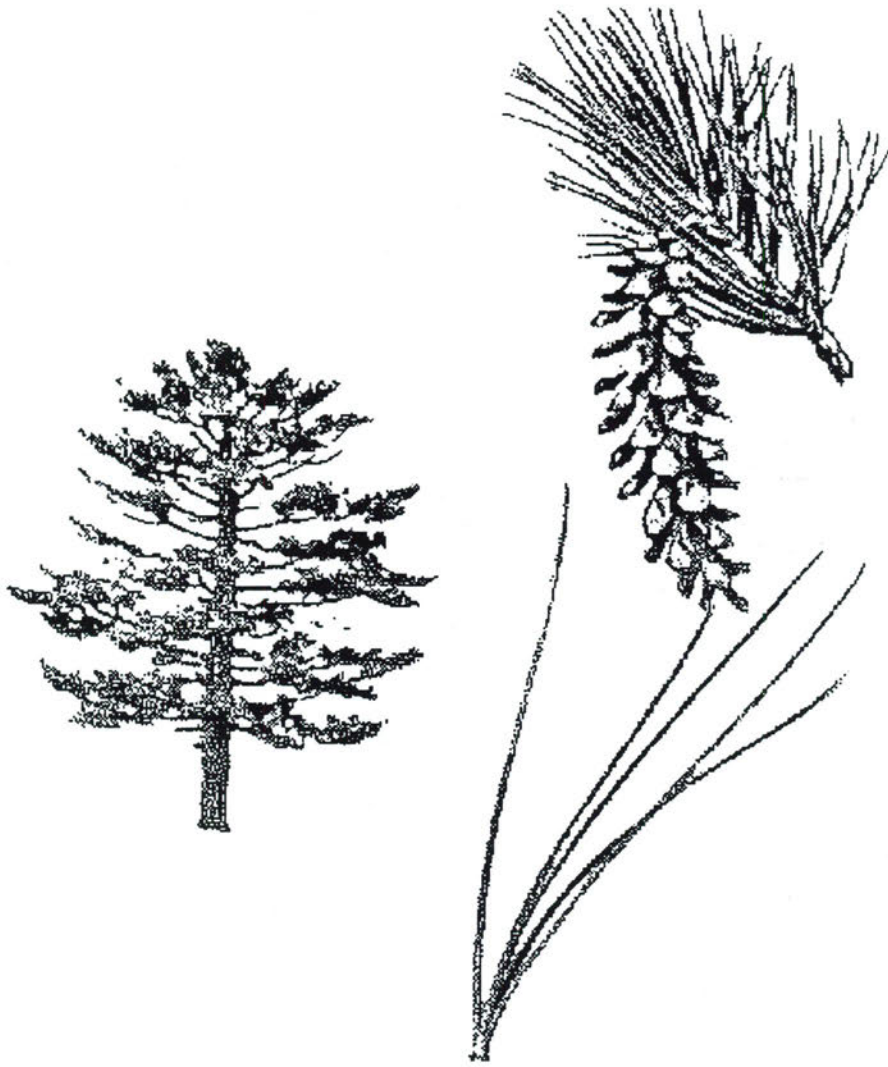
Leaf 5"-9" long, 2"-4" wide, oblong-ovate, 7-9 rounded lobes, usually divided by sinuses, which often extend to midrib, apex rounded, and cuneate base.

Flower nondescript.

Fruit nut, 1/2"-3/4" long, ovoid-oblong cup encloses one-quarter of nut length, bowl like, light chestnut brown shallow cup.

Bark light ashy gray, flaky, often breaks off in one-sided plates towards the top.

Twig glaucous, whitish to reddish brown.



EASTERN WHITE PINE *Pinaceae Pinus strobus*

From early history white pine has been and still is an extremely valuable species. White pine is the most important lumber producing soft pine of the east and the largest of the northeastern conifers. White pine commonly lives up to an age of 200 and can exceed 450 years. White pine lumber is used in furniture, core stock, log cabins, framing, paneling, mouldings, doors, sashes, cabinets, flooring, and still used for masts in tall sailing ships. White pine is a commercially important species in our area, especially in Carroll, Floyd, and Grayson counties, where it is harvested for lumber, Christmas trees and garlands.

GROWTH:

White pine grows on practically all soils, but grows best on moist, sandy loams throughout the Eastern United States. It grows from the upper Piedmont up to 4,000' in the Southern Appalachians. Open-grown trees produce broadly conical crowns with living branches nearly to ground level. Forest-grown trees produce a tall, cylindrical bole which is clear for nearly two-thirds of its length on mature trees. White pine grows rapidly in our area. Average heights are 80'-100' and 24"-42" in dbh. The largest tree recorded is 220' tall and 72" in dbh.

