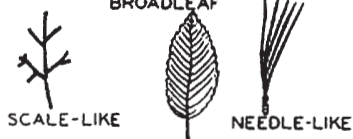


# LEAF CHARACTERS, SUMMER KEY

## KIND



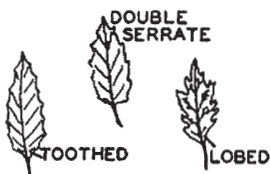
## ARRANGEMENT



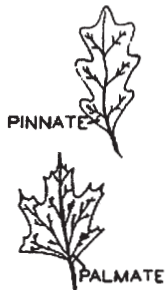
## FORM



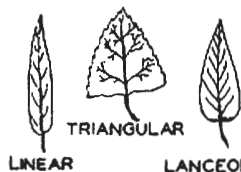
## MARGIN



## LOBES



## SHAPE



## BASE



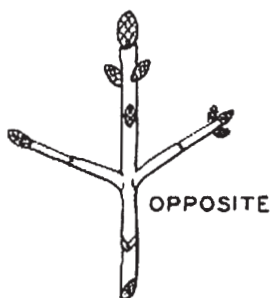
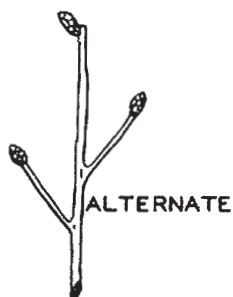
## APEX



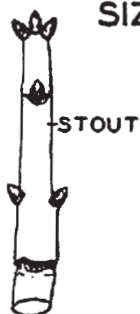
Plate 1

# TWIG AND BUD CHARACTERS, WINTER KEY

## ARRANGEMENT



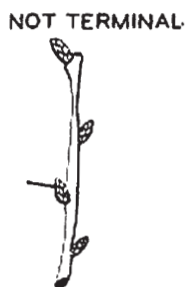
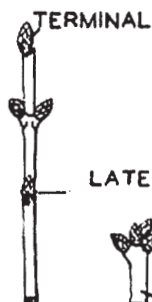
## SIZE



## PITH



## BUDS



LATERAL

CLUSTERED

## BUD SCALES



# 1. ARBORVITAE

## northern white-cedar

*Thuja occidentalis* Linnaeus

**Arborvitae** (meaning “tree of life”) is a medium-sized, slow-growing forest tree that is rather common in the northeastern part of the state, less frequent in the central and western parts. Dense arborvitae swamps are common in Madison County and northward and eastward. In the Adirondack region the tree also occurs frequently outside the swamps.

The wood is light, soft, brittle, coarse-grained, light yellowish brown in color, and durable in contact with the soil. It is used extensively for fence posts and small poles.

**Bark:** ashy gray to light reddish brown, separating in long, narrow, flat, shreddy strips, often more or less spirally twisted.

**Twigs:** decidedly flattened, arranged in fan-shaped clusters, and not to be confused with leaves that cover previous season's growth; with death of leaves in second season, twigs become reddish brown in color and shiny.

**Winter buds:** extremely minute, almost covered by scale-like leaves.

**Leaves:** scale-like, yellowish green in color, aromatic when crushed, borne in closely overlapping pairs; on leaves of leading shoots, glandular dot conspicuous in center of leaf.



**Fruit:** Oblong, erect cone, 1/2 inch long, reddish brown in color, persists through winter. Cone scales: 6 to 12, open to base at maturity in autumn of first season. Seeds: 1/8 inch long, in pairs, nearly surrounded by broad wings.

**Distinguishing features:** cones with few scales, dot in center of flat, scale-like leaf.

1a. **White-cedar** (*Chamaecyparis thyoides* (L.) BSP), a coastal plain tree, closely resembles the arborvitae.

## 2. BLACK ASH

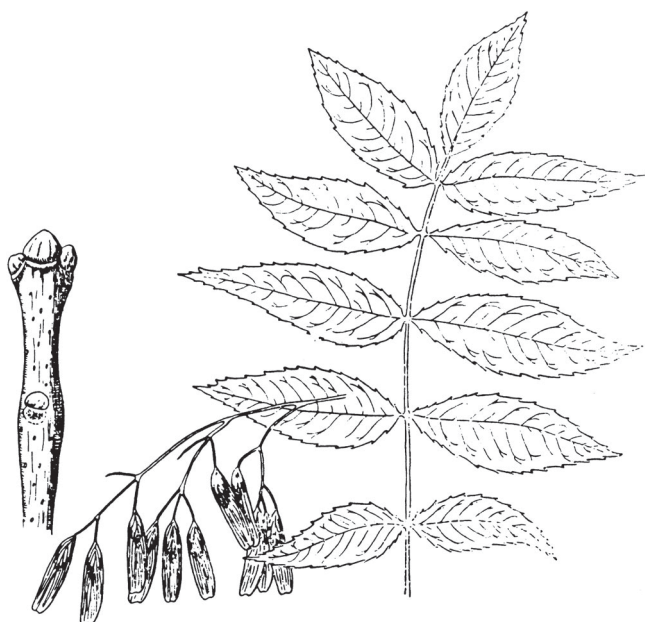
*Fraxinus nigra* Marshall

**Black ash** is most commonly found in deep swamps. Occasionally, though, it is found mixed with other hardwoods in moist, cold forests. Its wood is heavy, rather soft, tough, and coarse-grained and is used for hoops, chair bottoms, and baskets.

**Bark:** ashy gray in color, somewhat furrowed, forming thin, somewhat smooth scales that are easily rubbed off.

**Twigs:** very stout, similar to those of white ash but not shiny and usually lighter gray in color; leaf scar typically oval.

**Winter buds:** resembling those of white ash though usually decidedly black; terminal bud as long or longer than broad, sharp-pointed; lateral buds much smaller, blunt-pointed; last pair of lateral buds at some distance from terminal bud instead of nearly on a level, as in white ash.



BLACK ASH

Twig, natural size, leaf and fruit, one-third natural size

**Leaves:** opposite, compound, 10 to 14 inches long, with 7 to 11 leaflets similar to those of white ash but much longer in proportion to their width, without stems.

**Fruit:** winged seed, with wing broader and distinctly notched at tip; in clusters, ripening in early autumn.

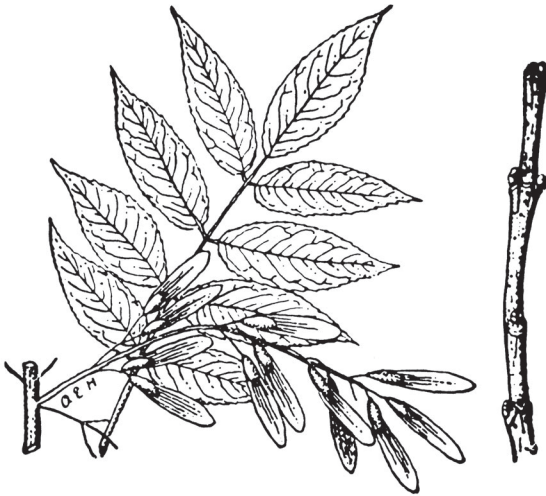
**Distinguishing features:** found in moist locations; leaflets without stems; black buds; notched tip in seed.

2a. **Red ash** (*Fraxinus pennsylvanica* Marshall) grows in wet spots but has the same uses as white ash. Red ash may be identified by slightly serrate leaflets, silky below, on a woolly leaf-stem, and by the woolly twigs marked by semicircular leaf scars.

### 3. WHITE ASH

*Fraxinus americana* Linnaeus

**White ash** is a valuable and rapid-growing tree in the woodlots of New York State. It is common throughout New York and is found up to an altitude of 2,000 feet in the Adirondacks. It prefers to grow in rich, moist woods and is common on abandoned agricultural lands. The wood is heavy, hard, strong, close-grained, and tough. Large quantities of white ash are used for agricultural implements, tool handles, oars, furniture, and sporting goods. In some locations, especially open edges and roadsides, branch dieback and tree mortality are common.



WHITE ASH

Leaf and fruit, one-third natural size; twig, one-half natural size

**Bark:** dark grayish brown in color, deeply furrowed with narrow, flat-topped, firm ridges that are somewhat scaly on older trunks; ridges in some instances tend to run together, enclosing diamond-shaped fissures.

**Twigs:** very stout, smooth, shining, grayish brown in color, brittle, flattened at leaf bases (nodes); leaf scar notched.

**Winter buds:** plump, blunt-pointed, dark brown or nearly black in color; terminal bud 1/5 inch long, larger than

lateral buds; last pair of lateral buds almost on level with terminal bud.

**Leaves:** opposite, compound, 8 to 15 inches long, with 5 to 9 leaflets; leaflets sharp-pointed, 3 to 5 inches long, with slightly and sparsely serrate margins; borne on short stems; by this characteristic may be distinguished from black ash leaflets, which are stemless.

**Fruit:** winged seed, 1 to 2 inches long, broadly paddle-shaped with wing occupying position of blade; borne in long, open, drooping clusters, ripening in September, often not dropping off until early winter.

**Distinguishing features:** thick twigs; compound leaves with stemmed leaflets; brown buds; ashy-gray, older bark.

3a. **Green ash** (*Fraxinus pennsylvanica* Marshall var. *lanceolata* (Burkhausen) Sargent) is frequently confused with white ash. The former has narrower leaflets with more noticeable serrations that extend farther toward the base, the leaflets are greener beneath, the terminal bud is more pointed, and the leaf scar is not notched. It has the same uses as white ash.

## 4. BIGTOOTH ASPEN

### large-toothed aspen

*Populus grandidentata* Michaux

**Bigtooth aspen** is a medium-sized, rapid-growing, short-lived tree that develops best on deep moist soils but is more common on dry, upland, sandy, or stony sites, where it rapidly covers slashes and burns. Here it provides habitat for wildlife that use early successional

cover. The wood is similar to that of the quaking aspen and is used for excelsior, pulp, woodenware, crates, and boxes.

**Bark:** resembles that of quaking aspen, though small branches are of a more pronounced yellow color. Lower trunk generally more deeply furrowed than that of quaking aspen.

**Twigs:** stout, round, reddish or yellowish brown in color in early winter, often pale and downy as contrasted with those of quaking aspen, which are shiny.

**Winter buds:** usually larger than those of quaking aspen, terminal bud present; lateral buds generally bending away from twig, dull, dusty-looking, light chestnut brown in color.

**Leaves:** alternate, simple, 3 to 6 inches long, roughly triangular with square base, blunt apex, coarsely toothed margin in direct contrast to finely serrate margin of quaking aspen.

**Fruit:** very similar to that of quaking aspen (p. 20). Seeds: spread by wind.

**Distinguishing features:** coarse teeth on leaf with square base; twigs downy.



BIGTOOTH ASPEN  
Leaf, one-half natural size; twig, one-half  
natural size; fruit, one-half natural size

## 5. QUAKING ASPEN

trembling aspen, popple, small-toothed aspen

*Populus tremuloides* Michaux

**Quaking aspen** is the most widely distributed tree in North America. It is common in most sections of New York State but is infrequent on the pine barrens of Long Island. It is a short-lived tree, but it has value as a cover tree in slashes, burns, and in old fields where it quickly establishes itself. The wood is soft, weak, not durable, light brown to white in color, and is used primarily in the manufacture of mechanical pulp, excelsior, crates, and boxes.



QUAKING ASPEN

Twig, natural size; leaf, one-half natural size; pistillate flower, natural size

**Bark:** on young trunks and branches yellowish green to whitish in color, on old trunks roughened with broad, flat, blackish ridges.

**Twigs:** smooth, shiny, reddish brown in color.

**Winter buds:** terminal bud 1/4 inch long, narrow, conical, often incurved, sharp-pointed, shiny, reddish brown in color; lateral buds smaller.

**Leaves:** alternate, simple, 1 1/2 to 3 inches in width, somewhat triangular in shape with rounded base, serrate margin, and flattened stem that allows slightest breeze to flutter leaves, from which this tree is named.

**Fruit:** scattered cluster of small, curved capsules, maturing in early spring. Seeds: within capsule, each with tuft of hairs, carried long distances by wind when capsule breaks open. (This explains why aspens spring up so quickly after fires on burned-over areas and in abandoned fields.)

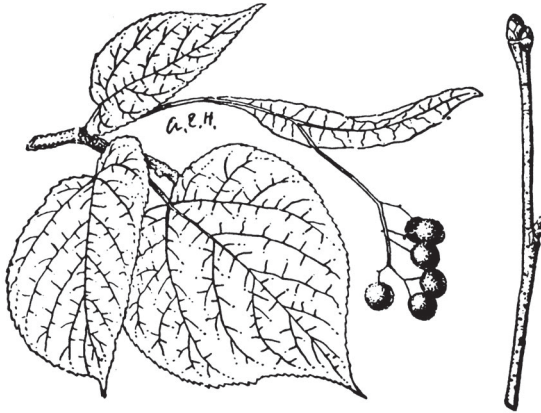
**Distinguishing features:** tiny teeth on margin of leaves; shiny twigs.

## 6. BASSWOOD

**linden, whitewood**

*Tilia americana* (Ventenat) Linnaeus

**Basswood** is a moderately common forest tree in New York State. It grows rapidly, and its lumber has a wide range of uses. It does best in the deep, moist soils of the woodlot sections but is generally distributed except in the high Adirondacks and Catskills. The wood is soft, even-grained, light, and fairly strong and is used for boxes, crates, inexpensive furniture, woodenware, and paper pulp; it is often used as a substitute for white pine.



BASSWOOD

Leaf and fruit, one-third natural size; twig, one half natural size

**Bark:** on young stems smooth, dark gray in color; on older trunks firm but easily cut, becoming furrowed into rather narrow, flat-topped ridges; on still older trunks furrows deeper, ridges more rounding and broader, surface scaly.

**Twigs:** rather slender, smooth, bright red or greenish in color or covered by gray skin, zigzag, slightly mucilaginous when chewed; fibers of bark on twigs very tough, may be used as rope.

**Winter buds:** terminal bud absent; lateral buds large, smooth, sometimes lopsided or humped, bending away from twigs, dark red or sometimes green in color.

**Leaves:** simple, alternate, heart-shaped, 5 to 10 inches long, sharp-pointed, coarsely serrate along margin; leaf base asymmetrical.

**Fruit:** round, woody nut, roughly pea-sized, borne singly or in clusters, with common stalk, attached midway to leafy bract, ripening in late fall but sometimes remaining on tree into winter. Bract acts as sail to scatter seed.

