

HANDBOOK OF TREES

**A SIMPLE GUIDE TO
TREE SPECIES IDENTIFICATION AND
INFORMATION IN NORTH AMERICA**

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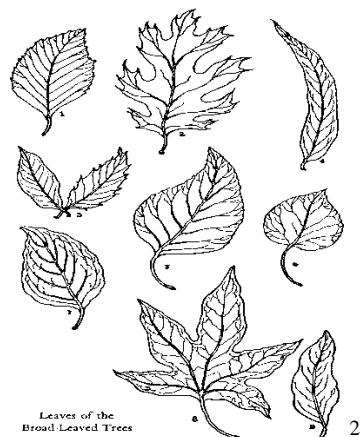
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TREE IDENTIFICATION KEY



Needle-like or scale-like leaves

Gymnosperms — Page 5



Broad leaves

Angiosperms (with some exceptions) — Page 19

1: Image courtesy of <http://kirbypl.wilkes.edu/tree1.html>

2: Image courtesy of http://www.yosemite.ca.us/library/trees_of_yosemite/broad-leaved_trees.html

Gymnosperms



Single Needles, not in bundles

Page 6



Needles in bundles

Page 8



Scale-like leaves

Page 15

Single Needles



Flattened needles

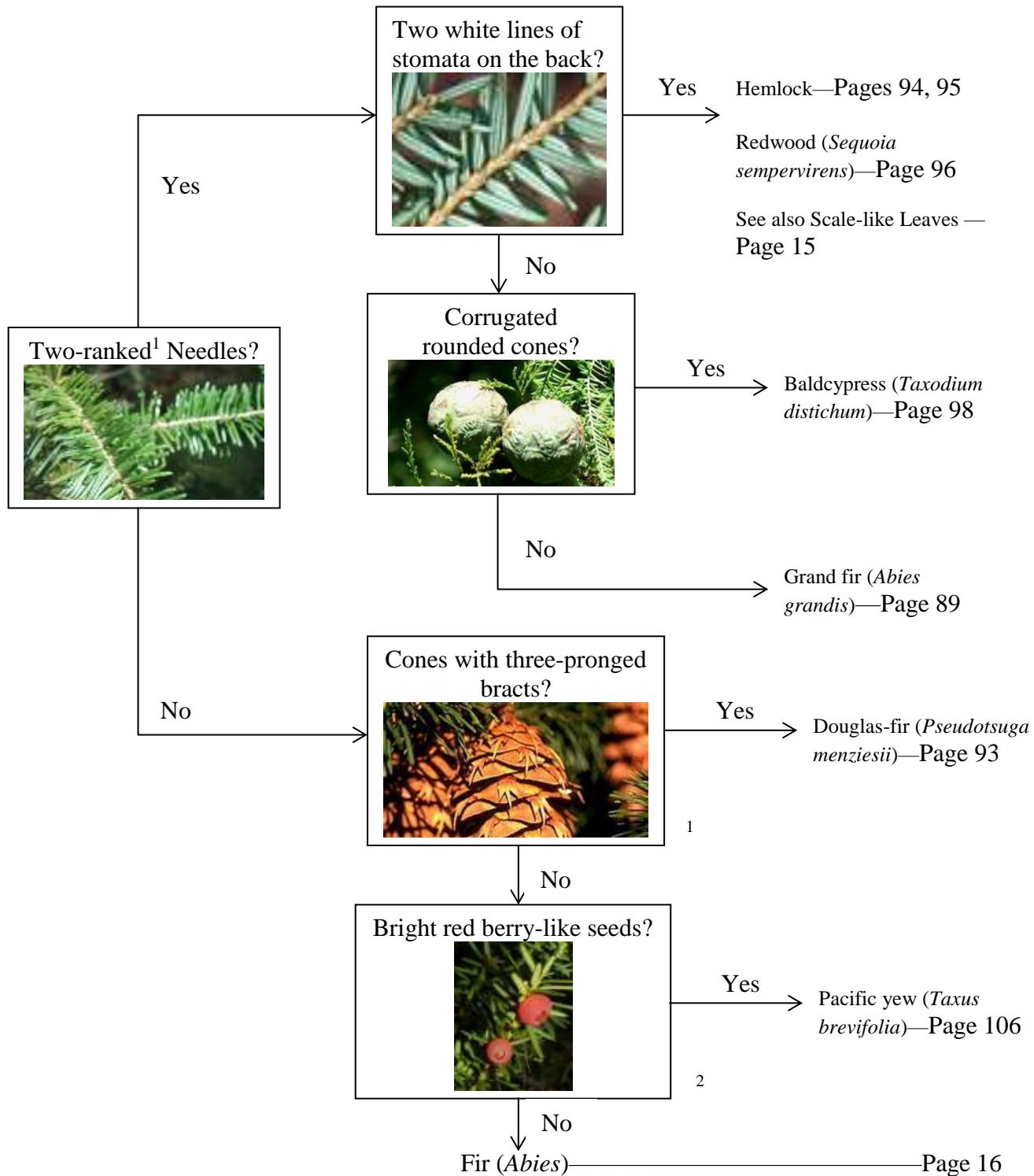
Page 7



Four-sided needles

Spruce (*Picea*)—Page 17

Single Flattened Needles



¹Two-ranked is a situation where the leaves, in this case needles, come away from the twig in two opposite directions.

1: Photo courtesy of <http://www.douglasfir.ca/>

2: Photo courtesy of <http://www.cas.vanderbilt.edu/bioimages/image/t/tabr2-cofemale42577.htm>

Needles in Bundles



5 needles per bundle — Soft Pines — Page 9



2 or 3 needles per bundle — Hard Pines — Page 10



Needles in dense clusters, deciduous — Larch (*Larix*) — Page 14

Soft Pines (*Pinus*)

Soft pines by needle feature:



5 per bundle; 3" to 5" long

Eastern white pine (*Pinus strobus*) —————— Page 61



5 per bundle; 2" to 4" long

1

Western white pine (*Pinus monticola*) —————— Page 62



5 per bundle; 2" to 4" long, spirally twisted

2

Sugar pine (*Pinus lambertiana*) —————— Page 63



5 per bundle; 2" long; cones 3" to 10" long, cylindrical

3

Limber pine (*Pinus flexilis*) —————— Page 64



5 per bundle; 2" long; cones 2 ½" long

4

White bark pine (*Pinus albicaulis*) —————— Page 65

1: Photo courtesy of http://whatcom.wsu.edu/mgtemp/plantid/images/western_white_Pine_needles.jpg

