Common

# of Pennsylvania

DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
BUREAU OF FORESTRY
www.dcnr.state.pa.us/forestry

Introduction

The trees of “Penn's Woods”—the translation of our state's Latin name—have supported people in what is now Pennsylvania for thousands of years. Trees are essential to our lives. They act as living filters, cleaning the air we breathe and the water we drink. They help heat our homes and cool our streets. They provide us flooring, cabinets, medicines, maple syrup, paper and countless other products. They are sources of the inspiration and beauty that help define Pennsylvania.

When early European settlers arrived in the state 400 years ago, almost all of the land was forested. Slowly, they cleared the land for agriculture and for fuel, housing and manufacturing. As the nation grew, the pace of land clearing quickened. By the early 1900s, nearly all of Pennsylvania's forest had been cut or burned.

Careful management during the last century has restored much of the forest. Today, forests blanket 60 percent of Pennsylvania. Although only a few stands of its original timber remain, the state now has thriving forests that provide a wealth of benefits to its citizens.

About 134 native and 62 introduced tree species grow across Pennsylvania. Its range of topography and climate—from coastal plain to mountain ridge-top and high plateau—allows the Commonwealth to support the many different kinds of trees that make our forests unique and special.

Use this book to learn about and explore the trees and forests where you live—on a tree-lined street, a timbered mountainside or in a wooded valley.

Explore Our State Forests

Pennsylvania is blessed with 2.2 million acres of state forest land for you to enjoy and explore. These forests belong to the citizens of Pennsylvania. The Department of Conservation and Natural Resources Bureau of Forestry manages them for their long-term health and productivity.

State forests are vast and remote. They offer unparalleled scenic beauty and boundless recreational opportunities. They are known for their extensive network of trails, awesome scenic vistas, flaming fall foliage and picturesque drives. Hiking, hunting, fishing, mountain biking, primitive camping, wildlife watching and picnicking are all popular activities.

But our state forests are much more than places to enjoy and recreate in. They are working forests, managed to provide wood products, clean air and water, and even energy sources such as firewood and natural gas. They are reservoirs of biological diversity, and play a valuable role in conserving important plant and animal communities.

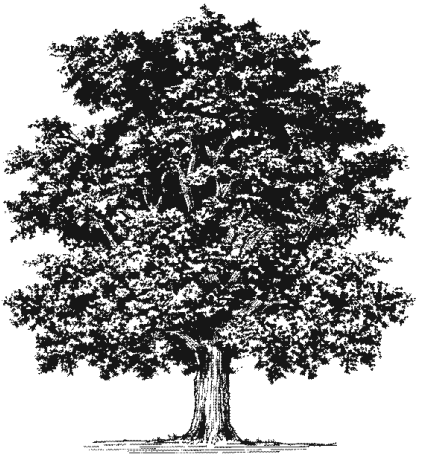
Each of Pennsylvania's 20 state forests offers something special and unique, from the remote glacial ponds of the Delaware State Forest to the trails and vistas of the Michaux, the high ridges of the Forbes or the waterfalls of the Loyalsock.

To learn more, visit www.dcnr.state.pa.us/forestry, or call (717) 787-2703.

Tree Identification Tips

Here are some tips to help you learn about Pennsylvania's most common trees:

- Carefully study the tree you want to identify. Look at leaves, twigs, buds and any flowers or fruits.
- When the leaves have fallen, you can still identify trees. It takes careful study of their twigs, buds, leaf scars and bark, and a little practice.
- Individual trees vary in their characteristics. The amount of sun a leaf receives affects its shape. And bark often varies with the age of the tree—younger trees are often smoother and more lightly colored.
- Species that look similar can often be distinguished by their typical habitat.



Sharing Trees with Children

Collecting tree leaves, nuts, pods or cones is a fun way to introduce kids to the natural world and sharpen their observation skills. Other activities you can use to bring nature home and foster an appreciation for trees include:

- **Keep a nature journal or scrapbook:** Draw pictures of tree twigs, barks or leaves. Write down the kinds of trees you saw in the woods.
- **Make a leaf collection:** Place a leaf between two layers of waxed paper and cover with a towel. Press the towel with a warm iron, being sure to cover all the wax paper on both sides. Cut out each leaf leaving a narrow margin of waxed paper around the edges. If you cut the paper a bit wider at the tip of the leaf, you can punch a hole, attach string and use your leaves, some twigs and other parts to make a leaf and branch mobile.
- **Do a bark or leaf rubbing:** For bark, hold a piece of paper against the tree and rub it lightly with a crayon, pencil or artist charcoal. Make leaf rubbings by laying a leaf vein-side up on a smooth surface. Cover with a piece of paper. Rub gently with crayons from side-to-side across the paper and the leaf image will appear.

V

Help Conserve Penn's Woods

We all live in "Penn's Woods," and play an important role in conserving the trees and forests that give Pennsylvania its name. Take the time to learn more about these action steps:

- Plant native trees and plants where you live.
- Care for your trees to ensure their long-term health.
- Identify and manage invasive species on your property.
- Plan for and manage your forest or woodlot.
- Consult a qualified professional before harvesting or pruning trees.
- Shop for local, sustainable wood products.
- Help prevent wildfires.
- Encourage land-use planning in your community that conserves trees and forests.
- Join an organization that promotes forest conservation.

Learn more about how you can help conserve Penn's Woods at **www.iConservePA.org** or **www.dcnr.state.pa.us/forestry**.

Using this Guide

This selection of Pennsylvania native trees is organized according to leaf shape and arrangement. Six common introduced species are listed separately. Each tree is identified by a popular name familiar to Pennsylvanians and its complete scientific name. *The most significant features for identification are described in italics.*

Studying leaves is usually the easiest way to identify a tree. Compare leaves of the tree you wish to identify with the drawings of “needle-like”, “simple” and “compound” leaf shapes and “alternate” and “opposite” leaf arrangements on pages viii and ix. Buds that will produce next year's twigs and leaves are found where the leaf stalk joins the twig. Leaf blades divided into compound shapes of separate leaflets still have buds at the base of the leaf stalk but never at the bases of the leaflets.

Conifers have narrow, needle-shaped leaves and in addition, Eastern redcedar has tiny scale-like leaves closely pressed to their twigs. On spruces and hemlock the needles are attached individually by a tiny stalk. The needles of pines are attached in bundles of two, three or five.

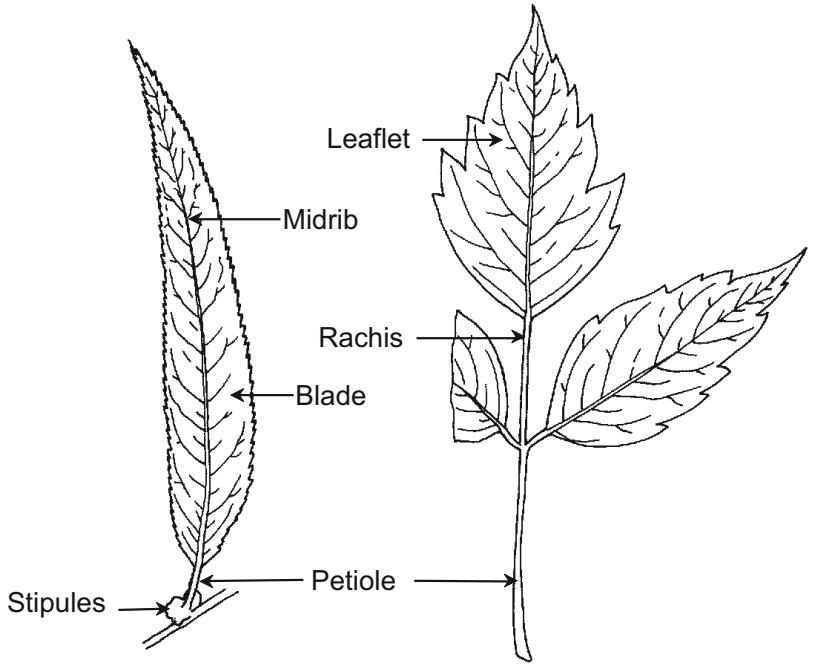
The tree key makes it easy to find the pages illustrating trees with each leaf type. In fall and winter compare the arrangement of leaf scars, buds and other twig characters to the illustrations. A glossary is provided in the back of the book to clarify unfamiliar terms.

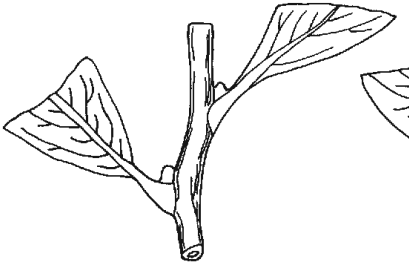
Tree Key

Native trees

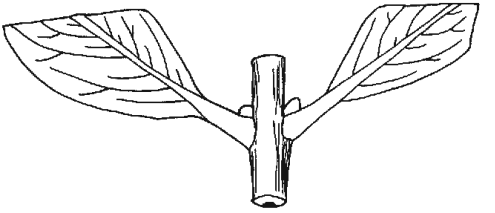
Introduced trees

Parts, Types, And Positions Of Leaves

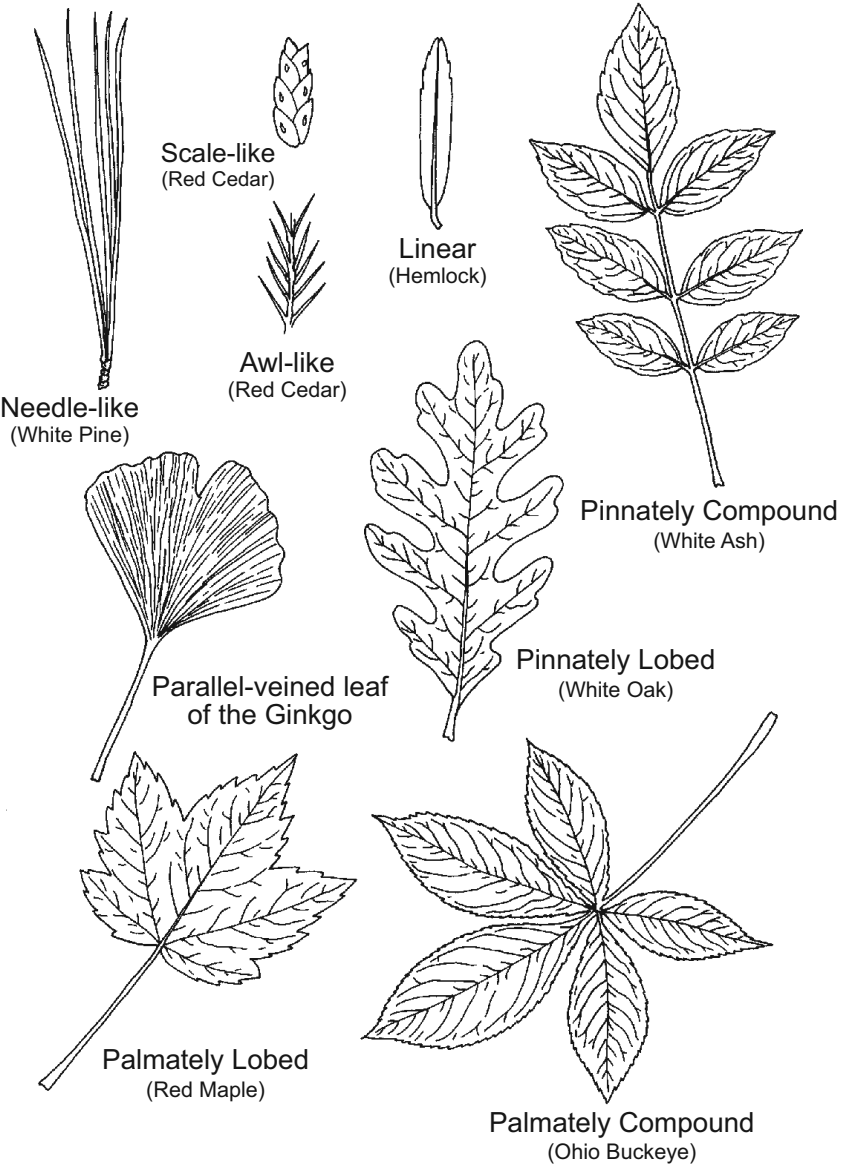




Alternate

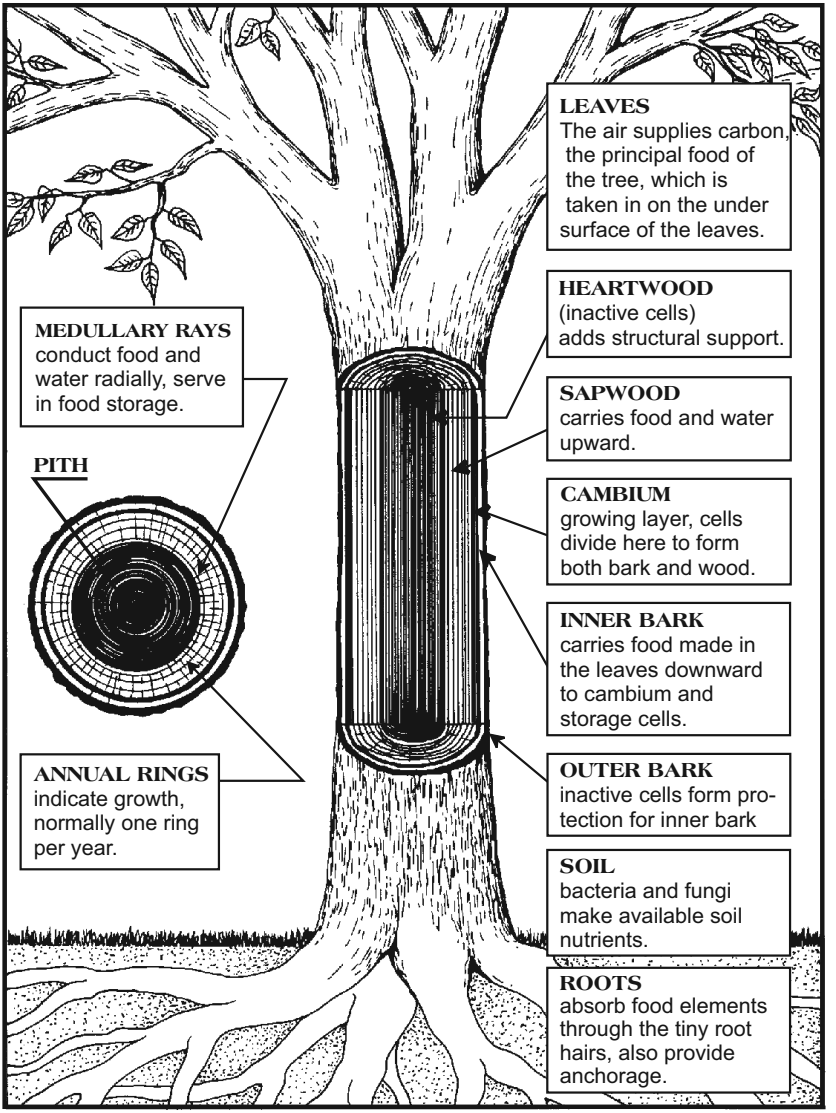


Opposite


Needle-like
(White Pine)
Scale-like
(Red Cedar)
Awl-like
(Red Cedar)
Linear
(Hemlock)
Pinnately Compound
(White Ash)
Parallel-veined leaf
of the Ginkgo
Pinnately Lobed
(White Oak)
Palmately Lobed
(Red Maple)
Palmately Compound
(Ohio Buckeye)

X

Diagram Showing Functions Of Different Parts Of A Tree



Courtesy of the *New Tree Experts Manual* by Richard R. Fenska

1

Eastern Hemlock

***Tsuga canadensis* (L.) Carr.**

LEAVES: Evergreen needles occur singly, appearing 2-ranked on twigs, flattened, *½" – ¾" long*, dark green and glossy above, *light green with 2 white lines below*.

TWIGS: Slender, tough, yellowish brown to grayish brown. Buds egg-shaped, 1/16" long, reddish brown.

FRUIT: *Cones ¾" – 1" long*, egg-shaped, hanging singly from the tips of twigs. Under each scale are 2 small, winged seeds.

BARK: Flaky on young trees, gray brown to red brown, thick and roughly grooved when older.

A large, long-lived tree, capable of reaching heights of 140 feet. Historically, hemlock contributed construction timber and tannic acid for tanning leather to Pennsylvania's economy. Found in cool, moist woods throughout the Commonwealth, Eastern hemlock is the official state tree of Pennsylvania. Ruffed grouse, Wild turkey and songbirds find food (seeds) and shelter in this tree. Deer browse it heavily when deep snow makes other foods scarce.

2

Eastern Redcedar

***Juniperus virginiana* L.**

LEAVES: Evergreen, opposite, *of two types, the older more common kinds are scale-like and only 1/16"-3/32" long, while the young sharp-pointed ones may be up to 3/4" in length*; whitish lines on the upper surface.

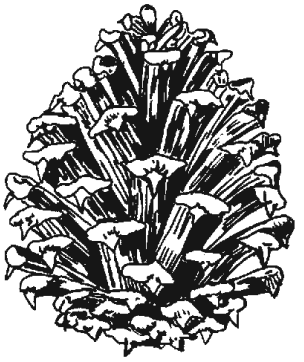
TWIGS: Slender, *usually 4-sided*, becoming reddish brown. Buds small and not readily noticeable.

FRUIT: *Bluish, fleshy, berry-like cones, with a white waxy coating, about 1/4" in diameter*; flesh sweet and resinous; contains 1-2 seeds. Cones ripen in one growing season.

BARK: Reddish brown, peeling off in stringy and flaky strips.

A slow growing and long-lived tree, to 40' high. Redcedar is adaptable to a variety of wet or dry conditions. It is a common pioneer species in abandoned farm fields in the southern tier counties and on rocky bluffs. The rot-resistant wood is used chiefly for fence posts and moth-proof chests. Cedar waxwings and other song birds and game birds eat the fruits.

3



Pitch Pine

***Pinus rigida* P.Mill.**

LEAVES: Evergreen *needles in clusters of 3*, stiff, 2"-6" long, yellowish green.

TWIGS: Stout, brittle, rough, angled in cross-section, golden-brown. Buds egg-shaped, about ½" long, resinous, red-brown.

FRUIT: Cones 2"-3" long with short, stiff prickles, nearly stalkless, often remain attached for 5 years or more after ripening. Many remain unopened until being heated by passing forest fire.

BARK: Green and smooth on young branches, thick, rough, grayish brown on older trunks.

