



4-H FORESTRY *JUDGING HANDBOOK*



SECTION I - TREE IDENTIFICATION

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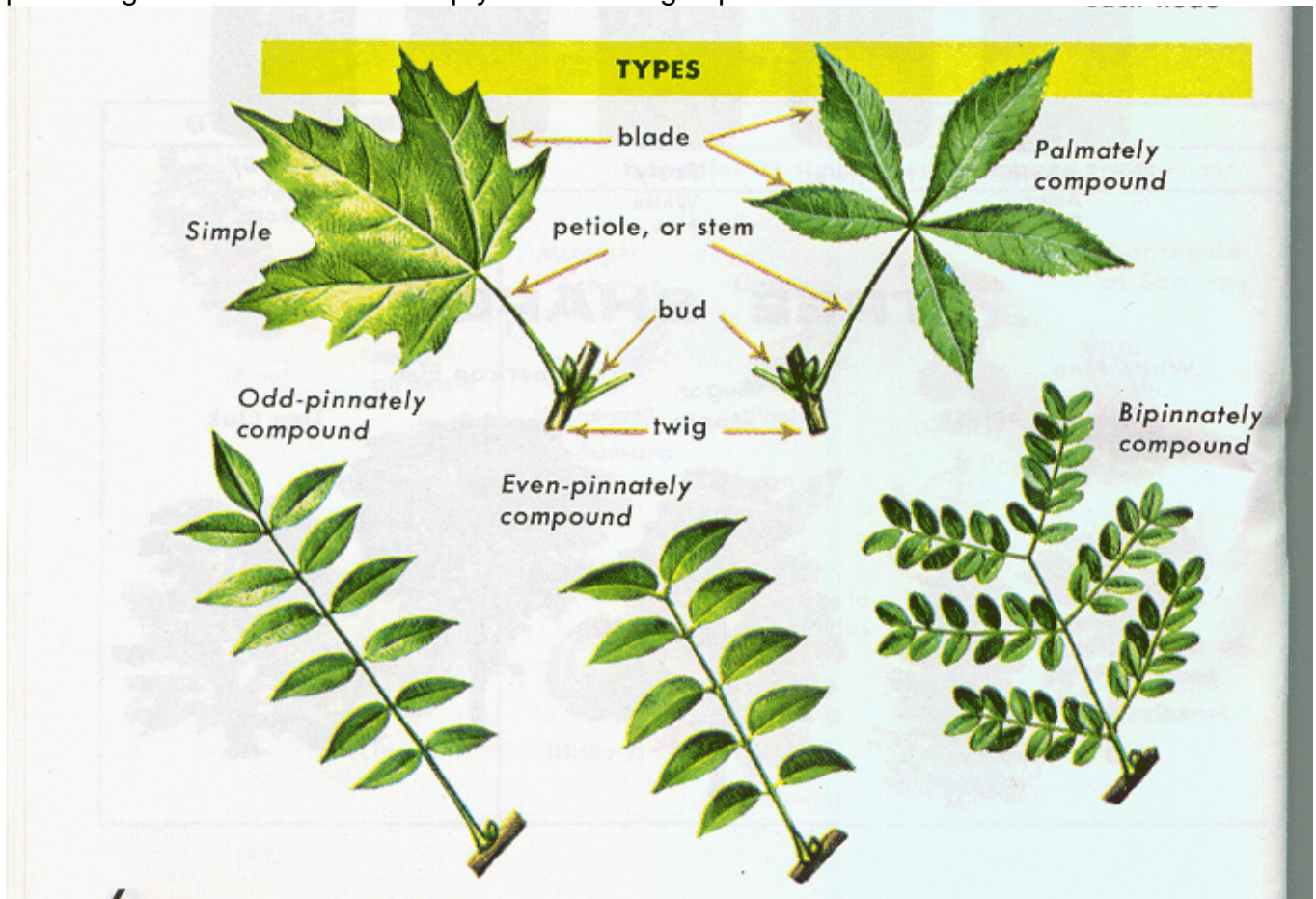
INTRODUCTION TO TREE ID

Identifying trees is an important part of Forestry Judging and also Dendrology. There are several things to keep in mind when you are out looking at trees to help you in making your guess as to what you've found:

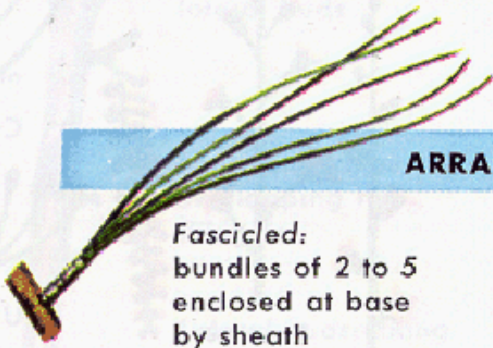
1. Location – Piedmont (here), Mountains, or Coastal Plain?
2. Topography & Habitat – on top of a ridge or down by a creek for example?
3. Types of leaves – simple vs compound?
4. Type of bark, fruit, flowers, buds, etc.

