Oaks, Elms, and Similar Species

White Oaks

- Acorns mature in 1 year
- Acorn caps are usually with relatively smooth scales and most often thin with some notable exceptions (bur oak, overcup oak, swamp white oak)
- Leaves lobed without bristle tips in most cases
- Bark is usually flaky, light-colored, without deep furrows (except chestnut oak- doesn't live in our area)
- Buds are often round shaped and with scales that aren't readily distinguishable

Quercus virginiana (live oak)

- Leaves
    - Almost evergreen
    - Tough, waxy
    - Often with prickles on their tips
    - Maybe entire or shallowly toothed, resembling a holly leaf
    - Young leaves or leaves on epicormic branches are often lobed
- Bark
    - Rough, blocky, dark (unusual for white oaks)
- Form
    - Large, widely branching tree typically with a short trunk
- Twigs and Buds
    - Relatively thin twigs
    - Buds are small and globe-shaped
- Fruit
    - Relatively smooth cap, very thin, a deep cup-shaped cap
    - Relatively small, narrow acorn
- Habitat
    - Grows in uplands. Grows along coastlines and on barrier islands.
    - Away from the immediate coast in Texas it grows in river valleys or in floodplains where water doesn't typically stand
    - In prairies it grows on sandy mounds as a dense grove
- Similar Species
    - Escarpment live oak (*Quercus fusiformis*) is the live oak species found in the Central Texas hill country and other rocky sites in Oklahoma and West Texas

Quercus stellata (post oak)

- Leaves
  - Typical leaf has cross-shaped lobes, but often can have many lobes
  - Leaves an abundance of stellate hairs on their underside
- Bark
  - Light-colored, flaky or on old trees or near the base it has a light-colored, blocky texture.
  - Often there are smooth patches on the trunk
- Form
  - Usually has branches starting low to the ground and the tree most often has a top that leans and begins to grow horizontally
  - Very twisted looking branches
  - Main branches have a profusion of small twigs along their length resulting in leaves growing all along them (very shaggy)
- Twigs and Buds
  - The buds are more pointed than in most white oaks but are still blunt tipped. They are round in cross-section
  - The twigs and buds have pale or tawny hairs, especially evident on new growth
- Fruit
  - Slightly warty cap, very thin and somewhat deep - cup shaped rather than bowl or plate shaped
  - Small acorn
- Habitat
  - Forms the main tree of Texas savannas or former savannas

    - Grows in dry uplands, often on mima mounds on the coastal plain
    - Grows in soil that has a clay pan near the surface
    - Extremely drought and fire resistant
- Similar Species
    - Sand post oak (*Quercus margarettae*) has simple hairs but grows on deep sands in the Pineywoods ecosystem north of the Houston area
    - Swamp post oak (*Quercus similis*) always has many lobes but is uncommon in our area and grows on wet sites

Quercus macrocarpa (Bur Oak)

- Leaves
    - The largest leaf of any oak
    - Rounded lobes like most white oaks
    - Very deep sinuses, cutting inward almost to the central rib
    - Obovate shaped - wider towards the leaf tip (away from the stem)
- Bark
    - Light-colored and flaky like most white oaks
    - Long, straight, linear fissures
- Form
    - Very twisted, but growing upright unlike post oaks and without small branches covering larger ones
    - Straight trunk devolving into a complex crown

- Twigs and Buds
    - Very thick, gray twigs
    - Twigs on young or lower branches with corky ridges
    - Large, round buds with claw-like appendages protruding from the terminal bud
    - Buds covered in tannish gray hairs
- Fruit
    - Largest of any acorn
    - The cap can almost completely cover the acorn and is very deep
    - The cap has a bur-like fringe and is very lumpy and thick
- Habitat
    - A true savanna species, it grows on the eastern edge of the central U.S. prairies and plains as well as along rivers within the plains
    - It grows on dry sites but can also be found within flood plains where flooding is infrequent and short-lived
- Similar Species
    - Overcup oak (*Quercus lyrata*) has large acorns with a cap that almost covers the nut, but the acorn cap isn't rough and doesn't have the bur-like fringe. Its leaves are also obovate but the lobes have more pointed ends and it grows in swamps.
    - Swamp Chestnut oak (*Quercus michauxii*) has large acorns but the caps don't cover more than half the nut, the leaves are also obovate but have regular tooth-like lobes. It grows in low, flat wet areas.

