Common Tree Groups in Eastern North America

The following genera of trees are common in eastern North America. Many of the groups listed below have been discussed in the text of other chapters. For genera with multiple species a diagnostic key is provided and at least one figure accompanies descriptions of genera.

Follow the hyperlink to the section of interest. You can return to this page by locating the TOP hyperlink with each tree group.

Hardwoods

Maples (Acer)
Ashes (Fraxinus)
Oaks (Quercus)
Cherries (Prunus)
Birches (Betula)
Beech (Fagus) and Chestnut (Castanea)
Hickories (Carva)
Basswood (Tilia)
Dogwoods (Cornus)
Poplars (Populus)
Musclewood (Carpinus) and Hophornbeam (Ostrya)
Tulip Poplar (Liriodendron)

Conifers

Hemlock (Tsuga)
Balsam Fir (Abies)
Pines (Pinus)
Spruces (Picea)
Red Cedar (Juniperus)
White Cedar (Thuja)
American Tamarack (Larix)
**TOP**  

Maples (*Acer*) are the most recognized genus of eastern North American trees. Sugar maple alone is the State Tree of New York, Vermont, West Virginia, and Wisconsin while Rhode Island lays claim to the red maple. Maples are excellent street trees that provide years of shade, grow quickly and produce vibrant red, orange, and yellow leaves in autumn.

All North American maples produce opposite leaves and the vast majority of species have simple, lobed leaves. Maple leaves exhibit various degrees of serration along the lobes. Red, striped, silver, and mountain maple have serration along the leaf sinuses while sugar maple is toothed only on the apex of the lobes. Ash-leaved maple or boxelder is the exception to these leaf rules by producing pinnately compound opposite leaves. Leaf shape, lower leaf surface color (white vs. green), presence or absence of leaf pubescence, and twig characteristics provide the best features to identify maples.

Maples produce fruits known as samaras. Individual samaras represent half of the flower ovary and each samara possesses a single seed. The ovary wall develops a large thin wing with a thickened leading edge that spins like a rotor upon falling from a tree. Not surprisingly, school aged kids will recognize maple samaras as helicopters. Significant variation exists among maples in the seed mass relative to the samara wing size. Sugar maple has relatively heavy seeds and small wings while the opposite is seen in red maple. The difference in seed dispersal traits appears to be related to successional stage. Sugar maple is a member of the climax forest and its seeds disperse less far than red maple which is found in younger forests.

Maples are among the few forest trees that are insect pollinated. Flowers of red and sugar maple are small, but produce scant volumes of nectar and are famous for attracting honey bees early in the spring. Other understory maples have white-colored flowers that may be lightly fragrant and attract other insects for pollination. The weedy box elder has flowers that are most definitely wind-pollinated. Box elder flowers have very long stamens that dangle anthers in the breeze and large feathery stigmas to receive wind-blown pollen. The breeding system of maples is rather confusing. Depending on the species, trees may possess either staminate (male) flowers or pistillate (female) flowers and other individuals may possess both staminate and pistillate flowers. This is a highly unusual sexual system in trees termed “polygamioecy.”

Maples tend to be prolific seed producers, although silver maple appears to be a mast ing species. The samaras provide food for many ground mammals and some birds. Seeds of sugar maple are shade tolerant and germinate underneath the forest canopy. Red, silver, and boxelder
are earlier successional species and their seeds germinate readily in old fields and along flood plains. Understory maples also exhibit shade tolerant seed germination.

Maple wood products are widespread. In addition to cabinets and flooring, maple has become a favorite for major league baseball bats. Maple wood seems to produce a larger sweet spot on bats, although the wood is more brittle and performs for a shorter period of time than ash. Maple burls are favorite woods for carvers as the infected wood provides novel designs of dark and light colored wood.

Maple syrup is a favorite regional product throughout New York, southern Canada, and New England. Virtually any maple will produce a syrup-worthy sap although sugar maple is the favorite. Sugar maple has a longer run of sap than other species. In addition, as buds break the sap of other maples develop a bitter taste when concentrated. Large sugar maples may yield up to 60 gallons of sap per year to provide approximately 1.5 gallon syrup.

Key to eastern Maples (Figure Maples)
1. Leaves pinnately compound. . .Boxelder (Acer negundo)
   1. Leaves simple
   2. Leaves white beneath
      3. Leaves sinus shallow and V-shaped. . . Red Maple (Acer rubrum)
      3. Leaf sinus deep and U-shaped. . . Silver Maple (Acer saccharinum)
   2. Leaves green beneath
      4. Leaf coarsely toothed near lobe apex, large forest tree. . . Sugar Maple (Acer saccharum)
      4. Leaf finely toothed along margin, small understory trees
         5. Twigs green with length-wise white stripes, leaves goose-foot in shape. . . Striped Maple (Acer pennsylvanicum)
         5. Twigs brownish, leaves with small apical points. . . Mountain Maple (Acer spicatum)

Note: Norway maple (Acer plantanoides) is an introduced species of weedy habit in many areas. Norway maple leaves are similar to sugar maple, but are distinguished by possessing a milky sap and the basal leaf lobes are as wide as the upper pair of lobes.

TOP Ashes (Fraxinus) have pinnately compound leaves that are arranged in an opposite manner along twigs. Winter twigs of ashes are easily distinguished by the opposite-leaved twigs of maple by possessing broad, semi-circular to horse-shoe shaped leaf scars. Terminal buds are large and pyramidal in shape. Boxelder could easily be confused as ash, however, boxelder generally has five leaflets per leaf as compared to seven or more for ash.