Getting all the possible information you have in the environment around you will help you in your quest to correctly identify the tree in front of you. Lets look at some simple terms used in identifying trees:

Leaves are either simple or compound. A simple leaf is a leaf with a single blade, while a compound leaf is composed of 2 or more leaflets. You can usually look for a bud forming at the base of a leaf to tell what is a leaf and what is a leaflet when you're starting out. Other important features to look for in trees are: leaf shape, venation, arrangement, fruit, twig, or bud types. The pictorial guides below should help you in learning important terms & tree features.



ARRANGEMENT



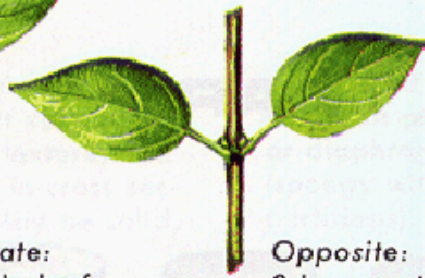
Fascicled:
bundles of 2 to 5
enclosed at base
by sheath



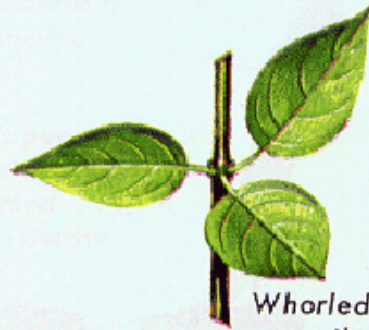
Clustered:
in false whorls
at tips of spurs,
without sheath