**Distinguishing features:** often found in clumps; usually large, heart-shaped leaf; hump-backed bud on zigzag twig; fruit a pea-like nut attached to a slender "parachute."



## 7. AMERICAN BEECH

*Fagus grandifolia* Ehrhart

**American beech** has perhaps the widest distribution of any forest tree in the state and for that reason is one of the best known. In the Adirondacks and Catskills, it forms an important part of the hardwood forest but is almost equally common throughout the rest of the state. Although the tree is of large and stately size, its wood is less valuable than that of many of its associates in the woodlot section of the state, with the result that it has been left standing. Because of its heavy shade, American beech has also excluded more valuable trees. Beech bark disease, which is a fungus that grows on injuries caused by a scale insect, infects and kills



large numbers of beech trees in the Northeast. The wood is heavy, hard, strong, tough, and close-grained and is excellent as fuelwood. It also is used largely in the acid-wood industry, for baskets and crates, and to some extent for furniture.

**Bark:** smooth, close, steel gray in color, easily recognized by this character.

**Twigs:** slender, zigzag, smooth, shining reddish brown in color, becoming gray on older twigs.

**Winter buds:** terminal bud present, slender, 3/4 inch long, sharp-pointed, covered with light brown scales; lateral buds not much smaller than terminal bud.

**Leaves:** simple, alternate, 3 to 4 inches long, ovate, coarsely toothed on margin, bristle tipped; at maturity very thin, dull green in color above, pale green beneath.

**Fruit:** stalked burr, covered with soft, curving prickles, containing a nut. Burrs: usually in pairs, open up to let nuts fall in early autumn, remain on tree into winter. Nut: triangular, pale brown in color, shining, with sweet, edible kernel.

**Distinguishing features:** smooth, gray bark; coarse, sharp teeth on leaf margin; cigar-shaped buds.

## 8. BLACK BIRCH

### cherry birch, sweet birch

*Betula lenta* Linnaeus

**Black birch** yields a variety of useful products. From the Hudson River Valley to Lake Erie, except along the higher mountains, in moist or dry, gravelly soils, this tree is well known to boys and girls for the wintergreen flavor of its twigs. The wood is heavy, strong, hard, close-grained, and dark brown in color with yellowish sapwood, and it is used for fuel and furniture, especially as a substitute for cherry or mahogany. Oil of wintergreen, used medicinally and for flavoring, is distilled from the twigs. Birch tea is made from scrapings of inner bark of twigs steeped in hot water.

**Bark:** on branches smooth, close, not peeling, dark reddish brown in color with conspicuous, light-colored, elongated breathing pores; on older trunks breaking into long, thick irregular plates almost black in color.

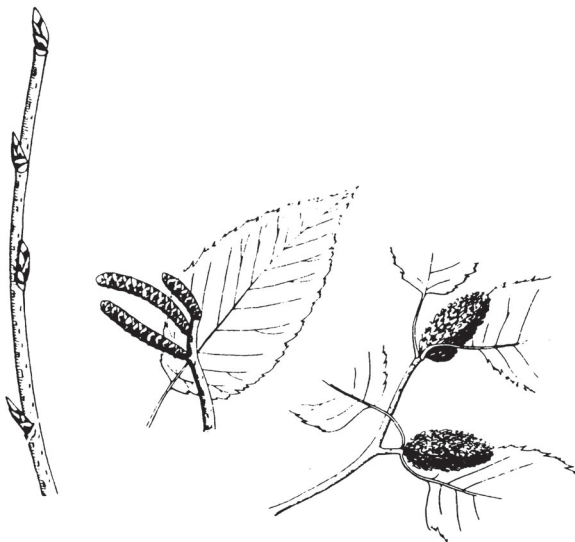
**Twigs:** slender, smooth, light reddish brown in color, with numerous, short, spur-like lateral twigs; strong wintergreen flavor when chewed.

**Winter buds:** terminal bud present on spur-like lateral branches only, about 1/4 inch long, conical, sharp-pointed, reddish brown in color, buds on season's growth usually bending away from twigs.

**Leaves:** alternate, simple, ovate, 2 to 5 inches long, sharp-pointed, with fine doubly serrate margin, found usually in pairs, not opposite on lateral spurs.

**Fruit:** an erect, cylindrical, cone-like structure as in other birches, 1 1/2 to 2 inches long, without stalk; winged nutlets falling in autumn and winter.

**Distinguishing features:** strong wintergreen flavor in twigs and bark; leaves usually in pairs on spurs.



BLACK BIRCH  
Leaf and twig, one-third natural size; male flower  
buds one-half natural size

## 9. GRAY BIRCH

### old-field birch, poplar birch

*Betula populifolia* Marshall

**Gray birch** colonizes disturbed and harsh sites and is particularly abundant in the lower Hudson Valley where it grows chiefly on dry, gravelly soils of burned-over areas and abandoned farms. Though often confused with the true paper birch, it is far inferior to that species in size and value of the wood. Its white bark renders it more attractive than the aspens, and the characteristic clump effect of its growth is striking, particularly along streams. The tree is short-lived and is rarely as much as 8 inches in diameter. The wood is light and soft and decays quickly. In New York it is used for fuelwood and pulpwood only.

**Bark:** on small stems, reddish brown in color, becoming with age dull, chalky white, not peeling off in papery layers as in paper birch; with distinct black triangular patch below each branch where it joins stem.

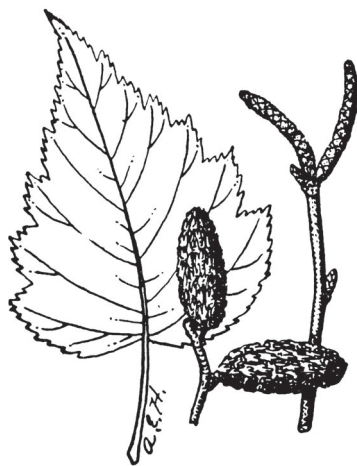
**Twigs:** slender, reddish brown in color, becoming dull chalky white with age.

**Winter buds:** small, smooth, pointed, brownish in color, in many instances bending away from twigs; end bud on season's growth not terminal.

**Leaves:** alternate, simple, 3 to 4 inches long, triangular in shape, very long-pointed, shiny on upper surface, margin doubly serrate.

**Fruit:** slender, erect, cone-like structure, 3/4 inch long, 1/3 inch thick, on short stalk; consisting of winged nutlets and 3-lobed scales in alternate layers; both become detached from central stem in late autumn and winter. Seeds: minute, broad wings, spread by wind.

**Distinguishing features:** long-pointed, triangular leaf; dull, chalky-white bark, not peeling in thin layers.



GRAY BIRCH

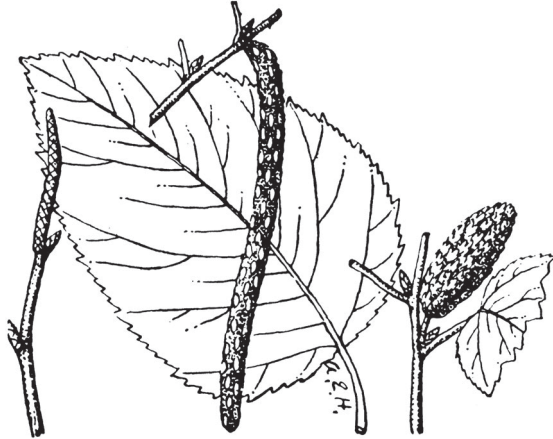
Leaf and twig, two-thirds natural size; fruit natural size; male flower buds at upper right

## 10. PAPER BIRCH

canoe birch, white birch

*Betula papyrifera* Marshall

**Paper birch** is well known throughout the Adirondacks and the Catskills and along the highlands of the Susquehanna and Delaware drainage by its white, papery bark. This shade-intolerant tree grows on a wide range of soils; it thrives along lakes, streams, and swamps and maintains itself on the higher slopes of our mountains. Spools, woodenware,



PAPER BIRCH

Twig, one-half natural size; leaf and fruit, natural size; male flower buds in winter at leaf; male flower in center

shoe lasts, wood pulp, and fuelwood are made from its light, strong, tough, hard, light brown wood.

**Bark:** on young stems, golden to reddish brown in color, early becoming chalky white and peeling off in thin, papery layers that, once separated from tree, are never renewed. Because it is tough, resinous, durable, and impervious to water, paper birch was the choice of all northern Indians for their canoes. Now it is the choice of the souvenir hunter.

**Twigs:** stouter than those in gray birch, dull reddish brown in color.

**Winter buds:** terminal bud absent as in gray birch; lateral buds small, sharp-pointed, bending away from twig.

**Leaves:** simple, alternate, ovate, blunt-pointed rather than slender at apex, 2 to 3 inches long, coarsely serrate on margin; at maturity dull dark green in color above, paler below.

**Fruit:** a cone-like structure as in gray birch, 1 inch long, 1/3 inch thick, usually pendant rather than erect; nutlets and bracts falling in late autumn and winter as with other birches.

**Distinguishing features:** white bark peeling in papery layers in older trees, in saplings reddish brown; ovate leaves.

# 11. YELLOW BIRCH

## silver birch

*Betula alleghaniensis* Britton

**Yellow birch** is an important and prominent timber tree in New York State. It is common throughout the state, except on Long Island, on rich, moist uplands in company with beech and sugar maple, but also is found with red spruce in the swamps and along waterways. The heavy, very strong, hard, close-grained, light brown wood is largely used for

furniture, woodenware, flooring, interior finish, airplanes, and agricultural implements. Its value for fuelwood entitles it to a place in farmers' woodlots. Its seeds often sprout and grow from the tops of rotten stumps and logs.

**Bark:** on young branches close, bright, silvery, yellowish gray in color; with age peeling into thin papery layers that roll back and extend up trunk in long lines of ragged fringe, making excellent tinder for starting fires in rain; on very old trunks becoming rough and furrowed, reddish brown in color.

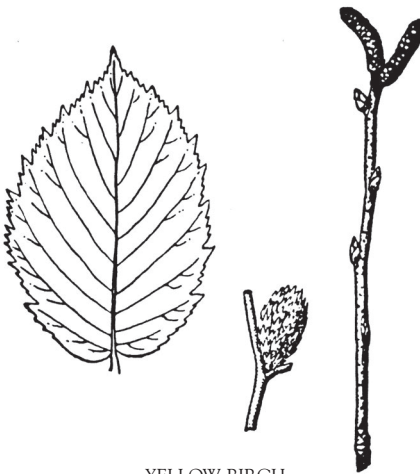
**Twigs:** similar to those of black birch though more yellowish brown in color and often hairy, slightly wintergreen-flavored; abundant, spur-like laterals as in black birch.

**Winter buds:** similar to those of black birch.

**Leaves:** similar to those of black birch; undersurface somewhat hairy, particularly along veins.

**Fruit:** similar to that of black birch though usually wider in proportion to its length, falling in late autumn and throughout winter. Bracts: 3-lobed, distinctly hairy, whereas in black birch they are smooth.

**Distinguishing features:** silvery gray to yellowish bark, peeling in thin sheets; slight wintergreen flavor in bark and twigs; undersurface of leaves hairy along veins.



YELLOW BIRCH

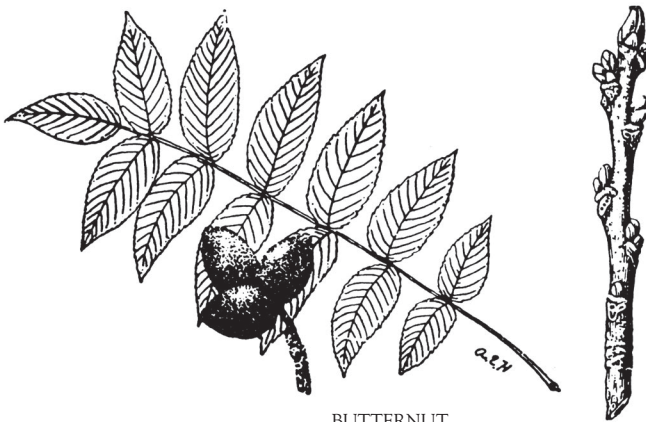
Leaf and twig, one-half natural size; fruit, one-fourth natural size; male flower buds at upper right

## 12. BUTTERNUT

### white walnut

*Juglans cinerea* Linnaeus

**Butternut** is a close kin to the black walnut though it is less valuable as a timber tree. It produces attractive wood and edible nuts, but it branches freely and seldom reaches a large size. It is common in moist soils, especially along fences and roads throughout the state, but is infrequent in the higher Adirondacks. The wood is light, soft not strong, coarse-grained, light brown in color, fairly durable, and easily worked and polished. It is used for interior trim, furniture, and fence posts. Many butternut trees are infected with a canker disease.



BUTTERNUT

Leaf, one-fifth natural size; twig, one-half natural size; fruit, one-third natural size

**Bark:** smooth on young trunks and branches, light gray in color; on older trunks deeply divided into long, broad, flat-topped, whitish ridges.

**Twigs:** stout, brittle, greenish gray in color, often hairy, easily identified by dark brown furry growth, or “mustache,” found just above most leaf scars; chambered pith dark brown as contrasted with light brown chambered pith of black walnut.

**Winter buds:** terminal bud pale, downy, blunt-pointed 1/2 to 3/4 inch long, flattened, longer than wide; lateral buds smaller and shorter.

**Leaves:** alternate, compound, with 11 to 17 practically stemless long-pointed leaflets, margins serrate as in black walnut; leaves up to 2 1/2 feet in length; leaf stalk, hairy where it joins stem.

**Fruit:** rather large nut, 1 1/2 inches long, tapering at end, black with fine cut ridges, enclosed in sticky, green husk usually in clusters of 3 to 5, ripening in October of first season. Kernel: sweet, oily, but somewhat difficult to extract. The butternut has the advantage of curing without removing outer husk.

**Distinguishing features:** “mustache” above “monkey-faced” leaf scars; dark brown, chambered pith.

## 13. BLACK CHERRY

*Prunus serotina* Ehrhart

**Black cherry** is the largest and most valuable of the cherry trees in New York State. It prefers rich bottomlands and moist hillsides but also is found in drier situations. It is common in most sections of the state, though it is seldom found above an altitude of 3,000 feet in the Adirondacks. Its wood is light, strong, hard, close-grained with pale reddish-brown heartwood and is much in demand for cabinetmaking, interior finishing, tools, ties, and fence posts. It is a valuable, fast-growing timber and wildlife food tree and should be encouraged in woodlots.