2: Photo courtesy of http://www.sci.sdsu.edu/plants/sdpls/plants/Pinus_lambertiana.html

3: Photo courtesy of <http://www.nps.gov;brca/naturescience/limberpine.htm>

4: Photo courtesy of <http://www.portlandnurserv.com/plants/natives/pinus.shtml>

Hard Pines (*Pinus*)

Hard Pines by natural range:

- Hard Pines in eastern North America _____ Page 11
- Hard Pines in southern United States _____ Page 12
- Hard Pines in western North America _____ Page 13

Hard Pines in Eastern North America

Hard Pines in eastern North America by needle length from long to short:



2 per bundle; 5–7" long, brittle

Red pine (*Pinus resinosa*) —————— Page 66



3 per bundle; 3–5" long, stiff, twisted

Pitch pine (*Pinus rigida*) —————— Page 71



2 per bundle; 1 ½" to 2 ½" long, twisted

Virginia pine (*Pinus virginiana*) —————— Page 72



2 per bundle, ¾" to 1 ½" long

1

Jack pine (*Pinus banksiana*) —————— Page 74

1: Photo courtesy of <http://www.treeplanflowerid.com/Pinus-banksiana.php>

Hard Pines in Southern United States

Hard Pines in Southern United States by needle length from long to short:



3 per bundle; 8–18" long

1

Longleaf pine (*Pinus palustris*) —————— Page 67



2 or 3 per bundle, 7–10" long

2

Slash pine (*Pinus elliottii*) —————— Page 68



3 per bundle; 6– 9" long

3

Loblolly pine (*Pinus taeda*) —————— Page 70



Usually 2, sometimes 3 per bundle; 3–5" long

4

Shortleaf pine (*Pinus echinata*) —————— Page 69

1: Photo courtesy of <http://www.thewoodbox.com/data/wood/longleaf-pine.htm>

2: Photo courtesy of <http://www.duke.edu/~cwcook/trees/piel.html>

3: Photo courtesy of <http://www.backyardnature.net/whatleaf.htm>

4: Photo courtesy of http://www.mushroomexpert.com/trees/pinus_echinata.html

Hard Pines in western North America

Hard Pines in western North America by needle length from long to short:



3 per bundle; 8–12" long, gray-green; flexible
Cones are 5–14" long, heavy, with reddish brown scales

1

Gray pine, Digger pine (*Pinus sabiniana*) ————— Page 77



2 or 3 per bundle; 5–11" long, flexible

Ponderosa pine (*Pinus ponderosa*) ————— Page 75



2 or 3 per bundle; 5–10" long; twisted, blue-green

2

Jeffery pine (*Pinus jeffreyi*) ————— Page 76



2 or 3 per bundle, 3–6" long, dark green, slender, flexible

3

Monterey pine (*Pinus radiata*) ————— Page 78



2 per bundle; 1–3" long, twisted

4

Lodgepole pine (*Pinus contorta*) ————— Page 73

1: Photos courtesy of <http://dendro.cnr.vt.edu/dendrology/syllabus/factsheet.cfm?ID=233>

2: Photo courtesy of http://www.sci.sdsu.edu/plants/sdpls/plants/Pinus_jeffreyi.html

3: Photo courtesy of <http://www.urban-treekey.org/trees/pinus-radiata/>

4: Photo courtesy of <http://thenatureniche.com/2011/11/09/lodgepole-pine/>

Larch (*Larix*)



Needles $\frac{3}{4}$ to $1\frac{1}{2}$ " long, blue green, 3-angled, deciduous

Cones oblong, bracts shorter than scales; $\frac{1}{2}$ – $\frac{3}{4}$ " long

Widely distributed across northern North America into Northeastern United States

Eastern larch, Tamarack (*Larix laricina*)

Page 79



Needles $1\frac{1}{4}$ – $1\frac{3}{4}$ " long, green, 3-angled, deciduous

Cones oblong, $1\frac{1}{2}$ – $1\frac{1}{4}$ " long, purplish to reddish brown

Distributed in Montana, Idaho, Oregon, Washington, British Columbia, Alberta

Western larch (*Larix occidentalis*)

Page 80

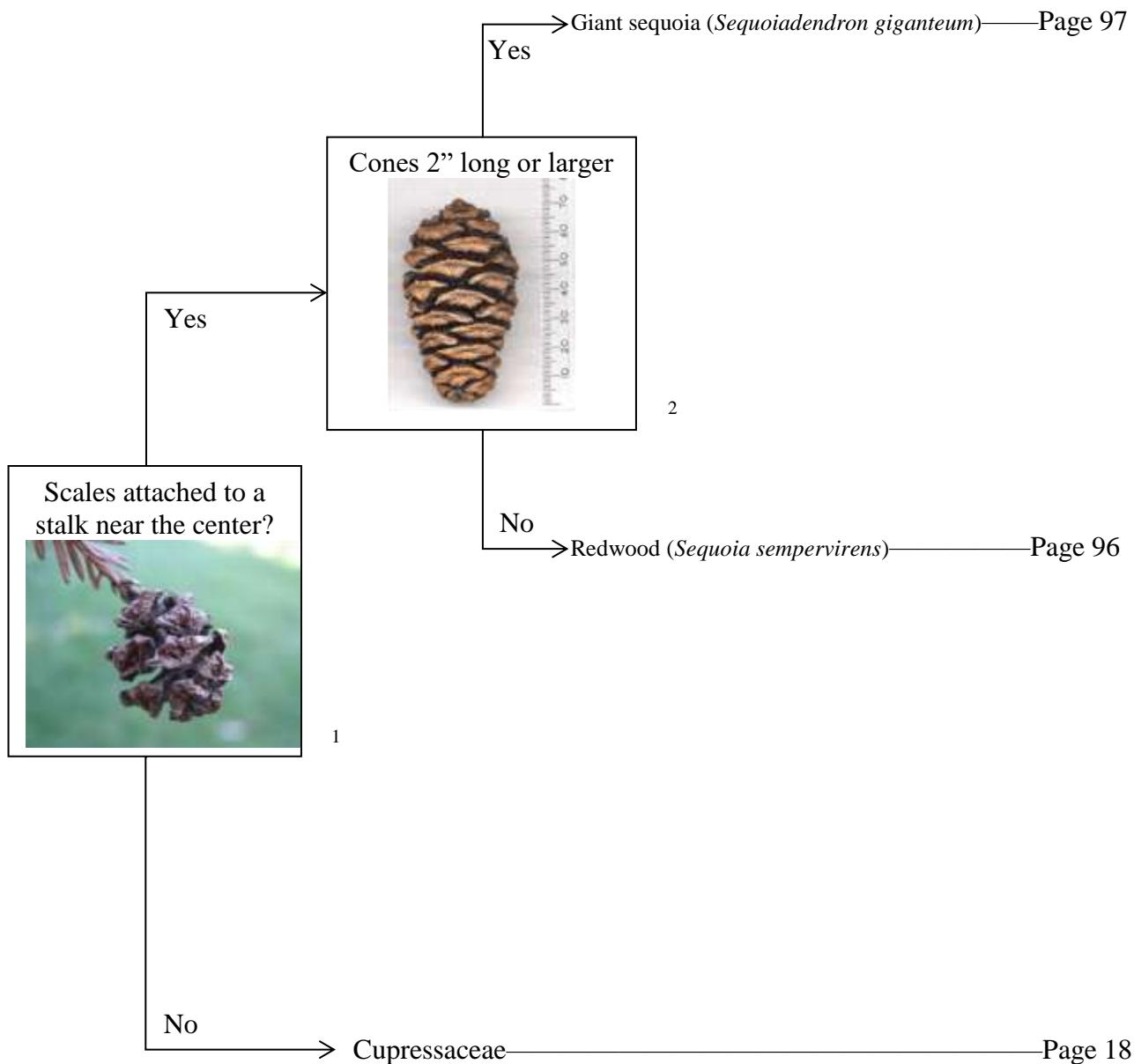
1: Photo courtesy of <http://luirig.altervista.org/schedenam/fnam.php?taxon=Larix+laricina>