Quercus michauxii (Swamp Chestnut Oak)

- Leaves
    - Large leaves
    - One of the chestnut oaks, that is oaks with regular tooth-like lobes on their leaves
    - Obovate shape (wider toward the tip)
    - Sinuses are very shallow, almost non-existent
- Bark
    - Light-colored flaky bark typical of white oaks
- Form
    - Often a very large tree
    - Spreading crown
- Twigs and Buds
    - The terminal buds are pointed, unlike most other white oaks
    - Buds are a reddish-brown color
- Fruit
    - A very large acorn
    - Cap is warty and thick for a white oak and is cup shaped
    - Cap covers half or less of the nut
- Habitat
    - Flatwoods, forests on flat lands with a clay soil that ponds water
    - Doesn't tolerate long duration ponding like the overcup oak
- Similar Species
    - Overcup oak has a similar leaf but with deeper sinuses and a more obovate shape where the tip is much wider than the base, and it grows in swamps. The cap almost completely covers the acorn.
    - Bur oak has a leaf with much deeper sinuses and has long, linear fissures on its bark. Its acorn has a bur-like fringe on the cap and can almost cover the nut completely.

Quercus lyrata (Overcup Oak)

- Leaves
    - Obovate with tooth-like lobes, but with deep sinuses
- Bark
    - Light-colored, flaky bark typical of white oaks
- Form
    - Often a very large tree with a straight trunk without lower branches
    - Spreading crown with massive branches
- Twigs and Buds
    - Cluster of round, blunt-tipped buds
    - Grayish in color with claw-like appendages embedded in the terminal buds
- Fruit
    - A large acorn
    - The cup is thick and almost entirely enclosing the nut
- Habitat
    - Swamps that may stay flooded for half of the year, the wettest habitat of any white oak

- Similar Species
    - Swamp Chestnut oak has large acorns but the caps don't cover more than half the nut, the leaves are also obovate but have regular tooth-like lobes. It grows in low, flat wet areas but doesn't tolerate prolonged flooding.
    - Bur oak has a leaf with much deeper sinuses and has long, linear fissures on its bark. Its acorn has a bur-like fringe on the cap. It doesn't tolerate prolonged flooding.

Red Oaks

- Acorns mature in 2 years
- Acorn caps usually have overlapping scales (imbricate)
- Leaves lobed, often with deep sinuses and with bristle tips in most cases
- Bark usually, but not always with deep fissures, not flaky, darker colored than white oaks, or at least dark and with deep fissures at the base. Sometimes smooth, especially in upper branches. A couple species have "ski tracks".
- Buds with overlapping scales, usually long, angled, pointed, oval to lance shaped.

Quercus nigra (Water Oak)

- Leaves
    - A good way to identify this oak, they stay on the tree until late winter
    - Obovate to oblanceolate, just a few inches long and usually with three lobes at the tip
    - Young trees and some canopy leaves have multiple lobes, but you'll always be able to find some with three lobes at the tip

- Bark
    - Relatively smooth on young trees and upper portions of old trees
    - Older bark is very tight with slight fissure (tight = very shallow furrows, almost smooth bark)
- Form
    - Very fast grower, large and spreading crown
- Twigs and Buds
    - Relatively thin twigs with long (1/4"), ovoid to pointed buds
- Fruit
    - Cap and acorn are very small, very shallow cap with squat acorn (wide relative to its length)
    - Exactly the same as willow oak
- Habitat
    - Moist to ephemerally (less than two weeks) inundated lands
    - Very common in flatwoods on clay soil
- Similar Species
    - Looks just like willow oak in all aspects except leaves are wider at the tip and have lobes
    - There are other oak species in Texas we haven't covered that resemble water and willow oaks (Laurel Oak, Upland Laurel Oak)

Quercus phellos (Willow Oak)