**Bark:** at first smooth, reddish brown in color, marked with easily seen, long, white breathing pores; with age becoming much roughened by irregular, close, dark, scaly circular plates with upturned edges.

**Twigs:** slender, smooth, reddish brown in color, with bitter almond taste that is characteristic of all cherries.

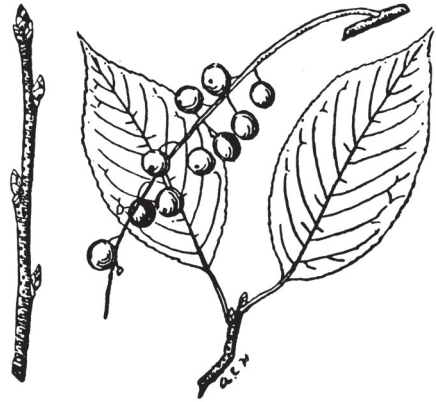
**Winter buds:** smooth, ovate, 1/8 to 1/6 inch long, sharp-pointed, chestnut brown in color; terminal bud present.

**Leaves:** alternate, simple, 2 to 5 inches long, lanceolate, broader than those of pin cherry, fairly long-pointed, margin finely serrate, tufts of hair along midrib on undersurface of leaf.

**Fruit:** single-seeded juicy fruit, about 1/2 inch in diameter, grouped on very short stems, in long, scattered, drooping clusters, purplish black when ripe in late summer. Birds and animals eat the fruit despite its bitter flavor.

**Distinguishing features:** long, white pores on young bark; dark, scaly, circular, saucer-like plates in older bark; hairy midrib below on leaf; fruit in short-stemmed clusters.

13a. **Sweet cherry or bird cherry** (*Prunus avium* Linnaeus) is an escaped cultivated cherry found in abandoned fields and hedgerows. Its shiny red bark and thick twigs are its outstanding features.



BLACK CHERRY

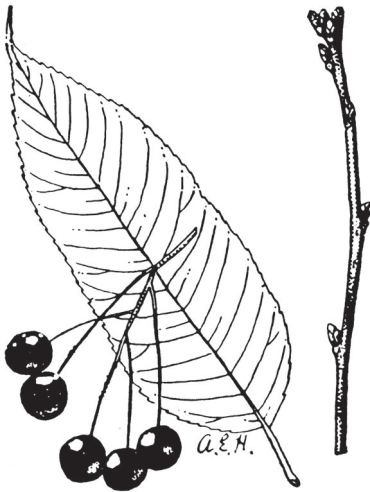
Twig, two-thirds natural size; leaf, one-third natural size; fruit, one-half natural size

## 14. PIN CHERRY

wild red cherry, fire cherry

*Prunus pensylvanica* Linnaeus fil.

**Pin cherry** thrives early on burned, cutover, and abandoned land throughout the state, except in the higher Adirondacks. It is not a timber-producing species, and its main value lies in its ability to cover wasteland and protect the soil until larger trees can establish themselves and crowd it out. The wood is light, soft, close-grained, with light brown heartwood, and is seldom used.



PIN CHERRY  
Leaf and fruit, natural size; twig, one-half  
natural size

**Bark:** bright, reddish brown in color, mostly smooth, often slightly peeling around trunk, marked with numerous long, pale, breathing pores; in old trees somewhat roughened near base.

**Twigs:** slender, smooth, shiny, bright red in color, characteristic bitter almond taste, peculiar odor.

**Winter buds:** very small, reddish brown in color, characteristically clustered at twig tip and sometimes along sides; terminal bud present, usually smaller than lateral buds around it.

**Leaves:** alternate, simple, 3 to 5 inches long, narrowly lanceolate as contrasted with broader leaves of wild black cherry, sharp-pointed, with finely serrate margin.

**Fruit:** round, juicy, one-seeded, light red in color, about 1/4 inch in diameter, arrayed on long stems, 3 to 5 in each cluster, ripening in July. Birds often pick ripe fruit.

**Distinguishing features:** smooth, reddish-brown bark, with long horizontal pores; branches at almost right angles to trunk; fruit in long-stemmed clusters.

14a. **Chokecherry** (*Prunus virginiana* Linnaeus) is a bushy shrub, although sometimes a small tree, furnishing food for game in hedgerows. Its dark brown bark shows lighter streaks of gray.

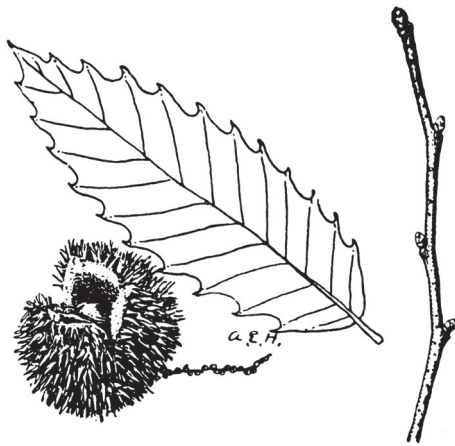


## 15. AMERICAN CHESTNUT

*Castanea dentata* (Marshall) Borkhausen

**American chestnut**, once common across the state south of the Adirondacks, has succumbed to the deadly chestnut blight, so that there are practically no live trees more than 4 inches in diameter. Perhaps almost any other species could have been better spared in the farmer's woodlot because of its rapid growth, the many uses for its wood, and the fine crop of nuts it furnished. The wood is light, soft, coarse-grained, reddish brown in color, and durable in contact with the soil. It is now used largely for posts.

**Bark:** on young trunks smooth, reddish brown in color, with age broken by shallow fissures into long, broad, flat, more or less slanting ridges.



AMERICAN CHESTNUT

Twig, one-half natural size; leaf and fruit, one-third natural size

**Twigs:** stout, greenish yellow or reddish brown in color, somewhat swollen at base of buds; pith star-shaped in cross-section.

**Winter buds:** small, ovate, light chestnut brown in color, set at angle to leaf scar; terminal bud absent.

**Leaves:** simple, lanceolate, alternate, 6 to 8 inches long, sharp-pointed, widely toothed.

**Fruit:** light brown burr, sharp, spiny without and hairy within; opening at first frost and letting fall generally 3 nuts. Nuts: shiny, woolly at top; shell very thin; kernel solid, white, sweet, and excellent to eat.

**Distinguishing features:** stout twigs with star-shaped pith; long leaves with widely spaced, sharp teeth.

## 16. EASTERN COTTONWOOD

*Populus deltoides* Bartram ex Marshall

**Eastern cottonwood** is an exceedingly rapid-growing, moisture-loving species that is found locally in moist places and along streams and lakes throughout the state except at the higher elevations. The wood is light, soft, and weak and is dark brown in color with thick nearly white sapwood that warps badly in drying. It is used for pulp and boxes. The cottonwood has been extensively planted as an ornamental tree along streets, but as such it has few merits because it is short-lived and the roots often penetrate and clog drains and sewers. It is not easy to destroy because, even after being cut down, the stump continues to sprout vigorously.

**Bark:** smooth on young trunks and branches; light yellowish green in color, becoming thick, ashy gray in color and deeply furrowed with age.

**Twigs:** stout, round or ridged below bud, bright yellow or greenish yellow in color; rank odor when broken.

**Winter buds:** terminal bud present, large, resinous, glossy, smooth, chestnut brown in color; lateral buds smaller, in many instances bending away from twig.

**Leaves:** alternate, simple, broadly triangular, 3 to 5 inches long, coarsely serrate margin, square base, long and laterally flattened leaf stalk.

**Fruit:** scattered cluster of capsules as in aspens, though somewhat larger (3 to 6 inches long), arranged in long, drooping tassels. Seeds: within capsule, numerous, small, surrounded by mat of fine hairs, ripening in spring, conveyed long distances by wind. The tree derives its name from this cotton-like mat of fine hairs.

**Distinguishing features:** rank odor when twig is broken; incurved teeth on leaf margin of triangular leaf.



EASTERN COTTONWOOD  
Leaf and fruit, one half natural size;  
twig, one-third natural size

## 17. CUCUMBER TREE

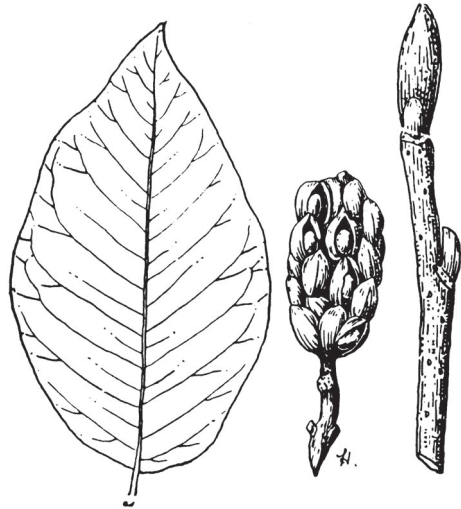
*Magnolia acuminata* Linnaeus

**Cucumber tree**, so called because of its cucumber-like fruit, is the only magnolia that is at all common in New York State outside of Long Island. In rich woods, on moist slopes, and along stream courses, from the central part of the state westward and southward, it is found locally. The wood is light, soft, close-grained, brittle, and light yellowish brown in color. It resembles that of yellow-poplar and, besides wood carving, has much the same uses. Because of its yellowish-green flowers, large leaves, rapid growth, and red seeds, it is often grown in lawns and parks.

**Bark:** grayish brown in color, with long, narrow furrows separating into rather loose, scaly, flat-topped ridges.

**Twigs:** brittle, brown in color, smooth or shiny, aromatic odor.

**Winter buds:** terminal bud oblong, somewhat curved, thickly covered with pale, silky hairs, pointed, about 1/2 inch long; lateral buds smaller, blunt, also hairy.



CUCUMBER TREE  
Fruit and leaf, one-third natural size; twig and bud,  
two-third natural size

**Leaves:** alternate, simple, ovate, pointed at tip, 4 to 10 inches long, entire margin. One of the few species of the state that has an entire-margined leaf.

**Fruit:** cone-like or cucumber-like, cylindrical mass, often curved, about 2 1/2 inches long, containing many scarlet, pea-like seeds that dangle from ends of short, white threads when ripe in early autumn.

**Distinguishing features:** smooth margin of large leaf; aromatic odor of twigs; oblong terminal bud; branching like that of pear tree, fruit like cucumber.

## 18. AMERICAN ELM

### white elm

*Ulmus americana* Linnaeus

**American elm** is one of the most beautiful, graceful, and best-known forest trees in New York. It occupies a wide range of sites, though it is typically a tree of the bottomlands, and it grows to be one of the largest trees in the state. (The Gowanda elm had a basal circumference of 39 feet.) The wood is heavy, hard, strong, tough, coarse-grained, difficult to split, and light brown in color; it is largely used for veneer, barrel staves and hoops, crates, and wheel hubs. The graceful symmetry of the crown makes the elm highly prized for ornamental planting. Unfortunately, this species has nearly disappeared from our parks and streets because of the lethal Dutch Elm disease. Improved resistant strains have been developed and planted ornamentally and in the wild in hopes that this majestic species can regain its former widespread occurrence.

**Bark:** dark gray in color, divided by irregular up-and-down furrows into broad flat-topped ridges, rather firm or occasionally flaking off in old trees; inner bark in alternate layers of brown and white.

**Twigs:** slender, smooth, reddish brown in color, not mucilaginous (like glue) when chewed.

**Winter buds:** winter twig obviously ends in leaf scar, hence larger bud near end of twig not truly terminal; lateral buds somewhat smaller, ovate, pointed, light reddish brown in color, smooth, 1/8 inch long.

**Leaves:** simple, alternate, 4 to 6 inches long, oblique at base, margin doubly serrate, at maturity dark green in color above, lighter beneath, midrib and parallel veins prominent; upper surface of leaf somewhat rough to touch, although not as pronounced as in slippery elm.

**Fruit:** flat, winged, deeply notched at end, 1/2 inch long, containing one small seed; in clusters, ripens in early May as leaf buds unfold, falling soon thereafter.

**Distinguishing features:** zigzag twigs; inner bark not mucilaginous, having alternate layers of brown and white; leaf slightly rough on upper side only; with oblique base.



AMERICAN ELM  
Twig, leaf, and fruit, one-half natural size

## 19. SLIPPERY ELM

### red elm

*Ulmus rubra* Muhlenberg

**Slippery elm** is a medium-sized forest tree of stream banks and low fertile slopes and is common south of the Adirondacks. The wood is hard, heavy, strong, coarse-grained, and fairly durable in contact with the soil. This tree is not an important commercial species but is used for fence posts, ties, and barrel staves and hoops.



SLIPPERY ELM

Leaf, one-third natural size; twig and fruit,  
one-half natural size

**Bark:** grayish brown in color, more or less deeply furrowed, ridges tending to lift more along one edge than in American elm; layers of outer bark reddish brown in color, shows no alternate layers of brown and white as in American elm; inner bark, next to wood, whitish, strongly mucilaginous (like glue), giving it the name "slippery elm."

**Twigs:** light gray in color, hairy, somewhat rough, characteristically mucilaginous when chewed.

**Winter buds:** terminal bud absent as in American elm; lateral buds 1/4 inch long, dark chestnut brown in color, covered at tip with long, rusty hairs.

**Leaves:** alternate, simple, oval, 5 to 7 inches long, oblique at base, margin doubly serrate;

at maturity thick, dark green in color above, decidedly rough to touch, paler and white-hairy below; midrib and parallel veins prominent.

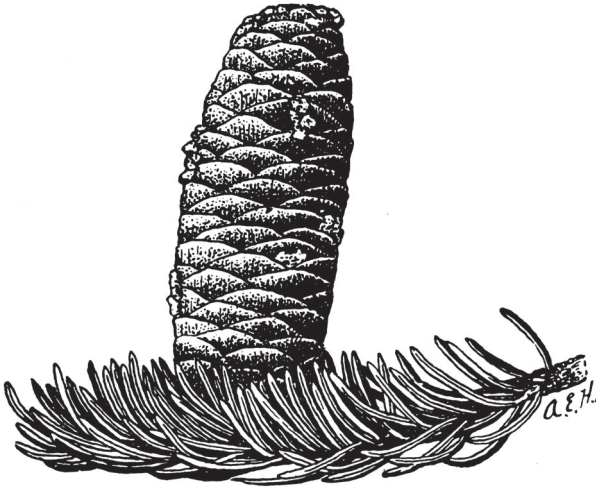
**Fruit:** flat-winged but not notched at end, 1/2 to 3/4 inch long, containing one seed; in clusters; maturing in late May or early June when leaves about half grown, falling soon thereafter.