Pitch pine is a medium sized tree, 50'-60' high and widespread in Pennsylvania except the northwestern counties. This fire-adapted species has thick bark which insulates and protects the trunk from damage. It prospers on poor, sandy soils as well as in upland bogs. Its resinous wood is very durable and used for railroad ties, sills of houses and barns and fuel. Pine tar and turpentine are distilled from Pitch pine. Its seeds are important to nuthatches, Pine grosbeak and Black-capped chickadee. Deer and rabbits browse the seedlings.

4

Red Pine

***Pinus resinosa* Ait.**

LEAVES: Evergreen needles in clusters of 2, slender, 4"-6" long, dark green, borne in dense tufts at the ends of branchlets; *Fresh needles snap cleanly when bent double.*

TWIGS: Stout, ridged, yellow-brown to red-brown, buds egg-shaped, about ½" long, brown at first and later silvery.

FRUIT: A cone, about 2" long, without prickles, nearly stalkless, remains attached until the following year.

BARK: Comparatively smooth, reddish brown. Upper trunk and branches light reddish orange.

Like White pine, this medium to large-sized tree develops one horizontal whorl of side branches each year, growing up to 110 feet. A valuable timber tree in the northern part of the State, its wood is used chiefly for construction lumber and pulp. Red pine is native to dry slopes in Luzerne, Wyoming, Tioga, and Centre counties and planted extensively by the Bureau of Forestry and the Pennsylvania Game Commission. Songbirds, mice and chipmunks feed on the seeds.

5

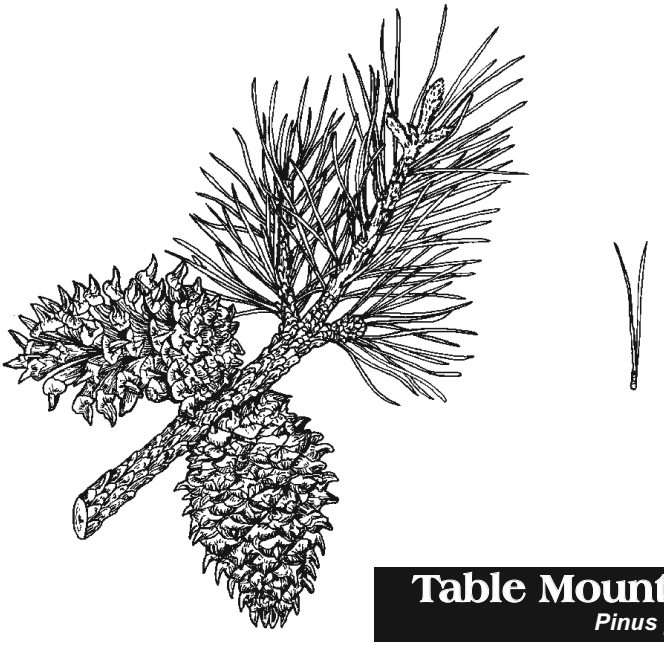


Table Mountain Pine

***Pinus pungens* Lamb.**

LEAVES: Needles in clusters of 2, 1"-3" long, light bluish-green, stout and very stiff, twisted and sharp-pointed, tufted at the ends of branches, persisting 2-3 years.

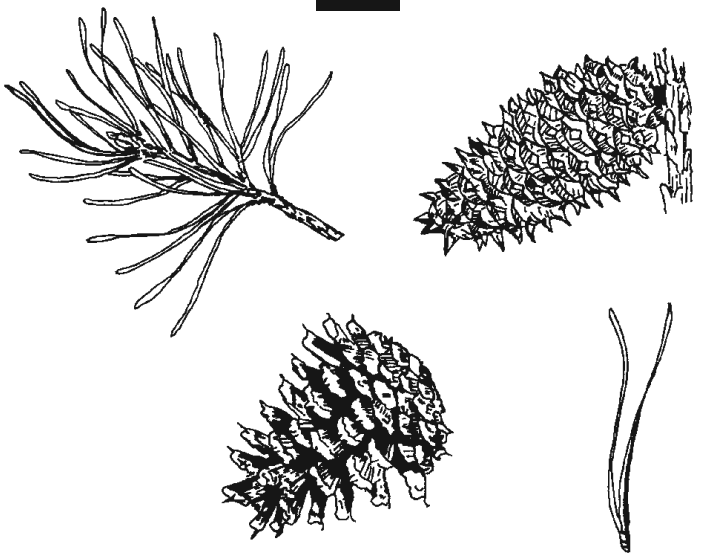
TWIGS: Stout, rather brittle, at first smooth and light orange to purplish, later rather rough and dark brown.

FRUIT: Cones 3"-4" long, sessile, egg-shaped but asymmetrical at the base, in whorls of 2-7. *Cone scales much thickened and tipped with a strong, curved spine.*

BARK: Dark reddish-brown, roughened by shallow fissures into irregular plates which peel off in thin films.

This Appalachian endemic species attains a height of 30'-40' on dry, rocky and gravelly slopes and ridgetops in the southcentral and southeastern counties. Not usually used for lumber due to its small size, it can display aggressive growth suited to protecting rocky slopes from erosion.

6



Virginia Pine

***Pinus virginiana* Mill.**

LEAVES: Evergreen needles in clusters of 2, twisted, stout, relatively short 1½"-3" long.

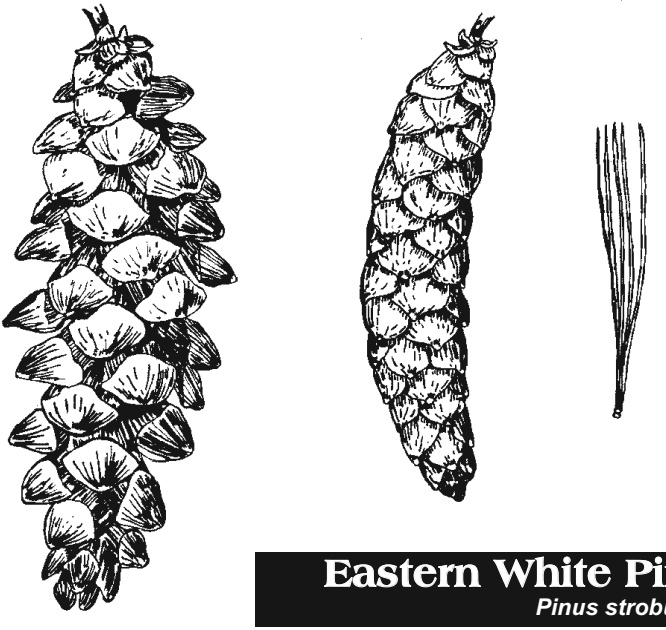
TWIGS: Slender, curved, flexible, brown to purple with bluish white coating. Buds egg-shaped, usually less than ½" long, brown and resinous.

FRUIT: Cone 2"-3" long, prickles small but sharp, *edge of scales with darker bands, usually without a stalk, many remain attached for 3 or 4 years.*

BARK: Smooth, thin, reddish brown and scaly, shallowly fissured into small flat plates.

Also called Scrub pine, this irregularly shaped small tree attains a height of 40'–50' or more on sandy or poor rocky soils of barrens and ridgetops. Virginia pine is a southern species that reaches its northern limit in Pennsylvania. It is valuable as cover for worn-out farmlands and is harvested for pulpwood. Virginia pine is not tolerant of shade or fire. The seeds are eaten by squirrels, songbirds and game birds. Caterpillars of the eastern pine elfin butterfly feed on the needles of this tree as well as pitch and short-leaf pine.

7



Eastern White Pine

***Pinus strobus* L.**

LEAVES: Evergreen *needles in clusters of 5*, soft flexible, 3-sided, 2"-5" long, and bluish green. *This is the only pine native to Pennsylvania with 5 needles per cluster.*

TWIGS: Slender, flexible, with rusty hairs when young, later smooth. Buds egg-shaped, usually less than ½" long, gray-brown. Each whorl of branches represents a year's growth.

FRUIT: *Cones 4"-7" long, without prickles, slightly curved*, resinous; each scale usually bears 2 winged seeds as do all our native pines.

BARK: Young trunks and branches greenish brown, later darker grooved and scaly.

Eastern white pines are large trees. At present they usually reach 50'-90' high but the original "Penn's Woods" saw white pines reaching 170' and more. It is one of the most valuable timber trees, found in moist or dry woodlands throughout the state and often planted as an ornamental in large open areas. Many birds, squirrels, chipmunks and mice feed on the seeds and soft needles. Inner bark of white pine is a preferred winter food of porcupine and deer browse the twigs.

8

American Larch, Tamarack

***Larix laricina* (Duroi) K.Koch**

LEAVES: Needles not evergreen; *occur singly near the ends of the twigs, elsewhere in clusters of 10 or more*; about 1" long, pale green, turning yellow and falling from the tree during autumn.

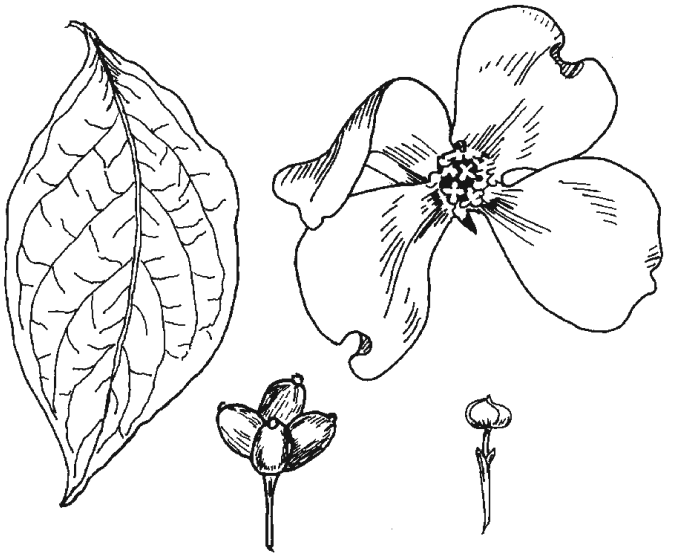
TWIGS: At first covered with a bluish white coating, becoming dull brown and with numerous short spurs. Buds round, small, 1/16" long, dark red.

FRUIT: A cone, about ½" long, egg-shaped, upright, matures in fall and often remains attached for several years.

BARK: Smooth at first, later becoming scaly, dark brown.

Tamarack is a medium-sized tree growing to 60' in sphagnum bogs of the glaciated northeastern and northwestern corners of the Commonwealth. It is the only cone-bearing native tree that loses its needles annually. Its wood is used chiefly for paper pulp, lumber, posts and railroad ties. European larch (*L. decidua*) and Japanese larch (*L. leptolepis*) are more commonly planted in the state. They can be distinguished from American larch by their larger cones, 1-1½" long.

9



Flowering Dogwood

***Cornus florida* L.**

LEAVES: Opposite, simple, 3"-5" long; clustered toward tips of twigs; margins smooth or wavy; *veins prominent and curved toward the leaf-tip.* Foliage turns wine-red in autumn.

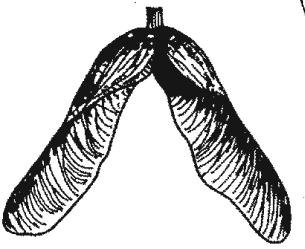
TWIGS: *Red tinged with green,* often with a bluish white powdery coating; marked with rings; tips curve upward. End leaf bud covered by 2 reddish scales; side leaf buds very small; *flower buds conspicuous, silvery, button-shaped, at ends of twigs.*

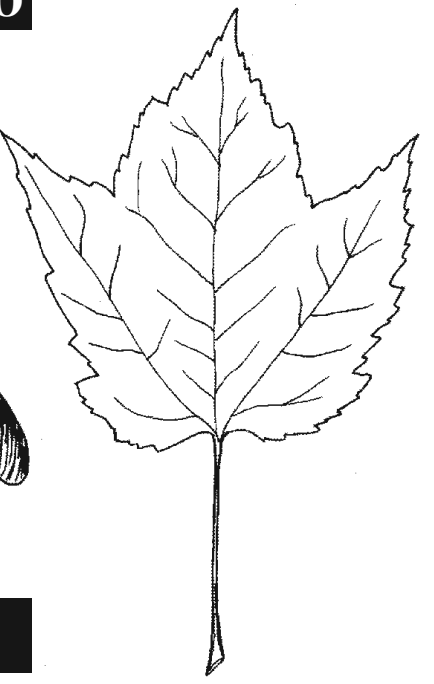
FRUIT: An egg-shaped red drupe, ½" long; usually in clusters of 2-5. Flowers greenish white or yellowish, small, in flat-topped clusters; *four showy white bracts underneath open before the leaves.*

BARK: Light to dark gray, broken by fissures into small blocks.

A small native tree growing to 30' with low spreading crown adapted to life in the shade of maples, oaks and hickories. Its extremely hard wood was used primarily for textile weaving shuttles, wheel hubs and bearings. Valued for ornamental planting horticultural varieties with red or pink bracts have been developed. Dogwood anthracnose disease killed about 75% of Pennsylvania's forest and ornamental dogwoods during the 1980s. More than thirty-six species of birds are reported feeding on the fruits.

10





Red Maple

***Acer rubrum* L.**

LEAVES: Opposite, simple, with *3-5 shallow lobes*, coarsely toothed, light green above, pale green to whitish beneath, turning brilliant red or orange in autumn.

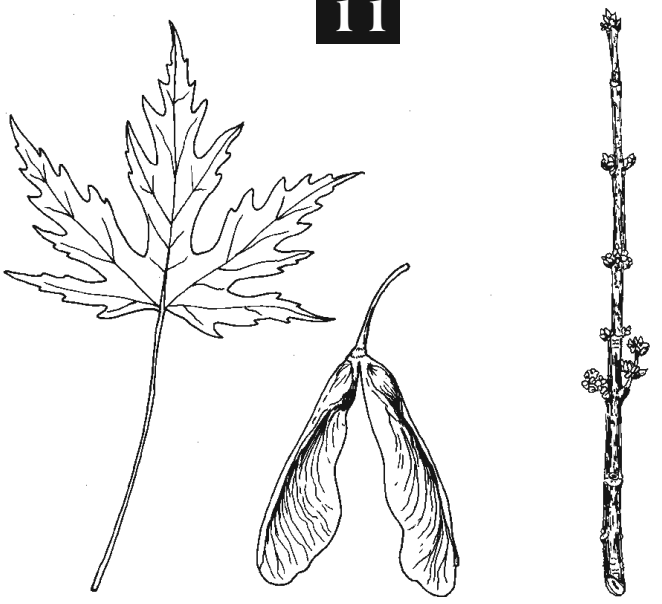
TWIGS: Slender, glossy, red or grayish-brown.

FRUIT: *Winged seeds called samaras, usually less than 1" long, in pairs spreading at a narrow angle*, mature in Spring.

BARK: *Smooth and light gray on young trunks and branches*, older trunks darker, shaggy and roughened with long, irregular peeling flakes.

The most abundant tree in Pennsylvania growing in a wide variety of habitats, typically reaching 80-100' high. It grows best in wet soils. Known as soft maple because its wood is not as hard as Sugar maple, this is an excellent ornamental tree. Young trees are heavily browsed by deer and rabbits; rodents consume the seeds.

11



Silver Maple

***Acer saccharinum* L.**

LEAVES: Opposite, simple, *deeply 5-lobed and coarsely toothed*, about 5" wide, *bright green above, silvery-white beneath*. Fall color is a greenish-yellow.

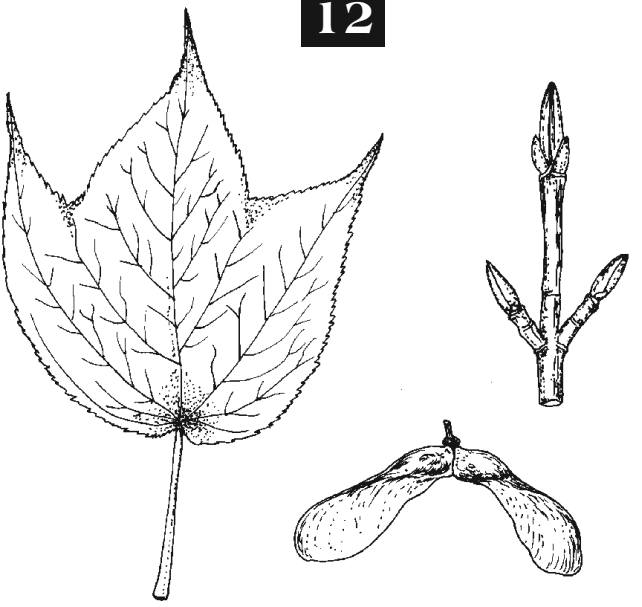
TWIGS: Slender, glossy, green in spring, turning chestnut brown. Lower branches have a distinctive upward curve at the end.

FRUIT: Largest of the native maples, wings 2" long widely spreading, maturing in spring.

BARK: Smooth and gray on young trunks, older trunks brown and furrowed with plates that curl out on both ends.

Found in moist woods and on stream banks throughout Pennsylvania, the largest reaching 100' high. Many mammals and birds eat the seeds. Planted as a shade tree but it has a tendency to split.

12



Striped Maple

***Acer pensylvanicum* L.**

LEAVES: Opposite, simple, 3-lobed, rounded at the base, with finely toothed margins and rusty pubescence on the lower surface when young.

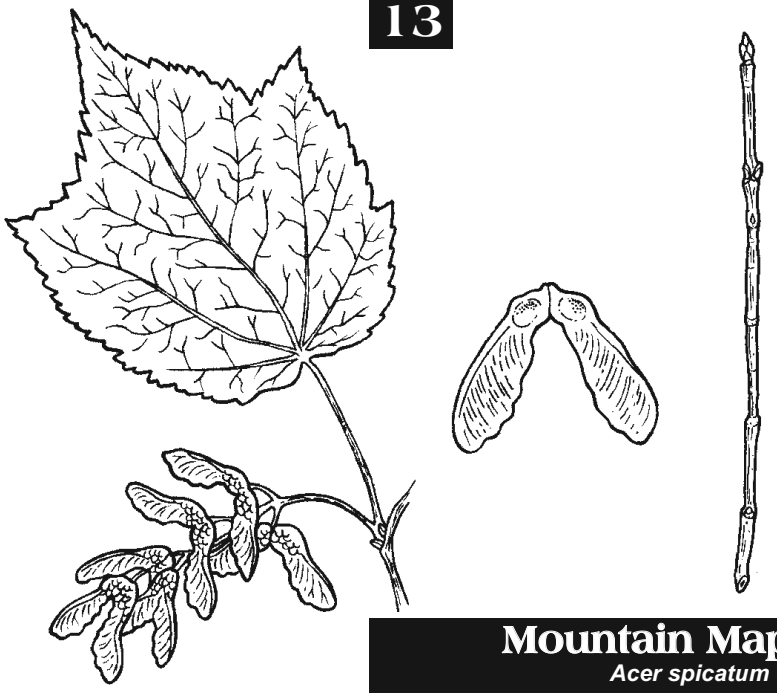
TWIGS: Smooth stout at first greenish, later red; pith brown; each seasons growth marked by 2 or 3 dark lines encircling the twig.