- Leaves
    - A good way to identify this oak, they stay on the tree until late winter
    - Lanceolate, shaped like willow leaves but without teeth or lobes
    - Leaves on young trees can have multiple lobes
- Bark
    - Relatively smooth on young trees and upper portions of old trees
    - Older bark is very tight with slight fissure (tight = very shallow furrows, almost smooth bark)
- Form
    - Very fast grower, large and spreading crown
- Twigs and Buds
    - Relatively thin twigs with long (1/4"), ovoid to pointed buds
- Fruit
    - Cap and acorn are very small, very shallow cap with squat acorn (wide relative to its length)
    - Exactly the same as water oak
- Habitat
    - Seasonally (less than one month) inundated lands; a wetland tree but not in swamps
    - Very common in flatwoods on clay soil
- Similar Species
    - Looks just like water oak in all aspects except most leaves are unlobed and aren't wider at the end
    - There are other oak species in Texas we haven't covered that resemble water and willow oaks (Laurel Oak, Upland Laurel Oak)

Quercus shumardii (Shumard Oak)

- Leaves
  - Multiple (7 - 9) lobes the upper leaves can have deep sinuses almost reaching to the mid-rib, leaves are obovate in overall shape
  - Patches of brown fuzz in vein axis on underside of leaf
- Bark
  - Dark with fissures near the base, smoother and lighter colored with "ski tracks" in upper branches
- Form
  - One of the largest of the red oaks with a large, spreading crown and straight trunk
  - The base of the tree is often buttressed
- Twigs and Buds
  - Moderately stout twigs with large, pointed, angled buds
- Fruit
  - The very large acorns with a very wide, yet very shallow cap (only a small portion of the nut's base is enclosed in the cap), are the way to separate this oak from other red oaks
- Habitat
  - A bottomland tree, but doesn't grow where water stands for more than a few weeks at a time
  - This tree is often the largest in the forest
- Similar Species
  - Nuttal Oaks grow in wetter areas that are often flooded for long periods (months) and have large acorns but the caps are not as wide and are very deep, enclosing a third to half of the nut

Quercus falcata (Southern Red Oak)

- Leaves
  - The typical leaf is shaped like a turkey foot, three lobes at the end, obovate
  - The base of the leaf is acute, swept towards the tip like a falcon's wings (if the bird's head was pointed towards the base)
  - The leaf can have multiple lobes like the Cherry Bark, Shumard and Nuttal Oaks, but without deep sinuses and usually with fewer lobes (often only 3 or 4)
  - Leaves are fuzzy on the underside, even after they've fallen to the ground
- Bark
  - Dark with deep, linear fissures and ridges
  - Ski tracks in the upper branches
- Form
  - A slower growing, smaller tree than the Cherry Bark, Shumard, and Nuttal Oaks
- Twigs and Buds
  - Moderately stout twigs with ovoid, pointed buds with fuzzy scales
- Fruit
  - A relatively small acorn, much smaller than Shumard and Nuttal Oak, but larger than Water and Willow oak
  - Very shallow cap
- Habitat
  - A dry land species, sometimes very dry where it is a stunted, twisted tree

- Similar Species
    - Hybridizes and resembles readily with the Cherry Bark Oak, but the underside of the leaf is fuzzy, has leaves with acute bases, and the bark has linear fissures versus blocky ones
    - Shumard Oak and Nuttal Oak grow in wet areas and their leaves have much deeper sinuses, are not hairy beneath, and have much larger acorns

Quercus pagoda (Cherry Bark Oak)

- Leaves
    - Multiple lobes that stick out at right angles to the mid rib
    - Flat bases or at least less acute than Southern Red Oak
    - Sinuses are not deep
- Bark
    - Looks like bark on a Black Cherry; dark with deep fissures in a blocky pattern with the rectangular blocky ridges having curled up edges
- Form
    - A very large and fast-growing tree with a wide, spreading crown
    - While branches frequently break off, this can be a long-lived tree and can be the largest in the bottomland hardwood forest
- Twigs and Buds
    - Moderately stout twigs with ovoid, pointed buds