The three common eastern ashes have different microhabitat preferences in the forest. White ash is a mid to early successional species in dry upland habitats. White ash saplings are frequently found in sunny locations on forest edges and in old fields. Green ash is another common ash, but is more likely to be found in
moist bottomland forests. Black ash is frequently overlooked and unknown, but occurs in moist forest depressions and along streams and rivers.

Ash species are dioecious and individual trees produce only staminate or pistillate flowers. Although the samaras of each species are easily identified to species, they provide diagnostic information for only the trees with pistillate flowers. Ash samaras are less aerodynamic than maple samaras. The thin samara wing slows the descent by spinning along its long axis as it rolls through the air. Ash seeds are shade intolerant and few ash seedlings are found in mature climax forests. The presence of large ash trees in a forest is a characteristic of a transitional forest between pioneer species and the climax maple-birch-beech-hemlock forest in the east.

All North American ashes are threatened by an exotic invasive insect. The Emerald Ash Borer (Agrilus planipennis) is believed to have been introduced to Michigan via infected ash crates in recent decades. Millions of forest and street trees are rapidly dying due to the spread of this insect throughout the Midwest. Several states have imposed restrictions on the transport of untreated ash or ash firewood throughout the state or across state lines. The economic impact of the emerald ash borer will be great as cities and states remove dead ashes from city streets and parks in its wake. In addition, ash is one of the most popular forest woods to be harvested for baseball bats, furniture, paneling, flooring, cabinets, and transportation pallets. The insect is now spreading eastward and will become a common problem in the next decade in New York State.

Key to the eastern Ashes
1. Leaflets stalked
   2. Lower leaf surface whitish. . . White Ash (Fraxinus americana)
   2. Lower leaf surface greenish. . . Green Ash (Fraxinus pennsylvanica)
1. Leaflets not stalked. . . Black Ash (Fraxinus nigra)

**TOP**

Oaks (Quercus) are most easily identified by their nut-like fruit that is partially enclosed by a scaly cup. Oaks are the most species rich group in eastern North America with at least 60 species nation-wide, but only about 10 species occurring in New York and New England. Oaks are divided into two discrete groups. The Black-Red Oak group has leaves that have bristle-tipped lobes and acorns mature in two years. White oaks have entire leaves or leaves with rounded lobes. Oak twigs tend to have buds clustered near the end of twigs.

White oak acorns are produce the same year as the flowers and are less bitter in taste. Oak flowers are highly inconspicuous and most species flower before producing new leaves. Staminate flowers are produced in elongated dense clusters. Pollen is wind-dispersed and female flowers are few at the node of the current year leaves. Identification of oak species is made more difficult in the southeastern and western states where species within a group sometimes hybridize.

Oaks are ecologically important trees. Many species specialize in discrete habitats from rich bottomland forests to mesic upland sites and xeric conditions in poor sandy soils to rocky hillsides. Acorns are often mast produced and deliver a substantial caloric rich food to deer,
squirrels, blue jays, ducks, turkeys and some western woodpeckers. White oak acorns also provided a mealy staple for some early North Americans. In general, oaks are disease resistant, but many insects make use of oak leaves as gall makers (see section on galls).

Oaks are favorite street trees as they grow quickly, provide excellent shade, and are sturdy in wind-rich regions. The white oak is a favorite of many and is the state tree of Maryland, Illinois, and Connecticut. Although the trees are stately and beautiful, the fall leaf color is something less than desirable and the slow abscission of leaves throughout the fall and winter angers most leaf rakers.

Oaks produce a hard ring-porous wood with discrete bands of spring and summer wood that gives oak wood products their distinctive signature. Oak wood commands a high price in the furniture, cabinetry, and flooring trade. Historically, oak was a favorite among ship builders. Oak cast barrels are extremely valuable in the alcohol industry. Charred oak barrels are used to impart a rich flavor and color to North American bourbon and to red wines. Cork is derived from the outer bark of the European cork oak and cork stoppers are used throughout the world in the wine and champagne industry.

Key to Oaks
1. Leaves bristle-tipped--Red Oak Group
   2. Leaves broadly rounded at base; acorn cup enclosing nearly 1/3 of nut
      3. Leaves with white-gray hairs on lower surface; sandy or rocky slopes of coastal region. .
         . Bear Oak (*Quercus ilicifolia*)
      3. Leaves not white-gray pubescent beneath
         4. upper leaf surface shing green; lower surface pale, yellow brown. . .Black Oak
            (*Quercus velutina*)
         4. Upper leaf surface green, paler beneath without yellow-brown appearance. . . Scarlet
            Oak (*Quercus coccinea*)
   2. Leaves V-shaped at base; acorn cup enclosing only base of nut
      5. Leaves deeply lobed to ½ of width; poorly drained sites (Hudson Valley of NY). . .Pin
         Oak (*Quercus palustris*)
      5. Leaves lobed to less than ½ width; upland well-drained sites. . . Northern Red Oak
         (*Quercus rubra*)

1. Leaves not bristle-tipped--White Oak Group
   6. Leaves deeply lobed to ½ of width along most of length . . . White Oak (*Quercus alba*)
   6. Leaves shallowly lobed to less than 1/3 of leaf length or lobed more deeply on lower half
      of leaf
   7. Leaves shallowly lobed along entire margin
      8. Wooded, well drained slopes in Appalachian region. . . Chestnut Oak (*Quercus
         prinus*)
      8. Lowland and wet soils with primarily a Midwestern distribution, occasional on
         eastern slope of Appalachians. . . Swamp White Oak (*Quercus bicolor*)
   7. Leaves shallowly lobed on distal half of leaf with at least one pair of deep lobes on
      proximal half. . . Burr Oak (*Quercus macrocarpa*)
Cherries (Prunus) are widely cultivated around the world and produce plums, apricots, and almonds in addition to the tart and sweet cherries. In addition, many species are grown as beautiful ornamental spring flowering trees. Although the flowers of native and cultivated cherries offer beautiful clouds of pink/white flowers, the floral odor is reminiscent of wet dogs and flies find the flowers particularly attractive. The cherry fruit is biologically referred to as a drupe which is a fleshy fruit with a single seed surrounded by a stony pit. Despite the appeal of agricultural cherries, these native species produce fruits that are extraordinarily bitter and tart. Although humans fail to relish the native cherries, I have seen bears climbing cherries to gorge themselves on the fruits. Watching the trees bend under the weight of black bears attests to the strength of cherry wood.