FRUIT: Wings very divergent, about ¾" long, maturing in September in drooping clusters. Marked on one side of the seed with a depression.

BARK: *Smooth greenish or reddish brown, conspicuously marked with longitudinal white streaks;* older trunks rougher, darker and less streaked.

Usually from 10'-25' high; common in the mountainous parts of the state on moist, cool, shaded slopes and in deep ravines. Its distinctive white stripes make it an attractive ornamental species.

13



Mountain Maple

***Acer spicatum* Lam.**

LEAVES: Opposite, simple, 6” long with 3-5 lobes and a coarsely toothed margin. Smooth on the upper surface and hairy on the underside, they turn orange or yellow in autumn.

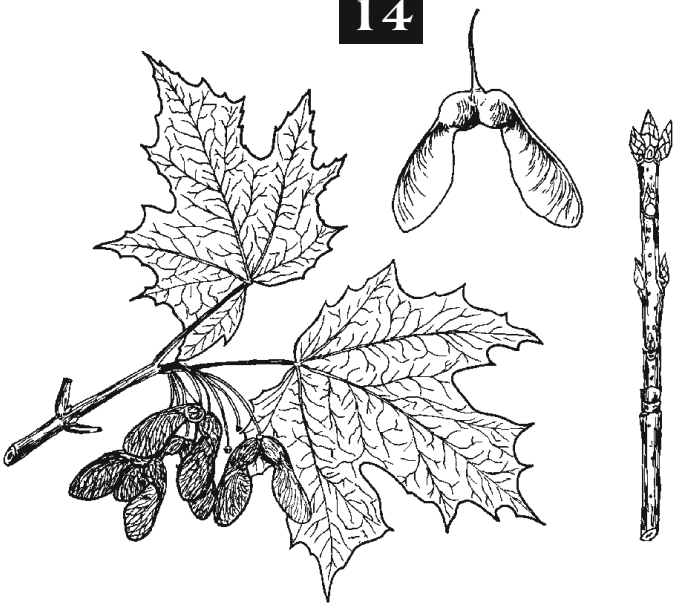
TWIGS: Finely hairy, reddish-purple and yellowish-green at first aging to grayish brown. Narrow V-shaped leaf scars below ¼" grayish or greenish buds.

FRUIT: Wings of the samaras slightly spread, ½" long. Green to red fruits ripen in September or October in clusters at the twig-ends.

BARK: Thin, rather smooth and brown to grayish-brown mottled with gray blotches.

Mountain maple is a shrub or small tree of the forest understory, reaching 25 to 30' high. Its short trunk bears rather straight, slender upright branches on cool, moist rocky hillsides and in ravines under sugar maple, yellow birch, beech, white pine and hemlock. More common in northern counties and at higher elevations of the Ridge and Valley and Allegheny Mountain physiographic provinces, it provides browse for deer, rabbits, and beaver. Ruffed grouse feed on its buds.

14



Sugar Maple

***Acer saccharum* Marshall.**

LEAVES: Opposite, simple, 5-lobed, the basal lobes short, with a few large teeth, 3-5” long, bright green above, pale green below. Leaves turn bright yellow, orange or red in autumn.

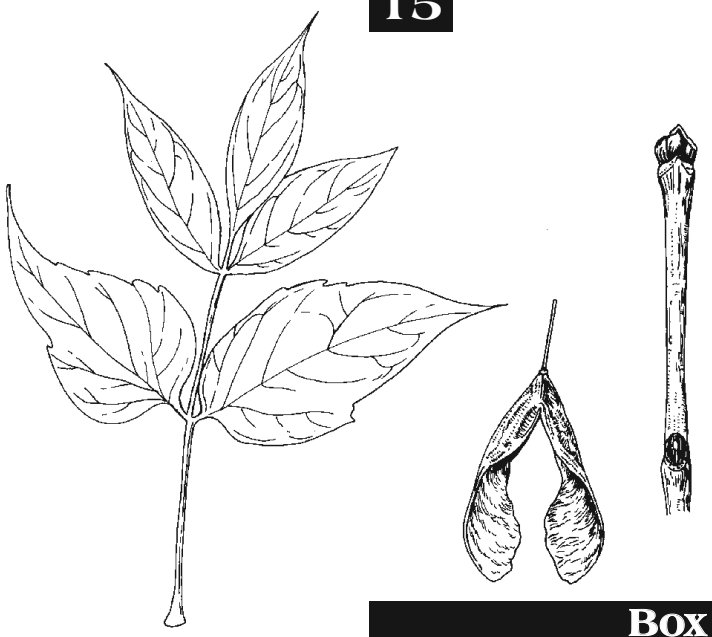
TWIGS: Reddish-brown to orange-brown. Buds brown and sharp pointed.

FRUIT: Double samaras with wings varying from almost parallel to right-angled, maturing in autumn.

BARK: Gray brown, smooth on young trunks, older trunks fissured with long, irregular flakes.

Also called Rock maple for its hard wood, this important timber tree is found on moist wooded slopes throughout Pennsylvania, typically reaching 90' high. Sugar maple wood is used for furniture, musical instruments and flooring and the sap is tapped for maple syrup production. Sugar maple is an excellent ornamental tree for large open areas. Birds and rodents eat the seeds. Deer, squirrels, porcupine and other mammals browse the twigs, buds and bark.

15



Box Elder

***Acer negundo* L.**

LEAVES: *Opposite, compound, with 3-5 coarsely and irregularly toothed leaflets, each 2"-4" long and 2"-3" wide.*

TWIGS: Stout, purplish-green or green, smooth and often with a whitish coating.

FRUIT: Wings about 1½"-2" long, V-shaped with narrow seeds, borne in drooping clusters. Fruits mature in September and remain far into winter.

BARK: Branches and young trunks smooth and grayish-brown, older trunks distinctly narrow ridged and seldom scaly.

A medium sized tree, occasionally to 70' high. Trunk usually short, dividing into stout branches forming a deep broad crown. Typically found in low moist areas, floodplains and stream banks. Most abundant in eastern and southern Pennsylvania, common along streams in the southwestern part and scattered elsewhere. Used in ornamental plantings.

16

White Ash

***Fraxinus americana* L.**

LEAVES: *Opposite, compound, about 10" long, with 5-9 stalked leaflets*, *whitish beneath*, margins entire or with a few rounded teeth toward the tip. Fall colors range from yellow to dark maroon.

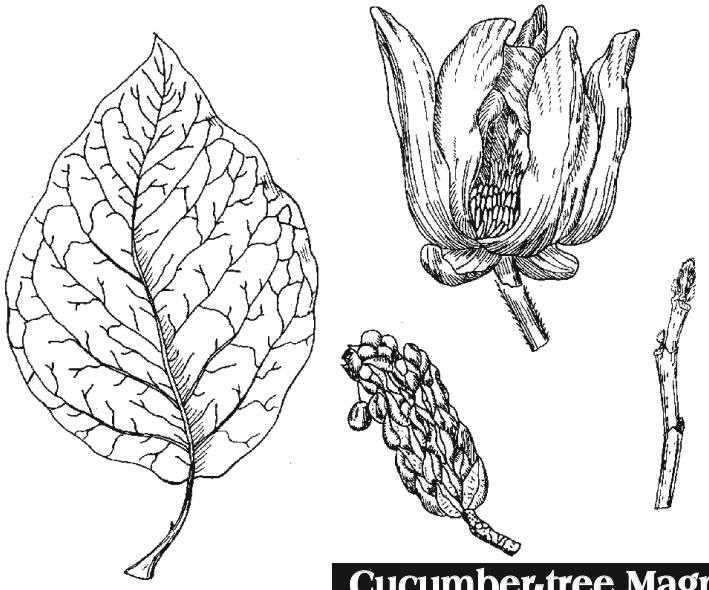
TWIGS: Stout, smooth, gray-brown with a few pale lenticels. Mature twigs have a peeling surface. Blunt, rusty-brown buds are inset into *half-circular leaf scars notched at the top*.

FRUIT: *A winged seed, called a samara, usually 1" to 2" long and ¼" wide, shaped like a canoe paddle with a rounded wing attached at the tip of the seed.*

BARK: Gray-brown, *even diamond shaped furrows separated by narrow interlacing ridges*.

Of Pennsylvania's four ash species, White ash is the most common. It is a large tree, often 80'. high or more with a long straight trunk, widespread on rich soils except in the mountains. *Fraxinus pennsylvanica*, called green or red ash is a very similar inhabitant of wet bottomlands. The wood of both species is used for sporting goods (especially baseball bats), handles, agricultural tools, and furniture. Black ash, *F. nigra*, inhabits cold swamps statewide. Pumpkin ash, *F. profunda*, is found only in wetlands in Erie, Crawford and Warren Counties.

17



Cucumber-tree Magnolia

***Magnolia acuminata* L.**

LEAVES: Alternate, simple*, 4"-12" long*, smooth above, downy beneath; margins smooth or sometimes wavy.

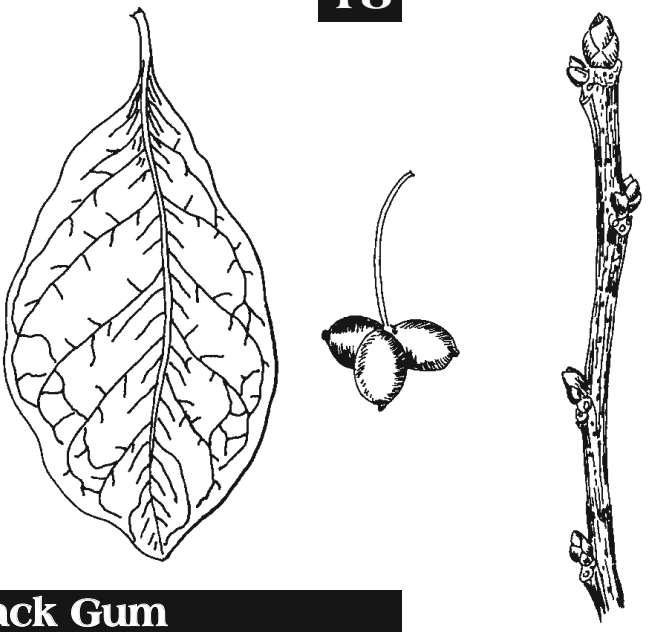
TWIGS: *Reddish brown, shiny, with peppery smell and taste*. Buds covered with greenish white silky hairs; end buds ½"- ¾" long.

FRUIT: *When young, like a small green cucumber.* When mature in autumn, 3"-4" long, a cluster of small red pods, each containing two scarlet seeds; often remains attached all winter.

BARK: Gray-brown to brown, developing long, narrow furrows and loose scaly ridges.

A large tree, reaching 90', native to rich upland woods and slopes in the western half of the Commonwealth. *The flowers are large (3" long) and greenish-yellow, blooming from April to June*. Magnolia wood is used mainly for interior finish, furniture and containers. Songbirds, squirrels and mice eat the seeds.

18



Black Gum

***Nyssa sylvatica* Marshall**

LEAVES: Alternate, simple, 2"-5" long, oval with entire and slightly thickened margins, dark green and shiny above, often downy beneath, turning vivid red in early autumn.

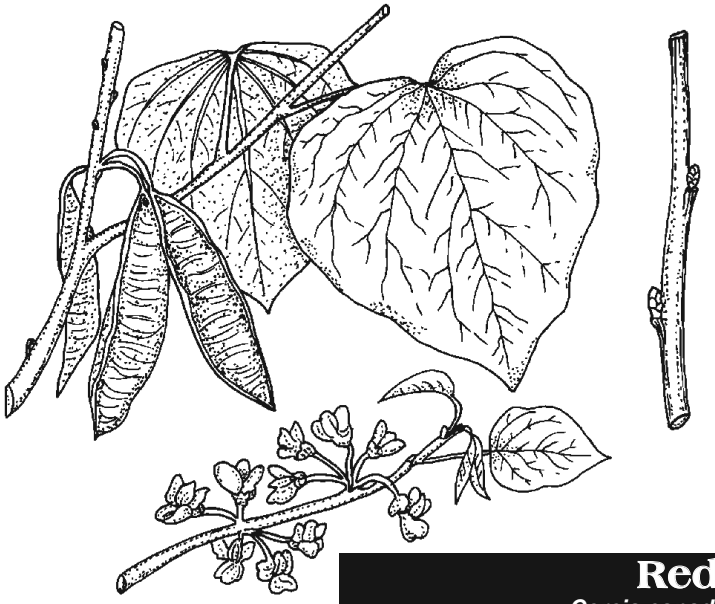
TWIGS: Smooth grayish to reddish brown, pith white and chambered, buds round, pointed and reddish brown, ¼" long.

FRUIT: A dark blue berry, ⅓"-⅔" long, 1-seeded with thin flesh, borne singly or 2-3 in a cluster, ripening in autumn.

BARK: Grayish, smooth to scaly, darker gray, *thick and fissured into quadrangular blocks forming what is called "alligator bark" on very old trunks.*

Also called black tupelo or sourgum, this is usually a medium sized tree on dry slopes and ridgetops, but it can reach over 80' and 5' in diameter in moist areas along streams. Most common in the southeast and southcentral portions of the state it is rarer in the northern tier counties. The wood is difficult to split and is used for boxes, fuel and railroad ties. The fruits, twigs and foliage provide food for many birds and animals. The brilliant red autumn color and abundant blue fruit make this species an interesting ornamental planting.

19



Redbud

***Cercis canadensis* L.**

LEAVES: Alternate, simple, *heart-shaped, 3"-5" long*, margins entire.

TWIGS: Slender, smooth light brown to gray-brown, with numerous small lenticels.

FRUIT: *A pod, rose-colored to light brown, 2½"-3" long by ½" wide*, containing ¼" egg-shaped, flattened, light brown seeds.

BARK: Thin, shallowly fissured, peeling into numerous scales, reddish-brown to very dark brown.

Usually a small tree, with a short trunk and branches forming a shallow, broad crown, 15'-20' high with a trunk diameter of 6", it has been known to reach 30' in Pennsylvania. *Prized for its bright rose-colored flowers in early spring.* Wild populations are native to limestone and diabase soils in the southern half of the Commonwealth, but Redbud is successfully cultivated further north.

20

Sassafras

***Sassafras albidum* (Nutt.) Nees**

LEAVES: Alternate, simple 4"-6" long, smooth, dark green above, much lighter beneath, *characteristically aromatic when crushed*. *Usually three shapes can be found on a tree: entire, 2-lobed and 3-lobed.*

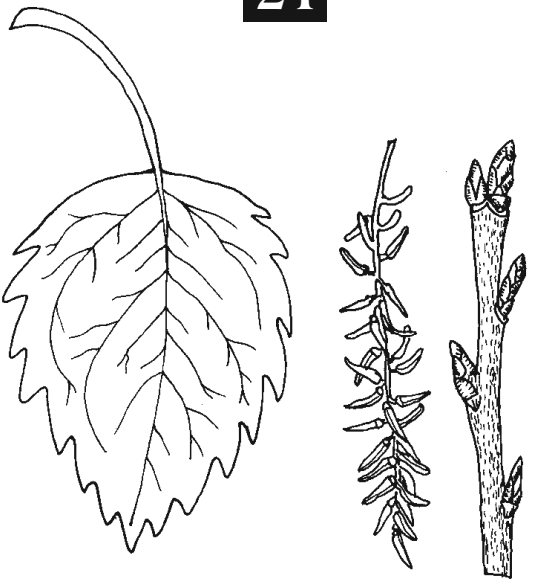
TWIGS: Bright green, sometimes reddish, smooth and shiny; large white pith. End bud much larger than side ones, with many loose scales.

FRUIT: A berry, dark blue, shiny, about ⅓" in diameter, on a red stem enlarged at the point of attachment; borne in clusters. Yellow flowers appear before the leaves unfold.

BARK: Young trees furrowed, greenish, changing to brown; inner bark salmon colored; older trees show deep fissures extending long distances up the trunk.

A small to medium-sized tree, up to 60' high but usually smaller, with crooked branches, often spreading by root suckers. Its roots, leaves, twigs and fruit have a spicy odor. The oil, once used for flavoring and medicine, may promote cancer. Sassafras wood is used chiefly for kindling, fuel and fence posts.

21



Bigtooth Aspen

***Populus grandidentata* Michx.**

LEAVES: Alternate, simple, 3"-4" long, *margins with coarse teeth*, dull green above, lighter below, *petiole flattened.*

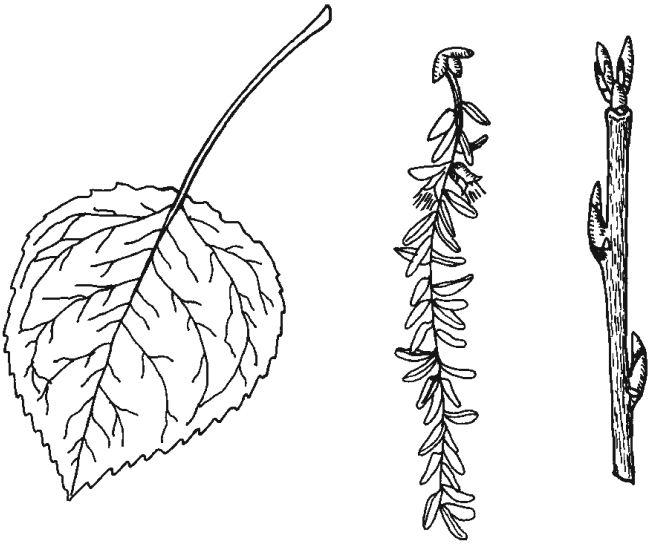
TWIGS: Stout, brown with a pale, woolly coating. *Buds blunt-pointed, dull, often woolly*.

FRUIT: Cone-shaped capsules on a drooping stalk similar to quaking aspen. Seeds are covered with long silky hairs.

BARK: Light gray to green when young, dark brown and rough with age.