**Distinguishing features:** inner bark chewy, without alternate layers of brown and white; leaf base oblique, rough above and below; twigs chewy; buds tipped with rusty hairs.

## 20. BALSAM FIR

*Abies balsamea* (Linnaeus) Miller

**Balsam fir** is a medium-sized forest tree generally distributed in deep, cold swamps throughout the state. The wood is light, soft, coarse-grained, not durable, pale brown in color, and of little value as a source of lumber. It is cut along with spruce for pulpwood and is desirable as a Christmas tree. Balsam pillows are made from the needles.



BALSAM FIR  
Branchlet and cone, natural size

**Bark:** smooth, grayish brown in color, dotted with balsam blisters containing fragrant oily resin; in old trees becoming somewhat roughened with small scales.

**Twigs:** smooth with age, grayish in color.

**Winter buds:** small, almost spherical, glossy, clustered at end of twigs.

**Leaves:** borne singly and twisting so as to appear 2-ranked as in hemlock, flattened rather than 4-sided as in spruces, dark green in color above, pale below with 2 broad white lines, 3/4 inch long, blunt, not stalked, aromatic when crushed, persistent 2 to 3 years.

**Fruit:** an erect cone, 2 1/2 to 4 inches long, rounded at top, ripening in autumn of first year, purplish green in color. Cone scales: longer than broad, somewhat fan-shaped, falling in winter following maturity of cone and leaving only erect central stalk to which they were attached. Seeds: in pairs, winged, dark brown in color, 1/4 inch long, ripening in September.

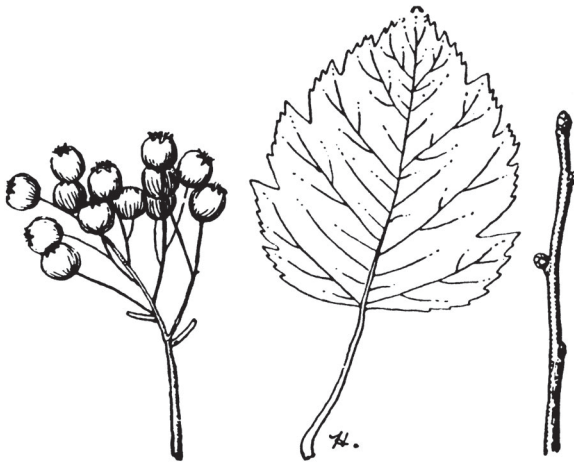
**Distinguishing features:** needles without stalks; blisters in bark; cone erect and falling apart when ripe.

## 21. THE HAWTHORNS

### thornapple

*Crataegus* Linnaeus

**Hawthorns** comprise a large group of small-sized trees. More than 20 varieties are common in New York State. The differences are chiefly in flower and fruit, and it seems advisable in this publication to call attention to the general characteristics of the group without going into the minute differences that separate the many species. The very small



SCARLET HAWTHORN  
Twig, leaf, and fruit, two-thirds natural size

size of the trees, generally less than 20 feet tall, makes them of no commercial value. In fact, some members of the group may be regarded as serious pests because of the rapidity with which they seed up old pastures, shading out available pasturage or making costly the preparation of the land for forest planting.

**Bark:** generally dark brown to gray in color, scaly.

**Twigs:** stiff, zigzag, armed with large, generally unbranched thorns 1 1/2 to 2 inches long.

**Winter buds:** round, chestnut brown in color; terminal bud usually present but no larger than lateral buds.

**Leaves:** simple, alternate, 3 to 4 inches long, 2 to 3 inches wide, serrate on margin; in some species leaves more or less ovate, others 5- to 9-lobed.

**Fruit:** berry-like, in a cluster, each fruit the size of a small cherry; when mature in early autumn, usually red, with 1 to 5 nutlets in center of fleshy covering; highly prized by birds in winter.

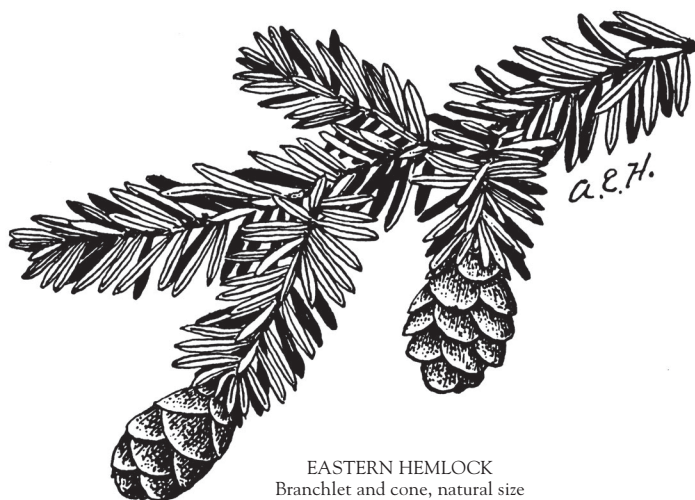
**Distinguishing features:** stiff thorns, 1 1/2 to 2 inches long; berry-like fruit, usually red.

## 22. EASTERN HEMLOCK

### hemlock-spruce

*Tsuga canadensis* (Linnaeus) Carriere

**Eastern hemlock** is a valuable forest tree that is very widely distributed throughout the state. It is particularly common on northern exposures, shaded gorges, steep mountain slopes, and borders of deep swamps. The wood is light, not strong, coarse-grained, brittle, not durable, splinters easily, and is light brown in color. It is largely manufactured into construction lumber and is also in demand for mechanical pulp.



**Bark:** reddish to grayish brown in color, with shallow, broad connecting ridges; inner bark bright cinnamon red in color. High tannin content of bark of commercial value in tanning leather.

**Twigs:** slender, yellowish to grayish brown in color, rough when needles are shed.

**Winter buds:** very small, reddish brown in color, not resinous-coated.

**Leaves:** borne singly, twisting to appear 2-ranked with third row pointing forward on top of twig; with distinct short stalk, flat, 1/2 inch long, rounded or notched at apex, dark green in color above, paler below with 2 white lines, persisting 2 to 3 years.

**Fruit:** a cone, stalked, pendant, 3/4 inch long, ripening in one year, grayish brown in color when mature, falling during winter following maturity. Cone scales: with rounded entire margins. Seeds: in pairs, winged, light brown in color, 1/16 inch long, ripening in September.

**Distinguishing features:** needles with tiny stalks; small cones.



## 23. BITTERNUT HICKORY

swamp hickory, water hickory, tightbark hickory

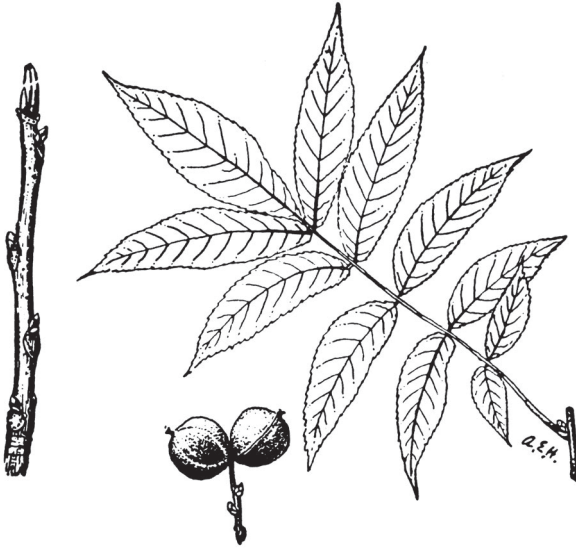
*Carya cordiformis* (Wangenheim) K. Koch

**Bitternut hickory** is occasional in most sections of the state except the higher Adirondacks or Catskills. It is by preference a bottomland tree growing on wet sites in pastures, fields, and along streams, though it is occasionally found on hillsides and ridgetops in small, moist depressions. It grows well on moist, rich soil such as that found in many farm

woodlots. The wood is heavy, very hard, strong, tough, and dark brown in color with paler sapwood. It is inferior to that of the other hickories but is used for practically the same purposes.

**Bark:** thin, close, with shallow furrows and narrow regular ridges, usually does not scale or shag off, light gray in color.

**Twigs:** slender, often yellowish in color, hairy toward end; grayish or orange-brown in color during first winter; pith brown and unlike any other hickory in this respect.



BITTERNUT HICKORY

Twig, one-half natural size; leaf, one-third natural size;  
fruit, one-half natural size

**Winter buds:** long, flattened, blunt-pointed, covered by 4 sulfur-colored scales; terminal bud from 1/3 to 3/4 inch long.

**Leaves:** alternate, compound, 6 to 10 inches long, with 7 to 11 long, narrow, sharp-pointed leaflets that are smaller and more slender than those of other hickories.

**Fruit:** a nearly round nut, thin-husked, brown in color, 3/4 to 1 inch long, without ridges. Kernel: bitter, not edible. Husk: clings to nut after falling. Shell is so thin that it easily can be crushed between fingers.

**Distinguishing features:** smooth bark and usually straight stem; sulfur-colored bud; 7 to 11 small leaflets.

## 24. PIGNUT HICKORY

pignut, brown hickory

*Carya glabra* (Miller) Sweet

**Pignut hickory** is a fair-sized upland species found mostly on dry ridges and hillsides throughout the state, except in the Adirondack region where it is found only at the lower elevations. The wood is strong and very tough. Its uses are similar to those of shagbark hickory.



PIGNUT HICKORY

Leaf and fruit, one-third natural size; twig, one-half natural size

**Bark:** typically close-fitting, dark gray in color, marked with shallow furrows and narrow ridges that are seldom shaggy, though sometimes becoming detached at end. Bark characteristics are quite variable.

**Twigs:** comparatively slender, smooth, tough, and pliable, reddish brown to gray in color.

**Winter buds:** small, oval, blunt-pointed, covered with reddish-brown scales, outer pair of which often drop off in winter; terminal bud less than 1/2 inch long, much smaller than terminal bud of shagbark hickory.

**Leaves:** alternate, compound, 8 to 12 inches long, with 5 to 7 leaflets, all nearly same size.

**Fruit:** pear-shaped to nearly round, thin-husked, buff-colored nut without ridges, 1 inch long, thick shelled. Kernel: at first sweet, later somewhat bitter. Husk: contrasted with shagbark hickory, all or part usually clings to nut after it has fallen to the ground.

**Distinguishing features:** 3 to 5 leaflets, all nearly same size; lacy design in bark; small terminal bud like that of rose.

## 25. SHAGBARK HICKORY

### scalybark hickory

*Carya ovata* (Miller) Koch

**Shagbark hickory** is the best known and most valuable of the hickories in this state. It is common in deep, moist soils throughout New York though rare in the higher Catskills and Adirondacks and is not reported from the pine barrens of Long Island. In the forest it



SHAGBARK HICKORY

Leaf, one-third natural size; twig, one-half natural size; fruit, one-third natural size

is a tall, straight-branched tree, but in open fields and along hedgerows where it often grows it usually forks near the ground into stout ascending limbs. The wood is very heavy, tough, elastic, close-grained, and is used chiefly for handles, vehicles, agricultural implements, and fuel. The fruit is important for wildlife.

**Bark:** light gray in color, smooth and seamy, becoming shaggy with age and peeling off into long strips that are loose at both ends and attached in middle, thus giving rise to the name "shagbark hickory."

**Twigs:** covered with numerous light dots, extremely tough and pliable, reddish brown to gray in color.

**Winter buds:** large, ovate, blunt-pointed, with papery, dark brown, loose bud scales; outer scales much darker, persistent through winter; terminal bud usually more than 1/2 inch long.

**Leaves:** alternate compound, 8 to 14 inches long, with 5 to 7 leaflets, 3 upper ones largest.

**Fruit:** smooth, white, 4-angled nut, enclosed in thick, round husk that splits into 4 sections as nut falls after heavy autumn frosts. Kernel: large, sweet.

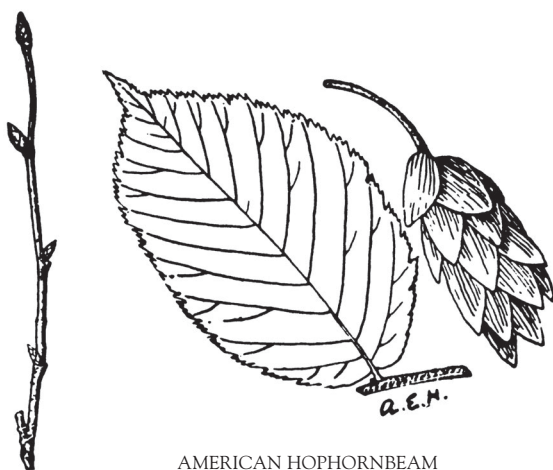
**Distinguishing features:** large terminal bud; 5 to 7 leaflets, outer 3 much larger; bark peeling in long plates.

## 26. AMERICAN HOPHORNBEAM

ironwood, eastern hophornbeam

*Ostrya virginiana* (Miller) Koch

**American hophornbeam** is closely related to the American hornbeam and is rather generally distributed throughout New York State on dry, gravelly, and stony soils of slopes and ridges, sometimes taking possession of woodlots in central New York to the exclusion



AMERICAN HOPHORNBEAM  
Twig, leaf, and fruit, one-half natural size

of other species. The tree is slow-growing and is rarely found larger than 10 inches in diameter. The wood is very heavy, hard, and strong, hence the name “ironwood.” It is used for tool and implement handles and for levers and makes excellent fuelwood when seasoned.

**Bark:** thin, very markedly flaky; light grayish brown in color, broken into narrow, flattish pieces, loose at ends.

**Twigs:** fine, reddish brown in color, smooth, and shiny; very easy winter character for identification of tree, particularly of young saplings.

**Winter buds:** terminal bud absent as in birches and elms; lateral buds small, light reddish brown in color, bending away from twig.

**Leaves:** alternate, simple ovate, 3 to 5 inches long, doubly and finely serrate on margin.

**Fruit:** small, seed-like nutlet, enclosed in inflated, sac-like bract. Bracts: in clusters 1 to 2 inches long, resembling hops, hence the name “hophornbeam.” Fruit usually falls before winter.

