# Vanderbilt University Arboretum Tree Tours

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Note: This PDF version of the Vanderbilt Arboretum Tree Tours is simply a "cut and paste" version of the online version that is a part of the Bioimages web site:

http://www.cas.vanderbilt.edu/bioimages/vu/frame.htm

Obviously with this paper version, you will not get the tree images and interactive map that operate in the online version. You can download the Bioimages web site onto a laptop and then operate the online version from your laptop (or obtain a CD of the website). See information at:

http://bioimages.vanderbilt.edu/

for information about downloading or obtaining a CD.

**About the tours**

These tours are designed to provide access to and information about representative tree species in the Vanderbilt University Arboretum. The trees on these tours were selected to represent native tree species that are commonly seen in Nashville and the middle Tennessee area. The tours also include a few commonly planted or naturalized species that are not native to Tennessee as well as a few other botanically interesting species that are present on campus.

The **Peabody tour** is shorter and features 46 trees, including many of the most common trees of Middle Tennessee. The **main campus tour** requires more walking, but features 63 trees, including many of the species covered in the Peabody tour as well as others that are only found on the main campus. It is possible to combine both tours if you have a lot of time and energy, and want a chance to review some of the species several times.

All of the trees on the tour are labeled and identified as a part of the tour with a dot on the label.

**Using this website**

Obviously most users can't be on the Internet and be walking around the Vanderbilt campus at the same time. However, the Bioimages web site (of which this tree tour is part) can be downloaded to a hard drive or obtained on CD-ROM. That would allow the user to access the website on a laptop while taking the tour.

The lower right frame will outline important features of the species and information about where the species is normally found. The upper right frame will by default display

images of the species. Clicking on text links in the lower right frame will automatically bring appropriate images into view in the upper right frame. If you are connected to the Internet, you can view high resolution versions of most of the images by clicking on them.

Navigation is accomplished by clicking on the "next" and "previous" links in the frame in the lower right corner. The left frame will display the tree's position on a map. Trees on the tour are shown as black squares, trees not discussed in the tour are shown as gray dots, and the tree under discussion is shown as a red square. You can also click on any of the black squares to jump directly to any tree on the tour. Sometimes using the browser's forward and back buttons produces unpredictable results, so it is better to navigate with the text links.

**Warnings**

The maps are intended to help you find your way. They are not intended for any other use and may not be entirely accurate. In particular, the position of the gray "other trees" are often incorrect.

Although I have tried to be as careful as possible to present accurate information and correctly identified images, mistakes are possible. Please confirm your own plant identifications with a technical key or plant taxonomist if accuracy is important.

Please report any errors or problems to steve.baskauf@vanderbilt.edu .

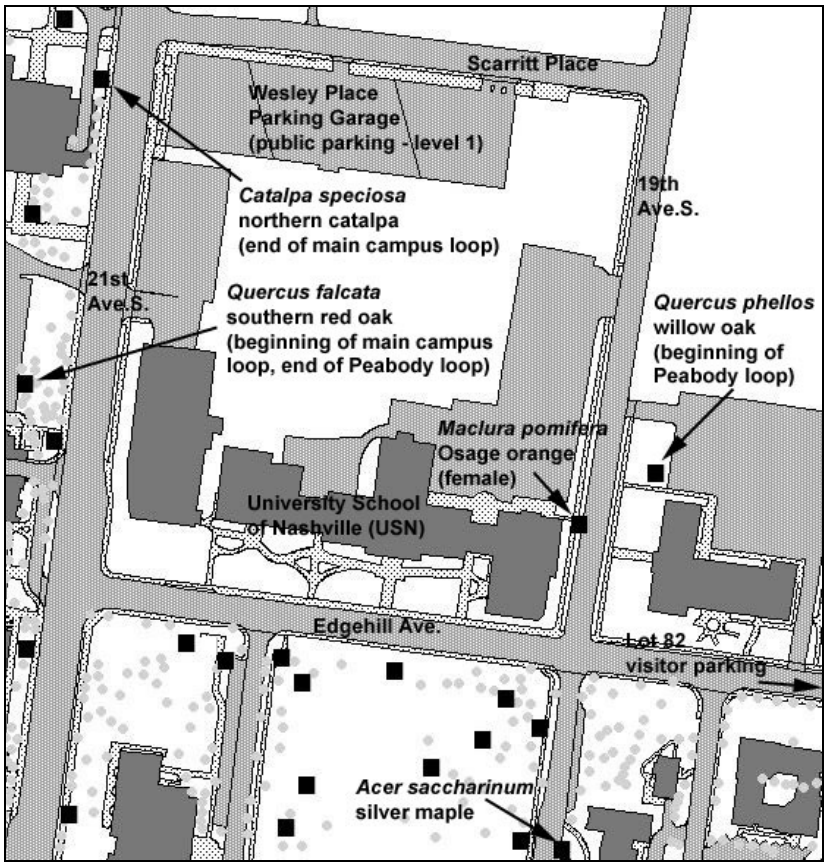
**Acknowledgements**

Dr. Robert Kral taught me most of the trees on this tour in his Dendrology class at Vanderbilt. He kindled my interest in learning trees.

I depended heavily on Wofford and Chester (2002) *Guide to the Trees, Shrubs, and Woody Vines of Tennessee* (University of Tennessee Press, Knoxville, TN) for range descriptions and some diagnostic characters. If you can, take the tours with this book in your hand. I also referred to Chester et al. (1987) *The Nut Trees of Land Between The Lakes* (The Center for Field Biology of LBL, Austin Peay State University, Clarksville, TN) for oak and hickory characters. Unfortunately it is out of print at the present.

Thanks to Judson Newbern for his support and encouragement in this project and to other members of the Vanderbilt Campus Planning staff who gave me access to the VU tree database and helped me get the data to make the maps.

Created November 2005 by Steven J. Baskauf, Ph.D., Vanderbilt University Dept. of Biological Sciences

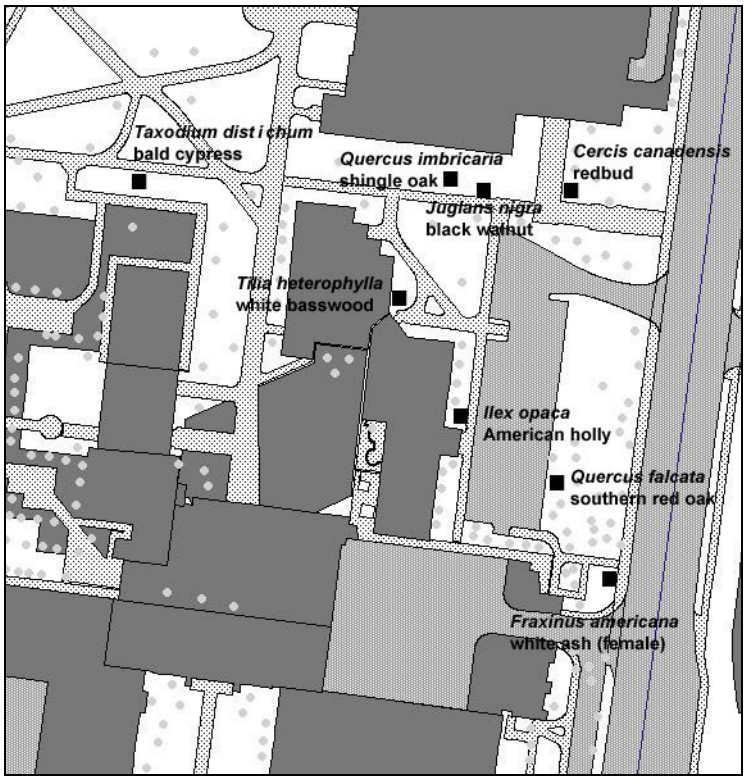



# Main Campus Tree Tour

If you are starting from the Wesley Place parking garage, exit onto Scarritt Place and turn left. Walk toward the main campus (passing Ben and Jerry's on your right) and cross 21st Ave.S. at the crosswalk. Turn left and walk along 21st and cross the entrance to the School of Nursing parking lot. On your right, you will see a very large tree between the street and the parking lot.

If you are starting from the Lot 82 visitor parking, walk west along Edgehill Ave. until it dead-ends on 21st Ave.S. Cross 21st and turn right. Cross the entrance drive to the MRB III loading dock. On your left, you will see a very large tree between the street and the School of Nursing parking lot.

If you would prefer to start the main campus tour from the west side, start the main campus tour from 2525 Parking Garage.




**Southern red oak** has leaves typical of other red oaks: pointed lobes with prickle tips and relatively deep sinuses between the lobes. It is different from the others in two ways: the base of the leaf is rounded or bell-shaped, and the terminal lobe curves off to the side (is "falcate", hence the scientific name: *Quercus falcata*). Sometimes the terminal lobe is very narrow, long, and bent, giving the leaf a very distinctive look. The bark doesn't generally have the same "striped" look that is typical for the bark of northern red oak.

Southern red oak is relatively common in middle Tennessee, particularly in dry areas. This beautiful tree is Vanderbilt's only southern red oak and is one of the largest trees on the campus.

Cross the parking lot of the nursing school to the tall, narrow tree at the right of the front door to continue to next tree.

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The shiny evergreen leaves with spine-tipped lobes make **American holly** easy to recognize, particularly in the fall and winter when its bright orange-red berries are present. Although holly is often found as a shrub, it can reach tree size in undisturbed forests. This is one of the largest holly trees on the Vanderbilt campus.

Holly is not common in the wild in middle Tennessee, but is often seen in other parts of the state, such as the Smoky Mountains. It is often planted as an ornamental bush and is found at a number of locations on campus.

Turn right and take the sidewalk away from MRB III. Take the sidewalk the the left that leads to the new part of the nursing school. The next tree is just to the left of the main entrance. **next tree** **previous**

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**White basswood** has leaves with very uneven leaf bases and a single toothed margin. It is distinguished from American basswood by the hairs on the lower surface of the leaves which can give the lower surface a whitish appearance. However, the amount of hairiness is variable and it is often not easy to determine whether a particular tree is a white basswood or an American basswood. Some taxonomists do not recognize white basswood as a separate species and call it a subspecies of American basswood.

Basswoods have very distinctive flowers and fruits. They hang in a cluster below a leaf-like bract. Bees love the basswood flowers and some say that basswood honey has the best flavor. In the fall and winter, basswood buds have a very distinctive look and in the wild, large basswood trees often have sprouts surrounding the base of the tree.

Return the way you came and turn left when you reach the sidewalk next to the parking lot. Follow it until it T's into another sidewalk and turn right. The next tree is small and on the side of a small hill next to the central library building.

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The tiny purple-pink flowers of **redbud** make it one of the most easily recognized small trees when it is blooming in the spring. In addition to emerging from the twigs, redbud flowers also come directly from some places in the trunk of tree. Although the flowers are much smaller than those of the last tree, they also have the structure typical of the pea family, and in the fall and late summer, redbud trees are covered with flat seed pods. Redbud leaves are also fairly distinctive. They are heart shaped with smooth margins.

Redbuds are very common in this area. Because they generally don't live as long as other trees, they are usually small trees or shrubs. They favor disturbed areas and so are very common along highways where they can produce clouds of brilliant purple-pink in the spring. They are also planted as ornamentals.

Go back along the sidewalk along the side of the central library. Just after the point where you turned from the nursing school sidewalk, you will see the next tree on the right.

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**Black walnut** leaves are one of the largest singly pinnate (leaflets arranged along a single central rachis) leaves in this area. Trees with similar leaves are tree of heaven and pecan. Later on this tour you will have an opportunity to compare another walnut tree with a tree of heaven nearby. The leaflets of tree of heaven have a distinctive gland in a

notch at the base of each leaflet. Walnut leaflets do not have this gland. Walnut twigs also have unusual chambered pith (please do not cut branches or twigs from trees on the Vanderbilt campus) and tree of heaven twigs do not. This large walnut tree shows the distinctive furrowed bark of walnut, which is quite different from the smoother bark of tree of heaven. Pecan trees are not common in the wild in this area so they aren't likely to be confused with walnut there. Pecan bark is also not deeply furrowed and its twigs do not have chambered pith.

If the fruits are present, these three trees can't be confused. Walnuts are very hard, round, and surrounded by a thick husk that doesn't split along any particular lines. In the fall, this particular tree usually has fruits hanging on the branches at eye level or on the ground beneath it. Pecans are oblong with a thinner shell and when ripe, their husks splits fairly easily into several pieces. Tree of heaven fruits are not nuts but rather are thin and winged.

Black walnut trees are fairly common in forests in this area, although large trees are somewhat rare because they are frequently cut for their valuable wood.

Continue along the walk to the next tree on the right.

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**Shingle oak** is one of the two oaks in this area which has leaves with no lobes. The other is willow oak, which has much smaller, narrower leaves than shingle oak. You can know that this species is an oak by its clustered buds at the end of its twig and by its acorn.

Although shingle oak is native to this area, it isn't as common in this area as other oaks. Another very large shingle oak is near the redbud you just viewed.

Continue following the sidewalk and go up the stairs. Follow the sidewalk until it passes next to Stevenson Center. The next tree is adjacent to the high retaining wall.

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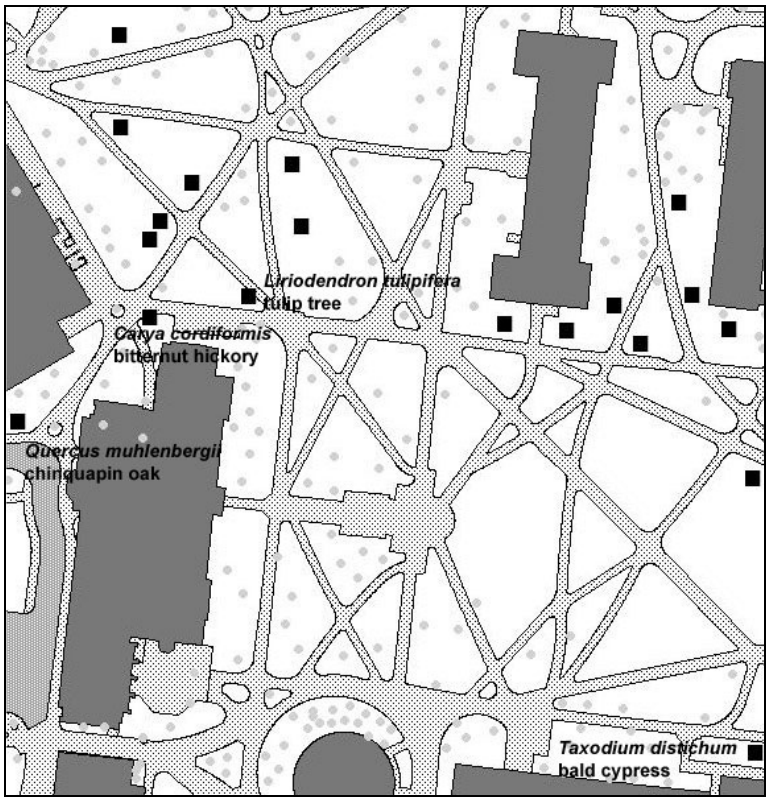
**Bald cypress** is unusual because it is one of the few conifers that looses its needles in the winter. It produces cones that are quite different from pines. The cones are round balls which split open along the lines producing rounded scales something like thumbtacks. The seeds fall from between the scales.