2: Image courtesy of http://www.mushroomexpert.com/trees/larix_laricina.html

3: Photo courtesy of http://departments.bloomu.edu/biology/Ricketts/Larix/L_occii/L_occii.html

4: Photo courtesy of http://www.conifers.org/pi/Larix_occidentalis.php; Basemap from www.expediamaps.com.

Scale-like Leaves



1: Photo courtesy of http://tree-species.blogspot.com/2008_03_01_archive.html

2: Photo courtesy of <http://forums.gardenweb.com/forums/load/conif/msg0610421322576.html>

Fir (*Abies*)

Species ranked by needle length from long to short:



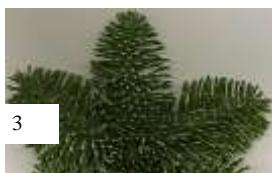
2" to 3" long; silvery-blue to silvery-green, extend at right angles from all sides of stem

White fir (*Abies concolor*) —————— Page 91



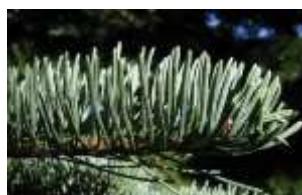
1" to 1¾" long; pale blue-green, strongly aromatic

Subalpine fir (*Abies lasiocarpa*) —————— Page 92



1" to 1½" long; blue-green, 4-angled

Noble fir (*Abies procera*) —————— Page 90



¾" – 1¼" long, silvery-blue to dark blue-green

Red fir, Silvertip fir (*Abies magnifica*) —————— Page 88



¾" long, shiny dark green above and silvery-blue below

Balsam fir (*Abies balsamea*) —————— Page 87

1: Photo courtesy of http://www.psn3.com/Abies_Concolor/Feuilles/554.html

2: Photo courtesy of <http://www.metrofieldguide.com/portfolio/evergreen/abieslasiocarpa/abieslasiocarpa.htm>

3: Photo courtesy of <http://www.graysgrandview.com/noblefir.html>

4: Photo courtesy of http://www.treenames.net/types/christmas_trees.html

5: Photo courtesy of <http://www.portlandnursery.com/plants/trees/abies.shtml>

Spruce

Picea

Species ranked by cone size from large to small:



2–4" long, elongated egg-shaped

Sitka spruce (*Picea sitchensis*) —————— Page 84



3" long, slender cylindrical. Needles with pungent smell

Colorado blue spruce (*Picea pungens*) —————— Page 86



1 ½–2 ½" narrow-shaped, light brown

White spruce (*Picea glauca*) —————— Page 83



1 to 2 ½" long, thin wedge-shaped scales

Engelmann spruce (*Picea engelmannii*) —————— Page 85



1 ¼ to 2" long, egg-shaped, chestnut brown

Red spruce (*Picea rubens*) —————— Page 81



¾ to 1 ½" long, purplish to brown

Black spruce (*Picea mariana*) —————— Page 82

1: Photo courtesy of <http://www.alaska-in-pictures.com/picture-of-sitka-spruce-cones-8873-pictures.htm>

2: Photo courtesy of <http://www.cas.vanderbilt.edu/bioimages/image/p/piel--cofemale60567.htm>

3: Photo courtesy of <http://www.for.gov.bc.ca/hfd/library/documents/treebook/blackspice.htm>

Cupressaceae

Species and their distinctive features:



Cones $\frac{1}{3}$ " to $\frac{1}{2}$ " long, erect, oblong, species distributed in Southern Canada, Lake States, Northeast, and Appalachians

Northern whitecedar (*Thuja occidentalis*) —————— Page 99



Cones $\frac{1}{3}$ " to $\frac{1}{2}$ ", erect, oblong, species distributed in Pacific Northwest and Inland Empire

Western redcedar (*Thuja plicata*) —————— Page 100



Cones $\frac{3}{4}$ to $1\frac{1}{2}$ " long, pendent, leathery, duck-bill like

2

Incense-cedar (*Calocedrus decurrens*) —————— Page 101



1: Photo courtesy of
<http://www.cas.vanderbilt.edu/bioimages/image/t/thpl-cofemale42743.htm>
2: Photo courtesy of <http://www.backyardnature.net/n/w/inc-cedr.htm>

Cones $\frac{1}{4}$ " to $\frac{1}{2}$ " long, reddish-brown, glaucous, drooping branchlets

3

Alaska cedar, Yellow cedar (*Chamaecyparis nootkatensis*) —————— Page 102



Cones $\frac{1}{3}$ " in diameter; reddish-brown; glaucous

4

Port-orford-cedar (*Chamaecyparis lawsoniana*) —————— Page 103



Photos courtesy of <http://lh2treeid.blogspot.com/2011/03/chamaecyparis-nootkatensis-alaska.html>
Photo courtesy of <http://tree-species.blogspot.com/2008/09/port-orford-cedar-chamaecyparis.html>