Cherry leaves are simple and alternate along twigs that smell of bitter almonds when scratched. The almond odor should be a signal that the leaves and twigs contain prunasin, a cyanogenic glucoside. As mammals or insects nibble the leaf tissue, cyanide is cleaved from a sugar making the leaves toxic to most herbivores. Some species of tent caterpillars are undeterred by the cyanide in cherry leaves. Many cherry species possess glands along the leaf petiole. These tissues produce small quantities of extrafloral nectar and attract ants early in the spring. Ants are notorious for guarding or farming these glands while nectar is produced.

The bark of fire cherry as well as young black cherries is lustrous with horizontal lenticels. This characteristic is reminiscent of young birch trees too. In sunlight the bark of fire cherry glows a deep red.

In the northeastern United States there are four common species of cherry. The common chokecherry and American plum form small trees or large shrubs in abandoned farm fields and fencerows. Black cherry is a transitional forest tree best known for its “burnt potato-chip-like bark.” Fire cherry is a pioneer species adjacent to coal fields and on nutrient poor soils. It colonizes and regenerates thick primary forests following fire. Cherry seeds are shade intolerant and saplings are most often found along forest edges and in old fields.

Mature black cherries are among the most highly prized forest lumber. The fine grain and naturally dark heartwood produces furniture of glowing reddish brown qualities reminiscent of mahogany. Black cherry is also desirable for gunstocks, tobacco pipes, and wood coffins. The wet mucilaginous inner bark of black cherry provides a soothing remedy for sore throats. Products containing black cherry bark extract may be found in health food stores.

Key to Common Cherries (Figure CHERRIES)
Flowers and fruits produced in elongated inflorescences (clusters)
Leaves with fine, sharp serrations along margin, underside of midrib bare. . .
Chokecherry (Prunus virginiana)
Leaves with blunt serrations along margin, underside of midrib clothed in fine tan, brown pubescence. . . Black Cherry (Prunus serotina)
Flowers and fruits in small, rounded clusters along twigs
Leaves lance-shaped, widest below middle. . . Fire Cherry (Prunus pensylvanica)
Leaves ovate to obovate, widest beyond middle. . . American Plum (*Prunus americana*)

**TOP Birches (Betula)** have attractive peeling bark and are grown for ornamental value in gardens and urban landscapes. They have double-serrate alternate leaves that often grow from short, long-lived lateral or spur shoots. Birches produce distinct male and female catkins and are wind-pollinated. The female catkins produce small, dust-like winged seeds that are of little value to wildlife, although winter irruptive common redpolls can be seen eating the seeds.

Yellow and sweet birch are members of the climax temperate deciduous forest in eastern North America. The crushed twigs and leaves produce a stronger wintergreen odor than Yellow birch. Sweet birch was once the primary source of wintergreen oil and in manufacturing birch beer. Today, laboratory synthesis of wintergreen is far easier and more efficient than extraction from native woodlands. The minute seeds of yellow birch must land in a sufficiently moist elevated site (e.g., rock crevices and moss covered logs) as the seeds and seedlings are not tolerant of hardwood leaf litter. Growth on top of decaying stumps and logs may yield yellow birch trees with large stilt-like roots emerging from the soil. Both yellow and sweet birch live to old ages and some old growth forests of the Adirondacks sport yellow birch in excess of 400 years. The wood of these species is very dense and a sought after timber species for indoor woodwork.

Gray birch is a pioneer species in New England. It rapidly colonizes nutrient poor soils that have recently been burned or abandoned from agriculture. The wood of this species is very weak and trees rarely live beyond 50 years. River birch is a southeastern tree species that prefers rich moist soils. It is native to the lower Hudson valley of New York and lives on rich moist soils. This species is being grown more often as an ornamental tree in central New York for its colorful peeling bark.

Paper birch is best known for its thick whitish bark. The bark can be peeled from trees, and yes the tree dies, soaked in water and then molded into flat panels or a covering for canoes. Adirondack art and early wall coverings are well-known for the use of paper birch bark. Paper birch is a member of the boreal forest and mountain regions throughout northern New York and New England. Paper birch survives higher altitudes than most other deciduous trees and is an associate with balsam fir and red spruce.

**Key to Common Birches**
1. Twigs with wintergreen odor
   2. Bark are young and medium aged trees peeling in gray to golden strips. . . Yellow Birch (*Betula alleghaniensis*)
   2. Bark on young and medium trees dark brown to gray. . . Sweet Birch (*Betula lenta*)
1. Twigs without odor
   3. Bark cream colored, brown to pink overtones in areas . . River Birch (*Betula nigra*)
   3. Bark white or gray
   4. Bark not peeling, leaf triangular and broadest at base, trunk with obvious chevrons at branch junctions. . . Gray Birch (*Betula populifolia*)
   4. Bark peeling in large pieces, leaves triangular but leaf base rounded, trunk without obvious chevrons. . . Paper Birch (*Betula papyifera*)
American Beech (*Fagus grandifolia*) is iconic to the forest of eastern North America. The future of American Beech in eastern forest is in question. Mature beech trees are succumbing to one of several bark fungi that are introduced by parasitic insects. Furthermore, climate change models predict that the optimal habitat for American Beech will move quickly northward over the next century.