Bald cypress is not found naturally in middle Tennessee. However it is an important swamp tree along the Mississippi River as far north as Illinois and along the southern coast. It is one of the few trees that can grow in standing water. In swamp conditions, the bottom of the tree develops "buttswell" by flaring out near the ground. Trees planted in dryer conditions do not show this trait.

Continue walking along the math building of Stevenson Center and past the round building at your left. Just before you reach Buttrick Hall, turn right and follow the sidewalk that goes in front of it. At the end of the building, turn left at the first sidewalk. Immediately on your right is the next tree.




**Tuliptree** gets its name from its unusual yellowish-orange flowers. The distinctive leaves also have a shape that reminds some of tulips as well. By late summer the flowers have turned into fruits, which are a collection of winged seeds attached to a central stalk.

Tuliptree is the state tree of Tennessee and is a very common tree throughout the state. It sprouts up rapidly following disturbance, but can also grow to enormous sizes in undisturbed forests. Large trees can be recognized even in the winter by their very straight trunks and the long, deep furrows in the bark. This particular tree was chosen for the tour because it has branches close enough to the ground to observe the leaves. A large tree appears later in the tour to provide an opportunity to see the bark and straight trunk typical of the species.

Continue toward Rand Hall with Buttrick at your left. The next tree is a large one on the left just before you reach Rand.

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Bitternut hickory leaves typically have 7 to 9 leaves. Its yellow buds differ from the reddish buds of red hickory (which also has leaves with 7 leaflets). The twigs are also

more slender than the twigs of mockernut hickory (*Carya tomentosa*), another hickory with 7 leaflets, and which has much larger, non-yellow buds. The bark is tight, unlike the shaggy bark of kingnut hickory (*Carya laciniosa*), which also typically has 7 (or 9) leaflets. To systematically separate hickory species, see the key to hickories.

The husks of the nuts have four wings, are relatively thin, and covered with yellow scales. The nuts are bitter and not good to eat. This particular tree has not been observed to produce nuts.

Bitternut hickory is fairly common in middle Tennessee. This is the only known bitternut hickory on Vanderbilt's campus.

Veer to the left of Rand Hall. At the point where the sidewalk meets a small drive, the next tree on the tour, a large one, is on your right.

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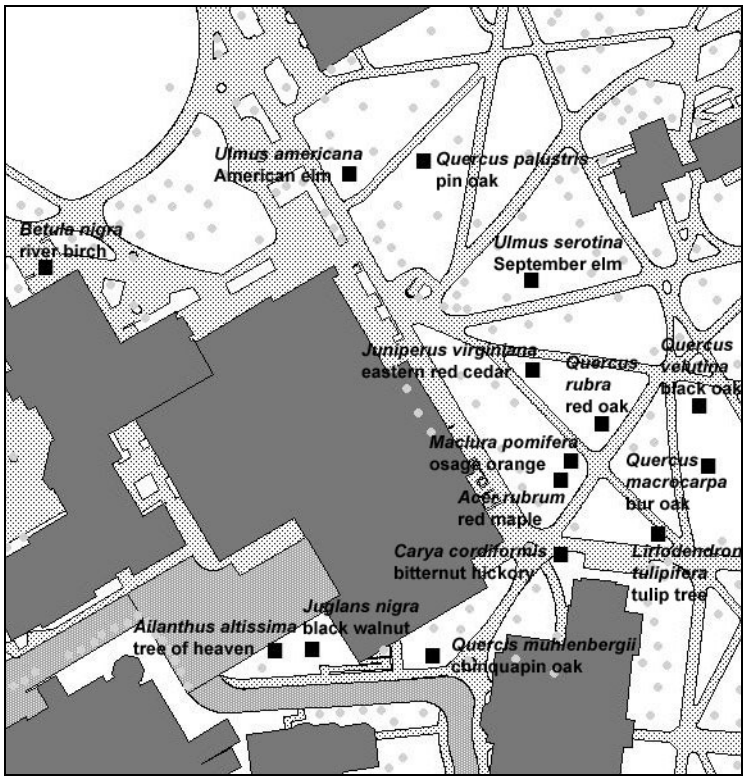
***Quercus muehlenbergii*** **(chinkapin oak)**, *Quercus michauxii* (swamp chestnut oak), *Quercus bicolor* (swamp white oak), and *Quercus prinus* (chestnut oak) have similar leaves but can be distinguished by careful examination as well as by their habitat, bark, and acorns. The first three of these species will be seen in this tour. In the wild, chinkapin and chestnut oaks would be found in uplands, while swamp white and swamp chestnut oaks would be found in wetlands. Therefore it is most important to be able to distinguish between these pairs.

The tips of the lobes (or large teeth) of chinkapin oak leaves have small glands at their tips. The glands are best seen using a hand lens. Chestnut oak leaf lobes do not have these glands. The bark of chinkapin oaks tends to flake off in long plates, while the bark of large chestnut oaks has deep furrows. When fully ripe, chinkapin oak acorns are small and nearly black with light colored caps. Chestnut oak acorns are more of a chestnut brown, large and somewhat bullet-shaped, and have more conical caps. Chestnut oaks are also typically found on dry ridge tops and slopes, while chinkapin oaks are found in more moderate conditions.

Chinkapin oak is fairly common in this area, although there are few examples on campus. Take the sidewalk to the right as it follows the drive. The next tree is the first one on the right in a small grassy area next to the Rand loading dock.




An better specimen of **black walnut** was observed earlier in this tour. This one is included so that it can be compared to a tree of heaven that is next to it. Compare it to the next tree, which is next to the retaining wall overlooking the loading dock parking lot.

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The leaves of **tree of heaven** have leaflets that have a gland in a notch at the base. Walnut leaflets do not have this gland. The bark of small and medium sized trees is fairly smooth and has vertical whitish streaks, in contrast to the furrowed bark of walnut. Tree of heaven fruits are winged and hang from the tree in large clusters, in contrast to the hard, round nuts of walnuts. Tree of heaven twigs do not have the chambered pith of walnut twigs (please do not cut branches or twigs from trees on the Vanderbilt campus).

Tree of heaven is an introduced species that spreads vigorously and is a problem invasive species in wooded areas. Even when pulled out of the ground, trees will resprout again and again from bits of root left in the ground. It is one of the few trees to thrive in even the most polluted urban areas and will sprout in cracks in sidewalks. It forms thick stands of small trees in vacant lots. It can be truly classified as a weed tree and is despised for the bad smell of its crushed foliage - hence one of its other common names: "stink tree".

To get to the next tree, retrace your steps back toward the bitternut hickory, but continue straight ahead on the sidewalk that heads out into the lawn. The next tree on the tour is a large one on the left.

This is your best opportunity to use the restroom and get something to eat or drink in Rand Hall, which is open to the public

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**Red maple** leaves have the typical shape and vein pattern of maples: pointed lobes and veins that radiate from a point near the leaf base (palmate veination). The leaf margins are toothed and the sinuses are more V shaped than the leaves of the common sugar maple.

In early spring, the red flowers, and later fruits, of red maple color the roadsides around Nashville. The fruit color can vary from bright red to greenish red. The leaves do not emerge until later. The flowers of maples can be either male or female and both sexes of flowers can be on the same tree. Over the years, the predominant sex of this particular tree has been observed to vary.

The next tree follows this one immediately on the left.

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**Osage orange** is an example of a **dioecious** (i.e. individuals either only male or only female) species. This particular tree is a female, but doesn't always produce fruit. In the fall, many of the strange, lumpy fruits can be found lying on the ground below female trees.

Horses are one of the few animals known to eat this fruit and potentially disperse its seeds. Given that horses are not native to North America, it is likely that the species' original disperser (probably a large mammal) died out during the mass extinction that occurred soon after the arrival of humans in North America. If it is true that this tree was dispersed by extinct mammals, it may have been saved from extinction by Native Americans who favored its wood for use in bows. Later, European settlers spread it throughout the central U.S. when they planted it as thick hedges to keep in livestock - hence one of its common names: hedge apple. To see an example of a female and its weird fruits, continue on to the second tree on the Peabody tree tour after completing the main campus tour.

Notice how the branches arch out and downward. The inner bark has a distinctive orangish brown color. Close examination of the twig will reveal small, sharp spines.

Continue following the same sidewalk as it crosses another sidewalk. The next tree is on the left.

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**Northern red oak** is a representative of a large group of similar oaks present in this area. Members of the red oak group (*Quercus rubra*, *Quercus falcata*, *Quercus palustris*,

*Quercus velutina*, *Quercus shumardii*, and *Quercus coccinea*) have leaves with pointed lobes that are bristle-tipped. (The five are on the main campus tour.) The members of the group can only be distinguished by careful examination of their leaves, buds, and acorns.

Northern red oak leaves have lobes that are fairly wide and the leaf sinuses do not extend deeper than half way to the mid-vein. Buds are not particularly hairy and the acorns have caps that do not extend very far down the nut. Perhaps the most noticeable thing about large red oaks is that their bark typically has a "striped" look caused by the flat tops of some of its ridges. To distinguish among oaks systematically, see the key of oaks.

Continue along the walk and take the first sharp right. After a short distance you will come to an enormous tree on the left with a small plaque at its base.

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**Bur oak** is one of the more distinctive oaks. Its leaves have rounded lobes, but the sinuses (indentations) are uneven. The sinuses near the leaf base may reach almost to the midvein. The acorns of bur oak are unmistakable. Their caps cover most of the nuts and have long fringes along the edge.

Bur oak is not particularly common, but it is found throughout middle Tennessee. There are several large bur oak trees on campus and this particular individual has been recognized as over 200 years old. Although it is impressive, it doesn't have any branches near the ground, so you will have to wait until later in the tour to get a better look at the leaves and twigs.

Go back along the sidewalk on which you came and the next tree is the first one on the right.

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**Black oak** is another member of the red oak group and its leaves are similar to other members of the group. The lower sides of its leaves have variable hairiness, from tufts of blond hair where the veins come together to entirely covered with hair (the species name, *velutina*, comes from the term for velvety hair). The sinuses of the leaves tend to go deeper toward the midvein than the sinuses of northern red oak leaves. The best way to recognize this species is by observing its buds under a hand lens. They are entirely covered with blond hairs. The scales on the caps of the acorns are also covered with blond hairs.

Black oak can be found in a variety of habitats, but tends to be on drier sites than northern red oak. This particular tree has no branches near the ground and unfortunately it is the only black oak on campus. You may find twigs and leaves on the ground to examine.

Take the sidewalk that heads towards the patio of Rand. The next tree is on the left just before this sidewalk merges with another

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**Eastern redcedar** is a common and unique evergreen in our area. It doesn't really have needles, but rather, narrow, scale-covered twigs. It does not have woody cones of the typical sort, but produces fleshy, bluish cones that are commonly called "berries". There are no other similar native species in middle Tennessee.

Redcedar is most commonly seen as a small or medium sized bush. It is very common along disturbed roadsides, especially on limestone outcrops. It can also grow into a fairly large tree if left undisturbed for enough years. Its ability to thrive on shallow limestone soil has given its name to cedar glades, a biologically important habitat common in the central basin of Tennessee. Despite its commonness there are few redcedars on Vanderbilt campus.

After the two sidewalks join, turn right on the next sidewalk that comes in from the right. The next tree is on the left, about half way between Rand Hall and Old Central.

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**September elm** is virtually identical to American elm, which is one of the next trees on the tour. The leaves of both species are double-toothed and somewhat rough and have the typical upward spreading shape of all elms. The important difference is that September elm blooms in late August and early September. Its winged fruits are on the tree at the same time as the leaves, in contrast to American elm, which drops its fruits before the leaves expand in the spring.

September elm is endemic to (found only in) the south central U.S. It is not particularly common, but is found throughout the Nashville area.

Go back toward Rand Hall and turn right to take the sidewalk that runs below the retaining wall.

Turn right at the first sidewalk, walk down the stairs and look for the next tree on the right.

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**Pin oak** leaves are distinctive among the oaks, with 5 to 7 lobes that project straight out from the midvein and taper to a point. The acorn cups have narrow caps. If you look up a large tree, you may notice its somewhat striped looking bark and branches which spread out from the main trunk like spokes of a wheel.

In the wild, pin oak would be found only in low, wet areas. However, it is a commonly planted street tree. It is present at a number of locations on Vanderbilt campus.

Turn back and go along the sidewalk and up the stairs. The next tree is on your right where the sidewalk T's.

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Elms can be recognized by their lopsided leaf bases and double-toothed margins. The surfaces of **American elm** leaves are somewhat rough, but not as sandpaper-like as the very common slippery elm (*Ulmus rubra*). Large elms have a very distinctive shape with upward-sweeping branches. American elm is one of the earliest blooming trees and in late spring, the ground below the trees is littered with many of the round, tiny, winged fruits. In the south-central U.S., another species, September elm (*Ulmus serotina*) is virtually indistinguishable from American elm except by the fact that September elm blooms in the fall rather than the spring. September elm will be seen later in the Peabody tree tour.

American elm was once one of the most common trees found along streets in cities in the eastern U.S. Now the Dutch elm disease has wiped out many of these large, beautiful trees. Vanderbilt campus has an unusual number of large American elm trees. The disease is spread by bark beetles which feed in dead branches. By meticulously trimming all dead wood off of the American elms on campus, most of the large trees have been spared the disease.

Walk with Rand Hall to your left, around the patio with the large green on your right. You will see the Sarratt Student Center (attached to Rand) ahead of you. Near the corner of Sarratt is a small cluster of shaggy-barked trees that are next on the tour.

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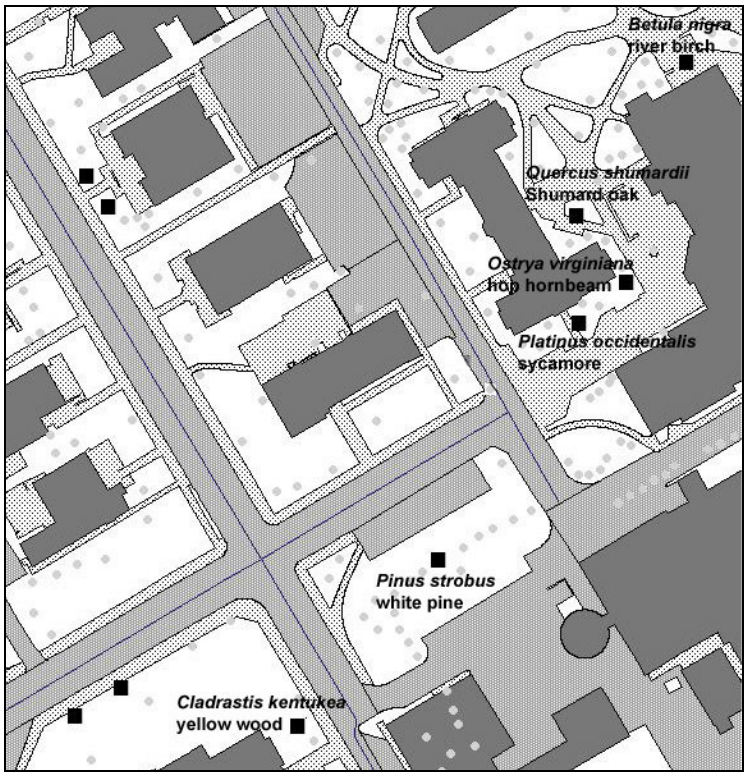
The most distinctive feature of **river birch** is its peeling bark, which hangs in layers with colors ranging from gray to brown to orange. Rows of dark dots (lenticels) mark the bark layers. The leaves are small and toothed. The fruits are a conelike, dry structure that shatters to release the seeds, leaving a central stalk.