Alternate:
a single leaf
at each node



Opposite:
2 leaves at
each node



Whorled:
more than
2 leaves at
each node

SHAPES



Acicular



Scalelike



Linear



Lanceolate



Oblong



Elliptical



Spatulate



Ovate



Orbicular



Reniform



Cordate

MARGINS



Entire

Sinuate

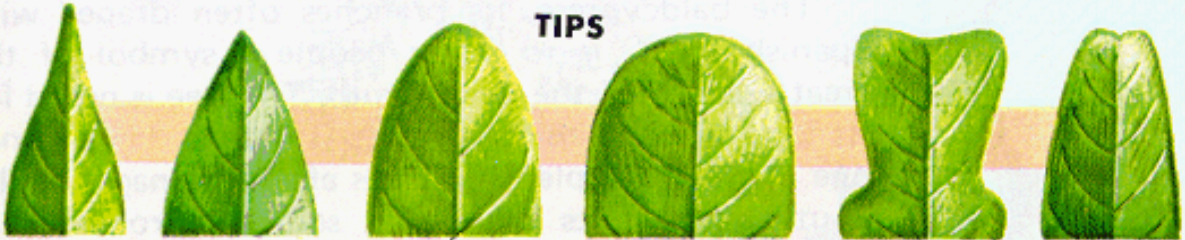
Serrate

Dentate

Lobed

Cleft

TIPS



Acuminate

Acute

Obtuse

Rounded

Truncate

Emarginate

BASES



Cuneate

Acute

Obtuse

Rounded

Truncate

Auriculate

VENATION



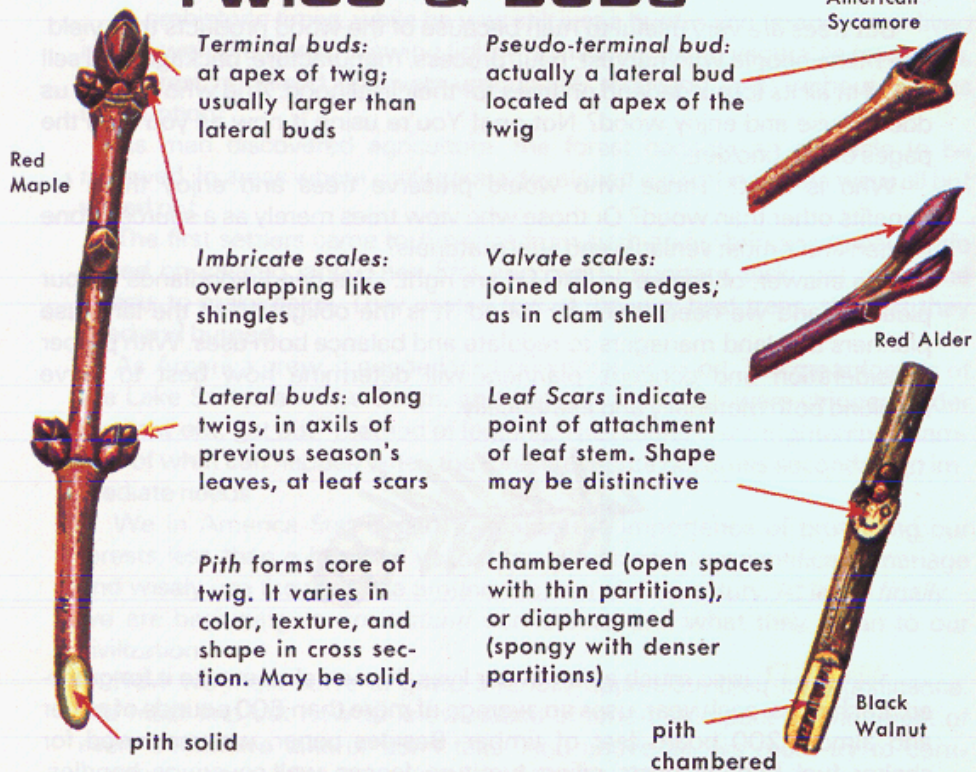
Parallel

Palmate

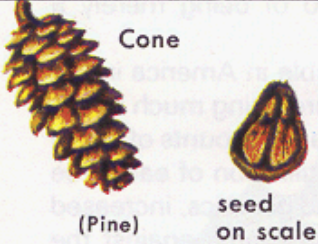








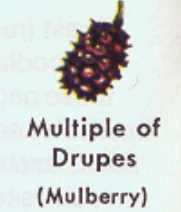



Pinnate

Arcuate

TWIGS & BUDS



FRUITS

| GYMNOSPERMS | ANGIOSPERMS | | | |
|--|---|---|--|---|
|  <p>Cone (Pine)</p> <p>seed on scale (Pine)</p> | Examples of simple and compound fruits | | | |
|  <p>fleshy (Yew)</p> <p>fleshy (Torreya)</p> | <p>Multiple of Achenes (Sycamore)</p>  | <p>Capsule (Poplar)</p>  | <p>Drupe (Cherry)</p>  | <p>Aggregate of Samaras (Yellow-poplar)</p>  |
| | <p>Samara (Elm)</p>  | <p>Legume (Locust)</p>  | <p>Pome (Apple)</p>  | <p>Multiple of Drupes (Mulberry)</p>  |
| | <p>Nut (Hickory)</p>  | <p>Aggregate of Follicles (Magnolia)</p>  | <p>Berry (Persimmon)</p>  | |

Photographs & Key Identification Features of GA Trees

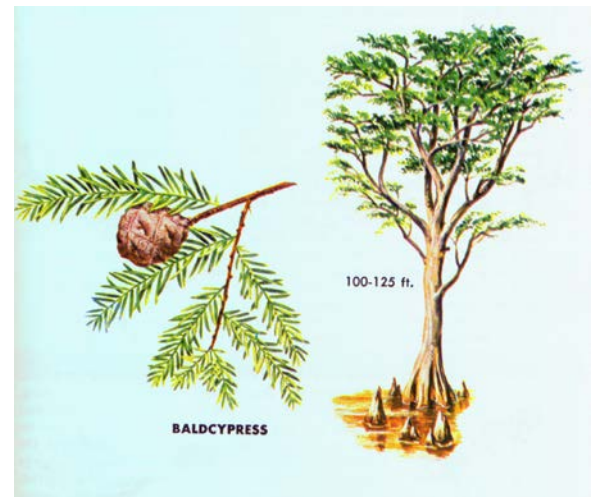


1. POISON IVY – *Toxicodendron radicans*

Whenever you are in the woods you need to be aware of what poison ivy looks like. It can grow in a variety of places and take on several forms. The most common is a small plant on the forest floor. The plant will have three leaves that are distinctly shaped. Remember the shape of the leaves when we show them to you and steer clear. Poison Ivy also grows as a vine that climbs trees. The vines almost look hairy from all the roots growing off the vine. These roots help it cling to trees. Poison Ivy is a plant we need to recognize and avoid to ensure we focus on learning trees and not on scratching poison ivy.

2. BALD CYPRESS – *Taxodium distichum*

Bald cypress is a tree you might recognize as a swamp tree. It's one of the trees that make the cypress knees that you see in swamps. Bald cypress are now commonly planted as an ornamental tree across the state. It was one of the original forest trees in the south. Bald cypress was one of the most valuable and highly prized timber trees in the region due to its large size, and excellent wood quality. The leaves of the tree are very distinct in shape. They almost look like a feather. The leaves are the small needles that come off the small branchlets.



3. BASSWOOD – *Tilia Americana*

Typically a mountain tree, basswood is a tree we may only see a few times. It has large, alternate, roughly toothed heart-shaped leaves that are sharply pointed. Basswood trees are very easily damaged by fire – so most large basswood trees are hollow. The wood is generally not valuable for lumber, but it is a favorite among wood carvers. The wood glues easily, has an even grain, and works easily.



4. BEECH – *Fagus grandifolia*

Beech trees usually have smooth gray bark that sometimes have peoples names or initials carved into them. The leaf is thin and papery like that of the river birch, but they are not flat at the base. The leaves also have parallel veins and a pointy bud that are good for helping separate it from other types of trees. Wood of the beech tree is used for toys, furniture and barrels. The nuts are important food for squirrels, turkey, wood duck and ruffed grouse.



Fig. 117 *Fagus grandifolia* × 1/3

5. BLACK CHERRY – *Prunus serotina*

Black cherry have simple alternate leaves that have finely toothed margins. Look for lenticels on twigs and dark purple or black drupe fruits. Often twigs and branches are infected with black knot disease. This characteristic alone will help you identify the trees until you are familiar with it. The fruit of black cherry is an important wildlife food for birds and small mammals. The wood of the tree is very valuable once the tree is large enough to use in furniture making due to its rich color and closely-grained structure.



6. BLACK GUM – *Nyssa sylvatica*

Simple alternate leaves that are somewhat oval in shape. The blackgum can look a lot like persimmon or dogwood leaves. The leaf margins of blackgum are often irregular and sometimes toothed. The blackgum also has terminal buds and three bundle scars where the leaf comes off. We haven't discussed bundle scars, but if you look where a leaf fell off or pull off a leaf you can look for the scars on the twigs. It is a highly prized "bee tree" for honey producers and also is a beautiful tree in the fall. Blackgum are most often the first to turn a brilliant red color in the fall, this has helped the tree gain in popularity as an ornamental.