Leaves are large with single terminating a lateral vein. Winter buds are long and cigar shape. Beech leaves are most easily confused with American chestnut. The teeth on chestnut leaves are curved and the winter buds are small and rounded.

American Beech bark is highly recognizable as a smooth gray bark with elastic properties. Natural artisans carving through the thin bark and into the cambium facilitate a scar forming process that will persist and grow as long as the tree lives. One of the more famous beech bark scars is from Daniel Boone "D. Boone cilled a bar on tree in year 1760 (INHS Report; January-February, 1997).

Beech trees bear both male and female flowers in separate inflorescences typical for many wind-pollinated forest trees. Beech nuts are triangular in cross-section and enclosed in husks covered in coarse bristles. Mature nuts are mildly sweet and a nice woodland treat provided you beat the squirrels to them. Blue Jays are regarded as important seed dispersers for American beech. They are capable of carrying 9-14 seeds in their crop to fall caches. Historically, Passenger Pigeons favored the nuts of American Beech.

Beech wood is valuable in veneers, railroad ties, rough lumber and charcoal. Beechwood is a favorite for fireplaces as the wood is dense and releases a lot of heat during a complete burn. Beech wood chips are sometimes used in commercial beer making. Beech offers no flavor to the beer, but merely increases surface area for yeast to ferment the wort at a quicker pace.

Hickories (*Carya*) have alternate pinnately compound leaves. The leaflets, unlike ashes, are toothed, and in many species the leaflets increase in size to the apex. Hickory twigs are stout with large terminal buds and broad, shield-shaped leaf scars. In most species the wood is tough and it is nearly impossible to snap cleanly without significant torque.

Hickories are monoecious and individual trees produce both male and female catkins. Female catkins have few flowers and are located near the stem tips. Male catkins will are usually clustered in groups of three and are produced further back on stems. Large nuts enclosed in a thick four-parted husk result from successful pollination and fertilization. The outer covering of the nut is stony and protects the large embryo with massive stores of lipid rich endosperm. The nuts of hickories are favorites among squirrels. The nuts also provide valuable food to deer and some ducks.

Shagbark Hickory is a long-lived hickory found on dry upland sites with oaks throughout New York except the Adirondacks. Everything about Shagbark
Hickory is big. The leaflets are large with the terminal three the largest. The terminal bud is large and covered by numerous bud scales. The bark shreds into long vertical plates that give it the shaggy appearance. Shagbark Hickory nuts are large (1.5-2.0 inches), aromatic, sweet-tasting and thin-shelled. Shagbark Hickory nuts are preferred over many other hickory and oak fruits in squirrel cafeteria tests.

Bitternut Hickory is a short-lived (<200 years) hickory native to moist woods and bottomlands throughout New York except the Adirondacks. This species reaches its peak in growth and nut production early in life (<125 years).

Pignut hickory is restricted to southern climates associated with the Finger Lakes region, adjacent to Lake Erie, and areas south of Albany. In some areas of southern states, pignut hickory has become more prevalent as the American chestnut has declined. The name pignut is taken from the putative snout-shape of the nut. Many texts are more likely to describe the shape as pear-shaped.

Hickory wood is dense, durable, and shock resistant. These traits make it an excellent choice for tools, furniture, flooring, doweling, and gymnastic equipment. Shagbark hickory wood has the highest heat value of all hickories and therefore is widely used in charcoal and meat smoking.

**Common Hickories (Figure HICKORIES)**

1. Lower surface of leaflets hairy. . . Shagbark Hickory (*Carya ovata*)
2. Lower surface of leaves hairless
   1. Terminal buds slender with two buttery yellow scales. . . Bitternut Hickory (*Carya cordiformis*)
   2. Terminal buds stout with several light brown scales. . . Pignut Hickory (*Carya glabra*)

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**TOP**  
**Poplars and Aspen (Populus)** are fast growing pioneer species. Several species exhibit extreme weediness by producing beaucoup lightweight seeds with cottony parachutes, rapid growth, and the ability to clonally reproduce via a far-reaching underground root system. The root system is water hungry and aggressive. Poplars are one of the trees that result in clogged sewage pipes and raise sidewalks when they are mistakenly planted along city streets.

Balsam poplar is an associate of balsam fir and white spruce in boreal like communities of northern New England. Eastern Cottonwood is a large growing species of bottomlands and swamps seldom growing in drier soils. Quaking aspen are pioneer species in the northern U.S., western mountain states and Canada. Bigtooth aspen has a more eastern distribution and can be found south along the southern Appalachians.

Leaves are alternate, rounded with lance-shaped tips. The leaves are toothed and often have three primary veins near the base. Poplars flower very early in the spring before leaves form. The silvery sheen to poplar flowers glitters along interstates and roadways.

The speed of growth is sacrificed in wood strength. Aspens and poplars bend and break quickly in heavy snows and hurricane force winds. The lightweight, light-colored softwood is used for transport crates, toothpicks, match sticks, and some kitchen utensils. The high cellulose low tannin wood is currently being considered as a renewable biofuel.