As the name suggests, river birch is found along rivers and streams. It is fairly common and is the only birch you are likely to see in the wild in middle Tennessee.

Follow the sidewalk that goes to the left around Sarratt. Head towards the front door of Cole Hall. The next tree is on the left as you face the front door in a small grassy area surrounded by sidewalk.




**Shumard oak** is another member of the red oak group. Its leaves are quite similar to those of other members of the group. One identifying feature is the lack of hair on the bud scales when examined under a hand lens. The twigs and acorns also tend to be covered with a grayish waxy layer. For a more technical method of distinguishing among the oaks, see the key of oaks.

Shumard oak is fairly common in middle Tennessee. It tends to be found in moist lowlands. A similar species, scarlet oak, is more likely to be found in dry uplands. There are several Shumard oaks in this part of campus. One actually has a name: "Big Al".

Proceed with Cole hall on your right and Sarratt on your left. At the corner of Cole Hall is the next tree.

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**Hop hornbeam** leaves are toothed on the margin and do not have the uneven leaf bases of elms. The leaves look very similar to the leaves of American hornbeam. These two trees can be distinguished by their bark. Hop hornbeam bark tends to flake off. American hornbeam bark is smooth, gray, and is fluted like muscles. Hop hornbeam fruits are a cluster of inflated scales.

Hop hornbeam is a common tree in the woods of middle Tennessee. Continue down the stairs to the next tree on your right.

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**Sycamore** is a tree that is easy to recognize. Although its leaves are similar to maple leaves, they are arranged alternately on the twig, rather than opposite as are maples. The bark of sycamore is one of the most distinctive features of the species. As the trees age, bark begins to peel off in irregularly shaped chunks. This gives the tree a "camouflage" look with the different-aged exposed layers having different shades of green and brown. On young trees and branches, the predominance of whitish bark makes the species stand out, especially in the winter time when leaves are absent.

The fruit of sycamore is also unique. The fruit is a hanging ball. As it matures and dries, hairs attached to the seeds behave as a parachute when the seeds come loose from the ball.

Sycamore is a very common native tree that is usually found along streams and rivers. On Vanderbilt campus, it is easy to confuse the few sycamore trees with the numerous, non-native London plane trees that have been planted and which look quite similar to sycamore. The London plane trees tend to have greener upper bark, while the upper bark of sycamore tends to be white.

Continue forward and veer to the left as you cross West Side Row. Walk behind the small parking area on your left. The next tree is there.

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**White pine** is easy to recognize by its needles. They are in clusters of five and the needles are white on one side. The cones are also quite different from other pines in this area.

White pine is not common in the wild in middle Tennessee. However, it is one of the most widely planted pines and so is very frequently seen around homes and towns. Continue on keeping the pines to your left and Vanderbilt Place on your right. Cross 24th Ave. S. and turn left on the sidewalk on the other side. Walk until you reach the corner of Branscomb Quadrangle. The next tree is on the right.

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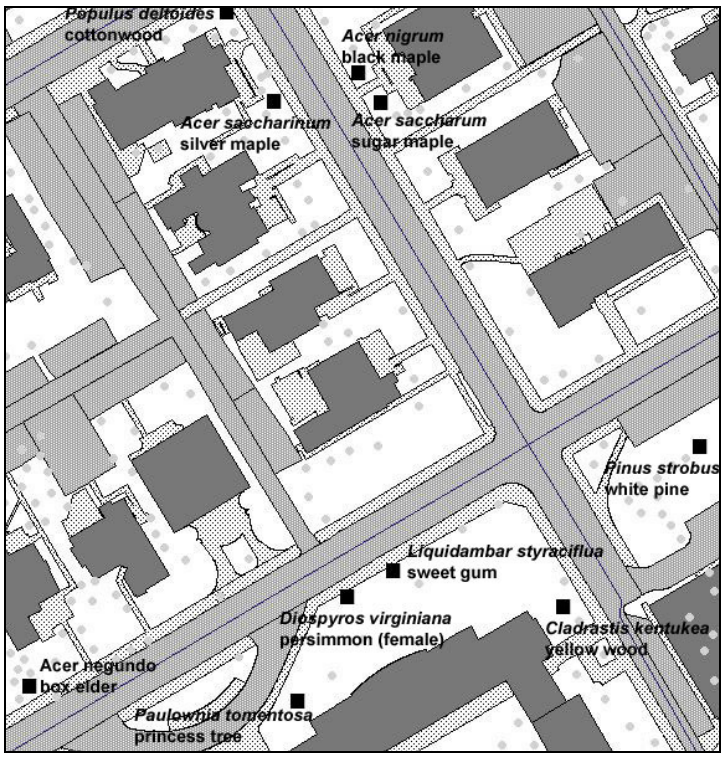
**Yellow wood** is the only tree in this area that has compound leaves with leaflets that alternate as they come off the central leaf stalk (or rachis). Large trees have fairly smooth and somewhat lumpy bark and in the spring it has fairly large, showy white flowers typical of those of the pea family. Later in the year, it produces small pods for fruit.

Yellow wood is native to this area, but is not common. It is sometimes planted as an ornamental. There are several yellowwoods planted along this side of Branscomb - some are quite large.

Return to the corner of 24th and Vanderbilt Place. Turn left and walk along Vanderbilt Place until you see the next tree on your left.




**Sweet gum** leaves are distinctive due to both their 5-pointed star shape and the pleasant, aromatic smell that they have when torn or crushed. The other very distinctive characteristic of the tree is its fruit, which looks like a spiky ball. In the fall, the ground below sweet gum trees is littered with hundreds of these fruits.

Sweet gums favor wet bottomlands. However, they also do fairly well in disturbed areas and are commonly seen as small trees along highways.

Continue along Vanderbilt place to the next tree.

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**Persommon** leaves are not very distinctive. They have no lobes and have smooth margins. They are sometimes confused with the leaves of black gum. The bark of all but the smallest trees will distinguish the two species. Persimmon bark looks like alligator skin, with the bark splitting into square lumps. Black gum bark is more ridged. The leaf scar of persimmon has one banana-shaped bundle trace, while the black gum leaf scar has three round bundle traces. If fruit is present in the fall, the two also look quite different. Persimmon fruit is a large, edible, orange to black berry. Black gum fruit is smaller and bluish-black.

Persimmon is a fairly common tree in middle Tennessee. Small mammals are known to gorge themselves on the piles of persimmon fruit under a large tree. Note that persimmons are dioecious (separate male and female trees), so if a tree is a male, it will never produce fruit. This particular tree is a female.

Follow the curved drive that leads to the front door of Branscomb until you see the next tree on the left.

---

**Princess tree** is a non-native tree with several distinguishing traits. The leaves range in size up to enormous. They are probably the largest simple (i.e. not compound) leaves of any tree that grows around here. They are typically arranged oppositely on the twig, but they can also be in whorls of more than two leaves. The bluish-purple, tubular flowers are quite pretty. They develop into pods that split open to disperse small black seeds. From a distance, the clusters of pods look a bit like grapes.

Princess tree is an invasive species often seen growing along roads. In this area it is not as aggressive as other invasives such as tree of heaven, privet, and bush honeysuckle, but in east Tennessee it is a more serious problem. In addition to spreading easily, it also regrows rapidly from the stump when cut down.

Cross Vanderbilt Place and go to the left. The next tree is along the sidewalk in front of the Alpha Chi Omega house.

---

If you are familiar with maples, you may be surprised to find that **box elder** is a maple. Unlike all other maples in this area, its leaves are compound. However, it does produce the paired, winged fruits typical of other maples. This tree is one of the few trees that have very green twigs and the leaves are arranged oppositely on the twig as is typical for maples.

Box elder is very common in our area, especially in wet, disturbed areas where it grows like a weed. However, it is only found in a couple locations on Vanderbilt campus.

If you started the main campus tour from the west side, you have reached the end of the main campus loop (return to 2525 Parking Garage)

To continue with the main campus loop, return along Vanderbilt Place until you reach 24th Ave.S. Cross 24th, then turn left and follow the sidewalk until you reach the Kappa Alpha Theta house. The next tree is on the right side of the entry sidewalk

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The next three trees provide an unusual opportunity to observe three similar maple species at the same location.

**Sugar maple** and black maple are very similar in appearance. In fact, some taxonomists consider them both as subspecies of *Acer saccharum*. The lobes of sugar maple leaves have smooth margins and overall the leaves are flat. The tips of black maple leaf lobes tend to droop. The small lobes nearest the base of sugar maple leaves tend to be larger than those of black maple, where they may be nearly absent. The winged fruits of sugar maple (and black maple) are of equal size, in contrast to the fruits of silver maple. The bark of large sugar maple trees is very distinctive. It is gray, with vertical plates that are raised at the edge.

Sugar maples are a common tree in this area and are found in a wide variety of habitats. They are one of the most common trees on the Vanderbilt campus.

The next tree is across the entry sidewalk.

---

As mentioned previously, **black maple** leaf lobes tend to droop. The bark of black maple tends to be darker and without the raised plate edges of sugar maple bark.

Black maple is not nearly as common as sugar maple. It tends to be found in wet lowlands.

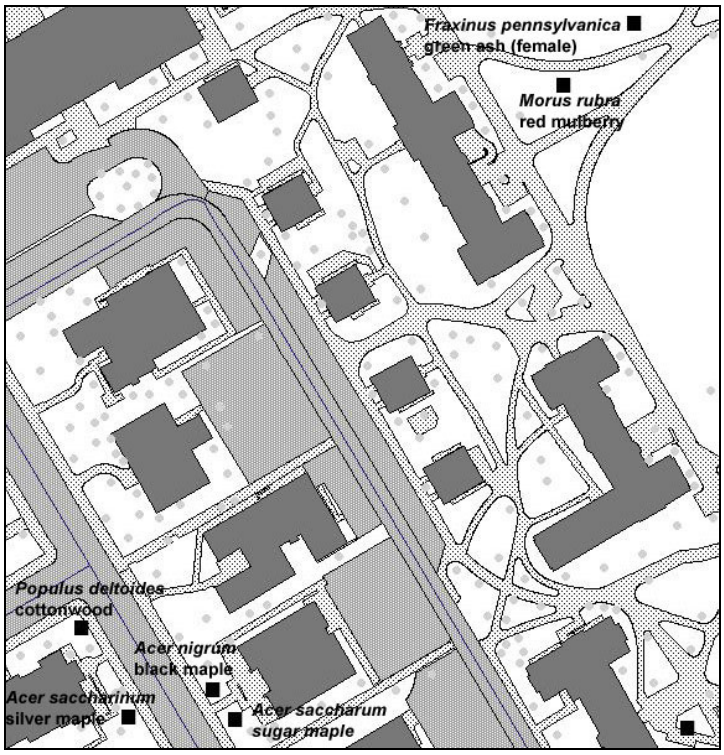
Cross the street to find the next tree. It is by the corner of the Kappa Alpha house.

---

In general, maple leaves are easy to recognize because they are opposite on the twig and have palmate veins. **Silver maple** leaves have jagged margins with small teeth along the lobes. In the spring, silver maple is one of the first trees to bloom. Its winged fruits often have one seed of the pair much smaller than the other.

In the wild, silver maple trees are typically seen only in wet areas, such as lowlands along large rivers. However, it is a commonly planted street tree, so it is very likely to be encountered by city dwellers.

Continue down 24th Ave. S. The next tree is on the left at the corner of 24th and Kensington Place




**Cottonwood** leaves have toothed margins and are roughly triangular. The petioles are flattened, causing the leaves to flutter in a breeze. The bark of large trees is deeply furrowed. The species is dioecious (separate male and female trees) and in the spring the male flowers look like flames hanging from the branches. When the fruits on the females mature and open, they reveal their cottony insides (hence the common name).

Cottonwood is a common tree along streams, rivers, and ponds in middle Tennessee. Unlike most trees, it can stand having its base submerged.

To get to the next tree, go back across 24th Ave.S. Follow the sidewalk between the St. Augustine Chapel and the Delta Delta Delta house until you cross West Side Row. Continue to the left of the building in front of you until you come out on the large Alumni Lawn. Turn left, then right at the first sidewalk. The next tree is on the left

---

The leaves of **red mulberry** are the best way to recognize this species. As the main veins approach the margin of the leaf, they loop around until they are parallel to the margin. Red mulberry is also one of the few trees with leaves that can be mitten-shaped with a single lobe "thumb" on one side. The other tree that commonly has leaves like this is sassafras, but sassafras leaves differ from mulberry by having untoothed margins. The mitten leaves are not always a good way to recognize red mulberry, because sometimes a tree will have few, or even no leaves that are mittened. If the tree is a female, you may also find its fruits in the summer. They change from red to black as they ripen.

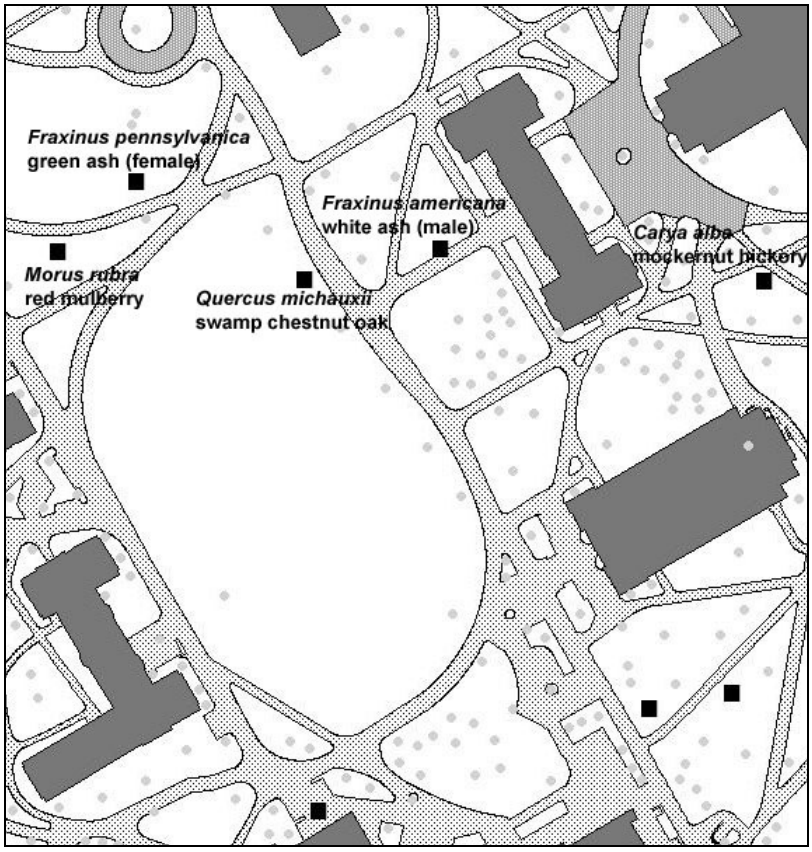
Red mulberry is the only mulberry that you will commonly find in the wild in this area. It is often a small tree or shrub, although it can become a large tree.