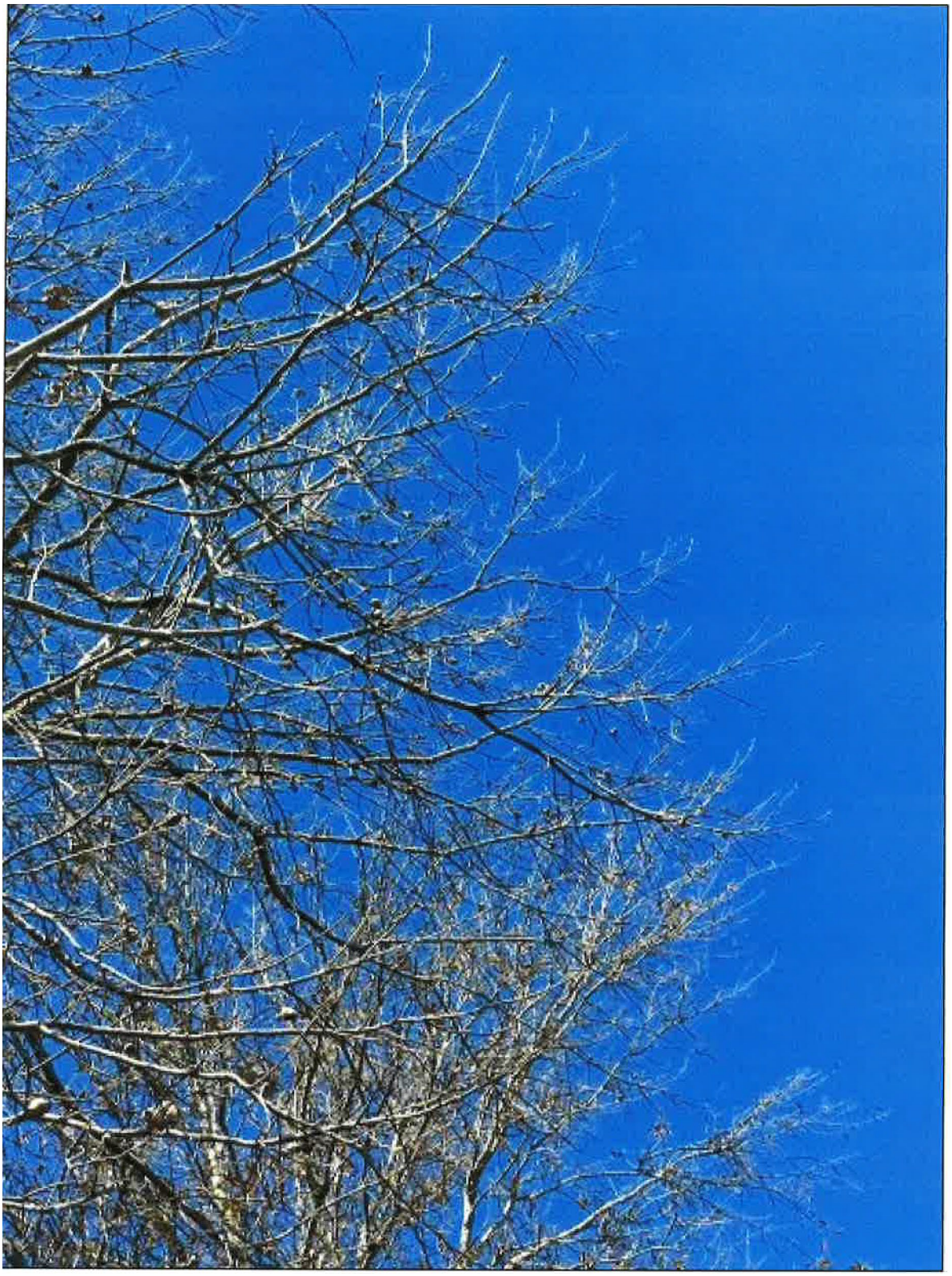
- Fruit
    - Exactly the same as a Southern Red Oak, relatively small with a shallow cap
- Habitat
    - A bottomland species that doesn't tolerate more than a few weeks of continuous inundation
    - Very common in flatwoods on clay soils
- Similar Species
    - Hybridizes with readily and resembles the Southern Red Oak, but the underside of the leaf is not fuzzy, the leaves have a flatter base, and the bark has blocky plates versus linear fissures
    - Shumard Oak and Nuttal Oak have leaves with deeper sinuses and have much larger acorns