Eastern cottonwood is found on well-drained, sandy, bottomland sites in the region. Female trees are prolific seed producers and individual may produce upwards of 48 million seeds
in a single season. The seed capsules split during dry periods in June and the cottony light
weight seeds drift great distances in the wind and water. The abundance of airborne seeds may
be mistaken as a warm June snow and will coat the ground in profusion. Eastern cottonwood
obtains great stature quickly as is reported to grow 120+ feet in as little as 30 years.

Quaking aspen trunks rarely grow to an impressive stature, aspen clones make-up for the
lack of size and age of large single-trunk trees. A clone in Utah is reported to cover more than
100 acres. Quaking aspen is common in both boreal and temperate habitats. The outer bark is
thin, translucent and the inner bark is laden with chlorophyll. Quaking aspen may gain an
advantage over other deciduous trees in boreal zones by being able to photosynthesize earlier in
the spring.

1. Leaf petioles rounded, buds sticky and fragrant
2. Tree of disturbed sites in northern New England. . . Balsam Poplar (Populus balsamifera)
3. Tree of bottomland forests throughout Midwest and lower New England (Populus
deltaoides)
1. Leaf petioles flattened laterally, buds smooth and without odor
3. Leaves finely toothed along margin. . .Quaking Aspen (Populus tremuloides)
3. Leaves with few large coarse teeth along margin. . . Bigtooth Aspen (Populus
grandidentata)

TOP Musclewood and Hophornbeam (Carpinus caroliniana and
Ostrya virginiana) are two members of the forest understory and edge.
Like other members of the birch family, the are wind-pollinated,
monoecious, and bear catkins. The leaves of these are very similar, but
characteristics of the winter buds, fruits, and bark make these species
easy to distinguish. Musclewood is a slow-growing under story tree in
moist near climax woods of eastern North America. Musclewood is
found in all areas of New York with the exception of the Adirondacks.
Eastern Hophornbeam or Ironwood (Ostrya virginiana) is found in all
states east of the North American Plains and in southern Ontario and
Quebec. It is found in a wide-range of forest and soil types.

Musclewood is easily identified, and name remembered, by its
bark which is smooth gray and rippled much like a weight-lifters forearm. The bark of
hophornbeam frays easily into vertical thin strips whereas musclewood bark is smooth and with
an undulating appearance. Musclewood fruits are small and nut-like partially enclosed by a
green, leaf-like bract. Fruits of hophornbeam are nutlets enclosed in pale green, inflated sacs.
Hophornbeam fruits resemble hop flowers from Humulus.

The alternate name of Hornbeam is derived from horn which means tough and beam
(sensu baum) which means tree. As implied, the wood of hornbeam is very tough, durable, and
dense. It has received limited use in tool handles, but its slow growth and small stature limit
commercial interests in Musclewood products. The wood of hophornbeam is very strong and
hard. It was once used, and may still be, for cartwheel spokes and axles.

Flower catkins, twigs, and nutlets provide food for browsing animals, grouse, turkey,
songbirds, and squirrels. Hophornbeam provides forage for deer, grouse, squirrel, and wild
turkey that eat the buds, twigs, leaves, flowers and fruits. Hophornbeam may be used as an
ornamental in rural areas, but not in cities. It is highly sensitive to industrial air pollution.
Tulip or yellow poplar (*Liriodendron tulipifera*) is the official state tree of Indiana and Kentucky. The official designation in Kentucky took more than forty years to establish and was up against heavy campaign by pro-Kentucky coffeetree lobbyists to have the name sake tree designated as the state tree.

Tulip poplar is neither a tulip nor a poplar. The four-lobed leaves resemble the silhouette of a tulip flower. In addition, the greenish-orange attractive flowers bear a superficial resemblance to tulip flowers. Tulip poplar flowers are an important source of nectar for honeybees early in the summer.

This fast growing forest tree more closely related to magnolias than anything else. It is very common east of the Mississippi River, but restricted to the Finger and Great Lakes regions of upstate New York. In the southern Appalachians, tulip poplar grows quickly, tall, and very straight. Trees often grow taller than the surrounding forest canopy. Historically, the wood was popular by Native Americans and colonists for dugout canoes. The wood is soft with a straight grain and is a valuable interior wood for furniture construction.

Basswood (*Tilia americana*). The fragrant white flowers of summer flowering basswood are distinctive among dominant trees in the eastern deciduous forest. The flowers are so attractive to bees that many honey producers can successfully process a unique light-colored honey with a pleasant, yet distinctive, aftertaste from the honeybees. The flowers and fruits are born underneath a hotdog-shaped leaf-like bract. This bract provides a twirling parachute for dispersing fruits in the fall. Leaves are heart-shaped to round with slightly uneven leaf bases. The leaf margins are filled with large coarse single teeth.

Basswood is a fast growing tree of primary forest. It has a high demand for soil nutrients and its decaying leaves are important in mineral recycling. Perhaps some of this demand is to create nitrogen rich chlorophyll in the xylem rays of young twigs. Although the seeds are not strongly shade tolerant, basswood has a remarkable ability to grow from stump and root sprouts to fill forest gaps.

American basswood produces a light colored wood that is reportedly great for hand carved projects. The wood also makes a nice light colored veneer. Occasionally, we have seen forest trees in central NY riddled with holes of yellow-bellied sapsucker. In some cases, the proliferation of sapsucker damage has contributed toward the early death of forest basswoods.

Three other basswoods are found in North America. These species share a center of diversity in the south eastern United States. Anyone who learns the distinct leaf, flowers, and fruits of American Basswood will readily recognize the southern species in their native habitat. American basswood is found through the Northeast and Midwest.