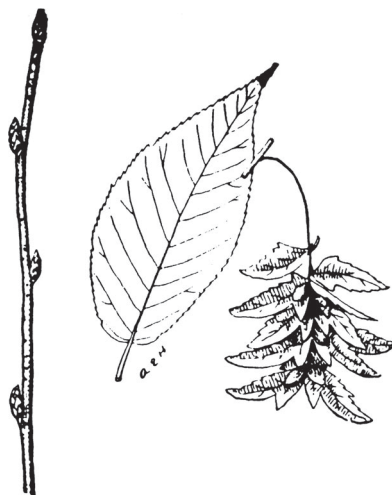
**Distinguishing features:** shreddy bark; shiny, reddish-brown twigs; papery fruit like a hop.

## 27. AMERICAN HORNBEAM

ironwood, blue-beech, water-beech

*Carpinus caroliniana* Walter

**American hornbeam** is a small-sized, bushy tree, found frequently along watercourses and the edges of swamps generally throughout the state. It is rarely more than 6 inches in diameter. The wood is very heavy, hard, strong, close-grained and is occasionally used for mallets on account of its hardness.



AMERICAN HORNBEAM  
Twig, leaf, and fruit, one-half natural size

**Bark:** smooth, thin, dark bluish gray in color, close-fitting, with smooth, rounded, length-wise ridges that resemble tensed muscles.

**Twigs:** very slender, dark red in color, shining.

**Winter buds:** terminal bud absent; lateral buds small, often angled in cross-section, narrowly ovate, pointed, covered with many reddish-brown scales.

**Leaves:** simple, alternate, ovate, 2 to 4 inches long, finely and doubly serrate on margin.

**Fruit:** a small prominently ribbed nutlet, 1/3 inch long, enclosed in 3-lobed leaf-like bract. Bracts with their enclosed nutlets are in long, drooping clusters that ripen and fall before winter.

**Distinguishing features:** “muscles” in bark; fruit a nutlet enclosed in 3-part “dress.”

## 28. AMERICAN LARCH

tamarack, hackmatack

*Larix laricina* (Du Roi) Koch

**American larch** is a forest tree of the swamps. In the mountainous sections of the state, it is frequently found well up the slopes but is confined to cold swamps in eastern, central, and western New York. The wood is very heavy, hard, and strong, light brown in color, and durable in contact with the soil. It is used for fence posts, telegraph poles, and railroad ties.

**Bark:** smooth, light gray in color on young trunks; with age becoming roughened with thin reddish-brown scales.

**Twigs:** slender, smooth, glossy brown in color, with short lateral wart-like branches.

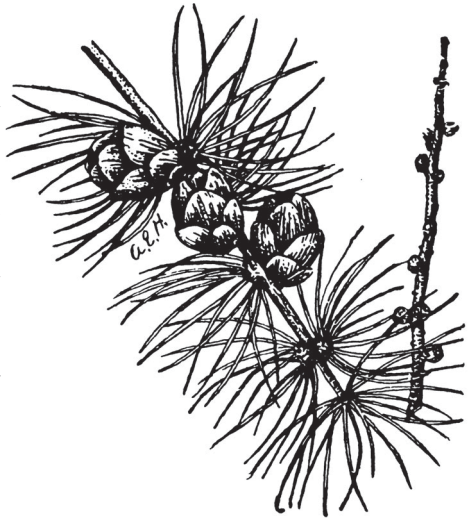
**Winter buds:** scattered along past season's twigs and at ends of short lateral branches, small, rounded, reddish brown in color, shining.

**Leaves:** borne singly on twigs of previous season's growth; on spurs of older twigs in clusters of 10 or more, flat, slender, pale green in color, about 1 inch long, falling off in autumn of first year.

**Fruit:** cone, 1/2 inch long, borne on short, curving stalks, maturing in autumn of first year, chestnut brown in color, standing upright from twigs, staying on tree for several years. Cone scales: concave in shape. Seeds: in pairs, winged, light brown in color, 1/8 inch long, ripening in early autumn.

**Distinguishing features:** many needles in cluster, dropping in autumn; small, stiff cone on incurved stalk.

28a. **European larch** (*Larix decidua* Miller), which is one of several species that are difficult to distinguish, has been planted for many years on lawns and more recently in forest plantations. It has infrequently naturalized. Its cones are 1 to 1 1/2 inches long, standing out from the twig. It grows on well-drained soils much more rapidly than the American larch.



AMERICAN LARCH  
Branchlet and cone, natural size

## 29. BLACK LOCUST

yellow locust, white locust

*Robinia pseudoacacia* Linnaeus

**Black locust** is not a native of New York but was a great favorite with early settlers as a dooryard tree from where it has escaped to form dense thickets along roadsides in many sections of the state. In favorable locations it spreads rapidly by means of root suckers. It grows with exceptional rapidity on well-drained fertile soils, and in such locations it seems better able to survive attacks of the locust borer, which have rendered the tree worthless in some areas. The wood is very strong, heavy, hard, and extremely durable in contact with the soil. As a post wood it has no equal and is also used for ties and fuelwood and, formerly, for insulator pins on pole lines.

**Bark:** rough even on young trunks, yellowish brown in color, becoming deeply furrowed into distinct, thick, rounded ridges that are not scaly.

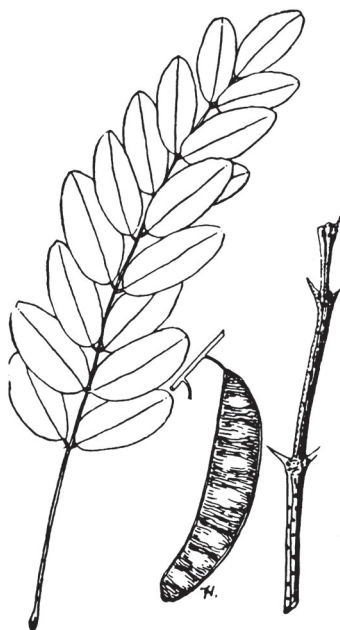
**Twigs:** slender, brittle, reddish to greenish brown in color; generally bearing short, stiff spines 1/4 to 1/2 inch long, in pairs at base (node) of leaves.

**Winter buds:** terminal bud absent; lateral buds very small, in a cavity below leaf scars, rusty brown in color, covered with down.

**Leaves:** alternate, compound, 8 to 14 inches long, with 7 to 19 entire leaflets arranged along central stem; leaflets usually odd in number, short-stalked, oval in shape, 1 1/2 to 2 inches long.

**Fruit:** a pod, flat, smooth, brown in color, 2 to 4 inches long, containing 4 to 8 small brown or black seeds, ripening in September. Pods: hang on into winter and are finally torn off by wind in halves with seeds attached; dried pod acts as sail to carry seed considerable distances.

**Distinguishing features:** compound leaves with oval leaflets; small, downy buds depressed in bark; short, stiff spines; papery pods.



BLACK LOCUST  
Leaf and fruit, one-third natural size;  
twig, two-thirds natural size

## 30. HONEY-LOCUST

### sweet-locust

*Gleditsia triacanthos* Linnaeus

**Honey-locust**, though native to western New York only, has been widely introduced as a hedge and ornamental tree and is hardy and scattered throughout the state except in the mountains. The wood is hard, strong, and coarse-grained but not as durable in contact with the soil as is the black locust. Its habit of growing in open rather than forest situations gives its wood a knotty character.



HONEY-LOCUST  
Leaf and fruit, one-fourth natural size;  
twig, three-fourths natural size

**Bark:** on young branches smooth, grayish brown in color, with age becoming roughened into firm, broad, blackish ridges with edges that curve outward.

**Twigs:** rather stout, smooth, glossy, zigzag; usually bearing stiff, sharp-branched thorns 3 to 4 inches long (lacking in most horticultural varieties), above leaf base (node).

**Winter buds:** terminal bud absent; lateral buds very small, not easily seen.

**Leaves:** alternate, simply or, more usually, doubly compound, 6 to 8 inches long; if singly compound, with 18 to 28 leaflets; leaflets usually even in number, elliptical, 1 1/2 to 2 inches long; if doubly compound, with 4 to 7 pairs of secondary leaf stems.

**Fruit:** flat pod, usually twisted, reddish brown in color, 10 to 18 inches long, 1 1/2 inches wide, 2 to 3 in each cluster, ripening in late autumn but staying on tree well into winter; each pod containing 10 to 20 brown oval seeds, 1/3 inch long. Fleshy part of pod is sweet, hence the name "honey-locust."

**Distinguishing features:** branched, stout thorns; usually doubly compound leaves, with elliptical leaflets; large, reddish-brown pod.



## THE MAPLES

Maples (*Acer* spp.) are an important group of forest trees in New York State. Sugar maple is the state tree, and maples provide syrup, valuable hardwood timber, wildlife foods, beautiful fall colors, lawn trees, and watershed protection.

Of the 16 or more maples east of the Rocky Mountains, 8 are found with moderate to high frequency in some parts of the state. These include sugar maple (*Acer saccharum*), red maple (*Acer rubrum*), silver maple (*Acer saccharinum*), striped maple (*Acer pensylvanicum*), Norway maple (*Acer platanoides*), box-elder (*Acer negundo*), mountain maple (*Acer spicatum*), and black maple (*Acer nigrum*). Only the first three will be described in this list. Other maples in the state that are less common and typically escaped from horticultural plantings include hedge maple (*Acer campestre*), Amur maple (*Acer ginnala*), Japanese maple (*Acer palmatum*), and sycamore maple (*Acer pseudoplatanus*).

Maples as a group are readily distinguishable from other trees by their opposite arrangement of buds, leaves, and twigs, together with the characteristically shaped simple maple leaf (box-elder is the only exception, having compound leaves). The fruit of the maple group is also distinctive. Without exception the fruit are winged seeds, borne in pairs and clusters of pairs, and commonly called samaras.

**Striped maple** is an increasingly abundant species in the maturing and shady forests of the state. It thrives in shade and is restricted to the subcanopy. Striped maple reproduces easily and sometimes forms a dense understory that inhibits the reproduction of other species. This species is distinguished by bright green bark with white stripes, large goose foot-shaped leaves, and its samaras with wide-reaching wings.

**Norway maple** has been widely planted in residential areas, now overplanted, and is considered an invasive weed in some of the many areas of the state where it has naturalized. There are many other more appropriate species that should be considered for ornamental planting. Norway maple is recognized by large, blunt terminal buds, interlacing and often spiraling black bark ridges, and a broad leaf on a long stalk. The leaf stalk has a milky sap when broken. The species was removed from some sections of New York City and Long Island during an infestation of the Asian longhorned beetle (*Anoplophora glabripennis* Motschulsky), an exotic insect that feeds on and reproduces in Norway maple, other maples, and a variety of other hardwoods.

**Box-elder** is a medium-sized tree found in moist locations at lower elevations, occasionally common, and its greatest value is stream bank stabilization and shading of streams. It is one of a few maple species with a compound leaf. It has no commercial value, and its weak wood makes it unsuitable for residential areas.

**Mountain maple** is recognized by the downy hairs on current-year twigs and buds and by its small size. Common only to moist ravines, steep slopes, and higher elevations, it has no commercial value but is a pleasant tree to encounter when hiking.

**Black maple** is similar to sugar maple and often considered only a variety of sugar maple. Black maple is distinguished with difficulty from sugar maple by its drooping leaf edges and tips, hairy lower surface of the leaves, and orange-brown dull twigs. Black maple's fall color is typically yellow compared to the brilliant orange to amber of sugar maple.

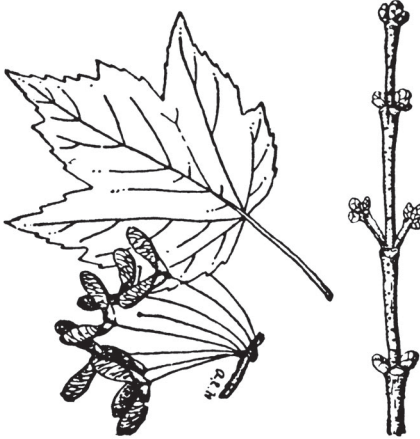
The other maples that occur in New York State are seldom encountered in the woods but may be found near residential areas where seeds from planted specimens have become established.

## 31. RED MAPLE

swamp maple, soft maple

*Acer rubrum* Linnaeus

**Red maple** derives its name from its brilliant autumn foliage. Though it is common in swamps all over the state, it is also abundant on moist slopes and increasingly common in partially cut woodlots. It is an extremely rapid-growing tree, furnishing a fairly strong, close-grained wood that is extensively used for cheap furniture, in the manufacture of baskets and crates, for mine props, railroad ties, and fuelwood.



RED MAPLE

Twig, one-half natural size; leaf and fruit, one-third natural size

**Bark:** on young trunks smooth, light gray in color, often resembling beech; with age becoming darker and roughened into long ridges, often shaggy or scaly on surface; bark character extremely variable on different trees in same stand.

**Twigs:** rather slender, bright or dark red in color, without odor when cut or broken.

**Winter buds:** broad, blunt-pointed, clustered, short stalk, red in color; terminal bud slightly larger than lateral buds; numerous large, plump flower buds along twig.

**Leaves:** simple, opposite, from 3 to 4 inches long, fully as wide, usually 3-lobed; clefts between lobes shallow and sharp angled as contrasted with deep clefts of silver maple; margins of leaf lobes coarsely serrate; at maturity leaves light green in color above, pale greenish-white below.

**Fruit:** samaras, in clusters on long stalks, ripening in May or early June. Seeds: joined more or less end on end. Wings: diverge at wide angles.

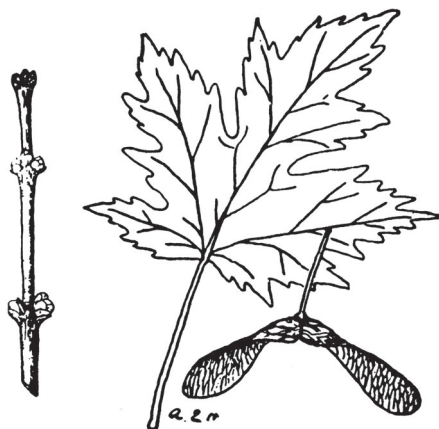
**Distinguishing features:** red buds and twigs, sharp angle between leaf lobes; leaf margin with teeth.

## 32. SILVER MAPLE

### white maple

*Acer saccharinum* Linnaeus

**Silver maple** is generally distributed throughout the state but is not nearly as common as red maple. It prefers the same general moist soil conditions, and the wood is used for the same purposes as the red maple with which it is included under the term “soft maple” by lumbermen. Silver maple is frequently planted as a shade tree owing to its rapid growth, but because of its weak wood it shouldn't be planted near homes or cars.