Quercus texana (Nuttall Oak)

- Leaves
    - Multiple (S -9) lobes the upper leaves usually have deep sinuses almost reaching to the mid-rib, leaves are oval in overall shape
    - Can have tufts of hair on underside of the leaf in the vein axis
- Bark
    - Light colored smooth areas between ridges, fissures are shallow (tight bark)
    - Upper branches are especially smooth and light colored

- Form
    - Somewhat pyramidal, relatively narrow crown in the forest, but wide and spreading when planted as a yard tree
    - Can be a large tree
- Twigs and Buds
    - More slender than other red oaks but with long, ovoid to pointed buds similar to others
- Fruit
    - Some acorns stay on the twigs until late January or early February
    - Large acorn with a very deep cap, enclosing 1/3rd to½ of the nut
- Habitat
    - Deeply flooded stream valleys where it may be inundated for months
- Similar Species
    - Shumard Oaks don't grow in areas that are often flooded for long periods (months) and their acorns have very shallow, wide caps that only enclose a small portion of the nut
    - Southern Red Oaks and Cherry Bark Oaks have much smaller acorns with rougher bark and their leaves don't have multiple lobes with deep sinuses

Nuttal Oak with acorns persistent into February



Elms and Similar Looking Species

- These trees are in three different plant families but have lance-shaped leaves, mostly with teeth (serrations) along their margins
- They all have simple leaves with alternate branching
- Ulmus spp. (Elms) are some of the most common in southeast Texas

Family Ulmaceae (Elm Family)

Ulmus americana (American Elm)

- Leaves
    - Doubly serrate, ovate with a lop-sided (uneven) base
    - Can be fuzzy or smooth on top
    - Lighter green color on underside as compared to top
- Bark
    - Tan-colored and when pieces are broken open they usually have alternating layers of light and dark, spongy and firm wood
    - Some pieces of the bark will be spongy, you can indent it with a fingernail
    - Easy to tear off pieces
- Form
    - Branches dividing in two again and again, forming a vase-shaped crown
    - Can be a very large tree
    - One of the first trees to flower in the year, mid to late February in the Houston area
- Twigs and Buds
    - Moderately stout twigs that zig zag
    - Elongated and pointed with overlapping scales, usually brown colored
- Fruit
    - An oval-shaped samara that ripens in early spring about½" long
    - Has a deep notch in its tip
    - Hairy only along the margin
- Habitat
    - A very common tree in our area
    - Grows in bottomlands, flatwoods, along streams and edges of swamps, sometimes in swamps
- Similar Species
    - Slippery elm (Ulmus rubra) has samaras (seeds) that are rounder, larger and have hair only on the surface of the seed cavity. Its twigs tend to be larger, grayer-colored, and the buds are rounder and darker in color. Hybridizes with American elm so you need the samaras present to be sure of identification.
    - Cedar elm (Ulmus crassifolia) and winged elm (Ulmus alata) have much smaller leaves, much thinner twigs, and much smaller samaras. The cedar elm has platy, peeling bark and fruits in late summer or fall

Ulmus americana twig, leaves and fruit

Ulmus rubra (Slippery Elm}

- Leaves
  - Doubly serrate, ovate with a lop-sided (uneven) base
  - Typically, larger than American elm, but not always
  - Very fuzzy on top
  - Lighter green color on underside as compared to top
- Bark
  - Tan-colored and when pieces are broken open, they usually have layers, but not of contrasting colors,
  - Some pieces of the bark will be spongy, you can indent it with a fingernail
  - Long, linear fissures in the bark that appear to cross over one another
- Form
  - Branches dividing in two again and again, forming large crown, but not with drooping branch ends like an American elm
  - Can be a very large tree
  - One of the first trees to flower in the year, mid to late February in the Houston area
- Twigs and Buds
  - Moderately stout twigs that zig zag less than an American elm
  - Elongated and pointed with overlapping scales, usually dark colored
- Fruit
  - A round to oval-shaped samara that ripens in early spring about¾" long
  - May have a shallow notch in its tip