Continue around the curve until you see the next tree on the left

---

Ashes can be recognized by their pinnately compound, opposite leaves. **Green ash** is a dioecious species, and this particular tree is a female. In the fall it provides an opportunity to observe the paddle-shaped fruits. Distinguishing between green ash and white ash (*Fraxinus americana*) can be difficult but the wings on the green ash fruits tend to extend along the edge of the fruit towards its base, while the wings of the white ash fruits tend to stop at the thick part of the fruit. Large trees of both white and green ash tend to have bark that is broken up into square-ish plates. Another ash species that is common in middle Tennessee (but not represented on this tour) is blue ash (*Fraxinus quadrangulata*). It is easily distinguished from white and green ash by its square twigs which are quite different from the round green ash twigs and white ash twigs.

Turn right at when a sidewalk crosses the one you are on. The next tree is on the right.




Both **swamp chestnut oak** and swamp white oak trees are found naturally in wetlands. They both have leaves similar to chinkapin oak: shallow rounded lobes (or large rounded

teeth) and lower leaf surfaces that appear whitish and may be hairy. The primary difference in the leaves are in the number of veins. Swamp chestnut oak leaves usually have 9 or more pairs of veins that extend to the lobes, while swamp white oak leaves have 5 to 8 pairs of veins with not all extending to the tips of the lobes.

If acorns are available, the two species are fairly easily distinguished. Swamp chestnut oak acorns have short peduncles (stalks) while swamp white oak acorns have very long peduncles. This individual produces acorns - the swamp white oak trees later on the tour have not been observed to produce acorns.

Turn left at the next walk on the left, and head toward the front door of Alumni Hall. The next tree is the large one on the left side of the walk.

---

The differences between **white** and green **ash** were discussed previously. This tree illustrates the bark of a fairly large tree. It is a male, and therefore does not produce fruit. At the end of the Peabody tree tour (which is also near the end of the main campus tour), there is a female white ash that produces abundant fruit and has branches near the ground.

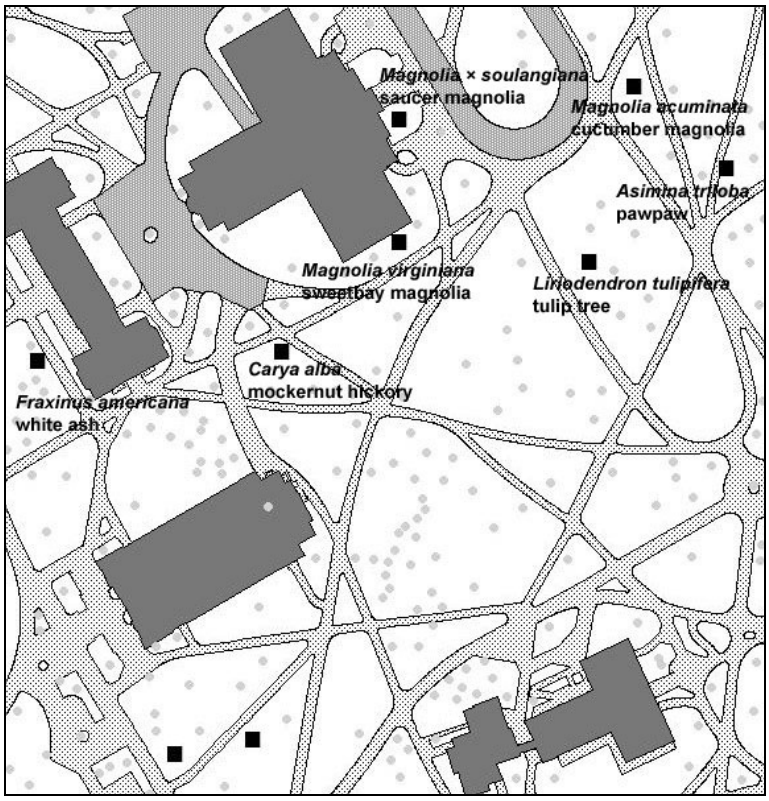
Before you reach the front door of Alumni Hall, turn right and take that sidewalk to the end of the building. Turn left and follow that sidewalk straight ahead until you are opposite a small parking area. The next tree is there on the right.

---

**Mockernut hickory** leaves typically have 7 leaflets. The petiole (leaf stalk) is hairy, unlike many other hickories. It has stout twigs and relatively fat buds that are not yellow (as were bitternut hickory buds). The nuts are tasty, but require a lot of work to crack their hard shells.

Mockernut hickory is common in middle Tennessee, particularly on dry slopes. This may be the only example on Vanderbilt campus, however.

Continue on toward Kirkland Hall on your left. The next tree is right against the wall of Kirkland Hall.




**Sweetbay magnolia** has typical magnolia flowers: large white petals and many stamens and pistils joined in the center. This type of flower has been considered "primitive" because it isn't adapted to any particular type of pollinator. The leaves are leathery and white on the lower surface. These particular trees have not been observed to set fruit.

Sweetbay does not occur naturally in middle Tennessee. The two individuals by Kirkland hall are among the largest in the state.

Follow the sidewalk around to the front of Kirkland Hall to then next tree, another magnolia.

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**Saucer magnolia** is actually a hybrid of two magnolia species and is not native to the United States. However, it is often planted as an ornamental and is more cold-hardy than other magnolias.

These trees are well-known on campus because they frame the front door of the main administration building.

Follow the drive as it makes a U. On the far side of the U is the next tree.

---

**Cucumber magnolia** differs from other magnolias in that its flowers are greenish and not particularly attractive. Its common name comes from its fruits which are greenish as they develop. Unlike the more well-known southern magnolia, cucumber magnolia looses its leaves in the fall.

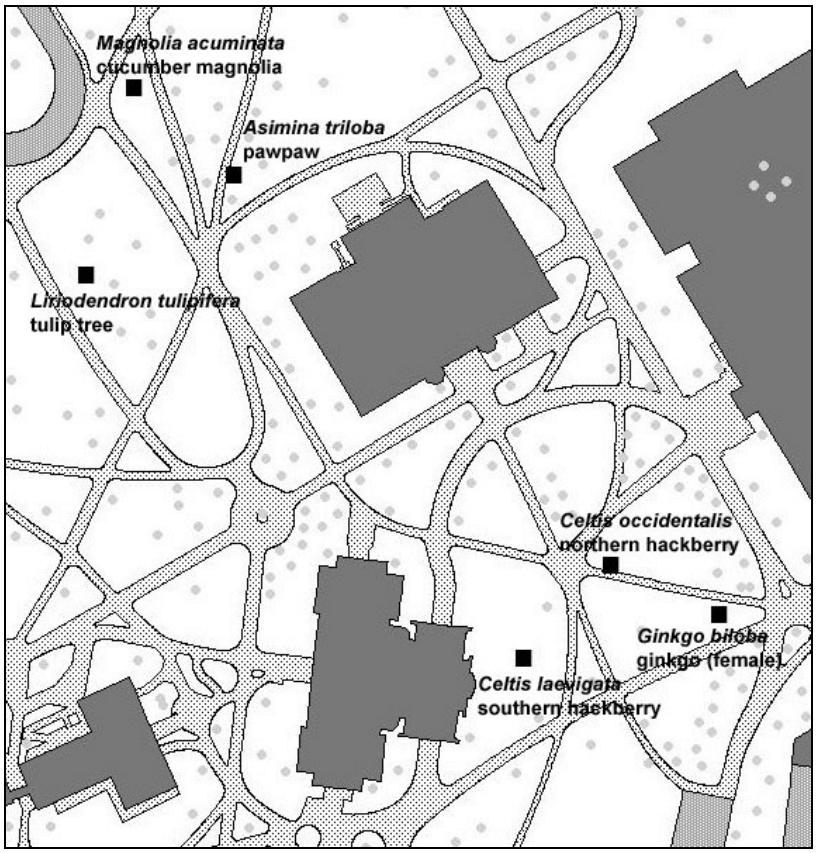
Cucumber magnolia is rare in the wild in middle Tennessee, but in east Tennessee it is common and is an important timber tree.

Return past the U of the drive and turn left at the first sidewalk that heads away from Kirkland Hall. The next tree is on the left.

---

Here is an example of a large **tulip tree**. Notice the ridged bark and straight trunk typical of the species. A smaller tree with leaves in reach was seen earlier in the main campus tour.

Continue along the path and make a sharp left turn at the first sidewalk. Follow that sidewalk and as it splits four ways, take the rightmost fork. On the left is the next tree.



**Pawpaw** is a distinctive tree in many ways. It has unlobed leaves without teeth along the margin which are notable because of their large size and typical shape: widening toward the tip end. The terminal buds are long and an unusual rusty brown color. The bark is gray and unridged, but has a rough surface.

Pawpaw flowers appear in the early spring and are typical of flowers that are pollinated by confused carrion flies: they smell bad and have a purple color. Frequently they do not set fruit, apparently because they don't get enough pollen from other trees. Fruit growers have found that they can reliably get fruit if they hand dead fish or road kill in their pawpaw patch to increase the number of pollinators.

Follow the sidewalk as it curves around the building and passes in front of the Law School. When the sidewalk reaches the end of the Law School building, make a sharp right where the walk splits several ways. The next tree is on your left.

---

Although **ginkgo** is not native to Tennessee, it is a unique and distinctive tree. It is unusual because it is a gymnosperm with broad deciduous leaves. (Most gymnosperms have evergreen needles). The fan shaped leaves are unmistakable with their repeatedly dividing veins. They are often notched at the tip. From a distance, the leaves make the branches look like large pipe cleaners. The bark of large trees is also distinctive with deep furrows and ridges.

Ginkgo is dioecious and this particular tree is a female. In the summer you can find the ground below the tree littered with the "fruits" of the tree which are technically cones. The mature female cones stink and for that reason, most people prefer to plant only male trees.

Ginkgos were thought to be extinct until they were discovered growing in China in the last century. They are now widely planted in cities and towns.

Continue along the sidewalk to the large tree on the right.

---

Hackberry leaves have somewhat uneven leaf bases, a characteristic they share with other members of the elm family. Unlike elms, they have single teeth or no teeth at all. As their name suggests, hackberry fruits are fleshy berries, in contrast to the dry, winged seeds of elms. Perhaps the most noticeable characteristic of hackberries is their bark. Overall, they tend to have smooth bark, similar to beech bark. However, hackberry bark nearly always few to many corky lumps scattered throughout the smooth bark, which is rarely the case with beech.

It is not always possible to assign hackberries to a particular species because they hybridize and can have intermediate characteristics. However, this tree has characteristics typical of **Northern hackberry** (*Celtis occidentalis*). Northern hackberry leaves are broader and more toothed than the leaves of southern hackberry (*Celtis laevigata*, the next tree on the tour). The fruit of northern hackberry is dark red or blackish when mature, in contrast to the more orange-red fruit of southern hackberry. Northern hackberry also has the smooth bark with lumps similar to that of southern hackberry.

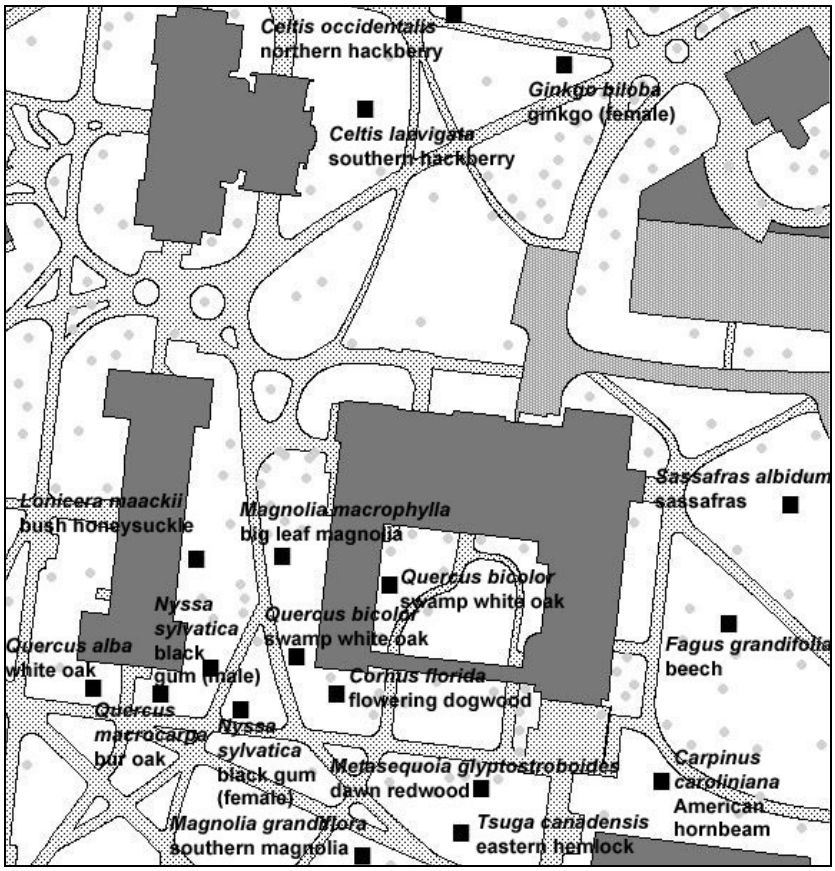
It is more typical around Nashville to find hackberries displaying the *C. laevigata* characteristics because we are near the southern edge of *C. occidentalis*. But as this tree illustrates, *C. occidentalis* types can be found in this area.

When the sidewalk joins with several other walks, turn left. When that walk forks, take the right fork. The next tree is on the right.

---

This individual has characteristics most typical of **southern hackberry**: relatively narrow leaves with few or no teeth (vs. the rounder, more toothed leaves of northern hackberry) and fruits that are more orange-red (vs. the dark red to black fruits of northern hackberry).

Continue to follow the sidewalk straight ahead. Pass the monument and continue as the walk goes between the Divinity School (on your left) and Garland Hall (on your right). Next on the tour are the small bushy trees along the side of Garland Hall.