A medium sized tree, 50'-70' high, common in early successional forests throughout the state. The seeds sprout best in open areas after cutting or fire and spread rapidly by sending up suckers from the roots. Bigtooth aspen is important for regenerating forest cover, protecting soil and slower growing species. Many animals browse the twigs and buds in winter and spring. The wood is used chiefly for making paper.

22



Quaking Aspen

***Populus tremuloides* Michx.**

LEAVES: Alternate, simple, *almost round 1"-3" in diameter*, margins finely toothed, shiny dark green above, lighter below; *petiole longer than the leaf blade, slender, flattened*. Fall color is brilliant gold.

TWIGS: Slender, reddish brown, smooth, shiny, pith white and 5-angled. Buds sharp-pointed, smooth, shiny, reddish, often curved inward.

FRUIT: Cone-shaped capsules on a drooping stalk, each ¼" long, and containing 10-12 seeds. Fruits mature in early summer releasing seeds covered with long silky hairs.

BARK: Pale yellow green to silvery gray when young, whiter at higher altitudes, becoming dark gray and rough with age.

A small, colony-forming tree, 30'–40' sometimes reaching 60' high. Rapid growing but short-lived. Most common on sandy or gravelly soils of old fields and open woods in northern Pennsylvania, but it can be found throughout the state. Important for revegetating recently cut or burned areas by sprouting from widespread roots. Its wood is used chiefly for pulp in manufacturing paper and cardboard. Many animals browse the twigs and it is a favorite food of beaver.

23

American Beech

***Fagus grandifolia* Ehrh.**

LEAVES: Alternate, simple, 3"-4" long, stiff leathery texture, with a tapered tip and sharply toothed margins, light green and glossy above, yellow green below.

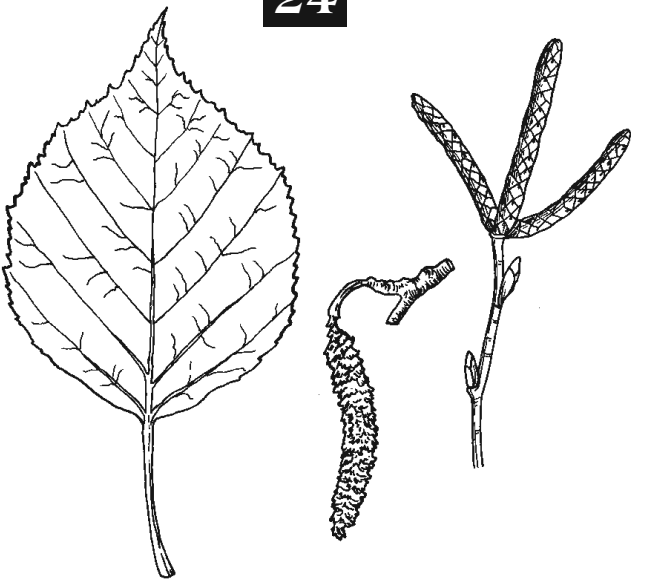
TWIGS: Slender, dark yellow to gray, at first hairy, later smooth, zigzag. *Buds very long slender sharp-pointed, covered by 10-20 reddish-brown scales.*

FRUIT: A stalked, prickly 4-valved bur containing triangular, pale brown, shining nuts.

BARK: *Smooth, light gray mottled with dark spots.*

Found on moist rich soils throughout the Commonwealth but more abundant in the north. An important timber species typically reaching 50'-60' high but can be higher. The beechnuts are very important food for wildlife including bears, squirrels, turkeys, and grouse. Beech is a handsome shade tree for large open areas in parks and golf courses.

24



Paper Birch

***Betula papyrifera* Marshall**

LEAVES: Alternate, simple 2"-3" long, 1½"-2" wide, upper surface dark green, lower surface light green, narrowed or rounded at the base, sharply toothed margins and sharp-pointed tip.

TWIGS: At first greenish and hairy, later becoming smooth reddish-brown.

FRUIT: Small 2-winged nutlets are held in a cone-like structure of scales about 1½" long.

BARK: *Trunk and older branches chalky to creamy white, marked with horizontal stripes and peeling off in thin layers.* Older trunks rough and often fissured into irregular thick scales.

A large tree to 50'-75' high on upland woods and slopes in northcentral and northeastern Pennsylvania. Seeds and buds are eaten by the Pennsylvania state bird, the Ruffed grouse. Twigs are browsed by deer. Native Americans used the bark for constructing canoes, shelters and containers.

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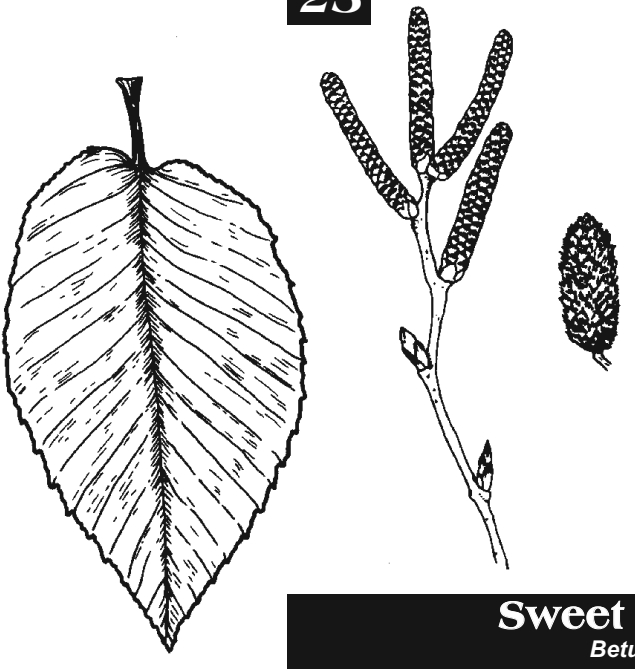


Sweet Birch

***Betula lenta* L.**

LEAVES: Alternate, simple, about 2½"-5" long, unevenly sawtoothed, dull green above, yellow-green beneath with some white hairs where the veins join the midrib. The leaf base is usually heart-shaped.

TWIGS: Green and somewhat downy when young, becoming reddish-brown, smooth and shiny. *They have a strong wintergreen flavor and smell.* Buds reddish brown, conical, sharp-pointed and shiny.

FRUIT: Small 2-winged nutlets are held in a cone-like structure of scales about 1½" long.

BARK: *Tight, dark reddish brown on younger trees, marked with horizontal lines of pale lenticels and often resembles the bark of young Black cherry.* On older trees the bark breaks into large black plates.

Also known as Black birch or Cherry birch, this tree normally attains heights of 50'-60' and is found on a variety of sites from rich fertile lowlands to rocky ridges throughout the state. The heavy, hard, strong wood is used for furniture, boxes, and excellent firewood. Distillation of the bark and twigs produces natural wintergreen oil. Fermented sap can be used to make birch beer. Ruffed grouse feed on buds and seeds, deer and rabbits browse the twigs.

26

Yellow Birch

***Betula alleghaniensis* Britt.**

LEAVES: Alternate, simple, 3"-4" long, doubly-toothed margins, dull green above, yellow-green beneath.

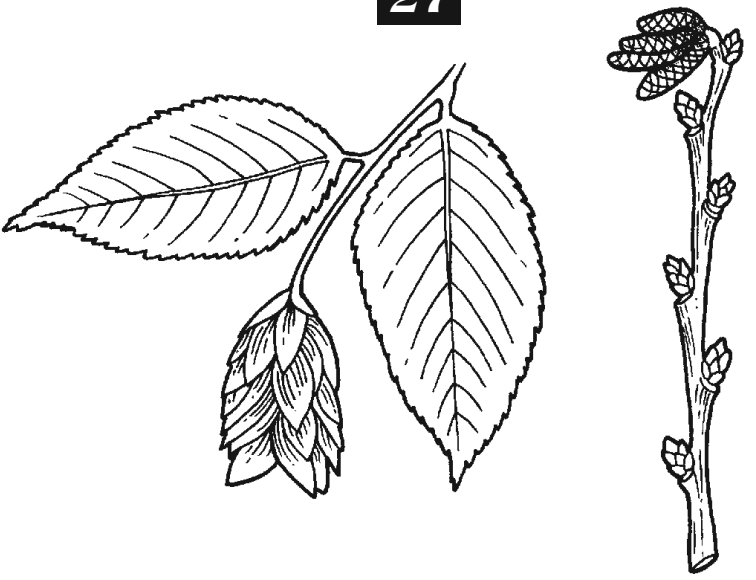
TWIGS: Green and hairy when young later brown and smooth, *with only a faint wintergreen flavor and smell*. Buds dull yellowish green, slightly downy.

FRUIT: As in the other birches, small 2-winged nutlets are held in a cone-like structure of scales about 1½" long.

BARK: *Young stems and branches yellowish or bronze and shiny, peeling off in thin papery strips*. Older trunks become reddish brown and break into large, ragged edged plates.

A medium to large tree, commonly 60'-75', occasionally to 100' tall. Prefers moist, cool soils and cool summer temperatures, often found on north facing slopes and swamps. The wood is used for cabinets, furniture, flooring, and doors. It was a principal wood used for distilling wood alcohol, acetate of lime, tar, and oils. The papery shreds of bark can be stripped off in emergencies and used as a fire starter even in wet conditions. Ruffed grouse feed on buds and seeds, deer and rabbits browse the twigs.

27



Hop-hornbeam

***Ostrya virginiana* (Miller) K. Koch**

LEAVES: Alternate, simple, a 3"-5" elliptic shape with sharply and doubly tooth edges. Some of the veins may be forked. They turn a dull yellow in autumn and many are held through winter.

TWIGS: Slender, reddish-brown, hairy at first becoming smooth. *Dormant ½" long male flower clusters in groups of three are conspicuous at the twig ends through the winter.*

FRUIT: *A cone-shaped cluster of inflated papery sac-like bracts each containing a ¼" nutlet. The clusters resemble the fruits of cultivated hops used in brewing.*

BARK: *Grayish-brown with a loose flaky, "shreddy" surface*.

A widespread but never abundant understory tree that can grow to 60' but is usually shorter. It favors dry rocky slopes and ridges frequently on limestone. The hard durable wood was used for sleigh runners, tool handles and other small items where strength was important. Both this species and American hornbeam are sometimes called "ironwood" and have similar values for wildlife.

28

American Hornbeam

***Carpinus caroliniana* Walter**

LEAVES: Alternate, simple, elliptical to oblong shape, 2'-4" long with sharply and doubly toothed edges and long-pointed tip. Leaf veins are never forked. Deep orange-red fall color makes it an attractive ornamental for wet sites.

TWIGS: Slender, green and hairy at first later smooth and reddish-brown with numerous pale lenticels.

FRUIT: *A very distinctive terminal cluster of 3-lobed leafy bracts each containing a small nutlet ⅛" long at the base.* Seeds are stored and dispersed by squirrels, chipmunks, grouse and turkeys.

BARK: Smooth bluish-gray with *rounded vertical ridges that have led to the name "musclewood".*

An understory tree usually growing to 30' in height but can be larger, with ascending branches and a spreading crown. Common throughout Pennsylvania along stream banks and floodplains in the oak-hickory and northern hardwood forests, this tree has many common names including "blue beech" "water beech" and "ironwood." The wood is heavy, hard and strong but its small size limits the use to homemade tool handles, mallets and craft items. The leaves provide larval food for tiger swallowtail, red-spotted purple, white admiral and striped-hairstreak butterflies.

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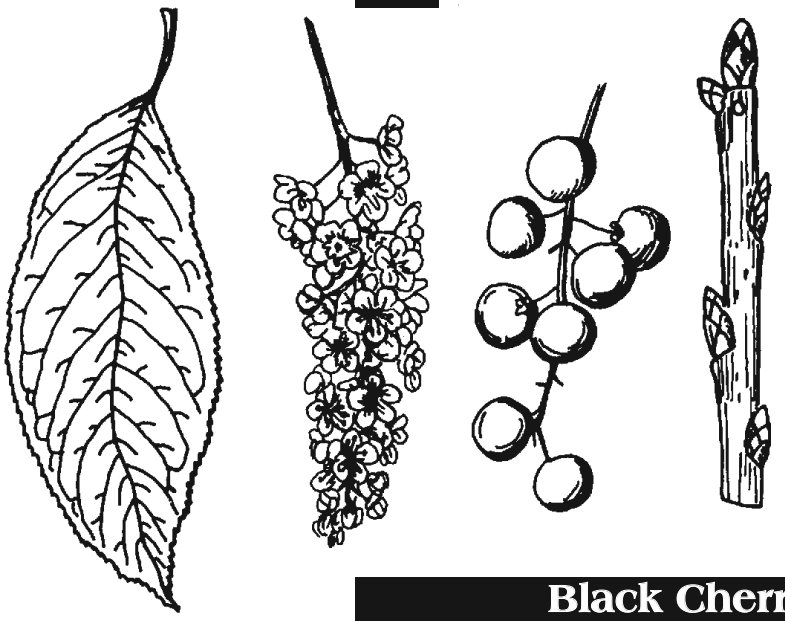


Black Cherry

***Prunus serotina* Ehrh.**

LEAVES: Alternate, simple, 2"-5" long, narrow with tapering tip, shiny above, paler below and *usually with one or more small glands at the base; margins with short in-curved teeth* which distinguish it from other cherries.

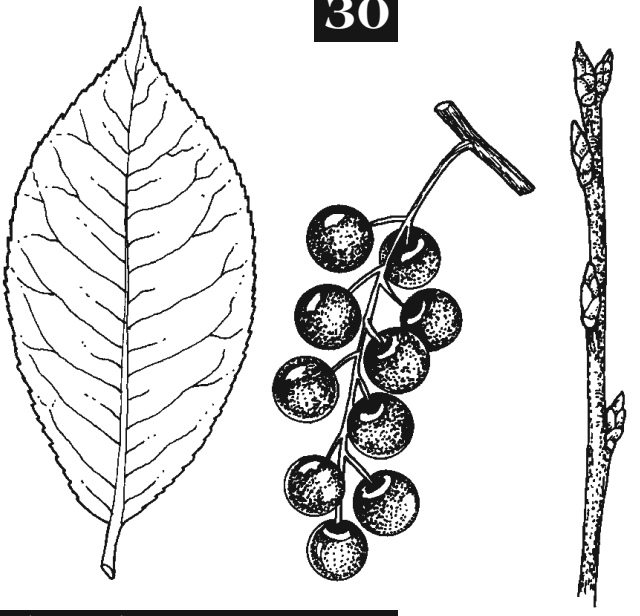
TWIGS: Smooth, reddish brown, marked with numerous pale, round lenticels; often covered with a thin gray coating which rubs off easily. Buds smooth, shiny, sharp-pointed, reddish-brown tinged with green.

FRUIT: Round, black with a purplish tint, ⅓"-½" in diameter, containing a single round, stony seed, arranged in hanging clusters. Flowers white, in June.

BARK: Young trunks shiny, reddish-brown, with prominent horizontal lenticels. Older trunks covered with dark scales or plates.

Commonly 50'-75' high, Black cherry grows throughout the State. It thrives best in fertile alluvial soil but also grows on dry slopes. The hard reddish-brown wood is highly prized for quality furniture and interior trim. Many game birds, song birds, and mammals, including black bear, eat the fruits and seeds.

30



Choke Cherry

***Prunus virginiana* L.**

LEAVES: Alternate, simple, 2"-4" long, widest above the middle, tapering or rounded at the base, abruptly pointed tips and sharply serrate margins, bright green above, paler beneath.

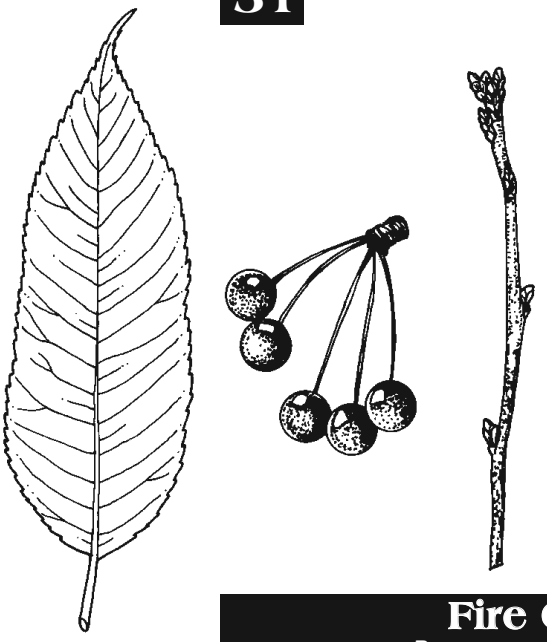
TWIGS: Stout, smooth, light brown to reddish brown, with numerous yellowish lenticels. Unlike Fire cherry, the lenticels are not horizontally elongated. *Bruised twigs have a disagreeable odor.*

FRUIT: A juicy, dark red to black drupe, about ⅓"-½" in diameter, in open, elongated, drooping clusters. The flavor is harsh and astringent.

BARK: Young trunks shiny, smooth, brownish, peeling off in thin film-like layers exposing the green inner bark. Older trunks dark gray, roughened by shallow fissures.

A fast-growing but short-lived shrub or small tree, rarely exceeding 25'. Found in a variety of open habitats, thickets, roadsides and upland woods throughout the Commonwealth, but more abundant in the western counties. One of the first species to revegetate cleared areas, it is attractive in flower and provides food to several dozen species of birds and mammals.

31



Fire Cherry

***Prunus pensylvanica* L.f.**

LEAVES: Alternate, simple, 3"-5" long, widest below the middle, with tapering or rounded base and sharp-pointed tips, sharply toothed margins, shining green and smooth on both sides.

TWIGS: Slender, smooth, glossy bright red, sometimes with a thin grayish coating, marked with numerous pale conspicuous lenticels which become horizontally elongated.

FRUIT: Juicy, light red drupes ¼" in diameter, tipped with parts of the persistent style, thin-skinned with sour flesh, maturing in early fall. Flowers in May, white, about ½" across, in flat-topped clusters of 4-5.

BARK: *Young trunks reddish brown, rather smooth with large horizontally elongated lenticels*, older trunks roughened but not fissured. *The outer bark peels off in thin film-like layers revealing green inner bark*.

Also called pin cherry, this shrub or small tree reaches 40', the trunk is usually short with branches forming a narrow flat-topped crown. Common in the mountainous sections of the state, rare in the southeast and southwest corners. A valuable reforestation species after fire or lumbering clears the land. It provides shade for seedlings of other tree species that follow it in succession and its fruits are food for many birds and small mammals. Deer browse the twigs and young leaves.