    - Hairy only along the outside of the seed cavity
- Habitat
    - An uncommon tree in our area, inhabiting moist, loamy soils
    - Grows along streams but outside of the area normally inundated by storm floods, also in fertile woodlands
- Similar Species
    - American elm (*Ulmus americana*) has samaras (seeds) that are smaller, more oval, with a deeper notch and hair only around the margin of the outside edge. Its twigs tend to be thinner, lighter-colored and with more pointed and lighter-colored buds. American elm tolerates wetter sites, but both trees can be found alongside one another.
    - Hybridizes with slippery elm so you really need the samara to tell the difference.
    - Cedar elm (*Ulmus crassifolia*) and winged elm (*Ulmus alata*) have much smaller leaves, much thinner twigs, and much smaller samaras. The cedar elm has platy, peeling bark and fruits in late summer or fall.

Ulmus rubra samaras and twigs

Ulmus alata (Winged Elm)

- Leaves
    - Doubly serrate, narrowly ovate to lanceolate with a lop-sided (uneven) base
    - Much smaller leaf than American and slippery elm (2 ½")
    - Smooth to rough surface
    - Lighter green color on underside as compared to top
- Bark
    - Tan-colored and when pieces are broken open, they usually have layers of alternating light and dark, but layers are not always of contrasting colors, very similar to American elm (*Ulmus americana*)
    - Some pieces of the bark will be spongy, you can indent it with a fingernail

- Form
  - Branches dividing in two again and again
  - Can be a large tree, but more often a smaller, mid-story tree
  - If it is large, it will have a large, flat-topped crown with somewhat drooping branch ends like an American elm
  - One of the first trees to flower in the year, mid to late February in the Houston area
- Twigs and Buds
  - Very thin, wispy twigs that zig zag and usually have orange lenticels
  - Tiny, pointed buds that are usually light-colored
  - Corky wings, usually just two on opposite sides of the twig, found especially the lower branches, but you may need to look hard to see them
- Fruit
  - A very small, oval-shaped samara (1/4") that ripens in early spring
  - Has a deep notch in its tip
  - Covered in hair
- Habitat
  - A common tree in our area, inhabiting invading old fields and prairies, as well as in forests on moist, loamy soils
  - Especially common in East Texas on moist, sandy soils
- Similar Species
  - American elm (*Ulmus americana*) and slippery elm (*Ulmus rubra*) have much larger samaras, much thicker twigs without wings, and much larger leaves
  - Cedar elm (*Ulmus crassifolia*) has platy, peeling bark, its leaves have rounded tips and are thicker and stiffer, and fruits in late summer or fall.

Ulmus alata (winged elm) twig and leaves

Ulmus crassifolia (Cedar Elm)

- Leaves
  - Bluntly serrated with a lop-sided (uneven) base
  - Much smaller leaf than other elms (1- 2")
  - Relatively thick, stiff leaf
- Bark
  - Gray-colored with hard, thin plates that curl up on the top and bottom
  - Plates can be broken off and are hard to snap
  - Unlike other upland elms, but similar to Planera aquatica (water elm)
- Form
  - A rugged looking tree with a very narrow crown, growing without spreading branches
  - Can be a large tree, but slow growing
  - In our area almost always covered in Spanish moss
- Twigs and Buds
  - Very thin, wispy twigs with orange lenticels
  - Tiny, pointed buds that are usually light-colored
  - Corky wings, usually just two on opposite sides of the twig, found especially the lower branches and young trees
- Fruit
  - A small, oval-shaped samara (1/2") that ripens in late summer or early fall
  - Has a deep notch in its tip
  - Covered in hair
- Habitat
  - A common tree in our area, inhabiting wet bottomlands and flatwoods
  - Can tolerate ponding on the edge of swamps, but not as wet as American elm
  - Especially common in Texas' coastal counties
- Similar Species
  - American elm (*Ulmus americana*) and slippery elm (*Ulmus rubra*) have much larger samaras, much thicker twigs without wings, and much larger leaves
  - Winged elm (*Ulmus alata*) has spongy, brownish bark, its leaves have pointed tips and are about twice as large, and fruits in late winter or early spring.