Dogwoods (*Cornus*) are widespread and common members of wetlands, fields, and moist forests throughout eastern North America. In southern areas, flowering dogwood (*Cornus florida*) graces the forest understory in early spring with white bracted-inflorescences.
northern states, wet ditches and fields may be dominated by the red-stemmed, silky, alternate-leaved, and gray-twigged dogwoods. Although these northern dogwoods lack the showy bracts of flowering dogwood, their presence and profuse flowers provide beauty to the landscape in early summer.

Dogwoods are easily recognized by their opposite, rounded leaves with smooth margins. Dogwood leaf veins are heavily arched and form graceful bends from the midrib towards the leaf tip never fully reaching the leaf edge. Twigs have a prominent tan, brown, or cream colored pith that is spongy in texture.

Fruits are patriotically colored (red, white, or blue) berries that provide valuable food for migrating fall birds. Dogwood fruits are not intended for human consumption and taste rather bland or bitter. Some references state that *Cornus florida* berries are poisonous. Given the lack of flavor and occasional reports of stomach aches, these fruits are best if not eaten. Dogwood fruits are heavily laden with fats and carbohydrates to full the southward migration of birds. Flowering dogwood has bright red fruits. Gray-twigged and red-stemmed dogwood fruits are bright white and borne on reddish stems to contrast with and advertise the fruits. Silky dogwood fruits progress from white to a bright blue and alternate-leaved dogwood has blue fruits and contrasting red stems. If you haven’t guessed by now, then you should note that *Cornus alternifolia* violates the opposite-leaf rule of the genus, but the leaf features of the group are easily recognized in this and all other dogwoods.

Bunchberry is a herbaceous perennial in northern woods. This anomalous dogwood is common in bog and mountain forests of the northeast. Non-flowering stems generally produce four leaves at two closely compressed nodes. Flowering stems most often have six leaves that are more or less in a whorl. The pollination system of this dogwood has received some research attention and is more formally discussed with forest ephemerals. I have eaten the pulp of bunchberry fruits without illness, but the inexperienced woodland naturalist may wish to avoid the tasteless fruits.

Key to Common Dogwoods
1. Leaves alternate, blue-colored berries on red twigs. . . Alternate-leaved Dogwood (*Cornus alternifolia*)
1. Leaves opposite, fruits not blue on red twigs
   2. Mature plant short, leaves wither four or six, appearing as a woodland herb. . . Bunchberry (*Cornus canadensis*)
   2. Mature plant a shrub or small tree
      3. Young twigs with fine hairs, pith tan-colored, fruits starting as white and maturing to blue. . . Silky Dogwood (*Cornus amomum*)
      3. Young twigs without fine hairs, pith white, fruits white on reddish stems
         4. Leaf stems smooth and green to bright red. . . Red-stemmed Dogwood (*Cornus sericea*)
         4. Leaf stems rough and brown to gray in color. . . Gray-twigged Dogwood (*Cornus foemina*)
COMMON CONIFERS

**TOP**  **Hemlock** (*Tsuga*) is a common and dominate tree in many regions of the Appalachians, Northeast and Adirondacks. Hemlock forests are heavily shaded and have a thick layer of humus. The heavy shade, tannin rich soil, and acidic soil pH of hemlock forests precludes many understory species from becoming established. Some ferns, lycodpos, and a few forest perennials are tolerant of these conditions. The hemlock forest floor is bare relative to other temperate forests.

Eastern hemlock is a long-lived forest tree native to the Great Lakes States, New England, and the southern Appalachian mountains. Hemlock is unusual among conifers in that it is tolerant of shade as a seedling. Hemlock seeds are sensitive to dessication. Seeds tend to germinate along moist, moss-covered nurse logs in the forest, but rarely upon humus covered soil. As the young tree grows and the nurse log rots away, elevated prop roots become evident. This pattern of germination, growth and establishment is similar to that observed in yellow birch.

Eastern hemlock was formerly an outstanding natural source of tannins for the leather industry. The urban use of eastern hemlock as a tree is becoming more widespread. It can be nicely sheared into dense hedges or allowed to grow as a specimen tree. The dense foliage provides suitable habitat and winter cover to many birds and mammals.

A major threat to natural stands of hemlock is the wooly adelgid. This aphid-like insect was introduced to North America from Asia in the 1920s. Without natural predators, the unchecked foraging of the adelgid on hemlock causes defoliation. After a few years a stand of hemlocks die forming a ghastly graveyard.

Hemlock needles are most easily confused with balsam fir. Both species have flattened needles with two whitish lines on either side of the lower midrib. Hemlock needles, however, are produced in two ranks on either side of the stem with a narrow stretch of small needles aligned next to the upper twig. Fir needles are produced in spirals along twigs that give the branches a fuller appearance. Perhaps the best distinguishing features is the presence of a distinct petiole at the base of hemlock needles that is angled towards the stem. Fir needles gradually narrow to the stem attachment without a distinct petiole.

**TOP**  **Balsam Fir** (*Abies balsamea*) is common in northern transitional montane forests in the northeast. Fraser fir is a sister species found above 4500 feet in the Appalachian Mountains of North Carolina and Tennessee. These firs are highly prized winter holiday trees because of they are compact, conical-shaped trees with fragrant foliage. Balsam fir has a thin gray bark that is grossily pimpled with resinous blisters. The blisters erupt with a thick, fragrant, and aromatic resin that was once used as a mounting agent and preservative for microscope slides. Balsam wood is soft and makes and excellent source of pulpwood for paper production.