32

Serviceberry

***Amelanchier* species**

LEAVES: Alternate, simple, oval shaped, the largest 3"-4" long by 1"-2" wide, sharp-pointed tip, finely toothed margin, round or heart-shaped base.

TWIGS: Red-brown to gray-brown and slender. The buds ¼"-½" long, slender, sharp-pointed, greenish to reddish-brown.

FRUIT: Fleshy, sweet, dry or juicy, about ⅓" in diameter with 10 small seeds. Ripening to red-purple in June-July. *The flowers 1¼" wide, with five white petals, in terminal clusters, bloom in mid-April before the leaves*.

BARK: *Smooth, light gray, developing shallow longitudinal fissures with age*.

Amelanchier arborea and *A. laevis* are small trees, typically under 40' high. Also called Shadbush and Shadblow, names referring to their blooming as shad ascend rivers to spawn. Showy white flowers of Serviceberry, seen through the still naked oaks, provide one of the first floral displays of spring on Pennsylvania ridges. The fruits are excellent food for birds, bears and other wildlife. Humans eat the berries fresh, or in pies, muffins or jam. Seven shrub species of Serviceberry are also found in Pennsylvania.

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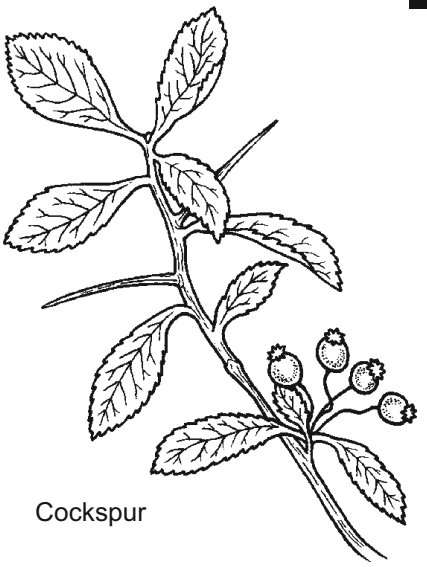
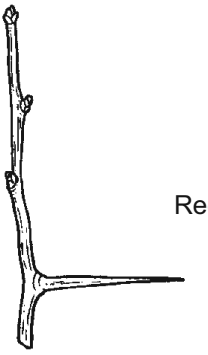
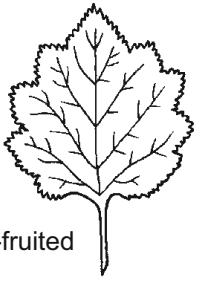


Cockspur





Red-fruited

Washington

Hawthorn

***Crataegus* species**

LEAVES: Simple, alternate, variously shaped but always sharply toothed and sometimes also lobed, thickish, dark green and lustrous, mostly 2"-4" long.

TWIGS: Smooth or hairy, grayish-brown with *stout straight or curved thorns 1"-2½" long*. The end buds are round and chestnut-brown about ⅛" long.

FRUIT: White flowers ½"-¾" across in flat clusters bloom in May and June. Small apple-like "haws"—greenish or dull red, up to ½" across containing 1–5 nutlets within a dry or juicy flesh—ripen in September and persist into winter.

BARK: Gray to reddish-brown and scaly

Small short-trunked trees or large shrubs 20'–30' high with sharp thorns. Hybridization between species and polyploidy make positive identification of species very difficult. Hundreds of species names have been proposed. The dense thorny branches provide excellent cover for songbirds. Thornless cultivars of cockspur and Washington hawthorns are widely planted ornamentals. The hard, dense wood is good for carving and turning but hawthorns are too small to have commercial value. Tiger swallowtail, viceroy, red-spotted purple and striped hairstreak butterflies feed on hawthorn leaves as caterpillars.

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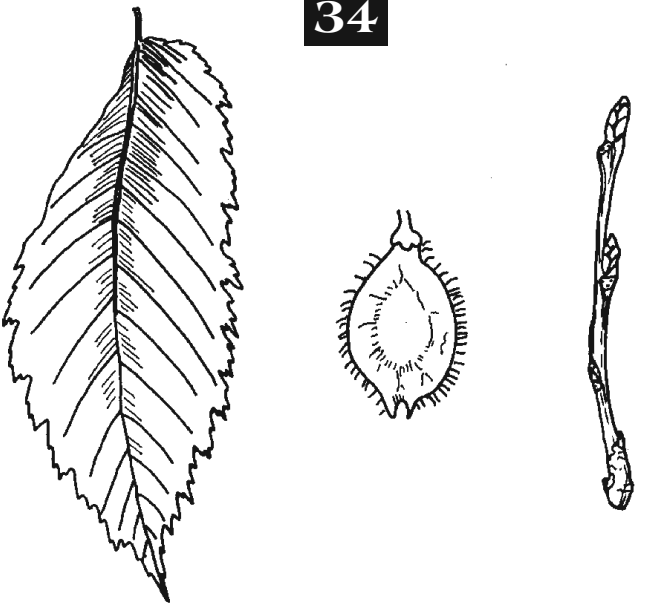


American Elm

***Ulmus americana* L.**

LEAVES: Alternate, simple, 4"-6" long, unequal at the base and tapered at the tip, smooth or slightly rough on the upper surface; usually soft-hairy below; veins prominent; margin doubly toothed, on a short petiole.

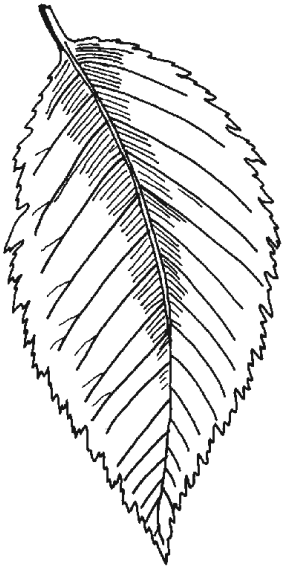
TWIGS: Slender, zigzag, brown, hairless or slightly hairy. Leaf buds ⅛"- ¼" long, flattened. Flower buds larger, below leaf buds. Bud scales red-brown, smooth or downy; margins dark.

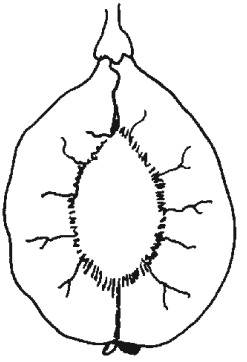
FRUIT: A seed surrounded by an oval, thin papery wing, ½" long, deeply notched at the tip; ripening in spring and borne in clusters; wing with scattered hairs along margin. Flowers and fruit appear before the leaves, as is true of Slippery elm.

BARK: Dark gray to gray-brown with long corky ridges; separated by diamond-shaped fissures on older trees. *A cross-section of bark shows alternating layers of white and brown.*

A large and highly prized shade tree growing 75-100' high. The drooping crown often gives it a vase-shaped appearance. Found locally throughout Pennsylvania, mainly on moist areas. The hard, tough, cross-grained wood is difficult to split and has many uses, including the manufacture of boxes, barrels and furniture.

35





Slippery Elm

***Ulmus rubra* Muhl.**

LEAVES: Alternate, simple, 5"-7" long; usually larger than those of American elm, *very rough upper surface* and rough or soft-hairy below; margin coarsely toothed. Petiole short.

TWIGS: Stouter than American elm, grayish and rather rough. Buds slightly larger than those of American elm, and more round (seldom flattened). Bud scales brown to almost black, rusty-haired.

FRUIT: Like that of American elm but somewhat larger, ¾" long; wing margin not hairy and slightly notched at the tip.

BARK: Similar to American elm, but reddish-brown, softer, and fissures irregular in outline. *Inner bark is sticky and fragrant.* A cross-section of the bark is evenly brown.

A medium-sized tree usually found near streams, the crown does not droop like that of American elm. The wood is commonly marketed with American elm.

36

Common Hackberry

***Celtis occidentalis* L.**

LEAVES: Alternate, simple, 2"-6" long, tip slender-pointed, margins toothed except near the rounded unequal base, rough upper surface, prominent veins beneath, leaf stem slightly hairy and grooved.

TWIGS: Slender, somewhat shiny, brownish with raised lenticels, pith white, chambered. Buds small, sharp-pointed, closely pressed to the twig.

FRUIT: Resembles a dark purple cherry, ¼"-½" in diameter on a long slender stem, sweet but thin flesh covering the pit, matures in autumn.

BARK: Grayish brown typically rough with *warty projections or irregular ridges*.

Usually a small tree 20'-35' high, but can be 80' or larger in southern Pennsylvania on moist limestone soils. Hackberry often displays clusters of short, dense branches called "witches brooms" and wart-like galls on the lower surface of leaves. A second, smaller species, *Celtis tenuifolia* Nutt., Dwarf hackberry, is found on dry slopes in southeastern Pennsylvania. Fruits of both species are an important wildlife food. The wood is used for furniture, boxes and containers but not in large quantity.

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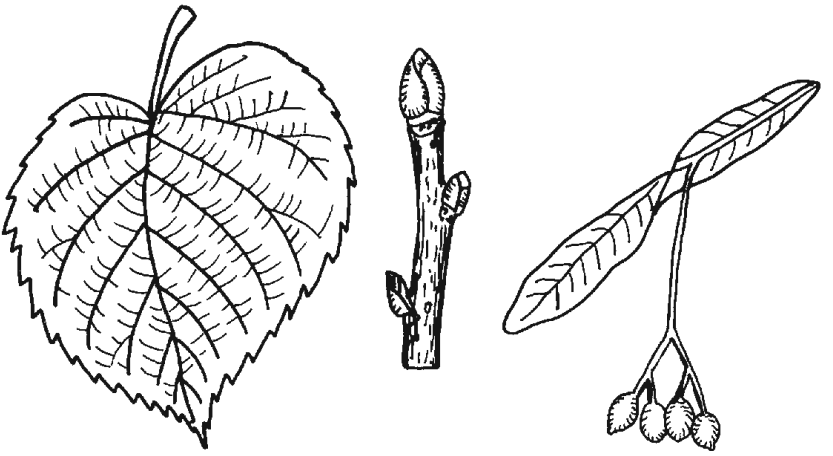

Basswood, American Linden

***Tilia americana* L.**

LEAVES: Alternate, simple, *asymmetrically heart-shaped, 4"-10" long*, shiny, dark green above, tufts of rusty hair beneath, margins sharply toothed.

TWIGS: Green or reddish when young, turning brownish-red, usually zigzag, buds deep red to greenish usually lopsided with 2-3 visible scales.

FRUIT: Nut-like, thick-shelled, downy, about the size of a pea, *borne in groups from a long stem attached to narrow modified leaf called a bract*. The clustered fruit and bracts may remain on the tree until late winter. Flowers yellowish-white, fragrant.

BARK: Young trunks smooth, dark gray, breaking into narrow scaly ridges on older trees.

A large tree usually found in mixture with other hardwoods on moist, rich valley soils statewide. Its wood is used for a variety of products including boxes, sashes, doors, picture frames and furniture. Food containers of basswood impart no flavors or odor to the contents. Inner bark fibers known as “bast” can be woven in to cords for nets and mats.

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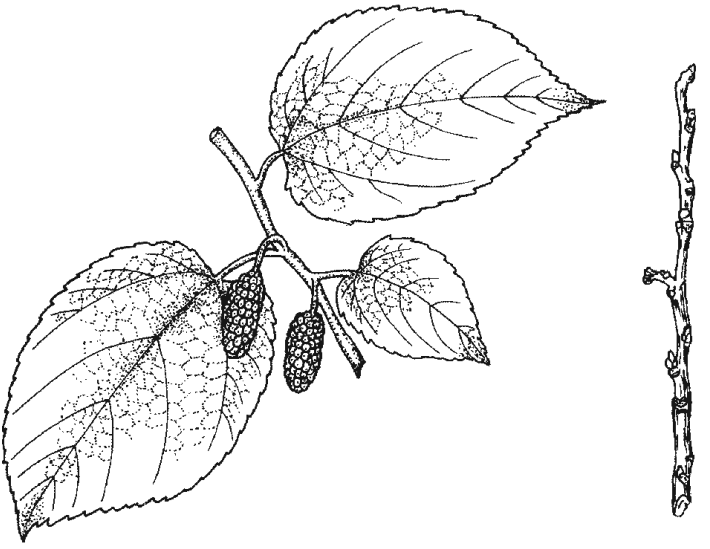

Red Mulberry

***Morus rubra* L.**

LEAVES: Alternate, simple, most often heart-shaped but sometimes lobed, 3"-5" long, rough on the upper surface; margins toothed.

TWIGS: Stout, smooth, glossy, slightly zigzag, greenish-brown tinged with red; enlarged at the nodes. *Milky sap is excreted from cuts.*

FRUIT: An *aggregate fruit, about 1" long, composed of many small drupes*, appears in July. First green, later red and finally dark-purple.

BARK: Dark grayish-brown, after 3 years roughed by longitudinal and diagonal splits and peeling in long, narrow flakes.

Typically found in rich, moist alluvial soils and lower slopes across southern Pennsylvania. It can attain heights of 50' but is usually shorter with trunks 12"-18" in diameter. The fruits are eaten by many birds, animals and people. The wood is durable in contact with the soil and has been used for fenceposts. An attractive ornamental, it should only be planted in large spaces because of its spreading growth form.

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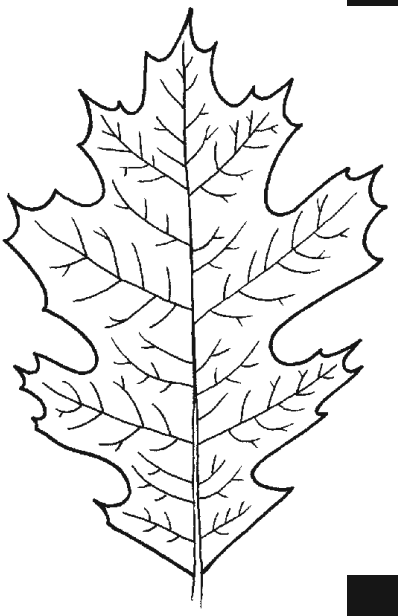

Black Oak

***Quercus velutina* Lam.**

LEAVES: Alternate, simple, 4"-8" long, 3"-5" wide; each has 5-7 pointed, bristle-tipped lobes, sinuses between the lobes go halfway to the mid-rib on lower leaves, deeper on top leaves; smooth and shiny above and usually covered with a rust-brown fuzz below.

TWIGS: Reddish brown, usually fuzzy. Buds blunt pointed, angular, yellow-grey, wooly.

FRUIT: An acorn, ½"-1" long, somewhat round, light brown. *The acorn-cup is bowl-like with wooly hairs, covering ½ or more of the nut; cup-scales sharp-pointed, forming a loose fringe at the rim*. Black oak acorns need two growing-seasons to ripen; kernels are yellow and extremely bitter.

BARK: Smooth and dark brown for many years, older trunks are dull black, furrowed, furrows forming irregular blocks; *inner bark orange to orange-yellow*.

A relatively fast-growing tree to 100' high. One of the most common oaks on dry, upland sites. The acorns are eaten by wildlife, but not preferred. The young stems and twigs are browsed by deer. A yellow dye can be made from the bark. The wood is lumped with other oak species and sold as red oak for general construction lumber and furniture.

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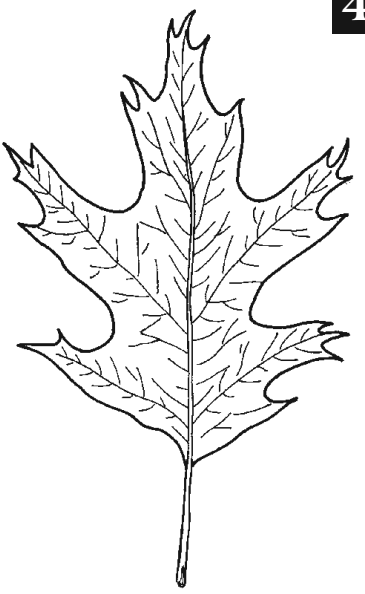

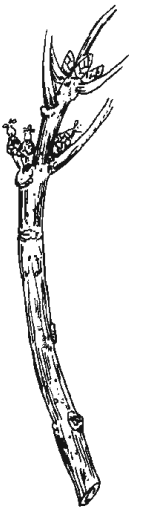

Northern Red Oak

***Quercus rubra* L.**

LEAVES: Alternate, simple, 4"-9" long, to 6" wide, with 7-11 bristle-tipped lobes, sinuses between lobes extend half-way to the mid-rib. Smooth, dull green above, paler with small tufts of reddish-brown hair in vein-axils beneath.

TWIGS: Greenish brown to reddish brown, smooth when mature. Buds pointed, light brown, smooth. The pith is star-shaped in cross-section.

FRUIT: An acorn, ¾" to 1¼" long; *the cup shallow, saucer shaped, covering ¼ of the nut,* cup-scales reddish-brown, narrow, tight, sometimes fuzzy on the edges. The acorns need two growing-seasons to ripen; the kernel is bitter.

BARK: Smooth and greenish-brown or gray, maturing to dark gray or nearly black and is divided into *rounded ridges between smooth gray streaks.*

A common dominant forest tree throughout the state growing to 100' or more in moist to dry soils. Deer, bear, and many other mammals and birds eat the acorns. It is often planted as a shade tree. The hard strong wood is used for furniture, flooring, millwork, railroad ties and veneer. The "red oak group" includes all oaks with bristle-tipped leaves and acorns ripening over two seasons.

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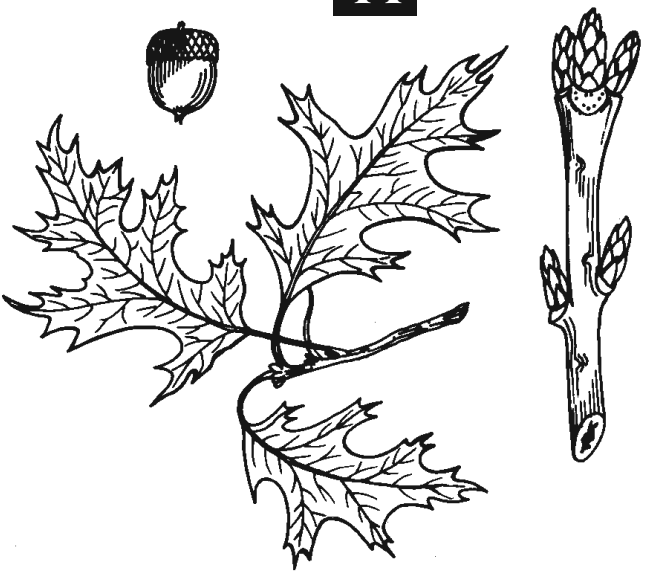

Pin Oak

***Quercus palustris* Muenchh.**

LEAVES: Alternate, simple, 4"-6" long with 5-7 narrow, bristle-tipped lobes, sinuses between the lobes deep (over half-way to the mid-rib) and rounded at the base; leaf surfaces smooth, shining above and paler below with tufts of hairs in the vein-axils.