Cones $\frac{1}{4}$ " in diameter; bluish-purple; glaucous

5

Atlantic white cedar (*Chamaecyparis thyoides*) —————— Page 104



Cones $\frac{1}{4}$ to $\frac{1}{3}$ " in diameter; pale green to dark blue; glaucous

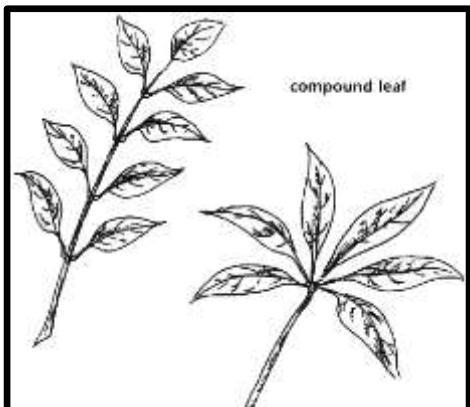
6

Eastern redcedar (*Juniperus virginiana*) —————— Page 105

5: Photo courtesy of <http://www.duke.edu/~cwcook/trees/chth.html>

6: Photo courtesy of <http://www.uwgb.edu/biodiversity/econotes/2004/juniper.htm>

Angiosperms

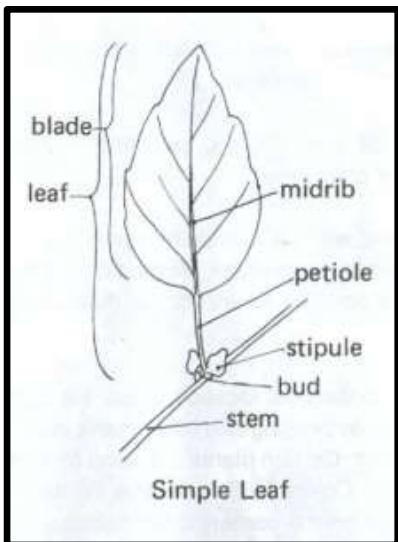


A leaf with more than one blade attached to a single leaf stem. A compound leaf is composed of a number of leaflets on a common stalk.

1

Compound leaves

Page 20



A leaf with one blade and no leaflets

2

Simple leaves

Page 31

1: Image courtesy of <http://www.answers.com/topic/compound-leaf-2>

2: Image courtesy of <http://desertflower.wordpress.com/2008/09/21/types-of-leaves/>

Compound Leaves

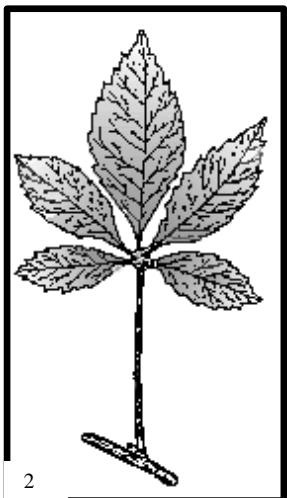


Feather-like or multi-divided leaflets arising from both sides of a common stalk

1

Pinnately compound leaves

Page 21



5–7 Leaflets radiating out from a common point

2

Palmately compound leaves

Page 30

1: Image courtesy of http://forestry.about.com/od/treeidentification/tp/tree_key_id_compound.htm

2: Image courtesy of <http://www.quincy.k12.mi.us/science7/Plants/leaf.htm>

Pinnately Compound Leaves



Leaflets with smooth margins —

Page 22



Leaflets with toothed or wavy margins —

Page 23

Pinnately Compound Leaves, Leaflets with Smooth Margins



Leaflets are pinnately compound, 1 ½–2" long;
Fruits are flat, brown hairless legume, 2–4" long

1

Black locust (*Robinia pseudoacacia*) —

Page 170



Leaflets are pinnately or bipinnately (doubly pinnate) compound;
Fruits are reddish to brownish twisted legume, 7–18" long

Honeylocust (*Gleditsia triacanthos*) —

Page 171

1: Photo courtesy of <http://www.springlake.org/historical/naturewalk/trees.html>

Pinnately Compound Leaves, Leaflets with Toothed or Wavy Margins

Leaflets similar in size and shape —————— Page 24



Leaflets different in size and shape —————— Boxelder (*Acer negundo*) —————— Page 178



Leaflet similar in shape with 3 end leaflets distinctively larger —————— Page 27

Pinnately Compound Leaves, Leaflets with Toothed or Wavy Margins Leaflets Similar in Size and Shape



(*Fraxinus*) ————— Page 26

Large leaves (1-3' long)?



Yes

→ Tree of heaven (*Ailanthus altissima*) ————— Page 166

Fruit upright, showy,
cone-shaped red drupes?



Yes

→ Staghorn sumac (*Rhus typhina*) ————— Page 180

xt page

Pinnately Compound Leaves, Leaflets with Toothed or Wavy Margins Leaflets Similar in Size and Shape (Continued)

Terminal leaf small or absent?

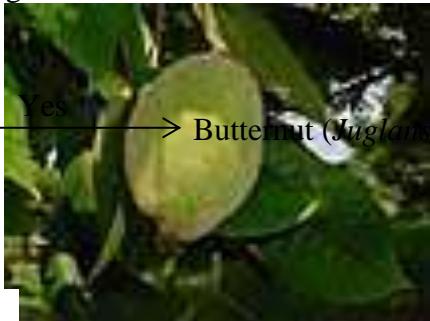


Yes

Black walnut (*Juglans nigra*) — Page 119

No

Very oily seed, egg shaped,
greenish bronze with thick husk?