Everyone in middle Tennessee who cares about the natural environment should learn to identify **bush honeysuckle**. It is an incredibly invasive tree species and as such is one of the greatest threats to natural areas in the vicinity.

Bush honeysuckle leaves taper to a point are opposite on the twig. In the spring they have strong-smelling white flowers. Later in the summer, they produce large numbers of red berries that are eaten and spread by birds. One can recognize the stems or trunks by the bark, which has characteristic vertical "claw marks". The stems arc outward from the clump, another characteristic that make the species recognizable from a distance.

Fortunately, bush honeysuckle is still relative rare outside the metropolitan Nashville area. But within Nashville, it is everywhere, choking out the native vegetation even in relatively undisturbed natural areas such as Radnor Lake and Warner Parks. This species should never be planted and should be removed wherever possible. Unfortunately, it is difficult to dig up large trees and unless all of the roots are removed, the bush will resprout.

The next tree is on the other side of the sidewalk next to the Divinity School.

---

**Big leaf magnolia** has flowers similar to the other magnolias seen previously, although they are larger. The white petals have a series of small purple lines near their base. Another obvious characteristic are the enormous leaves, which give this tree its common name. The fruits are typical for magnolias: cone-like with purse-like chambers that open to allow the red seeds to hang out. The leaf scars go all the way around the twig, as is typical for members of the magnolia family.

Big leaf magnolia is found in middle Tennessee, but is not common. It is most likely to be seen in ravines and along streams in the Cumberland Plateau.

Follow the sidewalk with the Divinity School to your left. When the path forks, take the right fork. The next species is represented by two trees, one on each side of the sidewalk.

---

**Black gum** leaves may be recognized by the fact that they are not very distinctive: they are simple, alternately arranged, with smooth margins. In the fall, they become noticeable as they become red with dark splotches. Black gum may be confused with persimmon, which has similar leaves. However, the leaf scar of black gum has three bundle scars, in contrast to persimmon which has a single, banana-shaped bundle scar. The bark of larger individuals of the two species are also quite different. Black gum's bark has vertical ridges, in contrast to the square plates of persimmon's bark. In the fall, black gum produces fleshy black fruits, although since the species is dioecious, only female individuals will have them. The tree on the left side of the sidewalk is a female that produces many fruits in the fall and the tree on the right is a male.

Black gum is fairly common in uplands in this area. Its habitat is quite different from other *Nyssa* species which tend to grow in swamps and wetlands.

When the another sidewalk crosses the one you are on, turn right and you will see the next tree on your right in front of Garland Hall.

---

The characteristics of **bur oak** were described earlier when the tour passed the bicentennial oak. This smaller opportunity has branches near the ground, so you can get a better look at the leaves. This particular tree also produces many acorns in the fall.

Continue on past the entrance to Garland Hall to the next tree, which is to the left of the entrance.

---

**White oak** leaves are fairly easy to recognize because of their large, rounded lobes. Their acorns have caps with a pebbly surface. The bark of large white oak trees is distinctive, with a grayish color and long, rounded, loose plates.

This particular white oak tree was chosen for the tour because it illustrates the concept of sun and shade leaves. The leaves near the edge of the canopy that are exposed to the bright sun tend to have deep sinuses and narrow lobes. The leaves toward the center of the canopy that are shaded by leaves above have shallow sinuses and fewer, wider lobes. The leaves illustrated by the link above were both taken from this particular tree.

White oak is common in the wild in middle Tennessee. It is also the most common oak on Vanderbilt campus and one of the most common trees. Its leaves and acorn are symbols of the university.

Turn back the way you came, pass between the two black gums and head to the corner of the Divinity School. The next tree, a small one, is there.

---

A small **swamp white oak tree** is near the corner of the divinity school. It provides an opportunity to observe the leaves closely. Around the corner and in the courtyard is a very large individual that was once ranked as the Tennessee state champion swamp white oak. Neither of these individuals have been observed to produce acorns.

As was discussed previously, swamp white oak leaves are similar to swamp chestnut oak leaves. Notice that the lobes/teeth of swamp white oak leaves tend to become less noticeable as you approach the base of the leaf. There are usually fewer than 8 pairs of veins extending to the teeth. Swamp white oak acorns have very long stalks.

Swamp white oak is normally found in wetland areas and isn't typically planted.

The next tree is around the corner from the small swamp white oak tree on the side of the Divinity school facing the library lawn. It is small.

---

Because of its showy, white "flowers" in spring, **flowering dogwood** is the most noticeable dogwood species. The "petals" of the inflorescence are actually bracts and not a part of the flowers which are yellow and clustered in the center. Other common dogwood species in this area do not have the showy white bracts. The opposite leaves of dogwoods are distinctive with their parallel veins curving around to follow the leaf margins toward the pointed tip of the leaf. The bark of dogwood is easily recognized year-round because of the small, round flakes that cover its surface. The red fruits of dogwood are also noticeable in the fall and winter.

This very distinctive species is common in the wild throughout Tennessee. It is one of the most popular native ornamental shrubs and is planted many places on Vanderbilt campus. Usually flowering dogwood is seen as a shrub or small tree, but if you are lucky you can be surprised to find tree-sized specimens towering over your head in an undisturbed forest.

Follow the sidewalk that leads from the Divinity School courtyard out into the library lawn. Turn left on the third sidewalk you cross. You will see the a large tree on your right.

---

**Southern magnolias** are unmistakable with their large creamy, white flowers and shiny evergreen leaves that are rusty underneath. Their twigs are encircled by the leaf scars and the fruits are typical for magnolias.

Southern magnolias are not native to Tennessee. They occur naturally further south. They are successfully planted in middle Tennessee, but they rarely reproduce successfully from seeds here. The large evergreen leaves also make the trees susceptible to severe damage from the ice storms that occur frequently here. There are many southern magnolias planted in this part of the main campus.

Look for the next tree, a large evergreen, on the other side of the sidewalk.

---

**Eastern hemlock** has short, flat needles that are arranged more or less in two rows along the twig. The lower surface of the needles have two white rows of stomata. Hemlock cones are small and woody. Both sexes of cones are found on the same tree.

Hemlocks do not occur naturally in middle Tennessee. But they are an important component of the forests of east Tennessee and can be the dominant species in valleys in the Smoky Mountains. The hemlock wooly adelgid, an insect pest, has recently invaded the Appalachian Mountains and threatens this majestic tree species with destruction.

Head directly towards the Divinity School to the row of trees growing along the iron fence.

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**Dawn redwood** also has needles in two rows along the twig. Male and female cones occur on the same branch. The mature female cones are small and woody.

Like ginkgo, dawn redwood is a species that was thought to be extinct until it was discovered in Asia in the last century. It is a "living fossil" closely related to the giant redwoods of California.

Return back to the path and follow it towards the Central Library to get to the end of the iron fence. Turn left and follow the sidewalk toward the Divinity School. Take the stairs down on the right. Turn right and on your immediate right is the next tree, a small one.

---

**American hornbeam** has leaves similar to hop hornbeam leaves which were seen earlier on the tour. The bark of American hornbeam is smooth like beech bark, but looks like it has rippling muscles beneath it. This is quite different from the shreddy bark of hop hornbeam. American hornbeam fruits hang in a small cluster which has a more leafy look than the hop hornbeam fruits.

American hornbeam is common in middle Tennessee forests.

Follow the sidewalk away from the library with the Divinity School on your left until you come to the end of the iron fence on your right. Go around the end of the fence and turn back to the right to get to the next tree which has low branches spreading down toward the sidewalk.

---

**Beech** is one of the more distinctive trees in this area. Large trees have unusually smooth bark without the lumps seen on the previous species. The leaves have very regular, parallel veins that extend all the way to a tooth at the margin. In fall and winter, the spear-shaped buds are unmistakable and the fruits look like no other.

Beeches are fairly common in this area. They often rot out in the center, making hollow trees common.

Head back in the direction from which you came and cross the sidewalk. The next tree is in the grassy area on the other side of the walk.

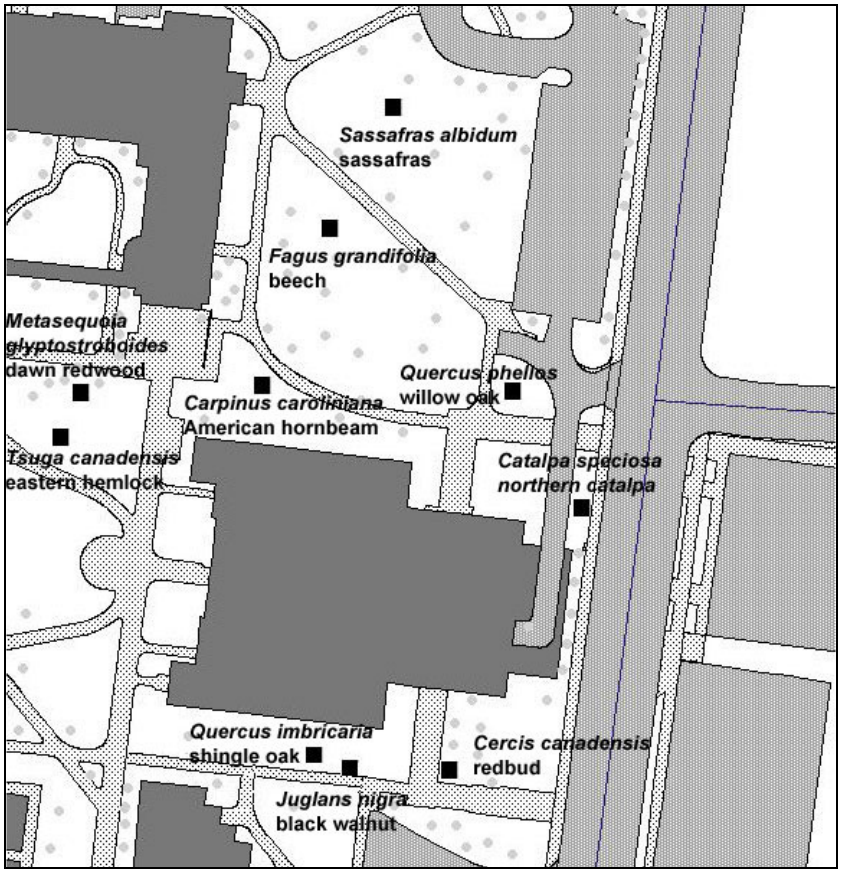
---

One rarely mistakes **sassafras** for any other tree if its mitten-shaped leaves are present. No other tree has mitten-lobed leaves with smooth margins. Unfortunately, some trees have few or no lobed leaves and their oval leaves look like those of several other species.

Several other characteristics can differentiate sassafras from other trees having leaves with no lobes or teeth. When crushed, the leaves emit an aromatic smell. Spicebush is the other small tree that has aromatic, unlobed leaves. However, spicebush leaves have a pointed tip and spicebush does not have the characteristic green twigs of sassafras. In this area, only box elder has green twigs like this, and box elder has opposite leaves rather than alternate ones like sassafras.

Sassafras fruits are rather odd looking with a single, berry-like structure attached to the end of something that resembles a golf tee. These fruits may be observed on some trees in the fall. The bark of large sassafras trees (such as this one) develop furrowed bark. When chipped, the ridges have a cinnamon color.

Return to the sidewalk and walk away from the Divinity School and towards 21st Ave.S. This sidewalk will turn right before joining the main sidewalk that heads to the street. At this junction, the next tree is on the left.




The small, narrow leaves of **willow oak** are quite different from most of the other oaks in middle Tennessee and without careful inspection one might think that a small tree was a willow. However, the clustered buds at the end of the twig are a sure sign that this tree is an oak. In the fall, large trees also produce acorns, which are also typical of oaks. The willow oak acorns are among the smallest produced by oaks.

Although not particularly common in middle Tennessee, some of Vanderbilt's largest trees are willow oaks, including one next to the American hornbeam you just saw, and the first tree on the Peabody tour which is a short distance from here.

Follow the sidewalk towards 21st Ave.S. As you reach the street, the final tree on the main campus tour is on your right.

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**Catalpa** trees are best known for their long fruits that hang in great masses from the trees in the fall. Although these seed pods look similar to those produced by members of the pea family, catalpa fruits produce flat, winged seeds rather than beans. In the spring, the

tree produces showy flowers that are quite interesting because they exhibit a color pattern known as "nectar guides". These patterns guide intelligent insects like bees to the back of the flower for a nectar reward while the flower dusts the bee with pollen.

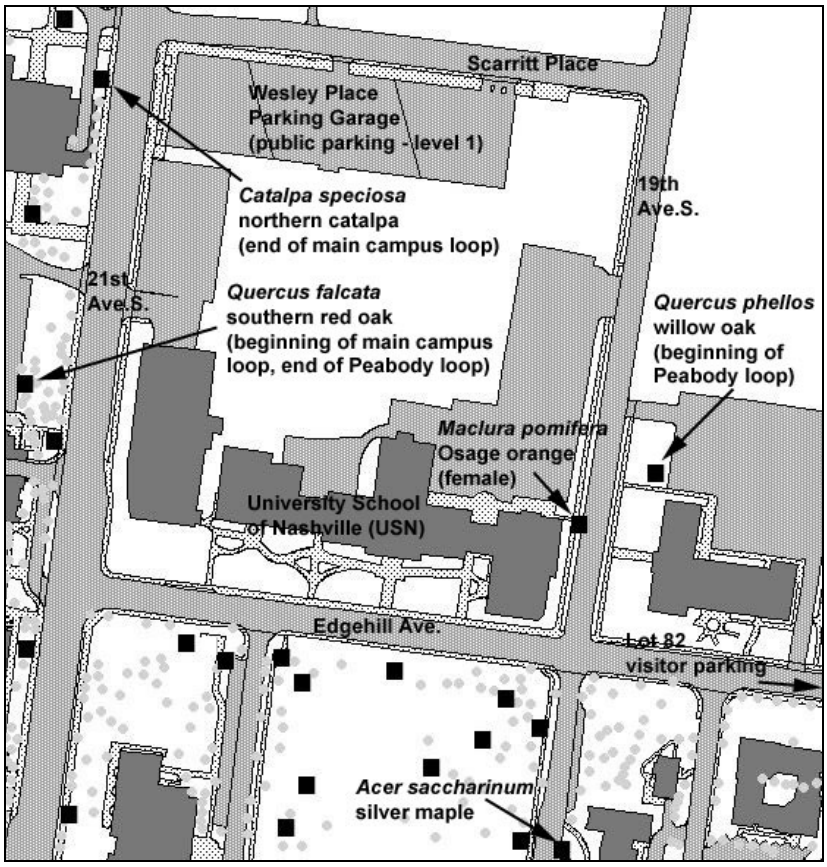
Because the tree has flowers, developing fruits, or mature fruits during most of the year, it is a relatively easy tree to recognize. The fairly large, heart-shaped leaves are also typical for the species.

There are two species of catalpa which are fairly difficult to distinguish. Most of the catalpas in Nashville are northern catalpa (*Catalpa speciosa*). Although native to west Tennessee, catalpas are not common in the wild. But they are common in cities where they are planted and establish themselves in disturbed areas.