Fig. 351 *Nyssa sylvatica* × 1/5



Fig. 352 *Nyssa sylvatica* × 1/14

7. BLACK LOCUST – *Robinia pseudoacacia*

Compound leaves with 7-21 oval leaflets with smooth petiole. Petiole base is often swollen. The fruit is a flat black bean shaped fruit that is full of winged seeds. Twigs and branches of black locust are often armed with thorns and the tree is often bushy in appearance. The tree is found in a variety of habitats across the state, but it is most frequently found in recently disturbed sites. It is a valuable nitrogen fixing plant that grows well on poor soils. The wood is frequently used for fence posts and railroad ties. The fragrant flowers also provide excellent forage for Bees to make honey from.



8. BLACK WALNUT – *Juglans nigra*

Black walnut trees have very large compound leaves that are 12-24 inches long with up to 23 leaflets. The fruit is a green ball that looks similar to an orange on the cove. Inside is a large nut. The meat of the nut is a favorite food of squirrels. Black walnut trees grow best on deep well drained soils such as well drained bottomlands around stream or rivers, and also up in the mountains. Walnut wood is very heavy, hard, strong and stiff. It has excellent shock resistance & durability. The wood is most commonly used in very expensive fine furniture. The wood is also popular for making gun stocks.



9. BOXELDER – *Acer negundo*

Usually found in moist locations such as swamps or the floodplain of rivers and streams across the Piedmont of Georgia. Look for the opposite, compound leaves and green twigs. Some people remember it by calling it the poison ivy tree. You can also look for clusters of seeds called samaras hanging from the tree. These clusters usually hang on the tree after the leaves fall providing food for wildlife during winter and fall months.

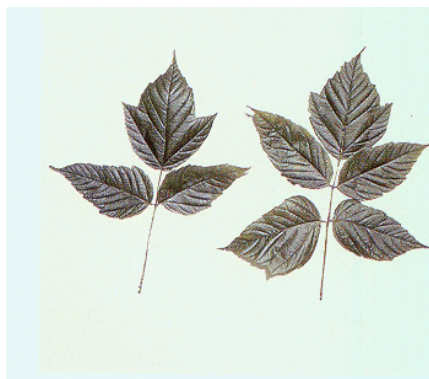


Fig. 307 *Acer negundo* × 1/4



Fig. 308 *Acer negundo* × 1/10

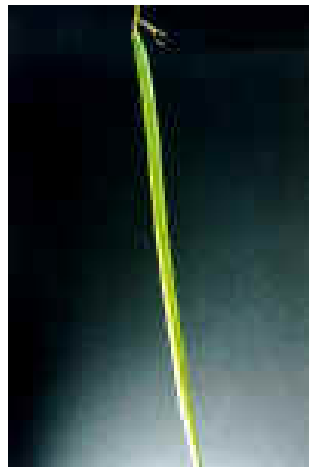
10. BUCKEYE – *Aesculus spp*

Palmately compound leaves with 5 to seven leaflets. Fruit is a smooth surfaced, uneven pod that is 2-3 inches long. Inside the pod are two large, brown, shiny nuts called buckeyes. A great place to see buckeye is at the PCMS Outdoor Classroom. We've got a nice one planted in the perennial flower bed at the entrance to the trail. Notice the leaf shape – it's very unique and easy to distinguish.



11. CATALPA – *Catalpa bignonioides*

Catalpa trees have simple leaves that are opposite. They can also come in whorls of three. Leaves are heart shaped with long pointed tips. They have wavy margins and fuzzy lower surfaces. Twigs have lenticels. Fruit on the tree looks like a giant bean that is full of samaras. This fruit helps us tell it apart from the Paulownia Tree. We don't have to worry about it though so just be sure not to confuse it with mulberry or red bud from last week. It usually has much larger leaves. Also, there is a caterpillar that attacks the trees each year called catalpa worms that make really good fishing bait.



12. COTTONWOOD TREES – *Populus deltoides*

Cottonwood is one of the tallest & fastest growing trees in North America. The leaves are triangular, toothed and pointed. One unique feature of the leaves is the flattened petiole and flattened base. Seeds of cottonwood trees often look like snowflakes when they are released in the spring.



13. **DOGWOOD – *Cornus florida***

Opposite leaves that are 3-6 inches long. They are oval shaped and pointed on the end.



The veins of the leaves curve around to the point at the end and are parallel to the leaf margin. The tree is often



planted for its spring blooms that have made it one of the most widespread ornamental trees in America. In its natural habitat the dogwood is typically an understory tree found across the state of GA in habitats ranging from well-drained upland sites to lower slopes and along streams.

14. **ELM – *Ulmus Americana***

Simple alternate oblong leaves. Unequal bases – doubly serrate leaf margins. Upper surface of leaves often scratchy – lower surface often hairy. Twigs long and slender, pale lenticels, chesnut brown buds – smooth waxy and pointed. The American elm is a common tree found throughout the state. It is a valuable timber tree, common ornamental tree, and also a popular street tree. It is also a popular wood for furniture, veneer, and baskets.