1

Yes

Butternut (*Juglans cinerea*) — Page 120



Egg-shaped fruit, often found near rivers
Water hickory (*Carya aquatica*) — Page 127

2



Longer fruit, dark brown l
winged nutlets

121

3

1: Photo courtesy of
<http://www.hort.cornell.edu/4hplants/Fruits/Butternut.html>

2: Photo courtesy of <http://aggie-horticulture.tamu.edu/carya/species/aquatica/aqulf.jpg>

3: Photo courtesy of
http://www.sfrc.ufl.edu/4h/Pecan_hickory/pecahick.htm



1

U-shaped leaf scar, slightly furrowed bark ————Green ash (*Fraxinus pennsylvanica*)—Page 183



V- or shield-shaped leaf scar, furrowed bark———White ash (*Fraxinus americana*)—Page 182

1: Photo courtesy of http://www.sbs.utexas.edu/bio406d/images/pics/ole/fraxinus_pennsylvanica.htm

**Pinnately Compound Leaves, Leaflets with Toothed or Wavy Margins
Leaflet Similar in Shape with 3 End Leaflets Distinctively Larger**



Most leaves with 5 leaflets

Page 28



Most leaves with 7–11 leaflets

Page 29

**Pinnately Compound Leaves, Leaflets with Toothed or Wavy Margins
Leaflet Similar in Shape with 3 End Leaflets Distinctively Larger
Most Leaves with 5 Leaflets**



Leaves 6– 10" long;
Bark smooth, tightly woven

Pignut hickory (*Carya glabra*) ——————

Page 126



Leaves: 10 – 14" long;
Thin plates curving away from trunk

Shagbark hickory (*Carya ovata*) ——————

Page 123

**Pinnately Compound Leaves, Leaflets with Toothed or Wavy Margins
Leaflet Similar in Shape with 3 End Leaflets Distinctively Larger
Most Leaves with 7–11 Leaflets**

Species ranked by leaf size from large to small:



Leaves 15 – 22" long, 7–9 leaflets (usually 7)
Bark scaly like Shagbark but straighter plates

1

Shellbark hickory (*Carya laciniosa*) —

Page 124



Leaves 9–14" long, with 7 to 9 leaflets, pubescent (covered with fine short hairs) below, pubescent rachis (axis, shaft)
Bark firm, close, with shallow furrows

Mockernut hickory (*Carya tomentosa*) —

Page 125



Leaves 7 ½ to 14" long, with 7 to 9 leaflets
Bark thin finely scaly

Nutmeg hickory (*Carya myristicaeformis*) —

Page 128



Leaves 7" to 10" long, with 7 –11 leaflets
Bark close and firm

Bitternuth hickory (*Carya cordiformis*) —

Page 122

1: Photos courtesy of <http://www.cas.vanderbilt.edu/bioimages/species/cala21.htm>

2: Photos courtesy of <http://www.duke.edu/~cwcook/trees/camy.html>

Palmately compound leaves



5–7 leaflets with no stalk

1

Horsechestnut (*Aesculus hippocastanum*)



2

Red buckeye (*Aesculus pavia*)

Yellow buckeye (*Aesculus flava*)

Ohio buckeye (*Aesculus glabra*)



5 leaflets with short stalk
Seed covered in smooth
husk

Page 181

1: Photo courtesy of <http://www.cas.vanderbilt.edu/bioimages/image/a/aehi--lf29702.htm>

2: Photo courtesy of http://lib.oh.us/tree/fact%20pages/buckeye_yellow/buckeye_yellow.html

Simple Leaves



Lobed leaves with deeply indented margins

Page 32



Leaves not lobed

Page 41

Simple Leaves Lobed



Veins in lobes arise from several places along central vein

Leaves pinnately lobed

Page 33



Main veins radiate from a common point where leaf attaches to the petiole

Leaves palmately lobed

Page 38



All veins arise from base of leaf

Leaves 2-lobed

Ginkgo (*Ginkgo biloba*) Page 107



Leaves with irregular and unsymmetrical lobes

Page 40

Leaves Pinnately Lobed



Leaves with bristle tips ————— Red Oak Group ————— Page 34



Leaves without bristle tips ————— Page 36

Leaves Pinnately Lobed, With Bristle Tips (Red Oak Group)

Due to subtle differences, species in this category should be identified by combined factors of leaf, acorn, and bark characteristics:



Leaves 5–8" long, oblong, 7 – 11 toothed lobes, separated by sinuses extending midway to mid rib;
Acorns $\frac{3}{4}$ –1" long, subglobose, enclosed $\frac{1}{4}$ of way by shiny, shallow cap;
Bark gray with alternating rough and smooth vertical plates, ski-slope like (continuous patterns)

Northern red oak (*Quercus rubra*) —

Page 139



Leaves 5–7" long, obovate to ovate, 5–7 toothed lobes, separated by sinuses of varying depth;
Acorns $\frac{1}{2}$ – $\frac{3}{4}$ " long, ovoid, striate, enclosed $\frac{1}{4}$ of way by brown scaly cap;
Bark thick, black, deeply furrowed, inner bark bright orange

Black oak (*Quercus velutina*) —

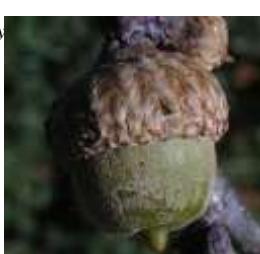
Page 140



Leaves 6–8" long, obovate to oval, 7–9 toothed lobes, separated by moderately deep sinuses;
Acorns $\frac{3}{4}$ –1 $\frac{1}{4}$ " long, ovoid, Covered with a thick, shallow, saucer-shaped cap;
Bark thick, broken into pale to whitish scaly ridges, deep, dark furrows

Shumard oak (*Quercus shumardii*) —

Page 141



Leaves 5–9" long, obovate, shallowly 3–lobed or deeply 5–7 lobed, falcate, underside covered with densely matted hairs;
Acorns $\frac{1}{2}$ ", subglobose, orange-brown, enclosed less than 1/3 by shallow, pubescent cap

Southern red oak (*Quercus falcata*) —

Page 142

2: 2nd and 3rd photos courtesy of <http://www.cas.vanderbilt.edu/bioimages/species/frame/qufa.htm>

Continue to the next page...