Balsam fir occurs in monotypic stands in the Adirondack Mountains. The thin sandy soil, shallow roots, and windy conditions of mountain forest cause large tracks of fir blow downs called fir waves (see disturbance). Balsam fir seedlings regenerate quickly into dense forests that are preferred by Blackpoll warbler and Bicknell’s thrush. Fir cones are produced in clusters near the apex of the tree. In years with prevalent seed production, balsam fir becomes and important lipid-rich food for winter chickadees, squirrels and porcupines.
Pine (Pinus). There are several pine species found in the Appalachian, southern pinelands, coastal plain and northern forests. In central New York as well as New England, white, red, jack, and Scots pine are common. Pines are easily identified by possessing needles in clusters of either 2, 3, or 5 needles. The needles are semi-circular in cross-section.

Scots pine is introduced from Europe and is grown for soil conservation and lumber. Needles are short, twisted and in clusters of 2. Scots pine or Scotch pine (Pinus sylvestris) is one of the most easily recognized pines in the world. Its young bark is scaly with a beautiful orange color. Many who see this bark for the first time believe the tree is diseased. Although Scots pine is native to Europe, it has been widely planted and appears to have become naturalized in many locations of North America. Scots pine was likely introduced via European colonists in the 17th and 18th centuries.

Scots pine performs better than other pines in compacted clay soil. It has historically been the pine of choice for the Christmas tree industry for its tight compact growth and near perfect shape.

Red Pine (Pinus resinosa) occupies the southern border of the boreal forest in New England, southern Quebec and Ontario, and the Great Lake States. In New York, natural stands of red pine are found in the Adirondacks and the southern tier region of upstate. Red pine is most often found on dry, nutrient-poor, sandy soils. The needles are three to a cluster and readily snap when bent. Crushed needles emit a nice citrus aroma when crushed in the palm.

One of the oldest and largest natural stands of red pine in New England can be found on the south side of Rt. 28 at the South Inlet Bridge on Raquette Lake. Several trees are believed to be older than 200 years and stand more than 100 feet tall. These are remarkable characteristics for Adirondack pines that escaped the saw of early lumberjacks.

Red pine has been planted for cultivation throughout New England. It is used for pulpwood, lumber, fence posts, and railroad ties. Red pine has been planted for soil conservation on dunes and in sandy areas. It helps stabilize sand by preventing wind erosion. The needle litter also assists by holding in moisture in the soil.

White pine (Pinus strobus) is one of the most valuable trees in the United States. It is found throughout New York State. White pine grows quickly and obtains heights of 130+ ft in a little more than 200 years. Stately white pines are often found growing beyond the canopy of hardwood trees in the Adirondacks. Large white pines show considerable flagging as the prevailing winds assist in shaping the growth pattern.

Cathedral Pines at Seventh Lake in the Adirondacks has nearly a dozen old growth white pines. Several trees in this forest are more than 150 feet tall with a diameter at breast height of 40+ inches.

White pine has soft, bluish needles, five to a fascicle, and the foliage makes this species a desirable tree for urban areas. Its dense foliage and quick growth provide important wind breaks and snow fences in some areas. The branches of white pine grow in a pinwheel like fashion by radiating from centralized points along the trunk.

White pine seedlings grow fast and produce a tap root that grows as much as 1 foot per year early in life. These qualities make white pine ideal for planting in areas for soil conservation. White pine has been planted on and around former mountain-top strip mines in West Virginia for this reason.

Jack pine (Pinus banksiana) were once abundant across eastern states as North America began is last glacial recovery. Today, jack pine is most abundant in northern New England and
the upper Midwest in Minnesota, Wisconsin, and Michigan. Jack pine has two needles to a cluster. It grows well on nutrient poor soils, but attains a highly irregular, miss-shaped form and does not fit our mental image of what a pine should look like.

Jack pine is grown in preserves for Kirtland’s Warbler in the lower peninsula of Michigan. Kirtland’s warbler is a federally endangered neotropical migrant. It spends winters in the Bahamas and breeds in jack pine forests. Kirtland’s warbler specializes in young shrubby jack pines and avoids trees that are 15 years or older. Although there are many factors that have contributed to the decline of Kirtland’s warbler, fire suppression in the upper Midwest has led to a decline in jack-pines of a suitable age. Jack pine produces closed, serotinous, cones that remain intact for many years until appropriate heat and dryness break the resinous seal between cone scales. These conditions are most common following low intensity fires.

Key to Common Pines
1. Needles in clusters of two. . . 2
   2. Cones produced near tips of branches. . .3
      3. Needles short (< 8 cm) and twisted, not brittle. . . Scots Pine (Pinus sylvestris)
      3. Needles long (>10 cm), not twisted, and brittle when bent. . . Red Pine (Pinus resinosa)
   2. Cones produced laterally away from branch tips. . .4
      4. Cones without spines or ephemeral spines; trees of boreal regions. . . Jack pine (Pinus banksiana)
      4. Cone scales with large stiff spines. . .5
         5. Cones large (8+ cm) and heavy. . . Table Mountain Pine (Pinus pungens)
         5. Cones small (<8 cm). . . Virginia Pine (Pinus virginiana)
1. Needles in clusters of three. . .6
   6. Cones broadest near the base, scales with stiff sharp bristle; closed or serotinous; trees with northeastern distribution. . . Pitch pine
   6. Cones broadest near middle, scales with small bristle; cones open at maturity; trees with southeastern distribution. . . Shortleaf pine (Pinus echinata)
1. Needles in clusters of five. . . White pine (Pinus strobus)

TOP  Spruces (Picea) are medium sized conifers with a distinctive pyramidal growth form. Needles are sharp-tipped, square in cross-section, and born singly around rough twigs. Seed cones come in a variety of sizes, but are usually pliable and leathery when young. Cones may become woody when remaining on the tree for several years. Spruces tend to produce mast seed crops every 2-5 years. The bark of spruce is grayish and scaly.