15. **HEMLOCK – *Tsuga canadensis***

Hemlock trees are one of our mountain trees. They prefer the moist cool slopes of the NGA mountains. The leaves are short needles like the ones that might have been on your Christmas tree. Pioneers in NGA couldn't find many uses for hemlock due to its soft, brittle wood. Therefore we often are able to find stands of very large hemlocks on many of the trails in the National Forests and state parks of NGA such as the one we visited on our Mountain Field Trip to Rabun County.



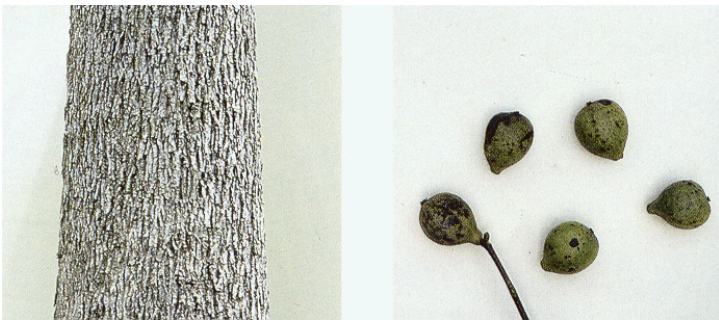
HICKORY TREES

16. MOCKERNUT HICKORY – *Carya tomentosa*

Hairy compound leaves with large leaflets are the best way to identify this tree. The petioles of the leaves are also hairy. Sometimes the diamond patterned bark, thick husked fruit, and large terminal bud also set it apart from other hickories when leaves are not accessible. The fruit of the tree is a nut that many forms of wildlife find very tasty.

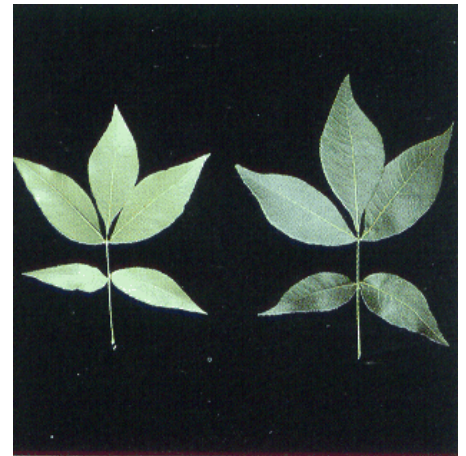


17. PIGNUT HICKORY – *Carya glabra*



Smooth, waxy compound leaves of the pignut hickory are similar in shape to the mockernut hickory. The pignut hickory is one of the only hickory trees with smooth, waxy leaves and petioles. Nuts of the pignut hickory don't have the thick shell the

mockernut have. They are often split part of the way open. Pignut and other hickories are common on upland sites across the state. They are important timber trees due to their strong wood that is used for things such as tool handles.



18. HOLLY – *Ilex opaca*



Spiny wavy edged leaves make holly an easy plant to distinguish in the forest. Typically a small bush or understory tree holly is a highly prized plant for Christmas decorations. The wood is tough & light grained but not very strong. It is usually used for interior-finishing & cabinets. Deer, turkey, & songbirds find the berries an important food source during the winter months.

19. **SOUTHERN MAGNOLIA – *Magnolia grandiflora***

A popular ornamental or estate tree the magnolia is commonly found all across the state of GA. It is a large evergreen tree that is known for its large showy blooms in the late spring and early summer. The leaves are thick and waxy. Usually dark green above and rusty and hairy below when fully mature. Younger trees and leaves won't have the rusty bottoms but the shape and size are consistent. The red seeds in the cone-like fruiting structure are a popular source of food for birds and small mammals.



MAPLE TREES

20. **RED MAPLE – *Acer rubrum***

Red maple trees are common trees found throughout the state. The tree has simple leaves that usually have three lobes, sometimes five. The middle lobe is usually less than half the length of the blade. Leaf petioles and twigs are often red in color. Fruit of red maples are paired samaras.



21. **SILVER MAPLE – *Acer saccharinum***



Silver maple leaves are deeply lobed compared to other maples. The underside is usually bright white and silvery. The tree prefers moist sites & grow rapidly to heights of 120'. The bark is smooth and light gray on young trees & scaly on older trees.



22. **MULBERRY – *Morus Rubra***

Large simple oval or teardrop shaped leaves. The fruit looks a lot like blackberries. Sometimes the tree will also have lobed leaves or mitten shaped leaves on new leaves or small trees which often set it apart from other trees such as basswood. The leaves also have a milky sap when picked off. The berries on the mulberry tree are a popular food for many birds, squirrels, raccoons, and opossum.



Fig. 185 *Morus rubra* × 1/5



Fig. 187 *Morus rubra* × 1/3

OAK TREES



23. BLACK OAK – *Quercus velutina*

Black oak usually occurs on dry, well-drained upland sites such as on ridges. The leaves are often hairy beneath, with tufts of hair in the leaf axils. Black oak buds are angular and wooly. Black oak leaves are highly variable in shape from lower to upper parts of the tree crown. The leaves usually have 5-7 lobes, a rounded base, with a shiny upper surface and yellowish lower surface. This tree is often confused with Pin Oak, Scarlet Oak, and Northern Red Oak. We don't need to know these for our competition, but we should learn there are trees similar for future reference. Black oak trees used to be useful as a source of tannins that were extracted from the bark of the tree. These tannins were used to tan leather. Black oak, like most other oaks, makes a great tree for lumber.