Leaves Pinnately Lobed, with bristle tips (Red oak Group)—Continued



Leaves 4–7" long, 5 to 9 lobed with wide, deep circular sinuses;
Acorns $\frac{1}{2}$ –1" long, oval, reddish brown, $\frac{1}{2}$ enclosed in bowl-like cap, circular grooves at apex;
Bark dark brown to black, similar to *Quercus rubra* above 3'

Scarlet oak (*Quercus coccinea*) —

Page 143



Leaves 3 – 5" long, obovate to oval, usually 5 lobed with deep sinuses;
Acorns $\frac{1}{2}$ " long, hemispherical, pale brown, striate, enclosed in thin saucer like cap;
Bark grayish brown, smooth;
Descending lower braches

Pin oak (*Quercus palustris*) —

Page 144



Leaves 4–8" long, obovate, 5 to 7 lobed separated by deep sinuses;
Acorns $\frac{3}{4}$ –1 $\frac{1}{4}$ ", reddish brown striate, $\frac{1}{4}$ – $\frac{1}{2}$ enclosed in deep thick cap;
¹ Bark dark gray-brown , broken into broad, flat ridges

Nuttall oak (*Quercus nuttallii*) —

Page 145



Leaves with very variable shape and size, shallowly 3-lobed, tawny, pubescent below;

Acorns 3/4" long, oblong, half enclosed in thick bowl-shaped cap

Blackjack oak (*Quercus marilandica*) —

Page 146



Leaves very variable in size and shape, sometimes resemble the shape of a turkey foot;
Acorns 1" long, oval, 1/3 enclosed in a thin bowl-shaped cap; Bark rough, nearly black; shrub

³ small tree or

Turkey oak (*Quercus laevis*) —

Page 147

1: Photos courtesy of <http://www.fwf.lsu.edu/plantid/webtour/species/nuttalloak/nuttalloak.htm>

2: 1st and 2nd photos courtesy of http://oplin.lib.oh.us/tree/fact%20pages/oak_blackjack/oak_blackjack.html

3: Photos courtesy of <http://www.duke.edu/~cwook/trees/qula2.html>

**Leaves Pinnately Lobed,
Without Bristle Tips**



Main vein ends in a lobe

White oak Group

Page 37



Main vein ends in a notch

Yellow-poplar, Tuliptree (*Liriodendron tulipifera*)

Page 110

**Leaves Pinnately Lobed,
without Bristle Tips, Main Vein Ends in a Lobe**



Leaves 5–9" long, 7–9 lobes with rounded tip

White oak (*Quercus alba*) —————

Page 132



Leaves 6–12" long, 5–9 lobed, end lobe much larger than side lobes

Bur oak (*Quercus macrocarpa*) —————

Page 133



Leaves thick, 4–6" long, deeply 5 lobed, three end lobes much larger than lobes near base make a cruciform appearance

Post oak (*Quercus stellata*) —————

Page 134



3" long, 7–11 deep lobes, finely pubescent (covered with fine soft short hairs)

Valley oak (*Quercus lobata*) —————

Page 138

1: Photo courtesy of <http://www.globalwatches.com/gallery.asp?filter=family&filtervarde=700>

Leaves Palmately Lobed



Opposite leaf and twig arrangement

Maple (*Acer*)

Page 39



Alternate leaf arrangement
Shallow or no notches between lobes
Large perfoliate stipules

American sycamore (*Platanus occidentalis*)

Page 112



Alternate leaf arrangement
Star-shaped, deeply palmate 5-7 lobed leaves

Sweetgum (*Liquidambar styraciflua*)

Page 114



Irregular and unsymmetrical leaves

Page 40

Leaves Palmately Lobed with Opposite Leaf and Twig Arrangement Maple (*Acer*)



Saw-toothed leaf edge;
Three large lobes and sometimes two smaller lobes;
Twigs slender, dark red, with minute lenticels;
V-shaped sinuses

Red maple (*Acer rubrum*)

Page 176



Leaves 5-lobed, coarsely toothed, pale green above, silvery underneath;
U-shaped sinuses

Silver maple (*Acer saccharinum*)

Page 177



Leaves 5-lobed, bright green above, pale and smooth below
Smooth margins;
U-shaped sinuses

Sugar maple (*Acer saccharum*)

Page 179

Leaves with Irregular and Unsymmetrical Lobes



Alternate leaf arrangement;
Leaves of varied shapes, entire or mitten like with two or three lobes;
Margins smooth

Sassafras (*Sassafras albidum*) —

Page 111



Leaves toothed with varied form from no lobes to deeply lobed;
Fruits are red or purple collection of small drupes

Red mulberry (*Morus rubra*) —

Page 118

1: photos courtesy of <http://www.duke.edu/~cwcook/trees/moru.html>

Simple Leaves Not Lobed



Leaf base is generally asymmetric

Elm family (*Ulmaceae*)

Page 42

Tiliaceae family

Page 43



Leaf base is generally symmetric

Page 44

Elm family (*Ulmaceae*)



Leaves 4–6" long, coarsely doubly toothed;
Fruits are winged samara with hairy margin

American elm (*Ulmus americana*) —

Page 115



Leaves 5–7" long, coarsely double toothed, surfaces very
scabrous;
Fruits are winged samara with smooth margin

Red (Slippery) elm (*Ulmus rubra*) —

Page 116



Leaves 2 ½–4" long, sharply toothed,
undersurface scabrous;
Fruits are dark purple drupes

Hackberry (*Celtis occidentalis*) —

Page 117

I: 2nd photo courtesy of <http://commons.wikimedia.org/wiki/File:Celtis-occidentalis-fruits.JPG>

Tiliaceae Family



Leaves 5–6" long, 3–4" wide; margin coarsely serrate, base unequal;

Pea-like fruits are clustered and attached to a curious, ribbon-like, greenish yellow bract

American basswood (*Tilia americana*) —

Page 159



Leaves similar to American Basswood, undersides whitish, tomentose (covered with short, dense, matted hairs);

Fruits slightly smaller than American Basswood

White basswood (*Tilia heterophylla*) —

Page 160

1: Photos courtesy of <http://www.cas.vanderbilt.edu/bioimages/species/tiamh.htm>

Simple Leaves Not Lobed, Symmetric Leaf Base



Leaves with smooth margins and no tooth

Leaves entire _____ Page 45



Leaves with a single tooth at the end of each vein

Leaves serrated _____ Page 129



Leaves with teeth between vein tips

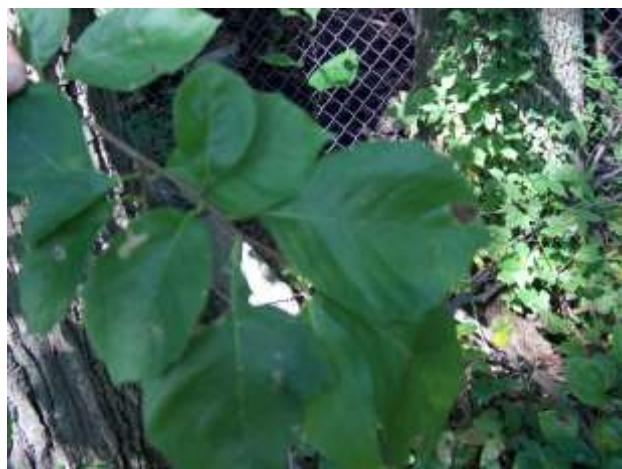
Leaves doubly serrated _____ Page 53

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Entire**



Opposite Leaf Arrangement

Page 46



Alternate Leaf Arrangement

Page 47

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Entire, Opposite Arrangement**