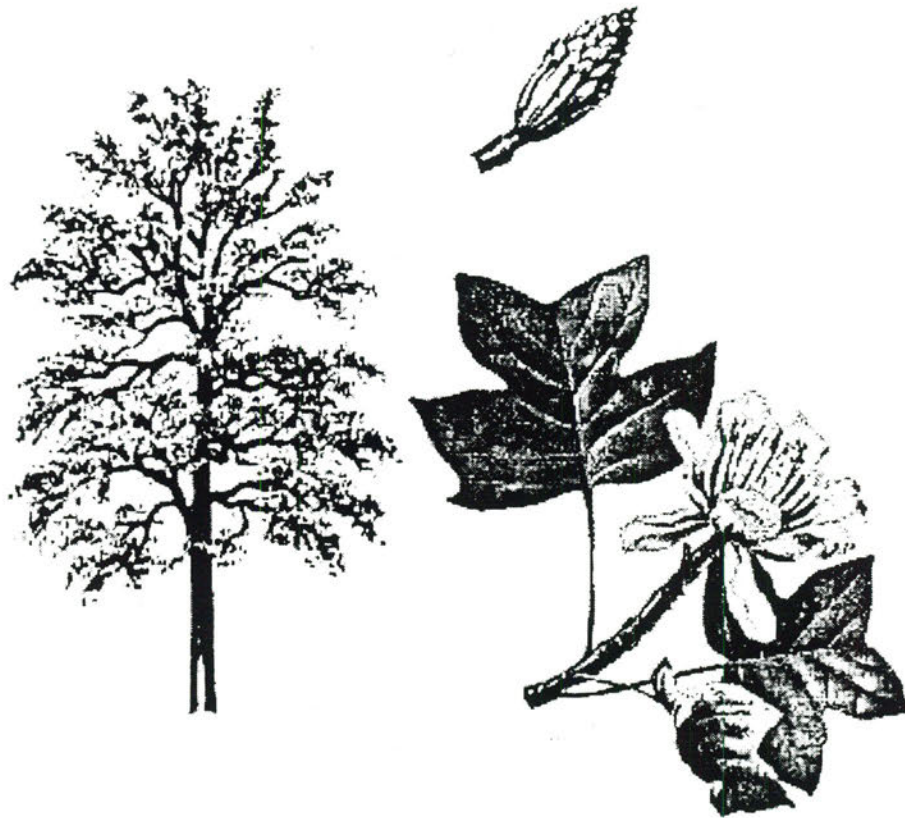
Leaf needles are 5 per fascicle, 3"-5" long, dark bluish-green, slender, flexible, and contain 3-5 rows of stomates on the underside surface that give it a white appearance.

Flower nondescript.

Cone 4"-8" long, narrow, curved, and oblong conic.

Bark young stems are smooth, dark green. On mature trees, bark is broken into small rectangular blocks.

Twig smooth, orangish-brown, smooth buds



YELLOW POPLAR *Magnoliaceae Liriodendron tulipifera*

Yellow poplar, also called tulip-tree or tulip-poplar, is one of the most distinctive, attractive, and tallest of eastern hardwoods. Yellow poplar produces high quality veneer, lumber for furniture, core stock, plywood, mouldings, has been frame graded for housing construction, and is used in oriented strand board (OSB). These characteristics make it one of the most valuable timber producers. It has distinctive value as a honey tree, wildlife food source, and as a shade tree.

GROWTH:

Yellow poplar thrives on many soils, and best growth is attained on riverbank soils throughout the Eastern United States. It grows from sea level to 4,500' in the Southern Appalachians. Poplar is shade intolerant. Maturity is reached in 200 years, with some living to 300 years. Yellow poplar averages 100'-150' in height and 24"-60" in dbh. Maximum recorded size is 200' with a 144" dbh. Mature yellow poplar has a striking and unmistakable outline. Forest-grown trees are almost arrow straight, tall, and clear of lateral branches for a considerable height, with a small oblong crown. Open-grown trees produce epicormic branching, but less than other species.