24. CHESTNUT OAK – *Quercus prinus*

The tree we are looking at today is actually a Swamp Chestnut Oak. I wanted you to see this one today because the leaves and acorns are almost identical to the Chestnut Oak we are responsible to know. The chestnut oak is usually found in upland sites in the mountains and upper piedmont. It is heavy, durable wood that was often chosen for fence posts. The leaves are distinctly shaped and they should be easy to remember. The edges on the oval shaped leaf are wavy.



25. LIVE OAK – *Quercus virginiana*

If you've ever been to the coast of Georgia to places like Savannah, Tybee Island, or St Simons Island you've seen live oak trees. Live oaks were planted along the eastern seaboard as a source of wood for wooden warships. The wood of live oak is very hard & cannonballs from old time warships would bounce off. Soon after planting, ships of iron and steel became popular thus leaving the live oaks to grow. Live oaks are evergreen trees. The leaves are small oval shaped leaves with rounded ends. The limbs are tough and gnarly, often with clumps of sphagnum moss hanging from them.



26. **POST OAK - *Quercus stellata***

The leaf of this tree looks similar to other oaks but usually you can look for a cross-shaped leaf pattern. The tree is usually found on dry sites in rocky or sandy soil throughout the state. The wood quality of this oak is less than other oaks, but the tree's drought tolerance enables it to grow where other hardwoods generally wouldn't be found.



27. **SOUTHERN RED OAK – *Quercus falcata***

The first thing we need to do is learn that there are two major groups of oak trees, the Red Oaks and the White Oaks. The wilted droopy appearance on this large southern red oak is one of the first thing to notice as you walk up to the tree. Upon closer inspection you can notice that the leaves have 3-5 lobes. The base of the leaf is also bell shaped in a way. That's how I always remember it southern red oak – southern bell.

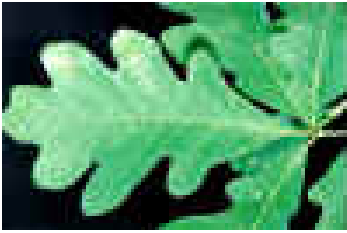


28. **WATER OAK – *Quercus nigra***

This tree is common in GA and is very common in many of our historic districts such as in Concord and Meansville. The tree is found in a wide variety of habitats and soil conditions. The leaves are somewhat smaller than other oaks and are variable in shape. They are usually spade shaped, but can have up to 3 lobes, and sometimes are often identical to laurel oak leaves. The tree also has a habit of holding onto dead limbs and twigs that gives the tree a scrubby appearance. Due to its holding onto limbs the wood of water oak trees is not as good as other oaks. It usually has more knots and is thus less valuable. One positive note for water oak trees is the heavy annual acorn crops that provide a major food source for deer, turkey, ducks, quail, raccoons, and small mammals.



29. **WHITE OAK – *Quercus alba***



Simple leaves that are generally widest above the middle. 7-10 rounded lobes w/o bristles. The bark on adult trees is a distinct whitish color that looks like it's coming off in large plates. Acorns mature in one season. They have a



bowl like cup that encloses the lower ¼ of nut. The white oak is common in GA, but usually occurs on deep, rich, well-drained soils.

30. **Pecan – *Carya illinoensis***

Pecan trees are very popular for the nuts they produce each fall & winter. Pike county is blessed with a number of large pecan trees that are the remains of what used to be large commercial pecan groves. Pecans are easy to distinguish from hickory tree leaves by looking for the sickle shaped leaflets on the compound leaves or looking for pecans.



PINE TREES

31. **LOBLOLLY PINE - *Pinus taeda***

Loblolly pine is one of the largest southern pines. The needles are usually 6-9 inches long and occur 3 per fascicle. Loblolly pine cones are dull brown to gray in color and are armed with sharp prickles. This tree is sometimes mixed up with slash pine, but just remember to look for 3 needles, look at the bark, and feel the cones.



Loblolly pine is one of the most widespread and valuable trees in the Southeast. The wood is used for lumber, pulp, and plywood.

32. **LONGLEAF PINE – *Pinus palustris***

Large cones, extra long needles, large limbs, and bright silvery buds distinguish this south Georgia tree. Longleaf pines once dominated south Georgia in an ecosystem called a Longleaf Pine/ Wiregrass Community. Today there are special initiatives to replace this community in our area and further south. Longleaf pines are very desirable for their high quality wood. There is a unique facet of its life cycle called a grass stage, whereby the tree grows very close to the ground like wiregrass. During this time period the tree grows huge tap-roots in preparation for a huge growth spurt. After the roots develop the tree grows at a tremendous rate. This “rocket stage” is a unique adaptation to help the tree outgrow the frequent wildfires that occur.