SILVER MAPLE  
Twig, one-half natural size; leaf and fruit, one-third natural size

**Bark:** on young trunks smooth, gray in color with reddish tinge; with age becoming reddish brown in color, more or less furrowed, surface separating in long, thin flakes that become free at ends and flake off.

**Twigs:** similar to red maple but has distinctly rank odor when broken or crushed.

**Winter buds:** similar to red maple but larger, usually very dense clusters of lateral buds.

**Leaves:** simple, opposite, 3 to 5 inches long, fully as wide, 5-lobed; margins of lobes coarsely serrate; clefts between lobes, particularly middle two, very deep; at maturity leaves pale green in color above and silvery white below, hence the name “silver maple.”

**Fruit:** samaras, much larger than in red maple though maturing at about same time in spring. Wings: more widely divergent than those of red maple. Sometimes only one side of samara develops.

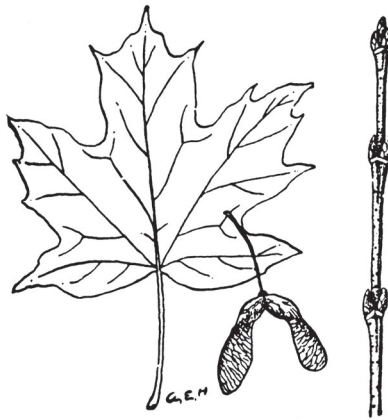
**Distinguishing features:** silvery bark on upper limbs; deeply cut clefts between coarse-toothed lobes; rank odor from crushed twig; large-winged samaras.

### 33. SUGAR MAPLE

hard maple, rock maple

*Acer saccharum* Marshall

**Sugar maple**, the official state tree of New York, is a magnificent forest tree abundant everywhere in the state outside of Long Island. Besides providing beautiful borders to many miles of highway and hundreds of thousands of gallons of maple syrup from the many thousands of sugar bushes in all parts of the state, it yields a wood of high grade. It is hard, strong, close-grained, and tough, with a fine, satiny surface, and is in great



SUGAR MAPLE  
Leaf, one-third natural size; fruit and twig, one-half natural size

demand for flooring, veneer, interior finish, furniture, shoe lasts, rollers, and as a fuelwood of the best quality.

**Bark:** on young trees dark gray in color, close, smooth, and firm, becoming furrowed into long, irregular plates lifting along one edge.

**Twigs:** slender, shining, color of maple sugar.

**Winter buds:** very narrow, sharp-pointed, brown in color, terminal buds much larger than laterals.

**Leaves:** simple, opposite, 3 to 5 inches long and fully as wide, 3 to 5 shallow lobes with wide-spaced coarse teeth, dark green in color above, paler below; clefts rounded at base.

**Fruit:** samaras, in short clusters, ripening in September. Seeds: join each other in straight line. Wings: turn down almost at right angles.

**Distinguishing features:** rounded cleft between lobes of leaves; leaf lobes lacking small teeth; sharp-pointed, brown buds; brown twig.

## THE OAKS

Of the 300 oaks known in the world, 55 are native to North America, and most of these are in the eastern United States. The oaks make up the largest group of forest trees native to New York. Sixteen species of oaks are native to this state. They grow under a wide range of conditions and show wide variations in form and other distinguishing characteristics. The oaks of New York do not thrive in the high forests of the mountains; therefore, representatives of the family found in the Adirondack section are in the sheltered valleys of the foothills. South and westward in the drainages of the Susquehanna, Genesee, and Alleghany Rivers, they become plentiful in variety and number.

The best way to become acquainted with New York oaks is to divide them into two major groups, the one comprising the white oaks and the other the black oaks. It is easy to place the oaks of New York in these two groups by remembering the following characteristics of each:

**The white oaks:** The leaves have rounded lobes (not bristle-tipped), and the kernels of the acorns are usually sweet. All the oaks of this group mature their acorns in a single season; for this reason they are sometimes called “annual oaks.” The most important members of the group in New York are **white oak, swamp white oak, bur oak, post oak, and chestnut oak.**

**The black oaks:** The leaves are bristle-tipped (not round-lobed), and the kernels of the acorns are usually bitter. All the oaks in this group require two seasons to mature their acorns; for this reason they are sometimes called “biennial oaks,” which means two-year oaks in contrast with the one-year white oaks. The immature acorns are very helpful in recognizing the members of the black-oak group, especially during the winter months when the trees are without leaves. The most important members of this group in New York are **black oak, red oak, scarlet oak, and pin oak.**

## 34. BLACK OAK

### yellow oak

*Quercus velutina* Lambert

**Black oak** is another dominant forest tree of the southern part of the state, though not as valuable or fast growing as northern red oak. It is usually found in gravelly soils and on drier sites than red oak. The wood is hard, heavy, and strong but is not considered as valuable as red oak. It is used chiefly for ties, construction, and fuelwood.

**Bark:** on young stems smooth, dark brown in color, soon becoming dark gray to black, very rough, broken by deep furrows into thick ridges that are further divided by cross furrows; roughened especially at base of trunk even in quite young trees; inner bark orange yellow in color, rich in tannin, yields yellow dye.

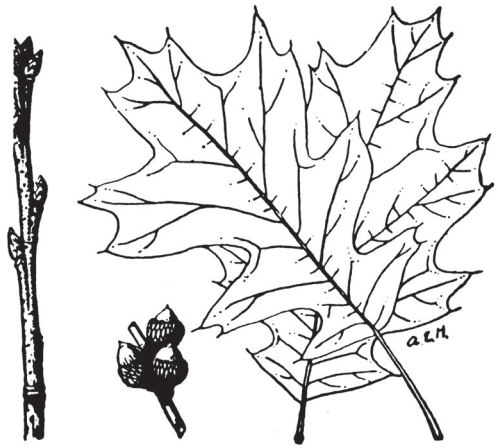
**Twigs:** stout, reddish brown in color mottled with gray.

**Winter buds:** cone-shaped, sharp-pointed, 1/4 to 1/2 inch long, covered with yellowish-gray wool, clustered at end of twig.

**Leaves:** simple, alternate, 4 to 10 inches long and 3 to 6 inches wide, with 5 to 7 lobes, toothed, bristle-tipped, separated by wide, rounded clefts, extending over halfway to midrib; at maturity leaves thick, dark green in color and shining above, paler and woolly beneath (particularly along midrib).

**Fruit:** acorn, borne singly or in pairs, with or without stalks, maturing in autumn of second year. Nut: reddish brown in color, 1/2 to 3/4 inch long, enclosed about 1/2 its length in light brown cup. Meat: yellow, very bitter.

**Distinguishing features:** orange-yellow inner bark; leaf unbalanced, heavier on outer end, woolly along midrib beneath; acorn small, half enclosed in cup. Lower branches usually remain below half height of tree.



BLACK OAK  
Leaf, one-third natural size; twig and fruit,  
one-half natural size

## 35. CHESTNUT OAK

### rock oak

*Quercus montana* Willdenow

**Chestnut oak** is named for its chestnut-like leaves. It is found principally on dry, rocky ridges and hillsides and is very common on such soils in the lower Hudson Valley. The wood is similar though somewhat inferior to white oak and is used generally for ties, posts, and rough construction. The lumber is too hard for interior finish.

**Bark:** on young branches smooth, thin, yellowish brown in color; with age becoming dark brown to black in color, deeply furrowed into long, more or less continuous thick, rough ridges that are sharp and angular. At bottom of furrow, bark may be reddish brown in color. The thick bark of mature trees is an important source of tannin.

**Twigs:** stout, light orange or reddish brown in color.

**Winter buds:** clustered at ends of twigs, sharp-pointed, light yellowish brown in color, 1/4 inch long.

**Leaves:** simple, alternate, thick, yellowish green in color above, somewhat paler beneath, 5 to 9 inches long, coarsely toothed as in chestnut, but teeth rounded and without bristle tips.

**Fruit:** acorn, borne singly or in pairs on short stalks, maturing in September of first season, starts sprouting soon after falling; one of our largest native acorns. Nut: shiny, light chestnut brown in color, 1 to 1 1/2 inches long, 1/3 enclosed in cup. Meat: white, somewhat bitter.

**Distinguishing features:** orange streak between ridges of bark; round teeth or scallops on leaf margin; long, slim acorn.



CHESTNUT OAK  
Leaf, twig, and fruit, one-third natural size

## 36. NORTHERN RED OAK

*Quercus rubra* Linnaeus

**Northern red oak** is the fastest-growing and largest of all the oaks native to New York State. It shows adaptability to a wide variety of soil conditions and ranges farther north than any other oak common to the state. The wood is heavy, hard, strong, light reddish brown in color, and is used for furniture, interior finish, ties, piling, ships, and general construction, though it is less durable than white oak.



NORTHERN RED OAK  
Leaf, one-third natural size; twig and fruit,  
one-half natural size

**Bark:** on young trees smooth, gray green in color; with age tardily breaking into rather regular, firm, elongated, flat-topped ridges with shallow furrows between. Smooth ridge tops markedly lighter in color than furrows. On very large trees, this characteristic is lost at base but is evident higher up trunk. Inner bark red in color.

**Twigs:** stout or slender, reddish to greenish brown in color.

**Winter buds:** clustered at ends of twigs, oval, sharp-pointed, 1/4 inch long, generally smooth (particularly on lower half).

**Leaves:** alternate; simple, 5 to 9 inches long, 4 to 6 inches wide, with 7 to 9 lobes; lobes sparsely toothed, bristle-tipped; wide rounding clefts extending halfway to midrib. At maturity thin, dark, shiny green in color above, paler and smooth below.

**Fruit:** an acorn, borne solitary or in pairs, either with or without stalk, maturing in autumn of second year; one of our largest acorns. Nut: chestnut brown in color, 3/4 inch long, only 1/5 enclosed in wide, shallow cup. Meat: pale yellow in color, bitter.

**Distinguishing features:** reddish inner bark; leaf balanced (no heavier at outer than inner end); large fat acorn with flat cup. In thick woods, lower branches usually are self-pruned to more than half height of tree.



## 37. SCARLET OAK

*Quercus coccinea* Muenchhausen

**Scarlet oak**, so called from its brilliant-colored autumn foliage, is most commonly found on poor soils. The wood is hard, heavy, strong, and coarse in texture. It is of inferior commercial value except in props, ties, and fuel. Because of the characteristic habit and brilliant autumn coloring it is often used for ornamental purposes.

**Bark:** on young trunks, smooth, light brown in color; with age dividing into irregular ridges with shallow furrows between; in general, ridges not as regularly flat-topped as in northern red oak or as roughly broken up as in black oak; inner bark reddish in color.

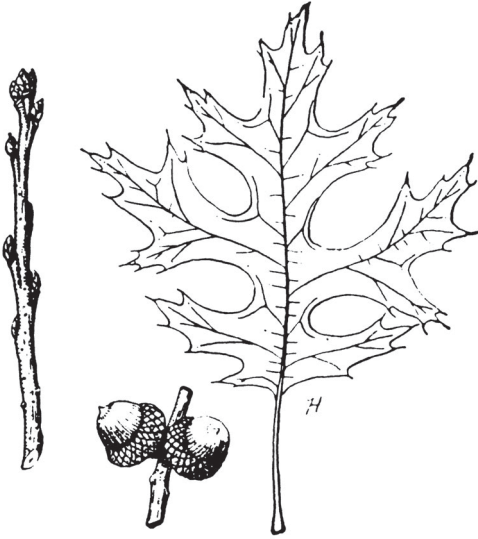
**Twigs:** medium stout to slender, light red in color.

**Winter buds:** broadly oval, blunt at top, clustered at end of twig, dark reddish brown in color, somewhat woolly.

**Leaves:** simple, alternate, 3 to 6 inches long and 3 to 5 inches wide, with 5 to 9 lobes; lobes toothed, separated by wide, rounding clefts, extending well over halfway to midrib; at maturity leaves thin, firm, shiny, dark green in color above, paler below.

**Fruit:** acorn, borne singly or in pairs, with or without stalks, maturing in autumn of second year. Nut: oval, reddish brown in color, 1/2 to 1 inch long, 1/2 to 1/3 enclosed in reddish-brown cup. Meat: pale yellow, bitter.

**Distinguishing features:** clefts between lobes of leaves extending nearly to midrib; lower branches persistent for many years, down curving.

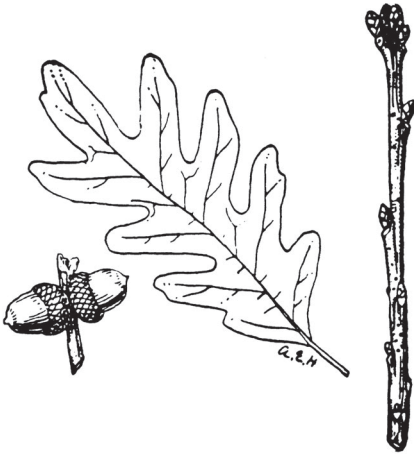


SCARLET OAK  
Leaf, one-third natural size; twig and fruit,  
one-half natural size

## 38. WHITE OAK

*Quercus alba* Linnaeus

**White oak** is an important forest tree in the southern two-thirds of the state, growing to large size and producing lumber of high grade and value. It is found in moist as well as dry locations and was once particularly abundant on what are now the best farmlands of the Genesee Valley. The wood is hard, heavy, strong, and durable. It is highly prized for furniture, flooring, implements, ties, and in general construction where strength is required, especially in piling and ships. White oak acorns are an important food for wildlife.



WHITE OAK

Leaf and fruit, one-third natural size; twig,  
one-half natural size

**Bark:** ashy gray in color, broken by shallow furrows into long, irregular, thin scales that readily flake off; on old trunks furrows frequently become deep.

**Twigs:** medium in thickness, greenish red to gray in color, smooth, sometimes covered with a bloom.

**Winter buds:** clustered at end of twigs, blunt, reddish brown in color, 1/8 inch long.

**Leaves:** alternate, simple, 5 to 9 inches long, with 5 to 9 rounded lobes, generally deeply cleft toward midrib, dark green in color above, paler below, frequently staying on tree over winter.

**Fruit:** acorn, either with short stalk or stalkless, maturing in one year. Nut: light brown in color, 3/4 inch long, 1/4 enclosed in cup, falling in September, frequently starts sprouting in late autumn. Meat: white, slightly bitter.