Oval leaves, 3- 5" long and 2- 3" broad;
Fruits are bright red drupes;
Bark broken into small blocks

Flowering dogwood (*Cornus florida*) ——————Page 172

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Entire, Alternate Arrangement**



With Acorns _____ Page 48

Without Acorns _____ Page 49

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Entire, Alternate Arrangement
Acorns Present**



Leaves 2–5" long, 1/3 – 1" wide, linear-lanceolate;
Acorns ½" or shorter; yellowish or greenish brown

1

Willow oak (*Quercus phellos*)

Page 148

1: 2nd photo courtesy of
http://www.meridian.k12.il.us/middle%20school/student_work/SeaMonkey/Willow%20Oak.html



Leaves 2–4" long, spatulate (broad at the apex and tapered to the base),
may remain on tree until late winter;
acorns ½" long, hemispherical, black striate, enclosed at base by thin,
saucer-like cap

2

Water oak (*Quercus nigra*)

Page 149

2: Photo courtesy of http://www.sfrc.ufl.edu/4h/Water_oak/wateroak.htm



Leaves oblong to elliptical, lustrous above, pubescent
below, tipped with needle-like bristle;
Acorns 5/8" long, enclosed 1/3 to ½ in thin red-brown
cap

3

Shingle oak (*Quercus imbricaria*)

Page 150



Leaves 2–5" long, persist until spring, dark glossy green above, paler and
pubescent below;
Acorns ¾" long, brown to black; 1/3 enclosed in turbinate cap

4

Live oak (*Quercus virginiana*)

Page 151

3: 2nd photo courtesy of http://www.meridian.k12.il.us/Middle%20School/student_work/Ryan%20Pierce/shingle%20oak.html
4: 2nd photo courtesy of <http://www.flickr.com/groups/afterclass/discuss/72157604130153299/>

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Entire, Alternate Arrangement
Acorns Absent**



Leaves leathery, persistent, bright green, very lustrous;
Fruits are 3" – 8" long elongated aggregate of follicles, rusty, hairy

1

Southern magnolia (*Magnolia grandiflora*) —

Page 108

1: Photos courtesy of http://commons.wikimedia.org/wiki/Magnolia_grandiflora



Leaves 6–10" long;

Cucumber-shaped fruits 2 – 3" long

Cucumber tree (*Magnolia acuminata*) —

Page 109



Leaves 4–6" long, infrequently one or two large marginal teeth on distal half, acuminate tip;
Fruits dark blue to black drupe, 1/3 to 2/3" long;
Twigs slender, glabrous with diaphragmed pith

Blackgum, Black tupelo (*Nyssa sylvatica*) —

Page 173



Leaves 5–7" long, 2–4" wide, dark green above, paler and downy below;
Fruits pendent on slender stalks, reddish purple;
Trunks have a swollen base that tapers up to a long, clear bole, and its root system is periodically under water

Water tupelo (*Nyssa aquatica*) —

Page 174

2: Photos courtesy of <http://commons.wikimedia.org/w/index.php?search=Nyssa+aquatica&title=Special%3ASearch>

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Serrated**



With Acorns _____ Page 51

Without Acorns _____ Page 52

Simple Leaves Not Lobed, Symmetric Leaf Base Leaves Serrated, With Acorns



Leaves 4 – 8" long with rounded teeth;
Acorns 1 – 1 ½" long, ovoid, enclosed 1/3 – ½ by a thin cap;
Bark brown to black, thick, massively ridged, deeply furrowed

Chestnut oak (*Quercus prinus*) —————

Page 135



Leaves 5–8" long, pubescent below;
Acorns 1 – 1 ½" long, enclosed less than 1/3 in a thick bowl-shaped cap;
Bark irregularly furrowed or scaly, ash gray tinged with red

Swamp chestnut oak (*Quercus michauxii*) —————

Page 136



Leaves coarsely serrated with relatively sharp teeth;
Acorns ½" long, with a thin bowl-shaped cap;
Barks ashy gray, rough and flakey

Chinkapin oak (*Quercus muehlenbergii*) —————

Page 137



Leaves 2.8–5.9" long, rounded teeth to entire, pubescent below;
Acorns taste bitter;
B Bark with heavy rounded ridges separated by deep narrow fissures

Tanoak (*Lithocarpus densiflorus*) —————

Page 131

1: 2nd and 3rd photos courtesy of <http://www.rnr.lsu.edu/plantid/webtour/species/swampchestoak/swampchestoak.htm>

2: 2nd photo courtesy of <http://www.cas.vanderbilt.edu/bioimages/image/q/qumu--fr16094.htm>

3: Photos courtesy of http://commons.wikimedia.org/wiki/Lithocarpus_densiflorus

Simple Leaves Not Lobed, Symmetric Leaf Base Leaves Serrated, Without Acorns

American chestnut (*Castanea dentata*)

Leaves $5\frac{1}{2}$ – 8 " long, coarsely and sharply serrate, bristle-tipped teeth;
Chestnut 2 – $2\frac{1}{2}$ " long; husk covered with branched spines;
Bark dark brown, shallowly fissured¹

Page 130

American beech (*Fagus grandifolia*)

Leaves $2\frac{1}{2}$ – 6 " long, dark green, simple and sparsely-toothed;
Sharply-angled nut, $\frac{1}{2}$ – $\frac{3}{4}$ " long, borne in pairs in a four-lobed husk;
Bark thin, smooth, blue-grey; Long slender bud

Page 129

Witch-Hazel (*Hamamelis virginiana*)

Leaves with a wavy-toothed or shallowly lobed margin, and a short, stout petiole;
Flowers yellow, slender, bloom late in fall;
Shrub to small trees

Page 113

American holly (*Ilex opaca*)

Leaves evergreen, leathery, spine toothed with bristle;
Fruits bright red drupe;
Bark grayish white, warty

Page 175

1: 2nd photo courtesy of http://commons.wikimedia.org/wiki/Castanea_dentata
2: 2nd photo courtesy of <http://www.flickr.com/photos/carthamus/2871984349/>

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Doubly Serrated**



Smaller teeth sandwiched between big teeth

Leaf margins with teeth of various sizes

Page 54



Leaf margins with teeth of similar sizes

Page 57

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Doubly Serrated, Leaf Margins with Teeth of Various Sizes**



Hawthorn

Thorny branches and yellow to red drupe-type fruits?