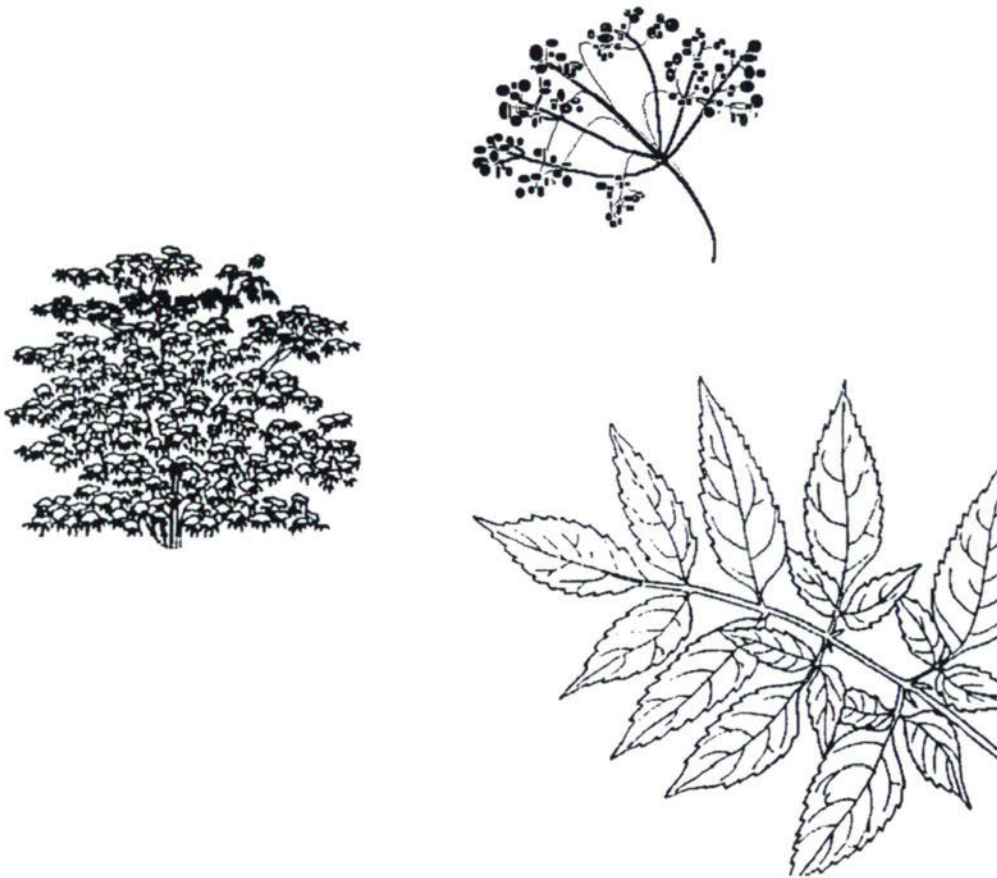
Leaf 4"-6" diameter, orbicular, mostly 4-lobed, margin entire, base and apex truncate.

Flower appear in May or June after leafout, 6 petals in 2 rows, light greenish yellow to orange colored, tulip shaped.

Fruit 2.5"-3" long, erect conelike aggregate of samaras; samaras 1.5" long, 1 or 2 seeded.

Bark on mature trees, grayish, broken up into long, rough rounded ridges, on young trees it is dark green and smooth.

Twig stout, reddish brown, bitter to taste.



AMERICAN ELDER OR ELDERBERRY *Sambucus Canadensis* elderberry

Elderberry is used mostly as an ornamental. It is planted for borders, screens and for the edible fruit. The fruit is good for jams and jellies, wine, and attracting birds.

GROWTH:

Elderberry is a small deciduous shrub that ranges eastern North America. It exhibits fast growth rates and shows potential for wetland sites. The branches are long and weak, pruning is essential to maintain form and good shape. Variable in size and shape, averages 5-12'.

Leaf compound, grayish-green, opposite, usually 7 leaflets, each leaflet 2-6" long and .5-2.5" wide. Elliptic to lanceolate, acuminate tip, sharply serrated.

Flower perfect, umbel, white to yellow white, borne in June or July, slightly convex, 6-10" wide.

Fruit purple-black, berry-like, about .25" in diameter, ripen from August through September.

Twig stout, pale yellowish gray, glabrous, and heavily lenticellate.



JAPANESE BARBERRY *Berberis thunbergii*

Barberry is planted for ornamental use in hedges, barriers, groupings and as a specimen shrub (alone). Different cultivars of barberry offer different foliage colors and forms. It is best used in landscaping where accent and color is desired during the growing season. The wood is very hard, durable, and resistant to ice damage.

GROWTH:

Barberry has a medium growth rate and is found throughout the Eastern United States. It averages 3-6' wide and 4-7' high. It is tough and is quite tolerant of most soil conditions, but is only moderately tolerant of droughty soil conditions or of excessive moisture.

Leaf simple, alternate, obovate to oblong, .5-1" long, narrowing at the base into a distinct petiole. Smooth margin except for a single sharp prickles at the tip, clustered and whorled. Bright green spring and red to red-maroon in the fall.

Flower yellow center, reddish on the outside. .25" across, solitary or 2-4 in a cluster.

Fruit bright red, oval elongate, .25" long, on a long slender stalk, very red, and remains on after leaves fall off.

Twig slender, often weeping when young, purple-brown to red-brown turning reddish gray with age. Inner bark is buttery yellow.