TWIGS: Dark brown-red, shiny, *slender, often thorn-like side-shoots which give this species its popular name*. *Lower branches grow at a descending angle, middle branches are horizontal, the upper branches ascending*.

FRUIT: *A small acorn, round about ½" in diameter*, light brown, often striped with dark lines. Acorn-cup thin, saucer-shaped, enclosing about ⅓ of the nut; cup scales tight, with a dark margin. Ripens over two seasons.

BARK: Light gray-brown, smooth for many years, old trunks with shallow fissures and narrow flat ridges.

Wild Pin oaks are typically found in wet sites growing 60' to 80' high across the southeastern, south-central and western Pennsylvania. It is often planted as a street tree because of its beautiful form and ability to withstand poor urban soils. The acorns are valuable wildlife food for wetland birds and mammals. The wood is not as valuable as other oaks because it warps and splits in drying.

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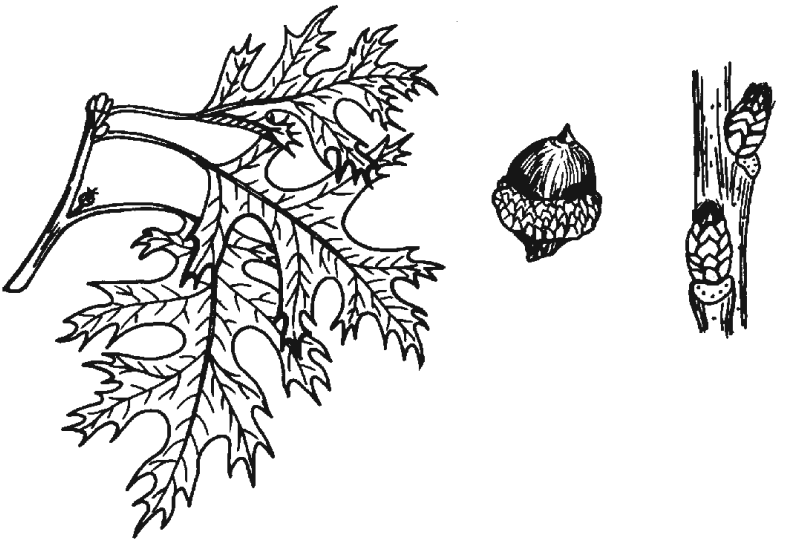

Scarlet Oak

***Quercus coccinea* Muenchh.**

LEAVES: Alternate, simple, 3"-6" long, with 7-9 narrow, bristle-tipped lobes, sinuses between the lobes go almost to the mid-rib. Shiny bright green above, paler and smooth beneath except for small tufts of hair in vein-axils; named for its scarlet autumn color.

TWIGS: Reddish brown, smooth when mature. Buds blunt pointed, to ¼" long, *upper half wooly*.

FRUIT: An acorn, to 1" long, oval, light brown; kernel white and bitter, ripening over two growing seasons. *Cup bowl-like, covering nearly half of the nut;* cup scales sharp pointed, smooth and tight.

BARK: Smooth and light brown for many years, older trunks are ridged, darker; inner bark reddish.

A medium to large sized tree to 80', of dry upland sites and many parks and streets. Drooping dead lower branches persist on the tree for many years. The acorns are important food for many mammals and larger birds. Fungus often infects Scarlet oaks as they reach medium size, rotting the wood.

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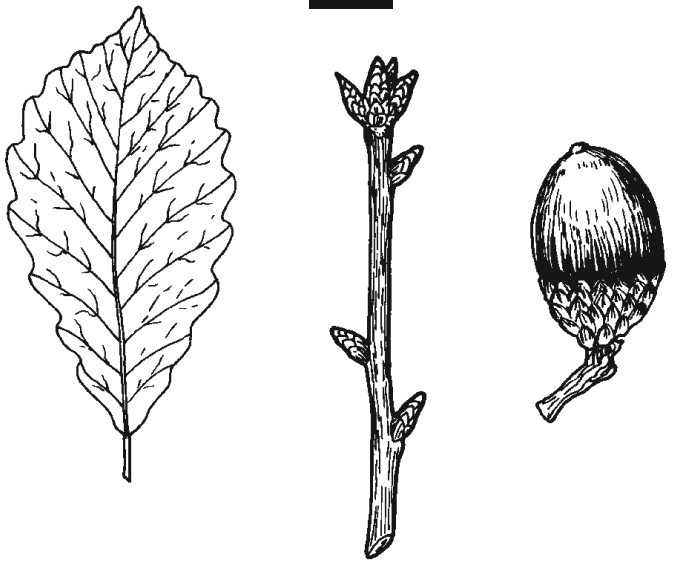

Chestnut Oak

***Quercus montana* Willd.**

LEAVES: Alternate, simple, 5"-9" long, to 3" wide; *with 7-16 pairs of course, rounded teeth*. Dark green and smooth above, pale green and occasionally downy beneath.

TWIGS: Smooth, orange-brown to reddish-brown. *Buds orange-brown*, sharp pointed, edges of scales hairy, ¼" to ½" long.

FRUIT: An acorn, 1" to 1½" long; rich dark brown, shiny. Cup thin, hairy inside, enclosing ⅓-½ of the nut; cup scales knobby. Fruit ripens in one growing season with kernels moderately sweet.

BARK: Grey and smooth on young trees, later dark brown to very dark gray, thick, with deep V-shaped fissures.

Also called Rock oak and Basket oak, this tree grows to 80' on dry slopes and ridgetops throughout Pennsylvania. Large crops of acorns produced every 4-7 years are important food for deer, bear, turkey and many other birds and animals. The bark is very rich in tannin and the wood heavy and strong. It is used for furniture, flooring, millwork, and railroad ties.

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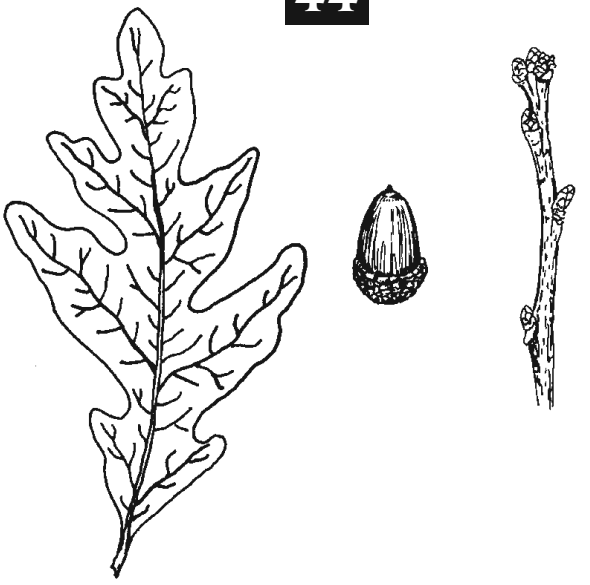

White Oak

***Quercus alba* L.**

LEAVES: Alternate, simple, 6"-9" long, and 4" wide, *with 6-10 rounded lobes; bright green above, paler below, both surfaces smooth on mature leaves*. Fall color is deep purple-red

TWIGS: Red-grey, often with a grayish coating. Buds rounded, reddish-brown, smooth, to ⅛" long; end buds clustered.

FRUIT: An acorn, ¾"-1" long, light brown, cup bowl like, hairy inside, enclosing ¼ of the nut; *cup scales warty at the base.* Acorn ripens in September after one season.

BARK: *Pale grey, scaly, not deeply fissured, often flaky*.

A dominant forest tree on dry to moist sites throughout the Commonwealth usually reaching 80'-100' high. White oaks live 400 years or more. The acorn is an important wildlife food and eastern Native Americans made a flour from these acorns. Traditional uses of White oak wood include hardwood flooring, whiskey barrels and boat building. The famous Revolutionary War frigate, USS Constitution, "Old Ironsides", was made of White oak. The "white oak group" includes all oaks with leaves having rounded lobe-tips without bristles and acorns that ripen in one season.

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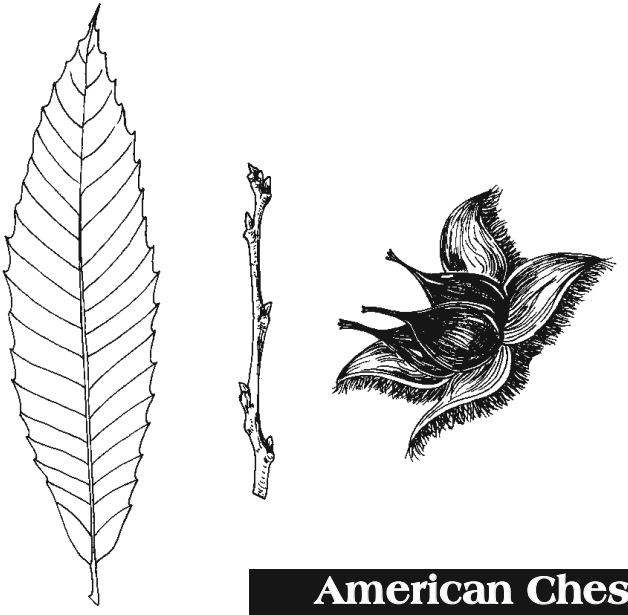

American Chestnut

***Castanea dentata* (Marshall) Borkhaussen**

LEAVES: Alternate, simple*, 5"-11" long, with sharp-pointed tips and hooked, sharply pointed teeth on the margins; smooth on both upper and lower sides.*

TWIGS: Stout smooth greenish to brown, with numerous small, white, raised lenticels.

FRUIT: *A prickly bur 2"-3" across, containing 2-3 nuts*. Nuts, flattened on one side, are shiny brown, sweet and edible.

BARK: Dark brown and thick with shallow irregular furrows separating broad flat ridges.

Formerly the most common and arguably the most valuable tree in Pennsylvania for both its wood and nuts. It now persists as stump sprouts and small trees due to the bark disease commonly called chestnut blight. Chinese chestnut, (*Castanea mollissima* Blume) is planted for its 1" nuts. Its leaves are shorter, up to 6" long and pubescent beneath. Chinese chestnut is resistant to chestnut blight and breeding programs designed to bring this resistance into American chestnut are underway.

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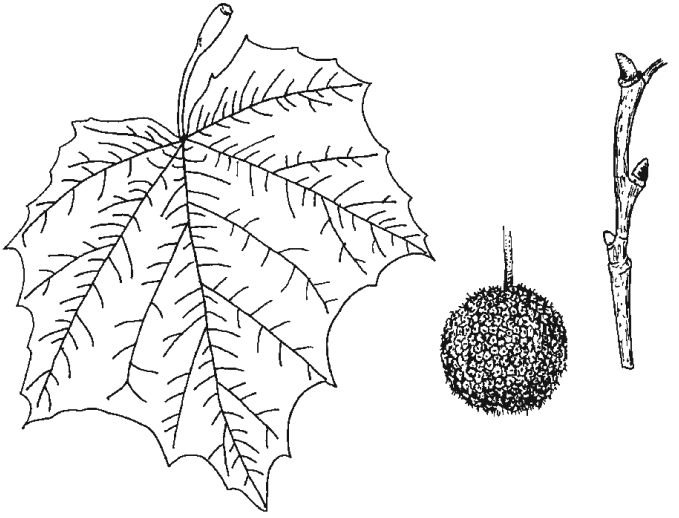

Sycamore

***Platanus occidentalis* L.**

LEAVES: Alternate, simple, 3-5 lobed, 4"-7" across, generally wider than long, light green above, paler and wooly beneath, petiole hollow at the base, enclosing next year's bud.

TWIGS: At first green and hairy, later brownish, smooth, zigzag, buds cone-like with a single, smooth reddish brown scale.

FRUIT: A round, light brown ball 1"-1¼" in diameter, made up of many seeds surrounded by silky hairs, hanging singly or in pairs by a tough, slender stalk throughout the winter.

BARK: *Consists of two layers, the outer peeling in brown flakes, the inner whitish, yellowish or greenish, the base of old trunks dark brown and fissured.*

Large, massive trees typically found on stream banks and floodplains attaining heights of 70'-125' or more. Also called Buttonwood or American planetree, the wood is used for furniture, butcher blocks and flooring. The London planetree, *P. x acerifolia* Willd., with 2-4 fruits per stalk, is commonly planted as a shade tree in urban areas.

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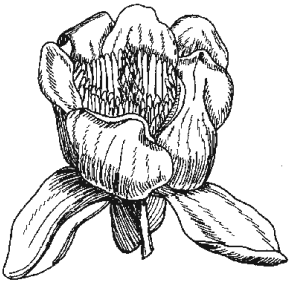

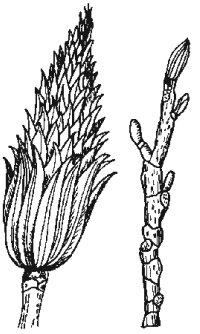

Tuliptree

***Liriodendron tulipifera* L.**

LEAVES: Alternate, simple, about 5” long and 4"-6" across, generally 4 lobed, with squared off and broadly notched tips, bright green, turning yellow in autumn.

TWIGS: In spring and summer, green, sometimes with purplish tinge; during winter reddish brown, *smooth, shiny and aromatic when broken. Buds large, smooth, flattened, "duck-billed."*

FRUIT: At first green, turning light brown when ripe in autumn; cone-like, 2½"-3" long, made up of winged seeds. Greenish-yellow tulip-like flowers in May or June.

BARK: Young trees dark green and smooth with whitish vertical streaks, older trunks dark gray and furrowed.

Also known as Yellow poplar, Tulip poplar, White poplar and Whitewood. A large tree to 140', the tallest of the eastern hardwoods. It grows rapidly and is an important timber and shade tree. The wood is valuable for veneer and many other uses. Songbirds and game birds, rabbits, squirrels and mice feed on the seeds. Whitetail deer browse the young growth.

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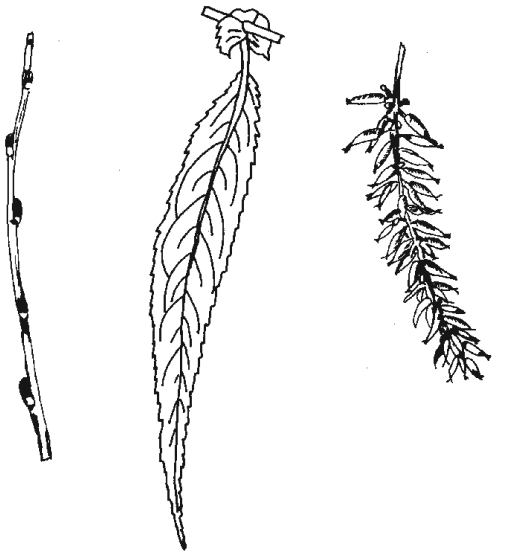

Black Willow

***Salix nigra* Marshall**

LEAVES: Alternate, simple, narrowly lance-shaped, very long-pointed, tapered or rounded at the base, finely toothed margins, smooth dark green above, pale green below. *Conspicuous stipules (small leafy parts at the base of the leaf-stalk) surround the twig.*

TWIGS: Slender, smooth and brittle, drooping, bright reddish-brown to orange.

FRUIT: Small reddish-brown capsules, ¼" long, in a long hanging cluster, each containing many tiny seeds. Each seed covered by a dense tuft of long, silky hairs.

BARK: Thick, rough, deeply furrowed, blackish-brown, with wide ridges and thick plates.

The largest of our native willows, typically reaching 60' in height. Found on streambanks and in wet meadows throughout Pennsylvania, it is most common in the east and south. Black willow wood is used in wickerwork and the bark contains medicinal compounds. Deer browse Black willow shoots. Weeping willow, (*Salix babylonica* L.), is a commonly cultivated species originally from China.

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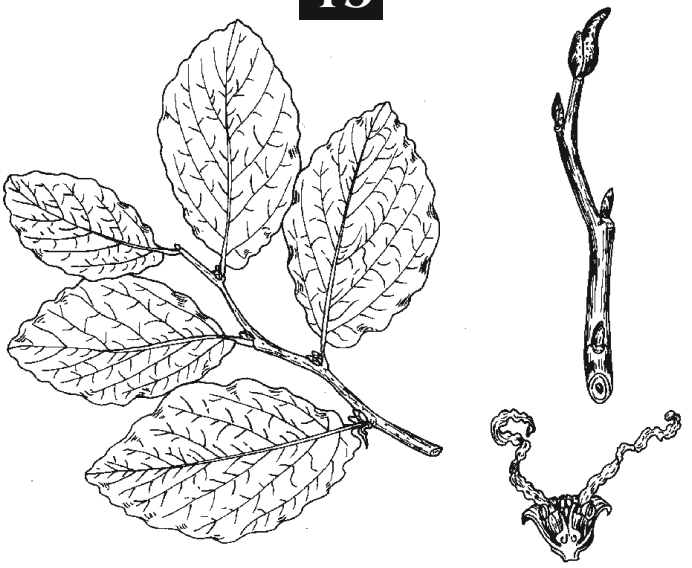

Witch-hazel

***Hamamelis virginiana* L.**

LEAVES: Alternate, simple, oval, 3"-6" long, 2"-4" wide, rounded to acute at the tips, asymmetrical at the base; margins wavy with broad rounded teeth; midrib and primary veins prominent.

TWIGS: Zigzag, light-brown with small light green pith, rather slender; buds are brown and fuzzy.

FRUIT: *Flowers with bright yellow strap-shaped petals. Yellowish-brown woody pods holding two shiny black seeds* ripen in October-November of the year following fertilization. Ripe pods burst open throwing the seeds 5' or more.

BARK: Light brown somewhat mottled, when young smooth, later scaly. Inner bark reddish purple.

A small tree or large shrub, to 25' high, tolerant of shade. Found in moist, rocky locations throughout the Commonwealth, occasionally ascending slopes to rather dry sites. A medicinal extract is distilled from the bark.