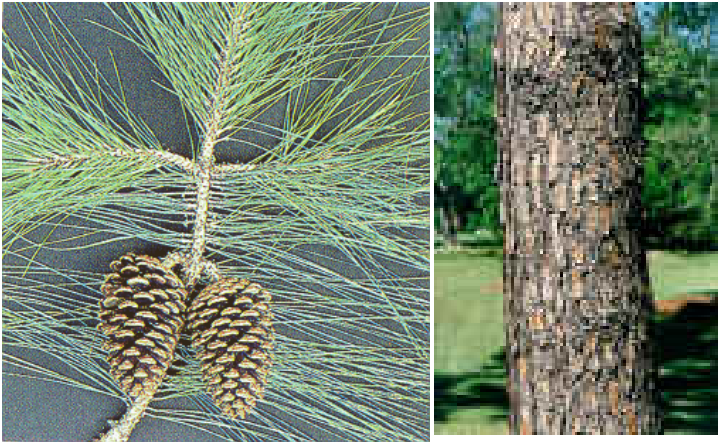


33. **SHORTLEAF PINE - *Pinus echinata***

Commonly found in the upper Piedmont of GA the shortleaf pine is often confused with Virginia pine. One unique characteristic is to look for pitch pockets on the bark. Shortleaf pine often has an open full crown with straight needles. Needles are usually 2-5” long and come 3 per fascicle. Virginia pine is a scraggly tree with an irregular crown. The needles of Virginia pine are often twisted. The cones of the shortleaf pine are similar in color to loblolly pine, but they are smaller in size and remain on the tree for up to two years after reaching maturity. The shortleaf pine is a useful tree for lumber and pulp, but once harvested they are usually replaced with planted loblolly or slash pine that generally grows more quickly.



34. SLASH PINE – *Pinus elliotti*



Commonly found in south Georgia especially on moist sites. Slash pine needles are often a bit longer than loblolly needles but shorter than longleaf in clusters of 2-3 per fascicle. Cones are not as prickly as loblolly and have a caramel brown color instead of grayish color. Slash is also characterized by the needles all over the twigs instead of only towards the tips of limbs like loblolly. Notice how they are on both sides of the cone unlike loblolly pine trees. Slash is an important timber tree similar to loblolly pine in the state of Georgia.

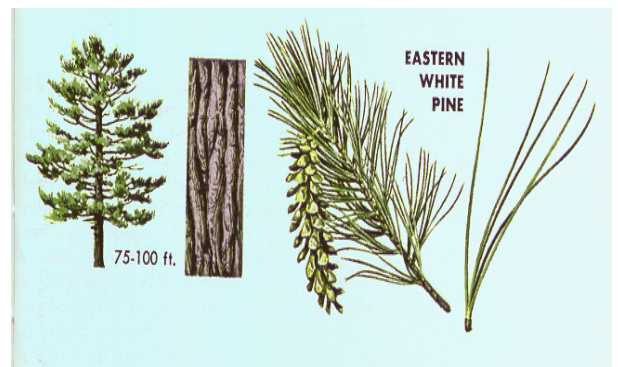
35. VIRGINIA PINE – *Pinus virginiana*

Virginia pine is usually a very scrubby pine that retains dead branches, even in dense stands. Needles are short – similar to those of shortleaf pine, found two per fascicle. They are often twisted in appearance. Virginia pine bark is smooth and less blocky than similar pines, such as shortleaf pine. Larger Virginia pines on good sites can be used for lumber, but the majority of these pines are useful only for pulp & paper. It occurs on a wide range of sites, frequently found in abandoned, severely eroded farmland.



36. WHITE PINE – *Pinus strobus*

White pine trees are easy to identify by counting needles (usually in 5's). The cones are oblong shaped. Branches are in definite whorls of long lateral branches that sweep upwards. This is the largest conifer in eastern forests due to its ability to long lifespan. Large white pines in GA are often only located in NGA on National Forest Land. The wood is light, straight-grained, and easily worked. It is used to make matches, lumber, interior finishes, & cabinets. Seeds from the white pine often make up a large percentage of squirrel diets in NGA.



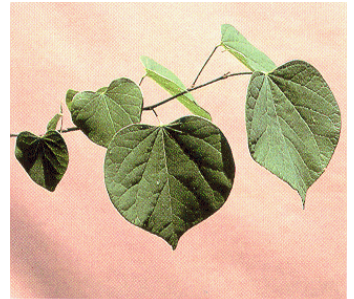
37. **YELLOW POPLAR - *Liriodendron tulipifera***

Simple leaves that everyone thought looked like a squished up Gumby last year. The leaf is somewhat distinct in shape with four main lobes. Yellow poplars are often well-pruned trees that grow over 100 ft tall. It is one of our most distinct and valuable hardwoods in the Eastern USA that occurs across the state.



38. **REDBUD – *Cercis canadensis***

Eastern redbud are a small tree that has very distinctly shaped leaves that almost appear heart shaped. The leaves are also palmately veined and the petioles are swollen. The tree is often planted as an ornamental landscape tree for its pink flowers in the spring, which later develop into bean shaped fruits that hang from the branches of the tree.



39. **RIVER BIRCH – *Betula nigra***

River birch have simple leaves that are almost triangular in shape. Summer thinks they look like Christmas trees. The bark on smaller trees is often peeling off and is very distinctive. River birch trees are commonly found along streams and rivers across the state. The tree is also a commonly planted ornamental tree in landscapes.



40. **REDCEDAR – *Juniperous virginiana***

Eastern red-cedar trees have scale-like leaves that are very small. The tree is very useful for fence posts, pencils, chests, wooden pails, and for shavings for pets. It is a compact column shaped tree who's cones provide food for mammals and birds such as the cedar wax-wing.