**Distinguishing features:** ashy gray, flaky bark; deeply cleft lobes in leaves; acorn 1/4 enclosed in cup.

38a. **Swamp white oak** (*Quercus bicolor* Willdenow) is a tree of the moist bottomlands with leaves wider at outer ends and rounded teeth. The bark on young branches and twigs separates into curling scales. The acorn cups are long-stalked and deeply saucer-shaped. The wood has the same uses as that of white oak, and its acorns are also important for wildlife.

## 39. EASTERN WHITE PINE

*Pinus strobus* Linnaeus

**Eastern white pine** is one of the most widely distributed, beautiful, and useful forest trees native to New York. It grows naturally in a wide range of sites, from the steep mountainsides in the Adirondacks to the hillsides and valley swamps of central and western New York. The miles of stump fences still standing in the southwestern section of the state are evidence of the abundance of the tree at one time in this region. The wood is soft, even-textured, very light brown in color, and easily worked. The lumber has a wide range of

uses for interior trim, sash and doors, boxes, and buckets. In fact, no other wood in the United States has such a wide range of uses.

**Bark:** thin, smooth, and greenish in color on young trees, becoming deeply furrowed and grayish brown in color on older trees.

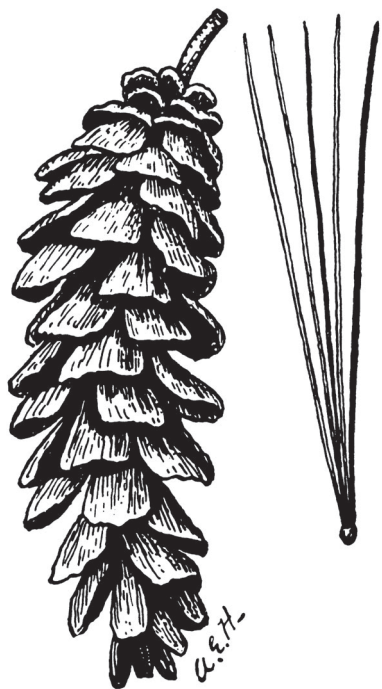
**Twigs:** rather slender, brittle, light brown in color.

**Winter buds:** sharp-pointed, yellowish brown in color.

**Leaves:** needle-like, in clusters of 5, 3 to 5 inches long, bluish green in color, soft, flexible, staying on twigs for 2 years.

**Fruit:** cone, 5 to 10 inches long, with short stalks, drooping, cylindrical, 1/2 inch in diameter, tending to curve from stem to apex, requiring 2 years to mature. Seeds: 2 under each scale, winged, ripening in September.

**Distinguishing features:** needles in clusters of 5; long, limber cone.



EASTERN WHITE PINE

Cone, one-half natural size; needles, natural size

## 40. PITCH PINE

hard pine, yellow pine

*Pinus rigida* Miller

**Pitch pine** is found on dry ridges and slopes in the northeastern section of the state and on Long Island and infrequently elsewhere. The wood is coarse-grained and brownish red in color. The tree seldom reaches a large size and the lumber is generally knotty. Its chief uses are for rough framing lumber, ties, mine props, and crates.

**Bark:** early becomes very rough and reddish brown to very dark brown in color; with age becoming deeply furrowed into broad, flat-topped ridges separating on surface into loose, dark reddish-brown scales. Unusual thickness of bark makes it New York's most fire-resistant tree. Clusters of needles very commonly found on main trunk.

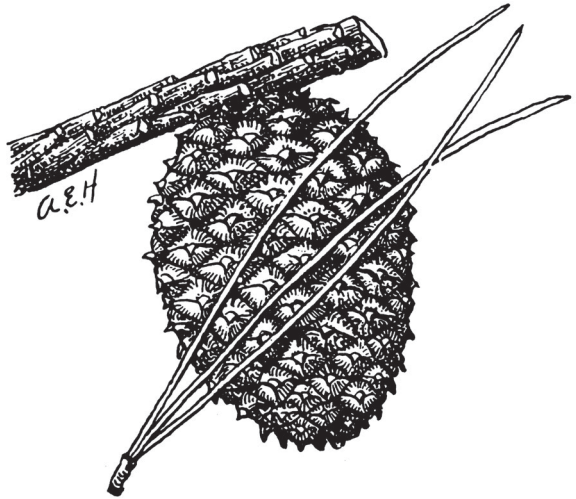
**Twigs:** coarse, brittle, golden-brown in color.

**Winter buds:** conspicuous, pointed, reddish brown in color, resin-coated.

**Leaves:** needle-like, in clusters of 3, 3 to 5 inches long, yellowish green in color, very stiff, staying on twigs 2 to 3 years.

**Fruit:** cone, 2 to 3 inches long, somewhat egg-shaped, without stem, requiring 2 years to mature; persists on tree for many years. Cone scales: each carries stiff recurved prickles. Seeds: 2 under each scale, dark brown in color, ripening in September.

**Distinguishing features:** needles in 3s; sharp prickles on tip of cone scale.



PITCH PINE  
Cone and needles, natural size

## 41. RED PINE

### Norway pine

*Pinus resinosa* Aiton

**Red pine** is a valuable, fast-growing timber tree that is less generally distributed than eastern white pine. It is found commonly on the sandy soils adjacent to the Adirondacks and frequently on dry benches in west-central New York. The wood is light, medium in texture, close-grained, pale red in color, and is often sold as white-pine lumber. Because

of its rapid growth and relative freedom from insects and diseases, it has been commonly planted on many of the thousands of acres of idle land in the state. This species does not grow well on poorly drained soils.

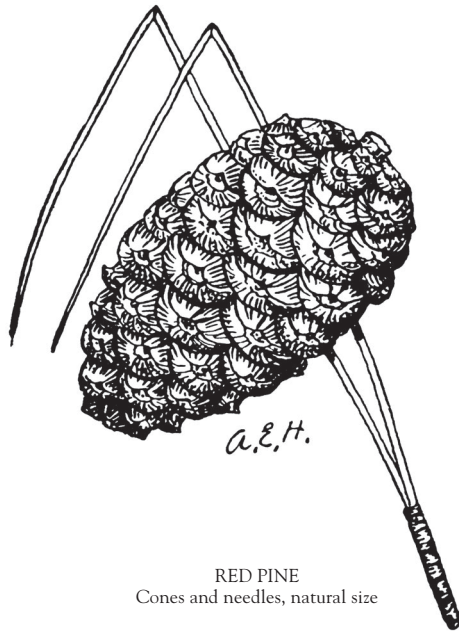
**Bark:** reddish brown in color, with shallow, flat ridges separating into thin, flaky scales.

**Twigs:** coarse, reddish brown in color, roughened at base of year's growth.

**Winter buds:** rather inconspicuous, with pointed reddish-brown scales.

**Leaves:** needle-like, in clusters of 2; 3 to 6 inches long, dark green in color, slender, remaining on twigs 3 to 4 years.

**Fruit:** cone, 2 inches long, without stem, requiring 2 years to mature, light brown in color when ripe, staying on tree into next season. Cone



RED PINE  
Cones and needles, natural size

scales: without spines or prickles. Seeds: 2 under each scale, winged, light chestnut brown in color, 1/8 inch long, ripening in September.

**Distinguishing features:** needles in 2s, breaking cleanly when bent; nearly round cone without prickles.

41a. **Scotch pine** (*Pinus sylvestris* Linnaeus) from Europe has been planted extensively throughout the state. It has naturalized from many of these plantings and is found in a variety of habitats. Its blue-green, twisted flat needles in clusters of 2, tapering cone 2 to 3 inches long with greenish scales, and the orange-brown bark on upper stem and branches are its main characters. It is used for pulpwood, framing lumber, ties, and Christmas trees.

## 42. EASTERN REDCEDAR

*Juniperus virginiana* Linnaeus

**Eastern redcedar**, a small-sized, slow-growing forest tree, is common to the poor, dry soils of the lower Hudson and Mohawk Valleys, is not common in the higher Adirondack region, and is infrequent in central and western New York, except on barren soils adjoining the Finger Lakes. It is found growing only in open woods and pastures where plenty of sunlight is obtained. The wood is soft, light, fragrant, brittle, dull red in color with contrasting white sapwood, extremely durable in contact with the soil, and easily worked. It is largely used in the manufacture of pencils, cedar chests, cabinet work, and interior finish. As a post wood, it has few superiors.

**Bark:** light reddish brown in color, separating in long, narrow, shreddy strips fringed along edges.

**Twigs:** generally 4-sided on mature trees, green in color from covering of minute leaves, not flattened or arranged in fan-shaped clusters, becoming reddish brown in color after fall of leaves.

**Winter buds:** minute, covered by overlapping scale-like leaves.

**Leaves:** various shades of green to reddish brown in color, persistent 3 to 4 years, of 2 kinds: (1) scale-like, closely overlapping, opposite in pairs, making twig appear 4-sided; (2) awl-shaped, 1/2 to 3/4 inch long, usually on young trees or more vigorous shoots and yellowish green to light bluish green in color, sharp-pointed.

**Fruit:** berry-like cone, 1/4 inch in diameter, light blue in color, with bloom at maturity in the autumn of first year. Fruit remains on tree during winter, highly prized by birds. Seeds: 1 to 2, wingless, brown in color, covered with thin, sweet flesh that has resinous flavor.

**Distinguishing features:** berry-like fruit; 2 kinds of leaves, sharp and awl-like and flat and scale-like.



EASTERN REDCEDAR  
Natural size

## 43. SASSAFRAS

*Sassafras albidum* (Nuttall) Nees

**Sassafras** is a small to medium-sized, shade-intolerant tree, best known, perhaps, for its bark and root, which have long been used for making sassafras tea. It is rare or absent in the higher Adirondacks and Catskills but is locally common on the sandy soil between these mountain ranges and is abundant on the hills along the lower Hudson River Valley



SASSAFRAS

Twig, one-half natural size; leaf, and fruit one-third natural size

and on Long Island. Its wood is soft, weak, brittle, coarse-grained, aromatic, and very durable in contact with the soil. It is used locally for fence posts.

**Bark:** reddish brown in color, deeply furrowed even in young trees, with flat-topped ridges crossed by horizontal cracks; inner layers bright cinnamon red in color.

**Twigs:** slender, brittle, spicy to smell, at first light yellowish green in color, later becoming reddish brown.

**Winter buds:** terminal bud present, 1/3 to 3/5 inch long, pointed, greenish in color; lateral buds much smaller.

**Leaves:** alternate, simple, 4 to 6 inches long, entire margined, varying greatly in shape on same tree, some ovate, others mitten-shaped (both left and right handed), still others 3-lobed, more rarely 5-lobed.

**Fruit:** berry-like, small, dark blue in color, containing a stony seed 1/4 inch long, on a stout red stem, usually in clusters; ripens early in autumn.

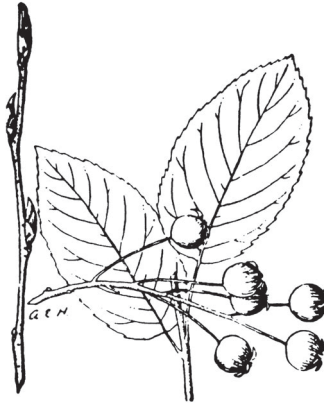
**Distinguishing features:** leaves with 3 different shapes; inner bark cinnamon red; spicy smell of twigs.

## 44. SHADBUSH

juneberry, serviceberry

*Amelanchier canadensis* (Linnaeus) Medikus

**Shadbush** is an attractive tree though not of value for timber because of its small size. In the spring when the shad are ascending the rivers, its small white flowers are commonly noticed along the drier banks of the streams, along fencerows, and on hillsides in open woods. It is common throughout most parts of the state, particularly in the central and



SHADBUSH

Twig, leaf, and fruit, one-half natural size

southern highlands. Its wood is heavy, harder than white oak, strong, close-grained, and dark brown in color often tinged with red. It is occasionally used for tool handles and is highest of all native woods in heat value.

**Bark:** very smooth, grayish brown in color, with age often marked with dark lengthwise streaks.

**Twigs:** slender, somewhat zigzag, olive green to purplish brown in color, smooth, but usually covered by thin grayish outer layer.

**Winter buds:** terminal bud 1/4 to 1/2 inch long, slender, sharp-pointed, greenish or purplish brown in color; lateral buds somewhat smaller than terminal bud or undeveloped.

**Leaves:** alternate, simple, ovate, 2 to 4 inches long, sharp-pointed, finely serrate on margin.

**Fruit:** a berry, sweet, reddish purple in color, about 1/3 inch in diameter, contains many seeds; borne in clusters; ripening in June or July; a favorite food for birds.

**Distinguishing features:** gray bark marked with streaks; finely serrate leaves; cluster of edible red berries.



## 45. RED SPRUCE

*Picea rubens* Sargent

**Red spruce** is a common and valuable forest tree of the Adirondacks and Catskills and occasionally is found at high elevations (2,000 feet) in eastern New York (Schoharie, Delaware, and Otsego Counties). The wood is light, close-grained, soft, and in great demand for chemical wood pulp. It has a peculiar resonant quality that makes it exceedingly valuable for the sounding boards of musical instruments. It is used also for framing.



RED SPRUCE  
Branchlet and cone, one-half natural size

**Bark:** very thin, peeling off in small reddish-brown scales.

**Twigs:** slender, reddish brown in color, usually coated with fine, pale hairs.

**Winter buds:** small, pointed, reddish brown in color.

**Leaves:** needle-like, borne singly rather than in clusters as with pines, but coming out all around stem, 1/2 inch long, without stalk, yellowish green in color, blunt-pointed, 4-sided in cross-section, remaining on twigs 5 to 6 years.

**Fruit:** a cone, 1 1/2 to 2 inches long, dark brown when ripe, borne on short stalk, pendant, maturing in one year, mostly falling off before next season. Cone scales: thin, entire-margined. Seeds: dark brown in color, winged, 1/8 inch long, ripening in September.