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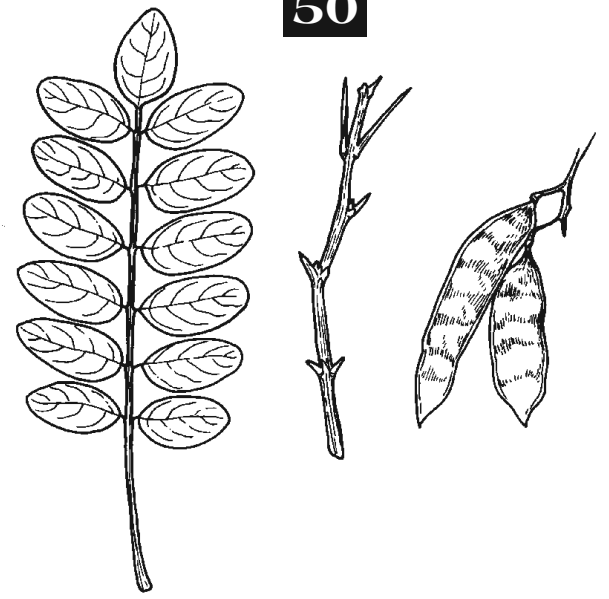

Black Locust

***Robinia pseudoacacia* L.**

LEAVES: *Alternate, compound, 7-19 oval leaflets 1"-2" long, margins smooth*.

TWIGS: *Angled, somewhat zigzag, brittle, with short stout prickles*; no end bud, side buds small and hidden in winter.

FRUIT: A thin, flat pod, 2"-4" long; usually with 4-8 seeds; splits on both sides when ripe. Flowers white, showy, very fragrant in drooping clusters, appearing in May and June.

BARK: Reddish brown, rough, furrowed, thick.

A medium-sized tree to 75' high, found in open woods, floodplains, thickets and fencerows throughout the State. Wood is durable in contact with the soil and in demand for posts, poles, railroad ties, and mine timbers. Unfortunately, several insects and wood rots cause heavy damage, especially to trees on poor soils. Squirrels eat the seeds and bees make honey from the nectar of locust flowers.

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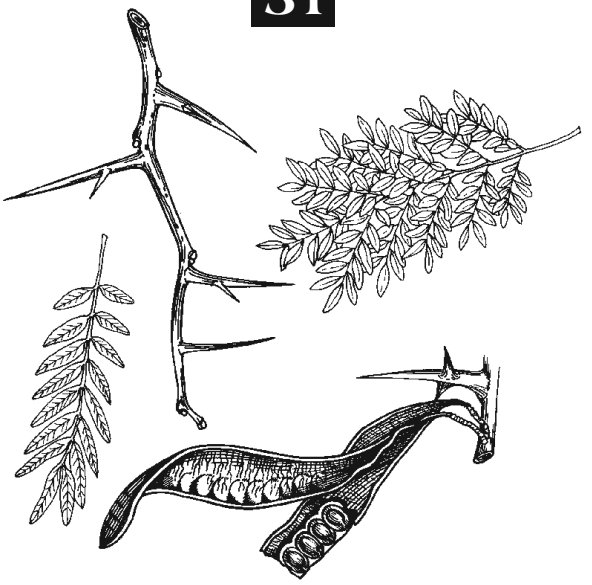

Honey-locust

***Gleditsia triacanthos* L.**

LEAVES: *Alternate, once and twice compound, 7"-8" long, having even numbers of 1" long leaflets* with fine-toothed margins, petiole grooved above and somewhat hairy.

TWIGS: Moderately stout, shiny, smooth, reddish to greenish brown, commonly mottled or streaked, and often *with long, branched, sharp thorns*. Twigs have no end buds and very small side buds.

FRUIT: A leathery pod, 10"-18" long, flat, often twisted with numerous very hard, dark brown, oval seeds. Pods contain a sweetish, gummy pulp.

BARK: Greenish brown with many long raised, horizontal lines of lenticels on younger trees, becoming brown to nearly black with long, narrow, scaly ridges separated by deep fissures and often covered with clusters of large, branched thorns.

Medium sized, commonly 40'-50' but can reach 100' high. Found naturally on rich, moist bottomlands in southwestern Pennsylvania, but widely planted as an ornamental throughout. A thornless variety with clear yellow fall color has been developed for the nursery trade. The strong, hard wood is used for fence posts and general construction, but it is not widely available. Many animals, including cattle, feed on the pods and seedlings.

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Bitternut Hickory

***Carya cordiformis* (Wang.) K. Koch**

LEAVES: Alternate, compound, 6"-10" long, divided into 7-11 lance-shaped leaflets, bright green and smooth above, paler and somewhat downy beneath, margins finely to coarsely toothed.

TWIGS: Slender smooth, glossy, orange-brown to grayish with numerous pale lenticels. *Buds covered by 4 sulphur-yellow, gland-dotted outer scales. End buds flattened, ¾" long.*

FRUIT: Nearly round, ¾"-1½" in diameter with a thin, yellowish gland-dotted husk, which splits into 4 sections almost to the middle when ripe. The round reddish brown nut has a thin shell protecting a bitter kernel.

BARK: The tight gray bark remains rather smooth for many years eventually developing shallow furrows and low, narrow interlacing ridges.

Bitternut hickory normally attains heights of 60'-75' when growing on moist, fertile bottomland soils but it can also be found on well-drained uplands throughout the state. The wood of this species is somewhat more brittle than other hickories and the nuts are too bitter to eat. Bitternut hickory is reported to be the best wood for smoking ham and bacon, giving a rich "hickory smoked" flavor.

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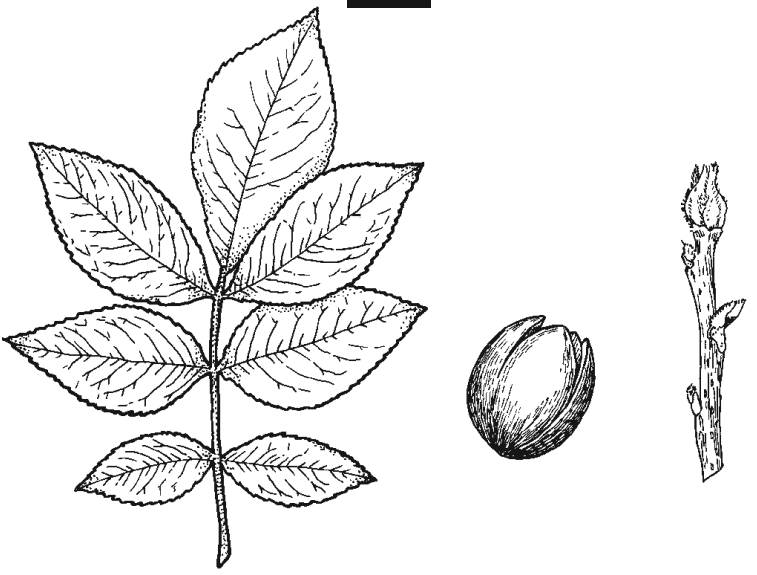

Mockernut Hickory

Carya tomentosa **(Lam. ex Poir.) Nutt.**
(sometimes listed as *Carya alba* (L.) Nutt. ex Ell.)

LEAVES: Alternate, compound, 8"-12" long with 7 to 9 leaflets, margins toothed, *the leaf stem and lower surface are hairy with golden glandular dots*, *crushed leaves very fragrant*,.

TWIGS: Stout and hairy, reddish brown to brownish gray with numerous pale lenticels and distinct three-lobed leaf scars. Buds large, with 3 to 5 yellowish brown, densely hairy outer scales, end buds ½" to ¾" long.

FRUIT: Nearly round to egg-shaped, 1½"-2" long, with a thick husk which splits into 4 pieces when ripe. The slightly ridged, thick shelled nut is reddish brown with a sweet kernel. Flowers in catkins, about May when the leaves are half-developed.

BARK: The gray to dark gray bark is tight when young and becomes regularly ridged as the tree ages.

Mockernut hickory is so named because the nuts appear large but have thick husks and shells and very small kernels. Found in moist open woods and slopes mostly in the southern part of the state, it usually reaches 50'-75' high. A black dye can be extracted from the bark by boiling it in vinegar solution. As with other hickories, the wood is heavy, hard, and strong and used for tool handles and furniture.

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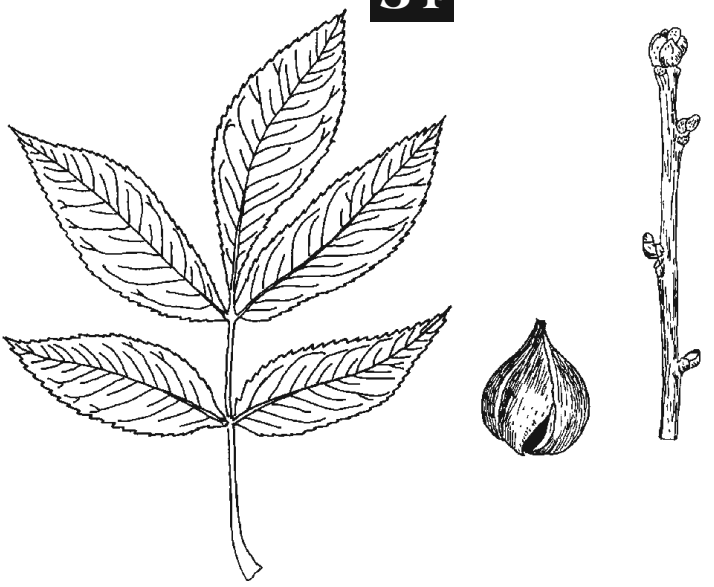

Pignut Hickory

***Carya glabra* (Miller) Sweet**

LEAVES: Alternate, compound, 8"-12" long usually divided into mostly 5 but sometimes 7, toothed, lance-shaped leaflets. The leaf is smooth on both surfaces, dark yellowish green above and paler beneath.

TWIGS: Slender and usually smooth, reddish brown with numerous pale lenticels. Buds reddish brown to gray, blunt pointed, with 6 outer scales which fall off during winter exposing the grayish downy inner scales. End buds ¼" to ½" long, smallest of our native hickories.

FRUIT: *Somewhat pear shaped tapering toward the stem, 1"-2" long with a thin husk only partly splitting when ripe.* Nuts brownish white, thick-shelled, kernels often taste bitter.

BARK: Gray to dark gray, usually tight, becoming shallowly fissured on older trees.

Pignut hickory reaches 90' high growing on dry ridgetops and slopes throughout the southern half of the state. As with other hickories, the wood is heavy, hard, and strong with very high shock resistance, and is principally used for tool handles. Although the nuts are too bitter for human use, they are an important food for squirrels and chipmunks.

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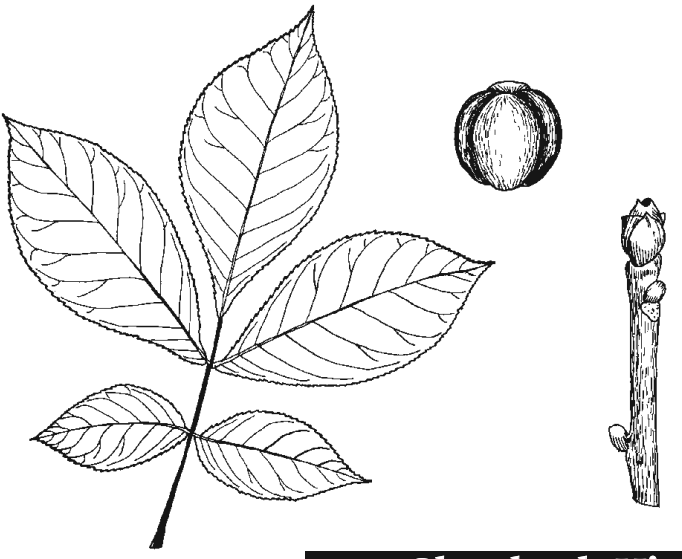

Shagbark Hickory

***Carya ovata* (Miller) K. Koch**

LEAVES: Alternate, compound, 8"-14" long, usually with 5 leaflets, dark yellowish green above, paler, often downy beneath, margins fine-toothed with tufts of hairs near the teeth.

TWIGS: Gray-brown to reddish brown, stout and often hairy with numerous lenticels. Buds are large with 3 or 4 nearly smooth, dark brown, loosely fitting outer scales and velvety inner scales; end buds ½" to ¾" long.

FRUIT: Nearly round, *1" to 2½" in diameter with a thick husk that splits into 4 pieces when ripe*. The usually thin-shelled, 4-ridged, white nut is pointed at one end and has a sweet kernel.

BARK: Younger trees smooth and gray; *older bark breaking into long, loosely attached plates giving the trunk a shaggy appearance.*

This 70' to 80' tall tree is found in rich soils on slopes and valleys throughout the Commonwealth. The wood of all the hickories is heavy, hard, and strong and used principally for tool handles. Hickory is a valuable fuel wood. Archaic uses included bow-wood, and wheel spokes for carriages and carts. The nuts are much relished by man and wildlife. The native Americans crushed the kernel, using both the oil the resulting nut meal.

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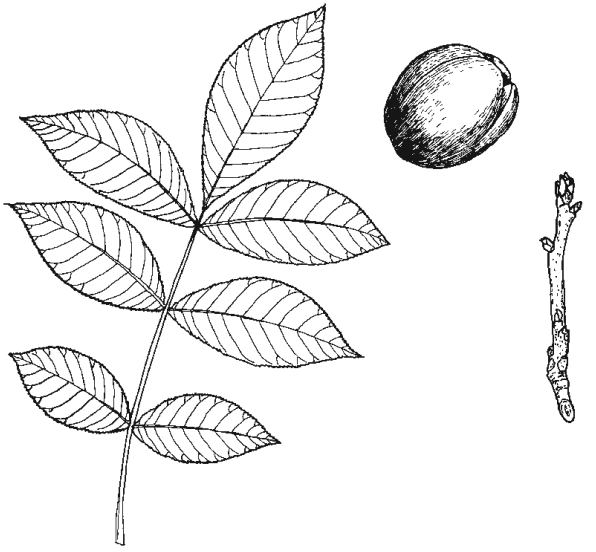

Shellbark Hickory

***Carya laciniosa* (F. Michaux) Loudon**

LEAVES: Alternate, compound, 10"-24" long, usually with 7 leaflets, dark green above, paler yellow green and hairy beneath, margins fine-toothed. The dried leaf axis, (petiole), often persisting on the tree all winter.

TWIGS: *Orange-brown, usually hairy and often angled with numerous orange lenticels, somewhat stouter than Shagbark hickory and with orange colored leaf scars.* The very large buds have 6 to 8 dark brown loosely fitting, keeled outer scales, end buds ¾" -1" long.

FRUIT: Largest of the native hickories, 1¾" -2½" long with a thick husk splitting into four pieces when ripe. The thick-shelled nut yellowish white to reddish brown, 4 to 6 ridged, pointed at both ends and containing a sweet kernel.

BARK: Closely resembles that of Shagbark hickory but with straighter, tighter plates and appearing less shaggy.

Also known as Kingnut hickory, this species is found on moist to wet, fertile bottomlands across southern Pennsylvania. The nuts are much in demand by man and wildlife. As with other hickories, the wood is very heavy, hard, and strong with very high shock resistance, and is principally used for tool handles.

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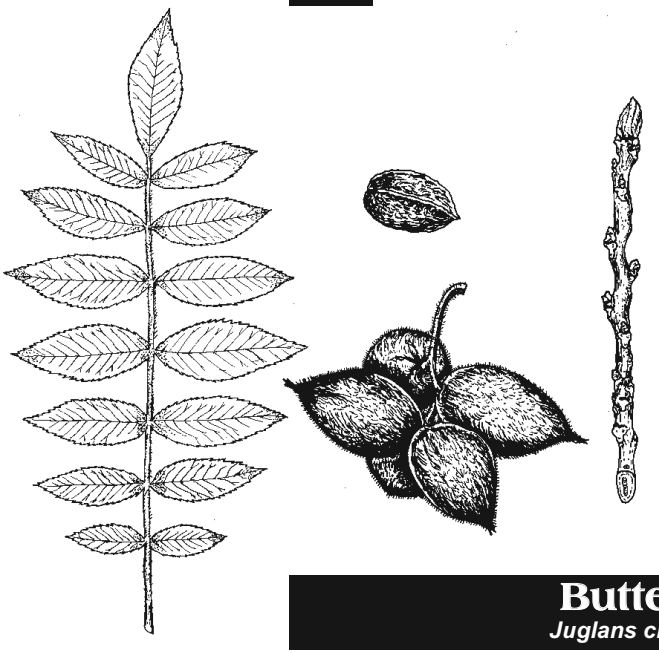

Butternut

***Juglans cinerea* L.**

LEAVES: Alternate, compound, leaflets 11 to 17, each 3"-5" long, small-toothed; dark yellow-green above, paler, hairy below; end leaflet same size as side leaflets; main leaf-stem with conspicuous sticky hairs. Butternut is one of the last trees to unfold its leaves in spring, and the first to shed them in autumn.

TWIGS: Stout, greenish-gray to tan, rough, brittle. *Pith chocolate-brown, chambered*. Buds light brown, hairy, not covered with scales; end bud ½"-¾" long, side buds smaller. Fringe of short hairs between leaf-scar and bud.

FRUIT: *An oblong nut, 1½"-2½" long, covered with a hairy, sticky husk*. The rough nutshell is pointed at one end, the kernel oily and sweet.

BARK: Young trunks rather smooth, light-gray; later becoming darker, deeply furrowed with wide, smooth, flat-topped ridges.

A medium-sized tree, to 60' high, usually in rich bottom lands and on fertile hillsides. Butternut is more common in northern tier counties and at higher elevations than Black walnut. Also called White walnut, its wood is used chiefly for furniture, instrument cases, and boxes and the nuts are an important wildlife food. Recently a fungal disease has killed many Butternut trees throughout its range.

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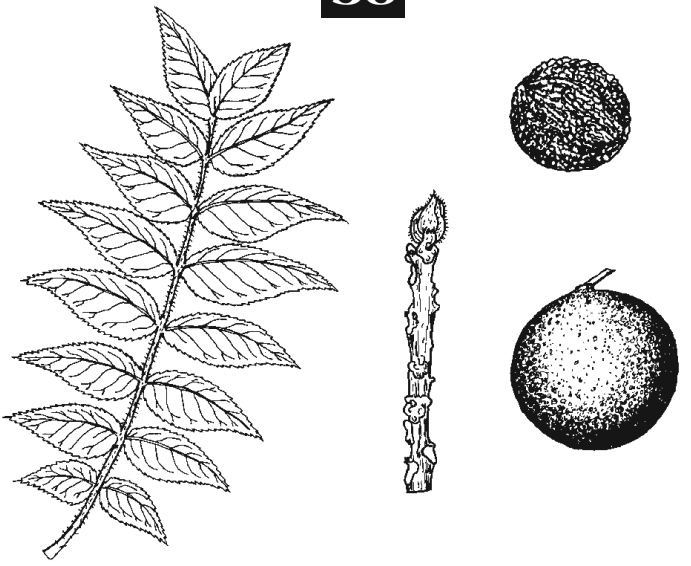

Black Walnut

***Juglans nigra* L.**

LEAVES: Compound, alternate; *leaflets 15 to 23, each 3"-4" long*, small-toothed; hairy below. End leaflet often absent or very small. Main leaf-stem with very fine hairs. *Crushed leaves have a spicy scent.*

TWIGS: Stout, orange-brown to dark brown, roughened by large leaf scars, easily broken; *pith pale brown, chambered.* Buds gray, downy; side buds ⅛" long, end bud larger.