White spruce (Picea glauca) is native to boreal forests across Canada and Alaska. White spruce is tolerant of many soil types, but is most commonly associated with early pioneer forests. It is sometimes planted as an ornamental tree in northern regions. It is also known as skunk spruce or cat spruce because of the strong urine-like odor of crushed needles and twigs.

White spruce is an important wood product across Canada. White spruce wood has been used to make musical instruments, wooden boxes, and fuel wood. Like red spruce, the bark can be removed and water cured to make a weather resistant covering for buildings as is seen in many original Adirondack style buildings.

Black spruce (Picea mariana) is found in wet organic soils of New England, the Adirondacks, and across the Canada boreal forest to Alaska. In the Adirondacks, black spruce is seen as a slow growing conifer in bogs and depressed wetlands.
Black spruce has significant commercial value in Canada where it is used as pulpwood. Black spruce has been grown on mineral poor sites in Minnesota as a Christmas tree (Silvics vol. 1). Like all other spruces, its Christmas tree qualities are limited as it is exceedingly prickly and has a tendency to drop its needles too soon.

Red spruce (Picea rubens) is found through much of New England in cool moist forests. It is also seen as a high elevation species along the southern Appalachians as far south as North Carolina. It is found in drier sites than black spruce. At high elevations (>4000 ft), red spruce is more shrub-like and stunted with some flagging (i.e., krumholz).

Red spruce saplings and seedlings are shade tolerant which is an unusual conifer trait also shared with eastern hemlock and balsam fir. Red spruce was once the dominant conifer on Adirondack peaks, but has experienced a significant decline in the Adirondacks as well as the southern Appalachians since the 1960s. It is believed that acid precipitation and air pollution are responsible for the decline of red spruce in these areas.

The wood of red spruce is used to make guitars and mandolins of the Adirondacks and New England. In the late 1800s, red spruce gum (resin) was collected from bark wounds and used as the first North American chewing gum.

Norway spruce is frequently planted for soil conservation and in urban settings. It is a fast growing species with large (10+ cm) leathery cones. Branchlets droop and weep and trees mature.

Key to Common Spruces.

1. Cones leathery and pliable when mature, twigs smooth without hairs. . . White Spruce (Picea glauca)
1. Cones tough and wood when mature, twigs with fine hairs. . .2
   2. Cones persistent for many years, 2-3 cm in length; tree in wet areas. . . Black Spruce (Picea mariana)
   2. Cones annual, 3-5 cm in length; mesic woodlands and mountains . . . Red Spruce (Picea rubens)

**TOP** Red Cedar (Juniperus virginiana) is a common roadside evergreen through the eastern United States. Red Cedar grows well on poor soils and rocky glades where competition with hardwood species is minimized. In many areas, red cedar is abundant along powerline cuts and abandoned agricultural fields. It is frequently associated with xeric species of hickory and oak. Needles are small and scale-like.

Pollen cones are small and deciduous. Female cones are borne on separate trees and when mature are bluish and somewhat fleshy. Mature juniper cones are fragrant when crushed. Birds rapidly devour cones which are high in fat and carbohydrate. Seeds are unscathed through the avian digestive tract and dispersed some distance away. This partially explains why red cedar is abundant along fences and utility lines where birds perch and defecate. The aromatic cones of western species are used to flavor gin.
Although the wood of red cedar does not command a high percentage of the market, its wood has beautiful colors and easy to work. The wood is resistant to rot and aromatic. Red cedar wood is most often used for fence posts and cedar chests.

**TOP**  **White Cedar Northern white cedar or arborvitae** (*Thuja occidentalis*) grows on limestone soils or on wet organic soils of northern states and southern Canada. Arborvitae is abundant in the Adirondack region along rivers, streams, fens, and swamps along lakes. In exposed sites, the tree seldom grows more than 20-25 feet as its dense evergreen canopy does not resist strong winds on wet soils.

Arborvitae was reportedly used to combat scurvy by 16th century French explorers as they moved across Canada. The tea made from evergreen needles and branches of arborvitae provided enough vitamin C to fight off the debilitating effects of scurvy until other fresh vegetables and fruits could be eaten. Today, the practice of drinking arborvitae tea is ill-advised. There is some controversy over the toxicity of the chemical thujone that is abundant in the needles of arborvitae.

Arborvitae wood is widely used in rustic Adirondack architecture. The wood is rot resistant and is an outstanding natural building product (e.g., lumber, shingles, and posts). Arborvitae provides important browse for deer in winter. In the Adirondacks, the arborvitae winter browse line is easily viewed along lakes and streams.

**TOP**  **American Tamarack or Larch** (*Larix decidua*) is a common wetland species in New York State. Its restriction to mineral deficient waterways and bogs is most likely an indicator of its low status in an ecological pecking order. Young trees perform well in a variety of soil types, but seeds, seedlings, and saplings are slow growing and poor competitors with faster growing hardwoods.

The name Tamarack originated with Algonquin Native Americans. The tree is best known as our only native deciduous conifer. The needles turn a brilliant yellow before dropping in the fall. Tamarack is easy to identify by the large number of needles produced in a pinwheel manner on stubby spur shoots. The thin branches, stubby spur shoots and deciduous habit give this tree a hauntingly elder appearance in nature. Tamarack is distinguished from European larch by possessing shorter needles (< 2.5 cm) and cones (<2.1 cm).

Tamarack has limited economic value, although the wood is rot resistant and has been used in some wood products. Tamarack wood has been used to make duck and goose decoys in Alberta Canada (Silvics v. 1).