This is the end of the main campus tour. You can finish your tour by crossing 21st Ave.S. and returning to the Wesley Place Garage. You can also start the Peabody tour from the parking garage. It eventually returns to this same point.

If you parked in the Lot 82 visitor parking, cross the street and follow Scarritt Place until it dead-ends into 19th Ave.S. Turn right and follow 19th until it runs into Edgehill Avenue. Turn left and follow Edgehill until you are back at the parking lot.

If you started the main campus tour from the west side at the 2525 Parking Garage, you should continue around the main campus loop by going south on 21st Ave. S. to *Quercus falcata*. It is the huge tree on the right in front of the Nursing School.




# Peabody Tree Tour

If you are starting from the Wesley Place parking garage, exit onto Scarritt Place and turn right. Walk towards the Scarritt-Bennett Center (stone buildings at the end of the street). Turn right at 19th Ave.S. and walk past the entrance of the Disciples of Christ Historical Society (on your right). About 2/3 of the way down the block, you will see a very large tree across the street in an open area next to a parking lot.

If you are starting from the Lot 82 visitor parking, walk west along Edgehill Ave. until you come to 19th Ave.S. Turn right and walk a short distance until you see a very large tree on the right side of the street in an open area next to a parking lot.

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This particular tree is included in the tour because it is believed to be the largest tree on the Vanderbilt campus.

Another example of **willow oak** is included later in the tour.

Continue walking south, with the University School parking lot on your right until you come to the steps that lead up to the USN entrance.

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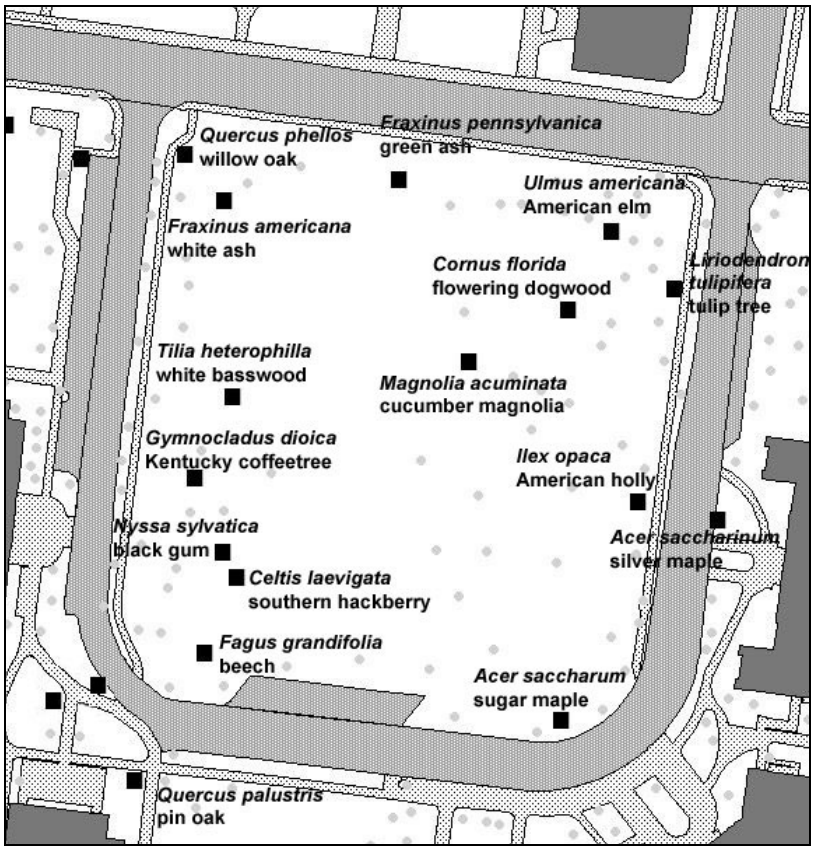
This rather pathetic example of **Osage orange** is actually not on Vanderbilt property. However, it is included in the tour because it is a female example of this **dioecious** (i.e. individuals either only male or only female) species. In the fall, many of the strange, lumpy fruits can be found lying on the ground below this particular tree.

Horses are one of the few animals known to eat this fruit and potentially disperse its seeds. Given that horses are not native to North America, it is likely that the species' original disperser (probably a large mammal) died out during the mass extinction that occurred soon after the arrival of humans in North America.

A better example (a male) of Osage orange will be seen later on the tour. Continue walking with USN at your right until you reach Edgehill Ave. Cross Edgehill and continue walking along the drive known as Magnolia Circle. Cross to the left side of Magnolia Circle when you are in front of the Home Economics building. The next tree is just to the left of the main sidewalk leading to the front door.




The next trees on the tour provide a comparison of two common maple species, **silver maple** and sugar maple. In general, maple leaves are easy to recognize because they are opposite on the twig and have palmate veins. Silver maple leaves have jagged margins with small teeth along the lobes. In the spring, silver maple is one of the first trees to bloom. Its winged fruits often have one seed of the pair much smaller than the other.

In the wild, silver maple trees are typically seen only in wet areas, such as lowlands along large rivers. However, it is a commonly planted street tree, so it is very likely to be encountered by city dwellers.

Follow the sidewalk along Magnolia Circle until it curves to the right. Cross the drive to the next tree.

---

Unlike silver maple, the lobes of **sugar maple** leaves have smooth margins. The winged fruits of sugar maple are of equal size. The bark of large sugar maple trees is very distinctive. It is gray, with vertical plates that are raised at the edge.

Sugar maples are a common tree in this area and are found in a wide variety of habitats. They are one of the most common trees on the Vanderbilt campus.

Walk back along Magnolia Circle towards Edgehill Avenue. The next tree is the small tree with shiny leaves on the left before you get to the stone wall that runs along Magnolia Circle.

---

The shiny evergreen leaves with spine-tipped lobes make **American holly** easy to recognize, particularly in the fall and winter when its bright orange-red berries are present. Although holly is often found as a shrub, it can reach tree size in undisturbed forests. Tree-sized holly specimens can be seen on the main campus part of the tour.

Holly is not common in the wild in middle Tennessee, but is often seen in other parts of the state, such as the Smoky Mountains. It is often planted as an ornamental bush and is found at a number of locations on campus.

Head towards the center of the green where the next tree is somewhat in the open.

---

**Cucumber magnolia** differs from other magnolias in that its flowers are greenish and not particularly attractive. Its common name comes from its fruits which are greenish as they develop. This particular tree has not been seen to produce mature fruit. Unlike the more well-known southern magnolia, cucumber magnolia looses its leaves in the fall.

Cucumber magnolia is rare in the wild in middle Tennessee, but in east Tennessee it is common and is an important timber tree.

Walk towards the corner where Magnolia Circle meets Edgehill until you reach the next small tree.

---

Because of its showy, white "flowers" in spring, **flowering dogwood** is the most noticeable dogwood species. The "petals" of the inflorescence are actually bracts and not a part of the flowers which are yellow and clustered in the center. Other common dogwood species in this area do not have the showy white bracts. The opposite leaves of dogwoods are distinctive with their parallel veins curving around to follow the leaf margins toward the pointed tip of the leaf. The bark of dogwood is easily recognized year-round because of the small, round flakes that cover its surface. The red fruits of dogwood are also noticeable in the fall and winter.

This very distinctive species is common in the wild throughout Tennessee. It is one of the most popular native ornamental shrubs and is planted many places on Vanderbilt campus. Usually flowering dogwood is seen as a shrub or small tree, but if you are lucky you can be surprised to find tree-sized specimens towering over your head in an undisturbed forest.

Walk toward the stone wall to find the next tree, which is tall and near the wall.

---

**Tuliptree** gets its name from its unusual yellowish-orange flowers. The distinctive leaves also have a shape that reminds some of tulips as well. By late summer the flowers have turned into fruits, which are a collection of winged seeds attached to a central stalk.

Tuliptree is the state tree of Tennessee and is a very common tree throughout the state. It sprouts up rapidly following disturbance, but can also grow to enormous sizes in undisturbed forests. Large trees can be recognized even in the winter by their very straight trunks and the long, deep furrows in the bark. This particular tree was chosen for the tour as an example of a large tree. A small tree appears later in the tour to provide an opportunity for a better view of the leaves.

Walk away from the stone wall and towards Edgehill Avenue towards the next tree which is large and has a few branches within reach.

---

Elms can be recognized by their lopsided leaf bases and double-toothed margins. The surfaces of **American elm** leaves are somewhat rough, but not as sandpaper-like as the very common slippery elm (*Ulmus rubra*). Large elms have a very distinctive shape with upward-sweeping branches. American elm is one of the earliest blooming trees and in late spring, the ground below the trees is littered with many of the round, tiny, winged fruits. In the south-central U.S., another species, September elm (*Ulmus serotina*) is virtually indistinguishable from American elm except by the fact that September elm blooms in the fall rather than the spring. September elm will be seen later in the Peabody tree tour.

American elm was once one of the most common trees found along streets in cities in the eastern U.S. Now the Dutch elm disease has wiped out many of these large, beautiful trees. Vanderbilt campus has an unusual number of large American elm trees. The disease is spread by bark beetles which feed in dead branches. By meticulously trimming all dead wood off of the American elms on campus, most of the large trees have been spared the disease.

Walk along the wall that follows Edgehill Avenue until you come to the next tree which is somewhat in the open.

---

Ashes can be recognized by their pinnately compound, opposite leaves. Like Osage orange, **green ash** is a dioecious species, and this particular tree is a female. In the fall it provides an opportunity to observe the paddle-shaped fruits. Distinguishing between green ash and white ash (*Fraxinus americana*) can be difficult but the wings on the green ash fruits tend to extend along the edge of the fruit towards its base, while the wings of the white ash fruits tend to stop at the thick part of the fruit. Large trees of both white and green ash tend to have bark that is broken up into square-ish plates. Another ash species that is common in middle Tennessee (but not represented on this tour) is blue ash (*Fraxinus quadrangulata*). It is easily distinguished from white and green ash by its square twigs which are quite different from the round green ash twigs and white ash twigs.

The next tree on the tour is at the corner of Edgehill and the entrance of Magnolia Circle. It is very large.

---

The small, narrow leaves of **willow oak** are quite different from most of the other oaks in middle Tennessee and without careful inspection one might think that a small tree was a willow. However, the clustered buds at the end of the twig are a sure sign that this tree is an oak. In the fall, large trees also produce acorns, which are also typical of oaks. The willow oak acorns are among the smallest produced by oaks.

Although not particularly common in middle Tennessee, some of Vanderbilt's largest trees are willow oaks, including the first tree seen on this tour and examples seen on the main campus tour. Walk away towards the center of the green to the next tree.

---

The differences between **white** and green **ash** were discussed previously. This tree illustrates the bark of a fairly large tree. However, it has no branches near the ground. At the end of the Peabody tree tour, there will be an opportunity to observe a female white ash that produces abundant fruit and has branches near the ground.

Walk along the edge of the open green until you come to the next tree, which is split into a double trunk.

---

**White basswood** has leaves with very uneven leaf bases and a single toothed margin. It is distinguished from American basswood by the hairs on the lower surface of the leaves which can give the lower surface a whitish appearance. However, the amount of hairiness is variable and it is often not easy to determine whether a particular tree is a white basswood or an American basswood. Some taxonomists do not recognize white basswood as a separate species and call it a subspecies of American basswood.

Basswoods have very distinctive flowers and fruits. They hang in a cluster below a leaf-like bract. Bees love the basswood flowers and some say that basswood honey has the best flavor. In the fall and winter, basswood buds have a very distinctive look and in the wild, large basswood trees often have sprouts surrounding the base of the tree.

Continue walking parallel to Magnolia Circle until you come to the next rather small tree.

---

The leaf of **Kentucky coffeetree** is one of the few that is bipinnately compound. Its leaflets are arranged in rows on parallel secondary "stalks" that come off of the central "stalk". The seeds are in hard pods that can be fairly large (although the pods on this particular tree aren't as large as some).

Although Kentucky coffeetree is native to the south-central U.S., it is not common in the wild. There is speculation that, like Osage orange, the seeds of Kentucky coffeetree were once dispersed by extinct large mammals who were able to chew up the hard seed pods. It is now found across a wider range where it has been planted by humans.

Continue away from Edgehill to the next small tree.

---

**Black gum** leaves may be recognized by the fact that they are not very distinctive: they are simple, alternately arranged, with smooth margins. In the fall, they become noticeable as they become red with dark splotches. Black gum may be confused with persimmon, which has similar leaves. However, the leaf scar of black gum has three bundle scars, in contrast to persimmon which has a single, banana-shaped bundle scar. The bark of larger individuals of the two species are also quite different. Black gum's bark has vertical ridges, in contrast to the square plates of persimmon's bark. In the fall, black gum produces fleshy black fruits, although since the species is dioecious, only female individuals will have them.

Black gum is fairly common in uplands in this area. Its habitat is quite different from other *Nyssa* species which tend to grow in swamps and wetlands.

The next tree is the large one to the left at the edge of the open green.

---

Hackberry leaves have somewhat uneven leaf bases, a characteristic they share with other members of the elm family. Unlike elms, they have single teeth or no teeth at all. As their name suggests, hackberry fruits are fleshy berries, in contrast to the dry, winged seeds of elms. Perhaps the most noticeable characteristic of hackberries is their bark. Overall, they tend to have smooth bark, similar to beech bark (the next tree). However, hackberry bark nearly always few to many corky lumps scattered throughout the smooth bark, which is rarely the case with beech.

Two species of hackberry are commonly found in Tennessee: **southern hackberry** or sugarberry (*Celtis laevigata*), and northern hackberry (*Celtis occidentalis*). In this area of range overlap the two species hybridize, so it is often not possible to unambiguously assign an individual tree to a particular species. This individual has characteristics most typical of southern hackberry: relatively narrow leaves with few or no teeth (vs. the rounder, more toothed leaves of northern hackberry) and fruits that are more orange-red (vs. the dark red to black fruits of northern hackberry). An individual with northern hackberry traits will be seen later in this tour.

Hackberry trees are common in this area with *Celtis laevigata* types the most common.