Ulmus crassifolia (cedar elm) leaves

Planera aquatica (Water Elm)

- Leaves
  - Serrate with blunted teeth
  - Much smaller leaf than American and slippery elm (2")
  - Smooth surface
  - Lighter green color on underside as compared to top
- Bark
  - Thin, hard plates that are naturally peeling off, exposing a red, inner bark
- Form
  - A mid-story to understory, multi-trunked tree
  - Short, almost a shrub
  - Wide, short crown that can be spreading like an acacia
- Twigs and Buds
  - Very thin, wispy twigs
  - Tiny (1/16"), pointed buds
  - Corky wings, usually just two on opposite sides of the twig, found especially the lower branches, but you may need to look hard to see them
- Fruit
  - A ball-like drupe with warty projections, somewhat like a sweetgum ball, that ripens in the spring
- Habitat
  - Grows only in swamps, often with bald cypress and tupelo
- Similar Species
  - Only cedar elm (*Ulmus crassifolia*) has platy bark
  - No other elm grows in deep swamps or resembles a multi-trunked shrub

Planera aquatica (water elm) bark

Family Cannabaceae (Hemp Family}

Celtis laevigata (sugarberry)

- Leaves
  - Generally, a smooth margin, but may have minute teeth
  - A lop-sided (uneven) base
  - Leaf is thin, membranous
- Bark
  - Gray-colored, smooth with warty projections
- Form
  - A medium-sized tree, often in the mid-story
  - Uneven crown, often leaning
  - Often with mistletoe clumps
- Twigs and Buds
  - Thin twigs with light-colored lenticels
  - Small, triangular, flat buds with no true terminal bud
- Fruit
  - A small drupe, orange or yellow with a hard seed inside
  - A single fruit on each stalk
  - Often persist into the winter
- Habitat
  - A very common tree in our area
  - Invades old fields and prairies, but common in bottomlands, flatwoods, and edges of swamps
  - Can tolerate ponding on the edge of swamps
- Similar Species
  - Leaves resemble elms, but not other elm-like tree has smooth, gray bark with warty projections

Celtis laevigata (sugarberry) bark and fruit

Betulaceae (Birch Family)

Carpinus caroliniana (musclewood, blue beech, American Hornbeam)

- Leaves
  - Ovate to lanceolate with double serrations
  - Moderate-sized (2 - 4" long)
  - Leaf is thin with a smooth upper surface and hairy lower surface
- Bark
  - Gray-colored, smooth with muscle-like fluting
- Form
  - A small, understory tree, usually less than 30' tall
- Twigs and Buds
  - Extremely thin twigs with dark, elongated, pointed buds
  - No true terminal bud
- Fruit
  - A pendulous cluster of nutlets enclosed in leaf-like bracts that ripen in the fall
- Habitat
  - Found in moist forests, often along streams, bottomlands, edges of swamps
- Similar Species
  - Leaves resemble elms, but not other elm-like tree has smooth, gray bark with muscle-like fluting

Carpinus caroliniana (musclewood) bark and fruit

Ostrya americana (Eastern Hophornbeam)

- Leaves
  - Ovate with double serrations and pointed tip
  - Moderate-sized (up to 5" long)
  - Leaf is thin with both surfaces slightly hairy
- Bark
  - Thin, narrow, brown, papery plates that curl up on their edges, peeling off naturally, easily rubbed off with the hand, fibrous
- Form
  - A small, understory to mid-story tree, usually less than 40' tall
- Twigs and Buds
  - Thin twigs that zig zag with light brown, elongated, pointed buds
- Fruit
  - A pendulous cluster of seeds enclosed in leaf-like sacks that look like hops and ripen in the fall
- Habitat
  - Found in moist forests, often along streams but not tolerant of inundations
  - Especially common on moist, sandy soils in East Texas
- Similar Species
  - Leaves resemble elms, but not other elm-like tree has thin, shredding bark or hop-like fruits

Ostrya virginiana (American hop hornbeam) bark and fruit