FRUIT: *A round nut, 1"-2" in diameter, shell rough, covered with a thick, almost smooth, green spongy husk*; oily kernel sweet. Flowers in drooping green catkins, appearing with the unfolding leaves, which is also true of butternut.

BARK: Dark brown to gray-black, with narrow ridges.

A large-sized tree, found locally on rich limestone soils mainly in the southern and western parts of Pennsylvania. The rich brown heartwood is highly valued for veneer and quality furniture, gun stocks and musical instruments. The oil-rich nuts are used in baked goods and feed many species of squirrels other small mammals.

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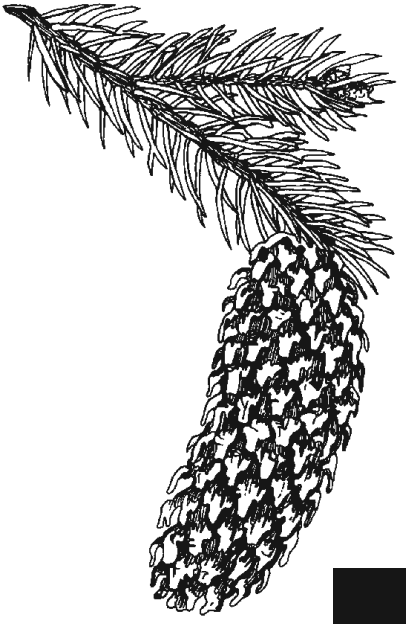
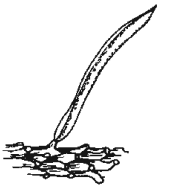
Introduced Species





Blue Spruce

***Picea pungens* Engelm.**

LEAVES: Needles 4-sided, stiff, in-curved and spiny pointed to 1¼", *usually bluish-green*, persist for 7-10 years.

TWIGS: Orange-brown turning gray-brown with age, without hairs. Buds dark orange-brown.

FRUIT: Cones to 4" long, cylindrical, tapering slightly at the tips, shiny chestnut brown; scales with irregularly toothed margins.

BARK: Relatively thin, scaly and pale gray when young becoming furrowed and reddish-brown with age.

A widely planted ornamental in Pennsylvania, Blue spruce is native to the Rocky Mountains at elevations of 5,900'-10,000'. Slow growing and long lived, specimens can reach 150' high but 60' is typical. Cultivated varieties can have silvery-white or golden-yellow needles.

Introduced Species

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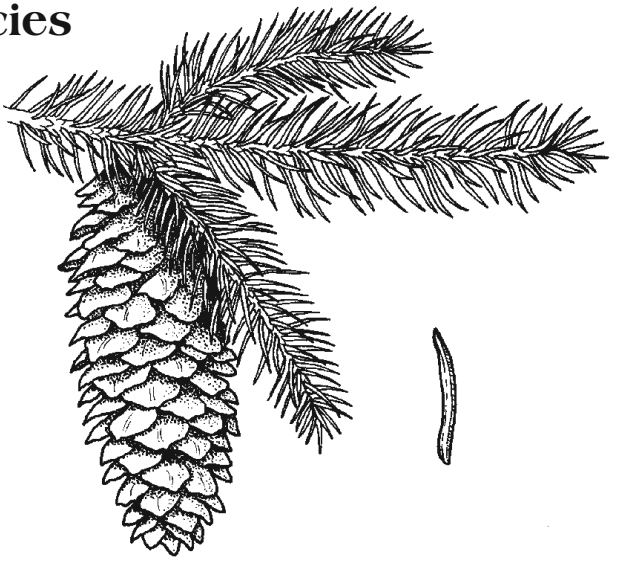

Norway Spruce

***Picea abies* (L.) Karst**

LEAVES: Evergreen needles occur singly, spirally arranged on twigs, sharp-pointed, four-sided, usually ¾" long, dark green.

TWIGS: Bright, golden-brown. Buds egg-shaped, darker than twigs.

FRUIT: A cylindrical cone, 5"-7" long, light brown.

BARK: Relatively thin, reddish brown, scaly, becoming gray-brown but seldom furrowed on old trees.

A European species that has become a valuable naturalized member of our forests, and extensively planted as an ornamental. A large tree with a dense conical crown, the largest specimens reach 120' with a trunk diameter of 4'. *Secondary branches hang down.* Its wood is used for paper pulp, boxes, crates and lumber. Songbirds, hawks and owls shelter in spruces. Red and white-winged crossbills eat the seeds and porcupines feed on bark and needles.

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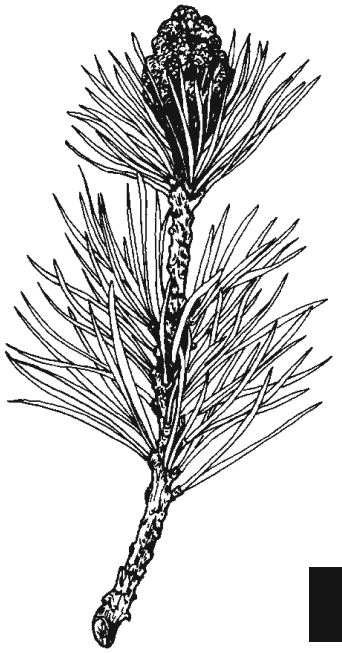
Introduced Species



Scots Pine

***Pinus sylvestris* L.**

LEAVES: Needles 2 per cluster, 1½"-3½" long, bluish-green or dark green stout, twisted, circular in cross-section.

TWIGS: Fairly stout, brittle, dark yellowish-gray, smooth.

FRUIT: Cones 1½"-2½" long, short-stalked, solitary or in pairs, usually pointing backward, grayish or reddish color.

BARK: Scaly, peeling off in flakes from ridges separated by long shallow fissures. Lower trunk rough and grayish, upper trunk rather smooth and distinctly reddish.

Native to Europe, tolerant of various soil and moisture conditions but intolerant of shade. Typically reaching 70' in height it can attain 120' with a diameter of 3'-5'. Widely planted for reforestation and horticulture, with occasional escapes from cultivation. Older books sometimes call it Scotch pine.

Introduced Species

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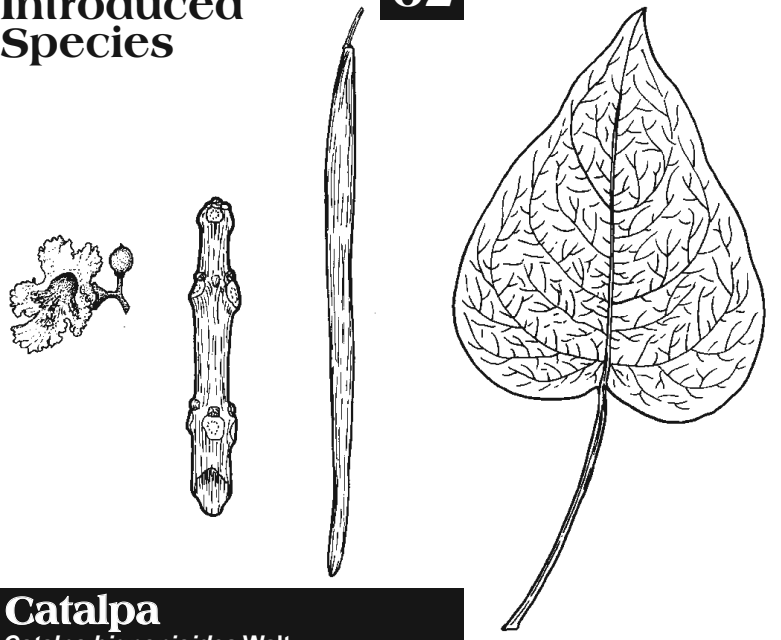

Catalpa

***Catalpa bignonioides* Walt.**

LEAVES: Opposite or whorled, simple, heart-shaped, 6"-10" long and 6" wide; margin entire or wavy; smooth above, hairy beneath.

TWIGS: Stout, yellow-brown; no buds at the ends. Side buds small, appear to be hidden in bark. Large, nearly round, depressed leaf scars are characteristic.

FRUIT: Bean-like, to 15" long, ½" wide, halves separating when ripe, may persist on tips of branches all winter, many seeds, each with long white hairs on both ends. Flowers in July, arranged in terminal clusters about 10" long; each showy flower white with yellow and purple spots, 2" in diameter.

BARK: Light brown, shallowly ridged and scaly.

A short-trunked, broad-crowned tree, to 50', native to southern states, but now widely planted and frequently escaped in the eastern U.S. Usually planted for its shade and flowers, the wood is durable and useful for posts. The Northern catalpa, *C. speciosa* Warder, with larger flowers and wider pods, has also been planted in the Commonwealth.

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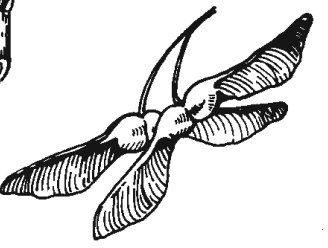
Introduced Species



Norway Maple

***Acer platanoides* L.**

LEAVES: Opposite, simple, coarsely 5-lobed, 4"-7" wide, milky sap exudes from the broken leaf-stalk.

TWIGS: Stout, reddish-brown. Buds glossy red with green at the base, bud scales with keel-like ridges. Leaf scars meet to form a sharp angle, encircling the twig.

FRUIT: Wings wide spreading to nearly horizontal, maturing in autumn.

BARK: Smooth and light brown on young trees, dark and fissured but not scaly when older.

Imported from northern Europe and extensively planted along city streets and in parks. Norway maple typically reaches 50' high. It frequently escapes from cultivation to grow in disturbed woods and roadways. Norway maple can be distinguished from other maples by the larger leaves, milky sap of the petiole, and the horizontal wings of the fruits.

Introduced Species

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Tree-of-heaven

***Ailanthus altissima* (P.Mill.) Swingle**

LEAVES: Alternate, compound, 1½'-3' long, composed of 11-41 leaflets, the lower with a few coarse teeth near the base which have distinctive glands.

TWIGS: Stout, yellowish-green to reddish-brown, covered with a fine velvety down; pith large, rather hard, light brown. Twigs have a rank odor when broken.

FRUIT: A spirally twisted wing, 1½" long, ½" wide, with 1 seed in the center, clusters often persist far into winter. Male and female flowers occur on separate trees.

BARK: Younger trunks smooth, light gray, older roughened with dark ridges, becoming dark gray and sometimes black.

This tree is originally from China and was first planted in this country near Philadelphia by English settlers. Often escaping cultivation, it is now found in disturbed woods, roadsides, vacant lots and railroad banks across southern Pennsylvania. The rapid growth of root sprouts makes it almost impossible to eradicate once established. Ailanthus can grow over 60' high.

GLOSSARY

Axil. The upper angle where a leaf stalk joins the stem or a smaller stem joins a larger one.

Alternate. One leaf attached at each node. See opposite and whorled.

Bract. A leaf-like structure often attached beneath flowers.

Capsule. A dry fruit which contains more than one seed and splits open when ripe.

Catkin. A compound bloom consisting of scaly bracts and flowers usually of one sex.

Deciduous. Refers to trees which drop their leaves in autumn. Compare with evergreen.

Downy. With very short and weak soft hairs.

Drupe. A type of fruit having a single seed enclosed in a hard layer and that covered with soft, often juicy flesh, as in cherries and peaches.

Evergreen. A plant that retains green leaves throughout the year. Life span of an individual leaf can be 2-15 years.

Leaflet. A leaf-like portion of the blade of a compound leaf. There is no bud in the axil of its petiole.

Leaf Scar. The impression in a twig at the point where a leaf was attached.

Lenticel. A pore in the bark of young trunks and branches through which air passes to interior cells.

Lobe. A division or projecting part of the blade of a leaf.

Opposite. Two leaves attached at each node. See alternate and whorled.

Pedicel. The stalk of a flower or inflorescence.

Petiole. The stalk attaching a leaf blade to the stem.

Pith. The spongy material in the center of twigs and young trunks.

Sessile. Refers to a plant part having its base attached directly to the stem without an intervening stalk.

Stalked. Refers to a leaf or flower having a length of petiole or pedicel between its base and the stem. See sessile.

Whorled. Three or more leaves or other parts attached to a stem at the same point.

Index

Resources

Other sources of information can be found online and in your local library or bookstore.

Common Trees of Pennsylvania. Online edition.
www.dcnr.state.pa.us/forestry/plants/commontrees/index.htm

Trees of Pennsylvania: A Complete Reference Guide by Ann Fowler Rhoads and Timothy A. Block. University of Pennsylvania Press, 2005.

A Field Guide to Eastern Trees (Peterson Field Guides) by George A. Petrides and Janet Wehr, Houghton Mifflin Harcourt, 1998.

The Sibley Guide to Trees by David Allen Sibley. Alfred A. Knopf, New York, 2009

Arbor Day Foundation Tree Identification Guide online at:
http://www.arborday.org/trees/whattree/

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Credits

Popular and scientific names used in this document are correlated with *Trees of Pennsylvania*: *A Complete Reference Guide* by Ann Fowler Rhoads and Timothy A. Block. University of Pennsylvania Press, 2005.

Written and edited by: Ed Dix and Seth Cassell with assistance from the DCNR Office of Education, Communications and Partnerships and the Bureau of Forestry Communications Committee

Layout and Illustrations by: L.A. Cook, S. Ebersole, B. Wadas, and K. Alsvary

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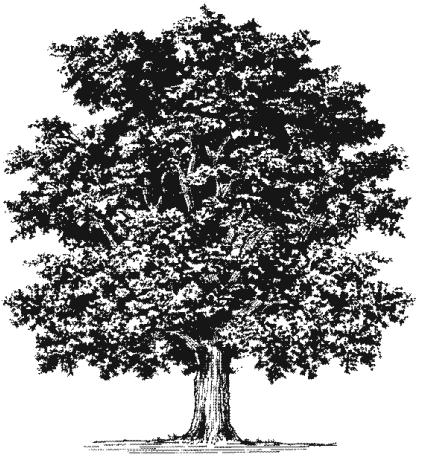
Notes



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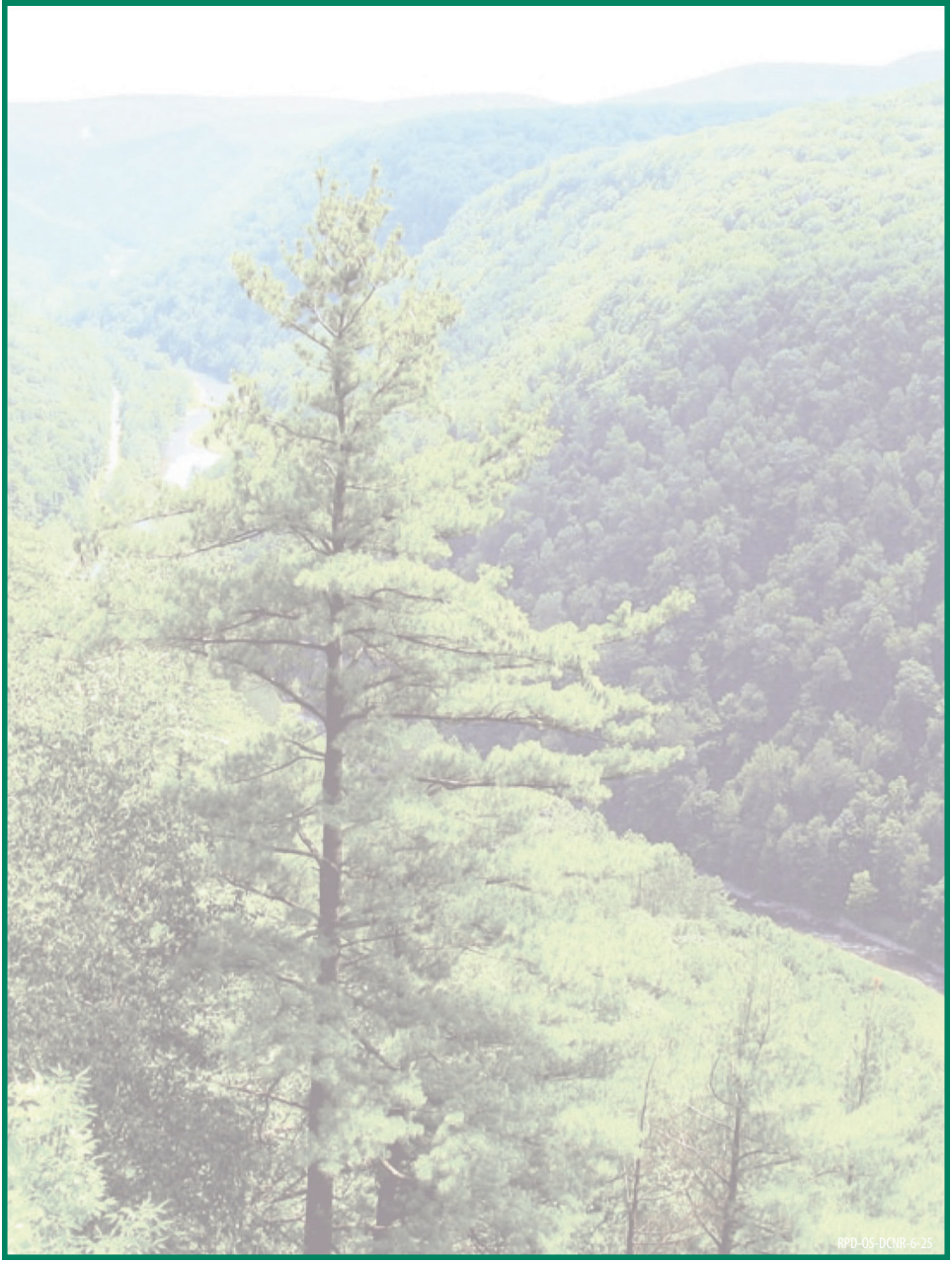

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