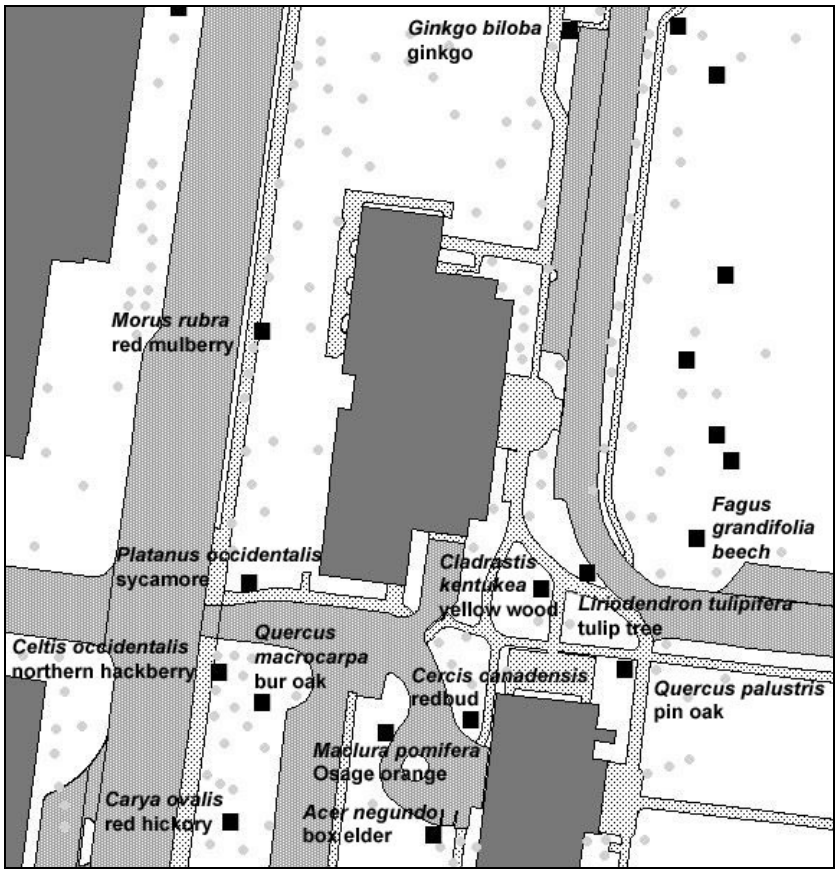
Turn right towards the campus to the next tree.

---

**Beech** is one of the more distinctive trees in this area. Large trees have unusually smooth bark without the lumps seen on the previous species. The leaves have very regular, parallel veins that extend all the way to a tooth at the margin. In fall and winter, the spear-shaped buds are unmistakable and the fruits look like no other.

Beeches are fairly common in this area. They often rot out in the center, making hollow trees common.

To get to the next tree, cross Magnolia Circle and go to the place where the sidewalk heads from the street up the hill. The next tree is there on the right.




**Pin oak** leaves are distinctive among the oaks, with 5 to 7 lobes that project straight out from the midvein and taper to a point. The acorn cups have narrow caps. If you look up a large tree, you may notice its somewhat striped looking bark and branches which spread out from the main trunk like spokes of a wheel.

In the wild, pin oak would be found only in low, wet areas. However, it is a commonly planted street tree. It is present at a number of locations on Vanderbilt campus.

Turn back and follow the sidewalk as it curves left to follow Magnolia Circle. The next tree is a small one, the first tree between the sidewalk and the street.

---

Earlier in this tour you saw a large **tuliptree**. This small tree presents an opportunity to take a closer look at the leaves and twig. Close examination of the twigs shows that the leaf scars go all the way around the twig. This is a trait of the magnolia family, of which tuliptree is a member.

Turn to your left and face the junction with the sidewalk leading to the library. The next tree is ahead of you.

---

**Yellow wood** is the only tree in this area that has compound leaves with leaflets that alternate as they come off the central leaf stalk (or rachis). Large trees have fairly smooth and somewhat lumpy bark and in the spring it has fairly large, showy white flowers typical of those of the pea family. Later in the year, it produces small pods for fruit.

Yellow wood is native to this area, but is not common. It is sometimes planted as an ornamental.

This is your best opportunity to use the restroom and get something to eat or drink in the Iris Cafe, which is open to the public. It is in the lower level of the library. To continue on the tour, head towards the library and turn right at the first sidewalk before you reach the patio. Take the steps down, then turn left and head down the hill. The next tree is on your right just before you reach the small circular parking area.

---

The tiny purple-pink flowers of **redbud** make it one of the most easily recognized small trees when it is blooming in the spring. In addition to emerging from the twigs, redbud flowers also come directly from some places in the trunk of tree. Although the flowers are much smaller than those of the last tree, they also have the structure typical of the pea family, and in the fall and late summer, redbud trees are covered with flat seed pods. Redbud leaves are also fairly distinctive. They are heart shaped with smooth margins.

Redbuds are very common in this area. Because they generally don't live as long as other trees, they are usually small trees or shrubs. They favor disturbed areas and so are very common along highways where they can produce clouds of brilliant purple-pink in the spring. They are also planted as ornamentals.

The next tree is the large one on the other side the small circular parking lot toward the street

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This is a typical example of **Osage orange**. Notice how the branches arch out and downward. The inner bark has a distinctive orangish brown color. Close examination of the twig will reveal small, sharp spines. This tree is a male and does not produce the wierd lumpy green fruits that you may have seen at the second tree on this tour.

If it is true that this tree was dispersed by extinct mammals, it may have been saved from extinction by Native Americans who favored its wood for use in bows. Later, European settlers spread it throughout the central U.S. when they planted it as thick hedges to keep in livestock - hence one of its common names: hedge apple.

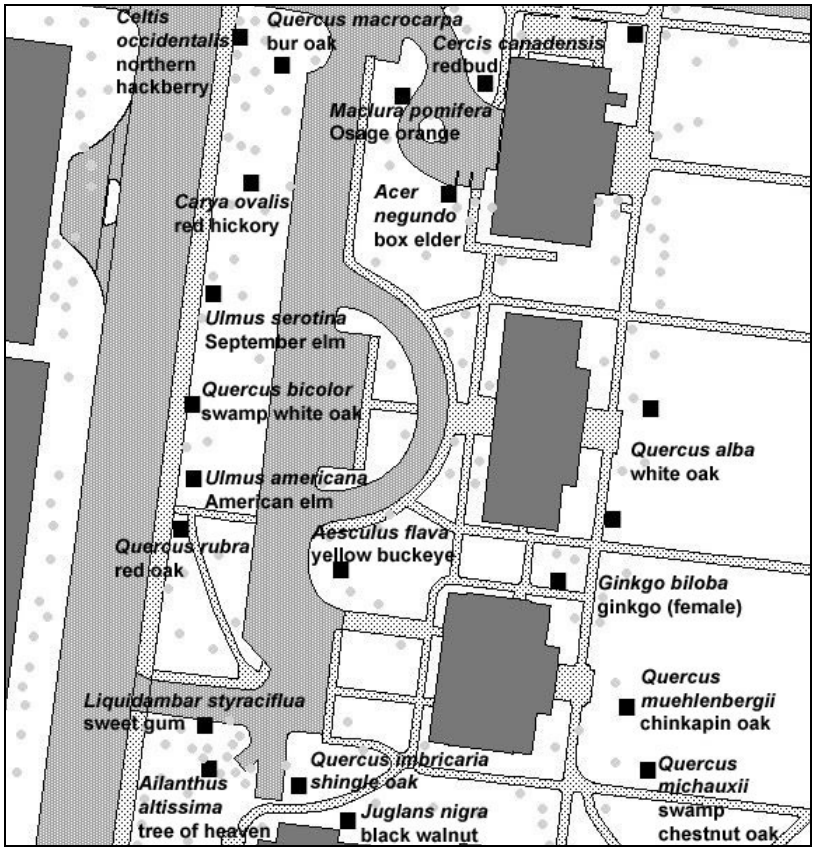
The next tree is on the far side of the circular parking lot from where you came down the hill. It is on the right of the stairs that go up the hill.

---

If you are familiar with maples, you may be surprised to find that **box elder** is a maple. Unlike all other maples in this area, its leaves are compound. However, it does produce the paired, winged fruits typical of other maples. This tree is one of the few trees that have very green twigs and the leaves are arranged oppositely on the twig as is typical for maples.

Box elder is very common in our area, especially in wet, disturbed areas where it grows like a weed. However, it is only found in a couple locations on Vanderbilt campus.

Go up the stairs and turn left onto the sidewalk that goes between the two buildings. When you come out into Peabody Green, turn right on the sidewalk that goes along in front of the buildings. As you near the entrance of the Administration building, the next tree is at your left.




**White oak** leaves are fairly easy to recognize because of their large, rounded lobes. Their acorns have caps with a pebbly surface. The bark of large white oak trees is distinctive, with a grayish color and long, rounded, loose plates.

After examining the large tree in front of the Administration building, continue along the sidewalk. Just before you reach the first cross walk, you will see another small white oak tree on the left. It will give you an opportunity to get a better look at the leaves.

White oak is common in the wild in middle Tennessee. It is also the most common oak on Vanderbilt campus and one of the most common trees. Its leaves and acorn are symbols of the university.

Continue ahead along Peabody Green until just before you reach the Cohen building. On the right, you will see some steps that go down the hill. The next tree is on the right at the bottom of the steps.

---

Although **ginkgo** is not native to Tennessee, it is a unique and distinctive tree. It is unusual because it is a gymnosperm with broad deciduous leaves. (Most gymnosperms have evergreen needles). The fan shaped leaves are unmistakable with their repeatedly dividing veins. They are often notched at the tip. From a distance, the leaves make the branches look like large pipe cleaners. The bark of large trees is also distinctive with deep furrows and ridges.

Ginkgo is dioecious and the tree in front of you is a male. The other tree near the sidewalk next to the administration building is a female. In the summer you can find the ground below the female littered with the "fruits" of the tree which are technically cones. The mature female cones stink and for that reason, most people prefer to plant only male trees.

Ginkgos were thought to be extinct until they were discovered growing in China in the last century. They are now widely planted in cities and towns.

Go back up the stairs and turn right. Continue until you are just in front of the entrance to the Cohen building. Face the center of the green and the next tree is in front of you.

---

*Quercus muehlenbergii* (**chinkapin oak**), *Quercus michauxii* (swamp chestnut oak), *Quercus bicolor* (swamp white oak), and *Quercus prinus* (chestnut oak) have similar leaves but can be distinguished by careful examination as well as by their habitat, bark, and acorns. The first three of these species will be seen in the next part of this tour. In the wild, chinkapin and chestnut oaks would be found in uplands, while swamp white and swamp chestnut oaks would be found in wetlands. Therefore it is most important to be able to distinguish between these pairs.

The tips of the lobes (or large teeth) of chinkapin oak leaves have small glands at their tips. The glands are best seen using a hand lens. Chestnut oak leaf lobes do not have these glands. The bark of chinkapin oaks tends to flake off in long plates, while the bark

of large chestnut oaks has deep furrows. When fully ripe, chinkapin oak acorns are small and nearly black with light colored caps. Chestnut oak acorns are more of a chestnut brown, large and somewhat bullet-shaped, and have more conical caps. Chestnut oaks are also typically found on dry ridge tops and slopes, while chinkapin oaks are found in more moderate conditions.

Chinkapin oak is fairly common in this area, although there are few examples on campus.

Return to the path that follows the edge of the green and continue in the same direction as before. Turn left at the next cross walk and the next tree is on your left. It is smaller than the chinkapin oak.

---

Both **swamp chestnut oak** and swamp white oak trees are found naturally in wetlands. They both have leaves similar to chinkapin oak: shallow rounded lobes (or large rounded teeth) and lower leaf surfaces that appear whitish and may be hairy. The primary difference in the leaves are in the number of veins. Swamp chestnut oak leaves usually have 9 or more pairs of veins that extend to the lobes, while swamp white oak leaves have 5 to 8 pairs of veins with not all extending to the tips of the lobes.

If acorns are available, the two species are fairly easily distinguished. Swamp chestnut oak acorns have short peduncles (stalks) while swamp white oak acorns have very long peduncles. Unfortunately, neither of the individuals on this tour typically produce acorns.

Return in the direction from which you came and follow the sidewalk away from the green and between Cohen and North Halls. Follow the sidewalk that branches to the left and approaches North Hall. The next tree is near the building and has no low branches.

---

**Black walnut** leaves are one of the largest singly pinnate (leaflets arranged along a single central rachis) leaves in this area. Trees with similar leaves are tree of heaven and pecan. One of the next trees on this tour is tree of heaven, and you will have an opportunity soon to examine its leaves. The leaflets of tree of heaven have a distinctive gland in a notch at the base of each leaflet. Walnut leaflets do not have this gland. Walnut twigs also have unusual chambered pith (please do not cut branches or twigs from trees on the Vanderbilt campus) and tree of heaven twigs do not. This large walnut tree shows the distinctive furrowed bark of walnut, which is quite different from the smoother bark of tree of heaven. Pecan trees are not common in the wild in this area so they aren't likely to be confused with walnut there. Pecan bark is also not deeply furrowed and its twigs do not have chambered pith.

If the fruits are present, these three trees can't be confused. Walnuts are very hard, round, and surrounded by a thick husk that doesn't split along any particular lines. Pecans are

oblong with a thinner shell and when ripe, their husks splits fairly easily into several pieces. Tree of heaven fruits are not nuts but rather are thin and winged.

A smaller walnut tree may be seen near the end of this tour and its leaves can be examined more closely than the leaves of this tree. Black walnut trees are fairly common in forests in this area, although large trees are somewhat rare because they are frequently cut for their valuable wood.

The next tree is the large tree ahead on the right side of the path, next to the short, paved access drive.

---

**Shingle oak** is one of the two oaks in this area which has leaves with no lobes. The other is willow oak, which has much smaller, narrower leaves than shingle oak. You can know that this species is an oak by its clustered buds at the end of its twig and by its acorn.

Although shingle oak is native to this area, it isn't as common in this area as other oaks. Another shingle oak tree which has branches closer to the ground is near the beginning of the main campus tree tour, which starts at the end of this tour.

To find the next tree, cross the short, paved access area and look for the next tree beyond the holly bushes.

---

As was just mentioned in the discussion of black walnut, the leaves of **tree of heaven** have leaflets that have a gland in a notch at the base. The bark of small and medium sized trees is fairly smooth and has vertical whitish streaks. Tree of heaven fruits are winged and hang from the tree in large clusters.

Tree of heaven is an introduced species that spreads vigorously and is a problem invasive species in wooded areas. Even when pulled out of the ground, trees will resprout again and again from bits of root left in the ground. It is one of the few trees to thrive in even the most polluted urban areas and will sprout in cracks in sidewalks. It forms thick stands of small trees in vacant lots. It can be truly classified as a weed tree and is despised for the bad smell of its crushed foliage - hence one of its other common names: "stink tree".

Walk towards the drive that enters from 21st Avenue and the next tree is just this side of the iron fence that separates you from the drive.

---

**Sweet gum** leaves are distinctive due to both their 5-pointed star shape and the pleasant, aromatic smell that they have when torn or crushed. The other very distinctive

characteristic of the tree is its fruit, which looks like a spiky ball. In the fall, the ground below sweet gum trees is littered with hundreds of these fruits.

Sweet gums favor wet bottomlands. However, they also do fairly well in disturbed areas and are commonly seen as small trees along highways.

To get to the next tree, retrace your steps back to the small paved access area. Follow the pavement to the drive, then follow the right edge of the drive to just before the place where the semicircular drop-off drive branches off. The next tree is the large tree at the right.