**Distinguishing features:** lack of rank odor from crushed needles; cone dark brown and falling early from tree.

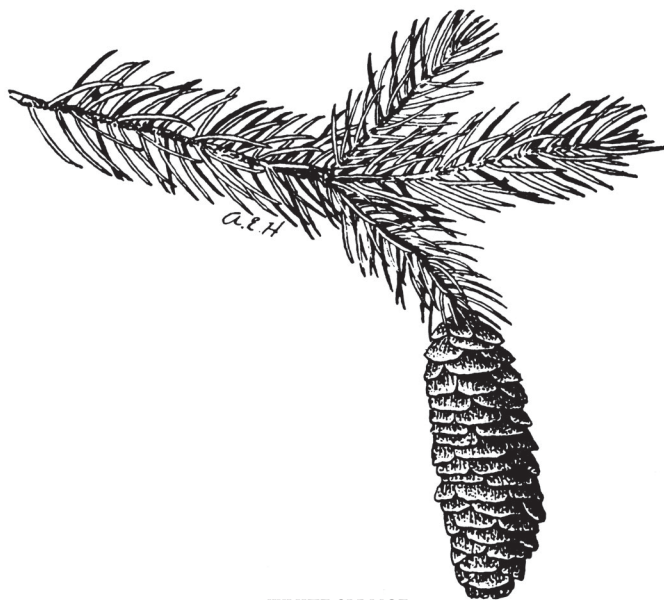
45a. **Black spruce** (*Picea mariana* (Miller) BSP) closely resembles red spruce and covers the same general range but is largely confined to swamps. It is used for pulpwood. The cones, unlike red spruce, remain on the tree for 2 or 3 years.

## 46. WHITE SPRUCE

### cat spruce

*Picea glauca* (Moench) Voss

**White spruce** is confined in its natural distribution to the Adirondacks, reaching its best development in the so-called "spruce flats" but extending also far up the mountain slopes. The wood is in great demand for chemical pulp. Its attractive foliage makes it prized as an ornamental tree, for which purpose it is planted far south of its natural range. It is also planted for Christmas trees.



WHITE SPRUCE  
Branchlet and cone, natural size

**Bark:** grayish to pale reddish brown, separating in thin scales.

**Twigs:** smooth, slender, yellowish brown in color.

**Winter buds:** small, blunt-pointed, light brown in color.

**Leaves:** needle-like, borne singly and densely crowded on twigs, light shiny green in color when young, becoming blue-green, 1/2 inch long, 4-sided in cross-section, without stalk, remaining on twig from 8 to 10 years. Odor: strong and rank when crushed.

**Fruit:** cone with very small stalk,

pendant, 1 1/2 to 2 1/2 inches long, pale brown in color when ripe, maturing in one year. Cone scales: thin, rounded, papery, entire margined. Seeds: 2 under each scale, brown in color, winged, 1/8 inch long, ripening in September.

**Distinguishing features:** papery cone scales; rank odor from crushed needles.

46a. The **Norway spruce** (*Picea abies* (Linnaeus) Karsten) from Europe, the common ornamental spruce of lawns and cemeteries throughout the state, also is used extensively in forest plantations. It has naturalized and is sometimes considered a troublesome weedy species. The cones, more than 6 inches in length, easily distinguish it from our native spruces.

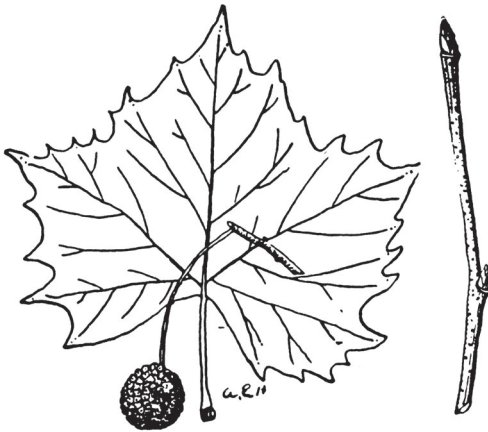
## 47. SYCAMORE

buttonball, buttonwood, plane tree

*Platanus occidentalis* Linnaeus

**Sycamore** is a large-sized forest tree that is common throughout the state except in the Adirondacks and higher Catskills and on Long Island. This species is most often found wherever the soil is moist and fertile, along streams, on river bottoms, in low, damp woods, and occasionally in drier places. Its wood is heavy, tough, hard, not strong, coarse-grained, reddish brown in color, and difficult to split or work. It is used for crates, tobacco boxes,

butchers' blocks, novelties, and occasionally for furniture and interior woodwork.



SYCAMORE  
Leaf, one-third natural size; twig and fruit,  
one-half natural size

**Bark:** dark brown in color at base of older trunks, shallowly furrowed into broad ridges that are broken up into small plate-like scales; higher up on trunk and branches, peeling off in large, thin plates exposing areas of whitish, yellowish, or greenish inner bark that are very striking in winter.

**Twigs:** rather stout, somewhat shiny, zigzag, at first green in color and fuzzy, later grayish or brownish and smooth.

**Winter buds:** terminal bud absent; lateral buds conical, dull-pointed, smooth, reddish brown in color, 1/4 inch long, only 1 scale visible, forming cap over bud.

**Leaves:** alternate, simple, broad, from 4 to 10 inches across, with 3 to 5 shallow lobes, thin, firm, smooth, bright green in color above, pale green and white woolly below, base of the stalk surrounding bud.

**Fruit:** ball, brown in color, about 1 inch in diameter, borne on long stem, made up of tiny seeds. Seeds: each furnished with long tuft of hairs; seed balls seldom break up before spring.

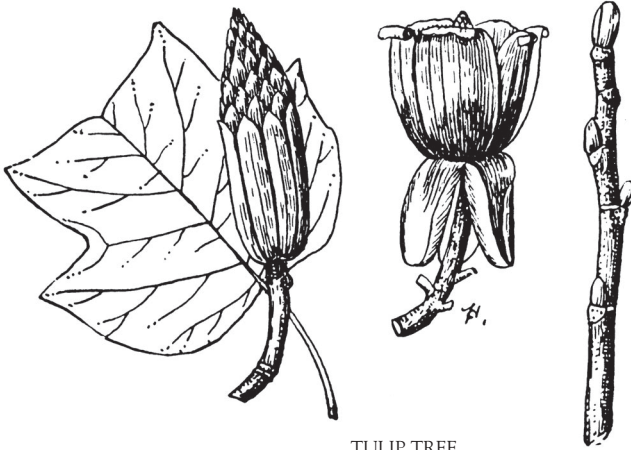
**Distinguishing features:** whitish to greenish under-bark on upper trunk and limbs; bud with 1 scale forming cap; broad leaves, woolly below; fruit a brown, pebbly grained ball.

## 48. TULIP TREE

yellow-poplar, tulip-poplar, whitewood

*Liriodendron tulipifera* Linnaeus

**Tulip tree** is one of our most distinctive and attractive trees. It is native from Saratoga and Rensselaer Counties westward along Lake Ontario to Lake Erie and becomes more abundant southward in deep, rich, moist soils. It is named for its large, tulip-like, greenish-yellow flowers. The wood is light, soft, brittle, not strong, straight-grained, light yel-



TULIP TREE

Flower, fruit, and leaf, one-half natural size; twig, two-thirds natural size

low or brown in color. It is largely made into lumber and interior finish and used where a soft, easily worked wood is required. Veneer of yellow-poplar is highly prized in airplane construction.

**Bark:** on young trees, smooth, ashy gray or brown in color; on older trunks, light gray to brown, thick, distinctly and regularly furrowed and ridged.

**Twigs:** smooth, shiny, rather stout, reddish brown in color, often branching first year, aromatic odor, very bitter taste.

**Winter buds:** terminal bud smooth, flattened, about 1/4 inch long, simple, blunt, covered by 2 reddish-brown bud scales giving appearance of a mitten; lateral buds similar but much smaller.

**Leaves:** alternate, simple, 4 to 6 inches long, almost square in outline, usually 3- or 4-lobed with truncate tip; most distinctive and unusual leaf of any of our native forest trees.

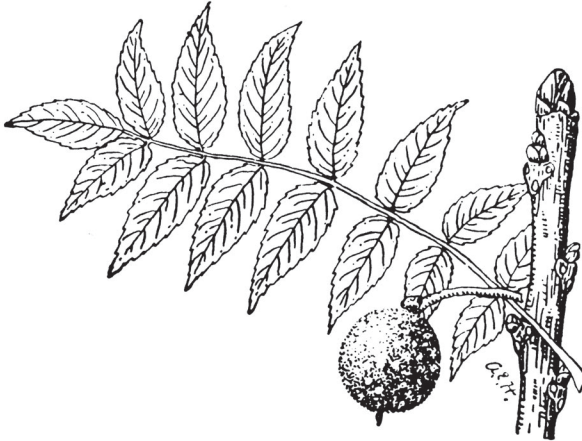
**Fruit:** cone, light brown in color, upright, pointed, 2 to 3 inches long. Seeds: long winged, ripening in September, and mostly falling soon after; outer ring of winged seeds may stay on tree into next season.

**Distinguishing features:** unusual leaf, with "cutoff" tip; bitter taste, aromatic odor of twigs; mitten-like terminal bud.

## 49. BLACK WALNUT

*Juglans nigra* Linnaeus

**Black walnut** is a valuable timber tree native to some areas of New York State. It can reach a large size and produces highly prized wood and large, edible nuts. It is common at low elevations in rich, well-drained bottomlands north to Saratoga and Jefferson Counties and west to Lake Erie. The wood is heavy, hard, strong, durable, rich dark brown in color, easily worked, and takes a fine polish. It is largely used in cabinetmaking, interior trim, and for gunstocks. It deserves protection and planting in suitable locations.



BLACK WALNUT

Leaf, one-fifth natural size; twig, three-fourths natural size; fruit, one-third natural size

**Bark:** thick, dark, deeply furrowed with rounded ridges between; grayish brown in color; inner bark dark chocolate brown in color.

**Twigs:** at first hairy, later smooth, stout, brittle, orange brown in color, cream-colored chambered pith.

**Winter buds:** terminal bud pale, downy, scarcely longer than broad, blunt-pointed, less than 1/3 inch long; lateral buds less than 1/6 inch long.

**Leaves:** alternate, compound, with 13 to 23 leaflets; leaflets 3 to 4 inches long, sharp-pointed, serrate along margin, usually stalkless; leaves up to 2 feet in length.

**Fruit:** a round nut, 1 1/2 inches in diameter, black, surface roughened by rather coarse ridges, enclosed in a yellowish green, fleshy husk, usually solitary or in clusters of 2, ripening in October. Kernel: sweet, edible, and when properly cured somewhat easier to extract than butternut. Outer husk must be removed if nuts will be stored.

**Distinguishing features:** large round nut; cream-colored, chambered pith.

## 50. BLACK WILLOW

*Salix nigra* Marshall

**Black willow** is the largest and most widely distributed of the native willows, although it is rare above an altitude of 2,000 feet in the Adirondacks and in the pine barrens of Long Island. It prefers moist or wet soils along streams or lakes but is sometimes found on fresh, gravelly or sandy soils where it can get plenty of light. It is of little importance as a timber tree because it often divides into several crooked, medium-sized trunks close to the ground and the wood is soft and weak. It is used chiefly for boxes, excelsior, pulp, and also for artificial limbs because of its lightness.

**Bark:** thick, rough with wide ridges covered by thick scales, varying in color from light to dark brown.

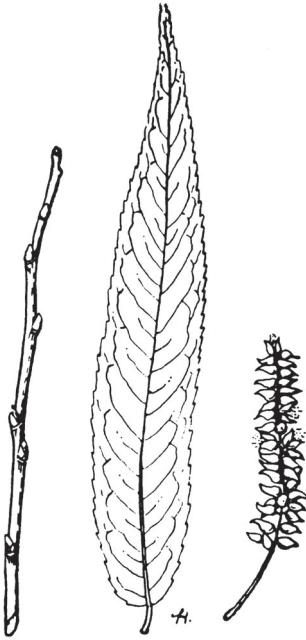
**Twigs:** slender, smooth, somewhat drooping, very brittle at the base, reddish brown in color; may take root and grow if they fall to the ground.

**Winter buds:** terminal bud absent, lateral buds small, sharp-pointed, reddish brown in color; only 1 bud scale.

**Leaves:** alternate, simple, linear, sharp-pointed, finely serrate margin, dark green in color above, pale green below.

**Fruit:** a smooth capsule, about 1/8 inch long, occurring in large numbers on drooping tassels, ripening in spring, reddish brown in color. Seeds: within capsule, covered with dense tuft of long, silky hairs.

**Distinguishing features:** narrow leaves; small buds with 1 bud scale.



BLACK WILLOW

Twig, leaf, and fruit, two-thirds natural size

50a. The **shining willow** (*Salix lucida* Muhlenberg) is an attractive small tree of moist soils, used extensively for holding soil in place where erosion is to be feared and also for ornamental plantings. Its shiny, broad leaves and yellowish-brown twigs will help to distinguish it from the black willow.

## GLOSSARY

<b>Alternate</b>	One (leaf or bud) at a node; placed singly at different heights on the stem.
<b>Blade</b>	The expanded part of a leaf; the leaf excluding the petiole.
<b>Chambered pith</b>	Pith in transverse plates with air cavities between them.
<b>Compound leaves</b>	Those in which the blade consists of two or more separate parts (leaflets).
<b>Deciduous</b>	Falling off in autumn or before.
<b>Entire</b>	Having a continuous unbroken margin, not toothed, notched, or divided.
<b>Lanceolate</b>	Several times longer than wide, broadest near the base and narrowed to the apex.
<b>Leaflet</b>	One part of a compound leaf.
<b>Leaf scar</b>	A scar left on the twig when a leaf falls.
<b>Linear</b>	Long and narrow with parallel margins; line-shaped.
<b>Lobed</b>	Divided into segments about halfway to the middle; segments are larger than teeth.
<b>Margin</b>	The edge of a leaf.
<b>Midrib</b>	The main or central vein of a leaf or leaflet or leaf-like part, a continuation of the petiole.
<b>Node</b>	A joint or place where leaves are attached to a stem.
<b>Oblique (leaves)</b>	Having unequal sides or a base with sides of unequal lengths.
<b>Opposite</b>	Two (leaves or buds) at a node, on opposite sides of an axis.
<b>Ovate</b>	Of the shape of a longitudinal section through a chicken egg, with the broad end toward the base.
<b>Palmate</b>	Radiating fan-like from approximately one point.
<b>Persistent</b>	Remaining attached; leaves not all falling off at the same time.
<b>Pinnate</b>	Arranged feather-like on each side of a common axis.
<b>Serrate</b>	Having sharp teeth pointing forward, saw-toothed.
<b>Simple leaves</b>	Those in which the blade is all in one piece; may be lobed or cleft but not divided all the way to the midrib.
<b>Spur</b>	A short, slowly grown branchlet.
<b>Terminal bud</b>	The bud formed at the tip of a twig.
<b>Thorn</b>	A modified stem or branch with a sharp point.
<b>Truncate</b>	Ending abruptly as if cut off transversely.