41. **PERSIMMON – *Diospyros virginiana***

Leaf margins of persimmon trees are smooth and untoothed. They are simple, oval shaped leaves that are dark green above and light green below. Sometimes you can look for black spots on the leaves as a key characteristic. They are similar to blackgum leaves which often have irregular toothed margins. Persimmon lack terminal buds, and have orange lenticels on twigs. Bark is similar to that of dogwood trees, but the leaves are alternate instead of opposite like in dogwood trees. The wood of persimmon is extremely hard, smooth and even textured. The wood is commonly used for golf club heads. The fruit of persimmon is food for numerous species of wildlife including people who enjoy making pudding from the ripened fruit.

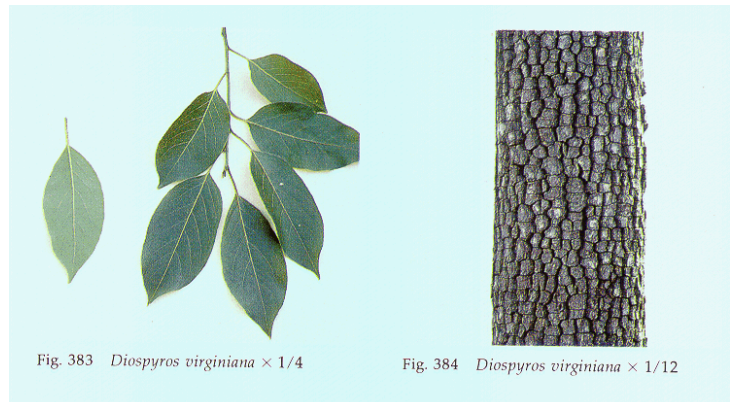


Fig. 383 *Diospyros virginiana* × 1/4

Fig. 384 *Diospyros virginiana* × 1/12

42. **SASSAFRAS – *Sassafras albidum***

Sassafras is easily recognized by looking for its variable leaves that possess a distinct odor, similar to the smell of lemon pledge when crushed. Also look for dark green twigs that sometimes have reddish brown corky ridges. Sassafras is commonly found along fence rows, on the edges of woodlands, or other locations where it can get full sun exposure. The tree was commonly used for a special type of oil that is distilled from the bark and leaves. This oil was used in flavoring extracts, soaps, and medicine. Sassafras tea was also made as a popular drink by boiling roots in water.



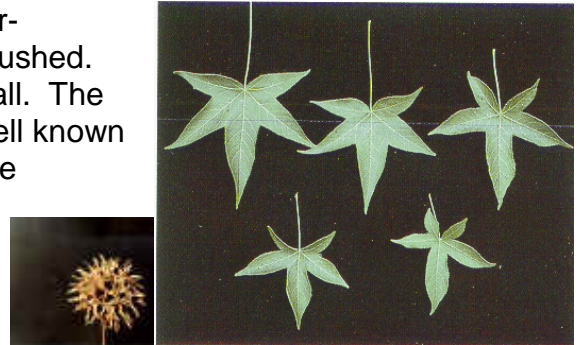
Fig. 215 *Sassafras albidum* × 1/5



Fig. 216 *Sassafras albidum* × 1/12

43. **SWEETGUM – *Liquidambar styraciflua***

The leaf of a sweetgum tree is almost star-shaped. The leaves are fragrant when crushed. The fruit of the tree is a little spiny gum ball. The tree is found all across the state and is well known for its ability to reforest cut-over sites. The sweetgum tree is one of the most valuable commercial hardwood trees in the southeast. It is widely used for veneer, interior trim, furniture and pulpwood.



44. **SYCAMORE – *Platanus occidentalis***

Distinctively shaped 3-5 lobed leaves that are quite large in size, palmately veined, and usually hairy are one key characteristic. Another thing to look for is the peely bark near the top of the tree. The tops of the trees are often white and smooth where the bark has peeled off and left the tree with a mottled appearance. Sycamore trees are one of the largest of American hardwood trees. It is commonly found along stream and river banks in moist bottomlands, but can also adapt to a variety of sites. The wood is very hard and difficult to split. The wood is often used for meat cutting blocks, boxes, crates, and also particle board or pulp.

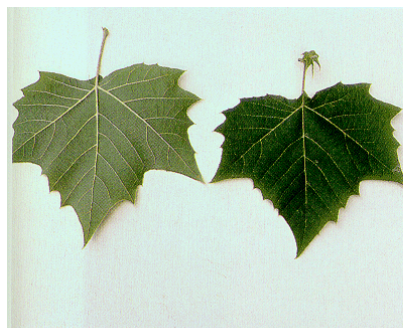


Fig. 225 *Platanus occidentalis* × 1/6



Fig. 226 *Platanus occidentalis* × 1/12

45. WILLOW – *Salix Nigra*



Black Willow trees look very much like weeping willow trees you might have seen planted around town. Instead of weeping the trees are a little more upright in growth. A great place to see willow trees is just off the boardwalk in the wetland area of our Pike County Outdoor Classroom. Black willows like moist soil & are valuable for lumber in certain areas like the Mississippi Valley. The wood is used to make crates, furniture, novelty crafts, & even artificial limbs.