---

Buckeye leaves are easily recognized because they are palmately compound (leaflets coming from a common point on their petiole or leaf-stalk) and are oppositely arranged on the twig. Two species are found in middle Tennessee -- **yellow buckeye** (*Aesculus flava*) and Ohio buckeye (*Aesculus glabra*) -- although neither species is common. However, yellow buckeye is one of the dominant species in cove forests of the Smoky Mountains. It is virtually impossible to tell these two species apart on the basis of their leaves and bark alone. They are best distinguished by their flowers and fruit. Yellow buckeye flowers are more whitish yellow and have petals with unequal length. Ohio buckeye flowers are more greenish yellow and have petals with equal length. The fruit of buckeyes is unusual. Several shiny, brown nuts (poisonous to humans) are present inside a thin hull that splits into several pieces. The hull of yellow buckeye is smooth, while the hull of Ohio buckeye is spiny.

Cross the drive to the grassy area between the drive and 21st Avenue. S. Follow a short sidewalk until another sidewalk joins it from the left. The next tree is on the left.

---

**Northern red oak** is a representative of a large group of similar oaks present in this area. Members of the red oak group (*Quercus rubra*, *Quercus falcata*, *Quercus palustris*, *Quercus velutina*, *Quercus shumardii*, and *Quercus coccinea*) have leaves with pointed lobes that are bristle-tipped. (The first three species may be seen on this tree tour and the first five are on the main campus tour.) The members of the group can only be distinguished by careful examination of their leaves, buds, and acorns.

Northern red oak leaves have lobes that are fairly wide and the leaf sinuses do not extend deeper than half way to the mid-vein. Buds are not particularly hairy and the acorns have caps that do not extend very far down the nut. Perhaps the most noticeable thing about large red oaks is that their bark typically has a "striped" look caused by the flat tops of some of its ridges. To distinguish among oaks systematically, see the key of oaks.

Turn right and walk along the stone wall that follows 21st Ave. The first tree on the right is the next tree.

---

**American elm** was seen earlier on this tour, and so will not be discussed again here. This individual has been included in the tour to give you an opportunity to compare it with September, which is nearby.

Continue walking along the stone wall until you come to the next tree.

---

As was discussed previously, **swamp white oak** leaves are similar to swamp chestnut oak leaves. Notice that the lobes/teeth of swamp white oak leaves tend to become less noticeable as you approach the base of the leaf. There are usually fewer than 8 pairs of veins extending to the teeth. Swamp white oak acorns have very long stalks (although this tree has not been observed to produce acorns).

Swamp white oak is normally found in wetland areas and isn't typically planted. However, a row of them has been planted along this side of 21st Ave. This individual is in the best shape -- many of the others have been mutilated by the power company.

Continue along the stone wall to the next tree.

---

**September elm** is virtually identical to American elm. Its leaves are double-toothed and somewhat rough and it has the typical upward spreading shape of all elms. The important difference is that September elm blooms in late August and early September. Its winged fruits are on the tree at the same time as the leaves, in contrast to American elm, which drops its fruits before the leaves expand in the spring.

September elm is endemic to (found only in) the south central U.S. It is not particularly common, but is found throughout the Nashville area and individuals much larger than this one are found on Vanderbilt campus.

Continue in the same direction until you come to the next tree on the tour. It is a large tree and is in the middle of the lawn.

---

**Red hickory** leaves usually have seven leaflets (occasionally 5) and its mature buds are usually reddish, in contrast to the yellow buds of bitternut hickory (*Carya cordiformes*). The twigs are also more slender than the twigs of mockernut hickory (*Carya tomentosa*), another hickory with 7 leaflets. The bark is tight, unlike the shaggy bark of kingnut hickory (*Carya laciniosa*), which also typically has 7 (or 9) leaflets. To systematically separate hickory species, see the key to hickories.

The fruits of red hickory have a relatively thin husk and their nuts are good to eat.

Red hickory is fairly common in middle Tennessee. However, it often hybridizes with other hickory species (such as shagbark hickory) and so it is sometimes not possible to classify individuals to species unambiguously. This is the only known red hickory on Vanderbilt's campus.

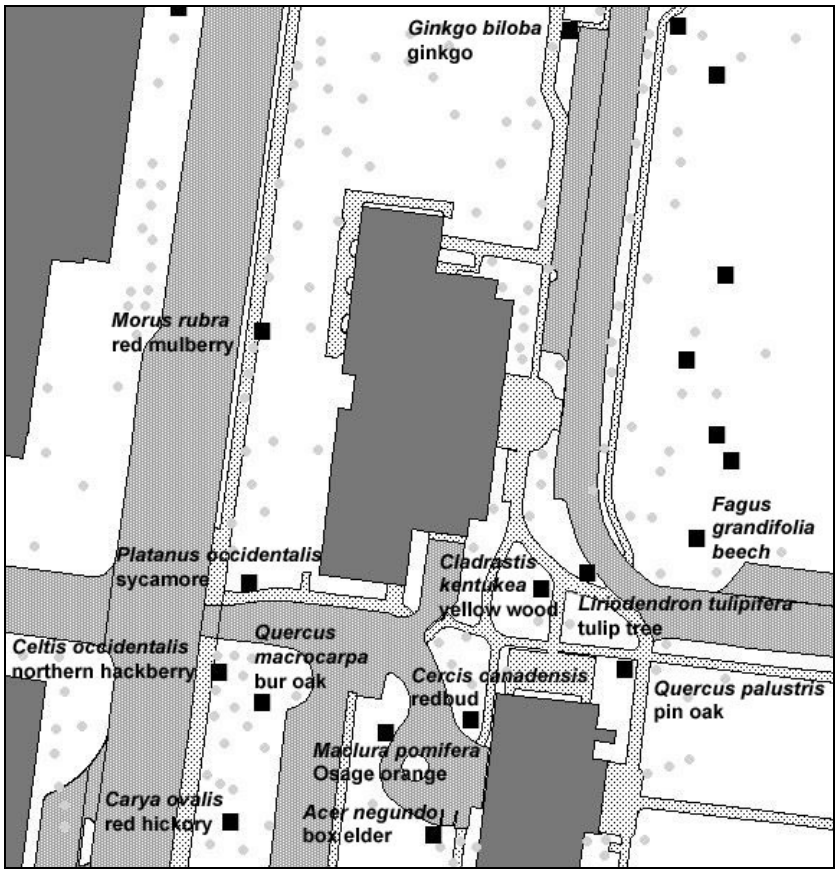
Continue towards the Kennedy Center (Susan Gray School). The next tree is a large tree near where the drive curves left toward 21st Avenue.

---

**Bur oak** is one of the more distinctive oaks. Its leaves have rounded lobes, but the sinuses (indentations) are uneven. The sinuses near the leaf base may reach almost to the midvein. The acorns of bur oak are unmistakable. Their caps cover most of the nuts and have long fringes along the edge.

Bur oak is not particularly common, but it is found throughout middle Tennessee. There are several large bur oak trees on campus and the example on the main campus tour is over 200 years old. This individual on the Peabody tour produces many acorns in the fall and its low branches provide one of the best opportunities to get a good look at the leaves.

The next tree is near the stone wall near the corner of 21st Ave. and the drive.




As was mentioned previously, it is not always possible to assign hackberries to a particular species because they hybridize and can have intermediate characteristics. However, this tree has characteristics typical of **Northern hackberry** (*Celtis occidentalis*). Northern hackberry leaves are broader and more toothed than the leaves of southern hackberry (*Celtis laevigata*, seen earlier on the tour). The fruit of northern hackberry is dark red or blackish when mature, in contrast to the more orange-red fruit of southern hackberry. This particular tree produces fruit abundantly. Northern hackberry also has the smooth bark with lumps similar to that of southern hackberry.

It is more typical around Nashville to find hackberries displaying the *C. laevigata* characteristics because we are near the southern edge of *C. occidentalis*. But as this tree illustrates, *C. occidentalis* types can be found in this area.

Cross over the drive to the Susan Gray School wing of the Kennedy Center. Turn left and follow the sidewalk. Just before you reach the corner of the drive and 21st Ave., you will see then next tree, a large one.

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**Sycamore** is a tree that is easy to recognize. Although its leaves are similar to maple leaves, they are arranged alternately on the twig, rather than opposite as are maples. The bark of sycamore is one of the most distinctive features of the species. As the trees age,

bark begins to peel off in irregularly shaped chunks. This gives the tree a "camouflage" look with the different-aged exposed layers having different shades of green and brown. On young trees and branches, the predominance of whitish bark makes the species stand out, especially in the winter time when leaves are absent.

The fruit of sycamore is also unique. The fruit is a hanging ball. As it matures and dries, hairs attached to the seeds behave as a parachute when the seeds come loose from the ball.

Sycamore is a very common native tree that is usually found along streams and rivers. On Vanderbilt campus, it is easy to confuse the few sycamore trees with the numerous, non-native London plane trees that have been planted and which look quite similar to sycamore.

Continue walking towards 21st Ave.S., then turn right and follow the sidewalk that goes between 21st. and the stone wall at your right. About half way down the block, you will see the next tree growing some distance away from the wall. It is heavily pruned.

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The leaves of **red mulberry** are the best way to recognize this species. As the main veins approach the margin of the leaf, they loop around until they are parallel to the margin. Red mulberry is also one of the few trees with leaves that can be mitten-shaped with a single lobe "thumb" on one side. The other tree that commonly has leaves like this is sassafras, but sassafras leaves differ from mulberry by having untoothed margins. The mitten leaves are not always a good way to recognize red mulberry, because sometimes a tree will have few, or even no leaves that are mittened. If the tree is a female, you may also find its fruits in the summer. They change from red to black as they ripen.

Red mulberry is the only mulberry that you will commonly find in the wild in this area. It is often a small tree or shrub, although it can become a large tree.

Continue along the sidewalk to the corner of Edgehill Ave., then turn right. Follow the sidewalk until it comes to the entrance of Magnolia Circle. Follow the sidewalk around as it T's into the sidewalk that leads to the pedestrian bridge. The next tree is on your left.

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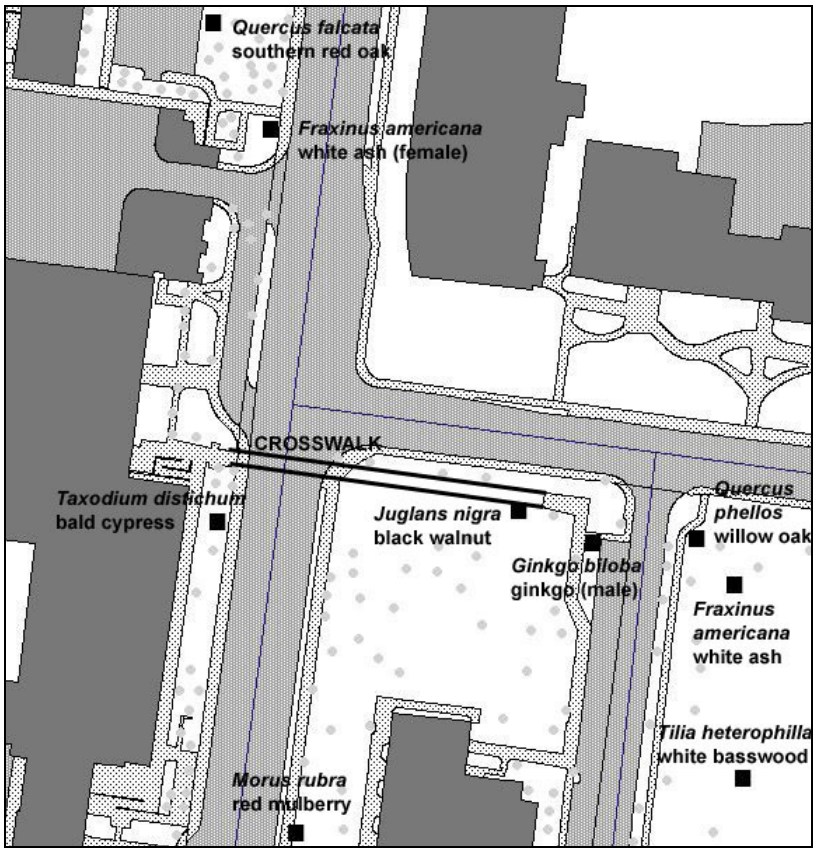
Earlier in the tour, you saw an example of a female **ginkgo** tree. This tree is a male. Most of the year, both sexes look the same. However, in the spring, the male produces cones that look different from the receptive female cones (which eventually develop into the fruit-like mature female cones).

Follow the sidewalk that leads to the pedestrian bridge. As you cross the bridge, the next tree is on your left. The branches of the tree reach near to the bridge.




Here is an opportunity to get a better look at the leaves and twigs of **black walnut**. The walnut tree we saw earlier on the tour had branches far above the ground.

Continue following the crosswalk over 21st Ave.S. On the other side of the street turn left. There are several individuals of the next tree growing with their branches near the elevated walkway.

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**Bald cypress** is unusual because it is one of the few conifers that looses its needles in the winter. It produces cones that are quite different from pines. The cones are round balls which split open along the lines producing rounded scales something like thumbtacks. The seeds fall from between the scales.

Bald cypress is not found naturally in middle Tennessee. However it is an important swamp tree along the Mississippi River as far north as Illinois and along the southern coast. It is one of the few trees that can grow in standing water. In swamp conditions, the bottom of the tree develops "buttswell" by flaring out near the ground. Trees planted in dryer conditions do not show this trait.

Reverse direction and take the elevated walkway along the edge of MRB III until you come to the large staircase on the right. Take the stairs down to the street level, then

make a U turn to the left. Cross the drive that enters the loading dock. Take the sidewalk along 21st Ave. and the next tree will be on your left.

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Earlier on this tour you saw a **white ash**, but its branches were far off the ground. The tree has branches near the ground and is a female. In the fall, it has abundant fruits that can easily be observed. You can also get a good look at its leaves and twigs.

Take the sidewalk that leads off to the left. Turn right at the top of the steps and walk with the parking lot on your left. The next tree is the enormous one ahead of you.

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**Southern red oak** has leaves typical of other red oaks: pointed lobes with prickle tips and relatively deep sinuses between the lobes. It is different from the others in two ways: the base of the leaf is rounded or bell-shaped, and the terminal lobe curves off to the side (is "falcate", hence the scientific name: *Quercus falcata*). Sometimes the terminal lobe is very narrow, long, and bent, giving the leaf a very distinctive look. The bark doesn't generally have the same "striped" look that is typical for the bark of northern red oak.

Southern red oak is relatively common in middle Tennessee, particularly in dry areas. This beautiful tree is Vanderbilt's only southern red oak and is one of the largest trees on the campus.

If you are taking the main campus tour, cross the parking lot of the nursing school to the tall, narrow tree at the right of the front door to continue to next tree.

This is the last tree on the Peabody tree tour. You can end the Peabody tour and return to Wesley Place Parking Garage by returning to the sidewalk along 21st Ave. S. and continuing along the street to the crosswalk at the corner of Edgehill Avenue which will take you back to the parking garage. If you came from the Lot 82 visitor parking, retrace your steps across the pedestrian bridge and take Edgehill Avenue back to the parking lot.