Yes ————— Hawthorn (*Crataegus spp.*) ————— Page 169

No ————— Birch Family (*Betulaceae*) ————— Page 55

Birch Family (*Betulaceae*)



Betula genus —

Fruits are erect or pendent strobiles (catkins), ovoid to cylindrical in shape

Page 56



Female catkins woody, ovoid in shape, do not disintegrate at maturity;
Mostly shrubby

Alnus genus —

Page 156



Fruits about 3–6 mm long, held in 3-lobed leafy bracts

Carpinus genus —

Page 157



Fruits enclosed in oval, flattened, papery sacs

Ostrya genus —

Page 158

Betula Genus



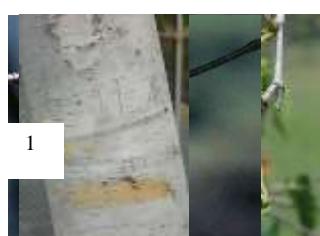
Fruits ovoid, sessile (without a stalk), erect strobile, 1 – 1 ½" long;
Bark golden gray to bronze, peeling into long, thin strips on young trees, and with reddish brown plates on older trees

Yellow birch (*Betula alleghaniensis*) —————— Page 152



Fruits ovoid, short-stalked, erect strobile, 1 – 1 ½" long;
Bark reddish-brown to black with prominent lenticels on young trees, and brownish-black with scaly plates on older trees

Black birch (*Betula lenta*) —————— Page 153



Fruits pendent, cylindrical with stalks, 1 – 1 ½" long;
Bark chalky to creamy white, separating into thin, papery strips

Paper birch (*Betula papyrifera*) ——————

P a g e 1 5 4



Leaves rhombic-ovate, deeply double serrate, broadly wedge-shaped base;

Bark salmon-pink, papery

River birch (*Betula nigra*) —————— Page 155

1: 2nd photo courtesy of http://www.oplin.org/tree/fact%20pages/birch_paper/birch_paper.html

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Doubly Serrated, Leaf margins with teeth of similar sizes**



Petiole—the stalk that connects the leaf to the plant—is flattened

Leaves with flattened petiole ——————

Page 58

Leaves without flattened petiole ——————

Page 59

**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Doubly Serrated, Leaf Margins with Teeth of Similar Sizes
Flattened Petiole**



Leaves 1 $\frac{1}{2}$ –3" in diameter, suborbicular to broadly ovate;
Buds conical, sharp-pointed with 6 – 7 reddish brown imbricated scales;
Bark smooth, greenish white to cream, gray, furrowed at bottom, eye-like features
Quaking aspen (*Populus tremuloides*)

Page 162



Leaves
Buds gray,
Bark olive

larger than *Populus tremuloides*, coarsely toothed;
puberulous (covered with minute hairs);
green, brown, furrowed at base

Bigtooth aspen (*Populus grandidentata*)

Page 163



Leaves 3–6" long, 4 – 5" wide; deltoid (triangle-like) with glands near the base;
Bark light greenish yellow on young trees, and ash-gray with thick ridges on old

Eastern cottonwood (*Populus deltoides*)

Page 164

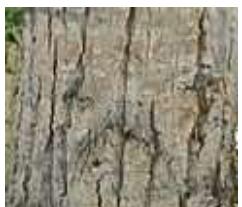
**Simple Leaves Not Lobed, Symmetric Leaf Base
Leaves Doubly Serrated, Leaf Margins with Teeth of Similar Sizes
Without Flattened Petiole**



Leaves 3–6" long, lanceolate, finely serrate, base obtuse;
Bark brown to black with deep fissures;

Black willow (*Salix nigra*) —

Page 161



Leaves 5–6" long, ovate with fine round tooth;
Buds $\frac{3}{4}$ " long, conical with 6 or 7 visible imbricated scales, resinous, fragrant;
Bark yellowish to dark gray.

Black cottonwood (*Populus trichocarpa*) —

Page 165



Leaves 2–6" long, narrowly oval to oblong, finely serrate, incurved teeth, pubescent along midrib, very bitter taste;
Fruits $\frac{1}{3}$ – $\frac{1}{2}$ " long drupe, black when ripe, bitter;
Bark reddish brown with narrow horizontal lenticels on young trees, and with dark plate-like scales on old

Wild black cherry (*Prunus serotina*) —

Page 167



Leaves yellow-green, narrower and less shiny than *Prunus serotina*;
Fruits bright red drupe, sour;
Bark with reddish, lens-shaped lenticels

Pin cherry (*Prunus pensylvanica*) —

Page 168

1: Photos courtesy of http://commons.wikimedia.org/wiki/Populus_trichocarpa

2: 2nd photo courtesy of http://commons.wikimedia.org/wiki/Prunus_serotina

SUMMARY OF SPECIES DESCRIPTION

Eastern white pine

Pinus strobus

Pinaceae

Needles:

5 needles per fascicle, 3—5" (7.6—12.7cm) long, ever green; blue-green, slender, and flexible, persisting 2-3 years.¹

Cones:

4—8" (10.2—20.3cm) long, narrowly cylindrical and often curved, scales are often tipped with white resin.

Twigs:

Orange-brown, glabrous, and slender.

Buds:

Terminal and lateral buds in clusters of mostly five, conical with red-brown scales.

Bark:

Smooth on young trees and grooved and blocky at maturity.

Distribution in North America:

From southern Canada, Lake States, south to Appalachian Mountains.



Eastern white pine is a large-size tree growing to 120 feet or more. The branches occur in whorls and extend horizontally, with one tier added annually. The species is the largest conifer of the Northeast and was once prized for ship masts in the Colonial period because of its tall, straight trunks. It is intermediate shade-tolerance, has a rapid growth rate, and is a soft pine.

Western white pine

Pinus monticola

Pinaceae

Needles:5 needles per fascicle, 2" to 4" long.¹**Cones:**5" to 15", narrowly cylindrical, yellowish to reddish brown. Cones are stalked with spineless scales.²**Twigs:**Moderately slender, greyish brown, glabrous³**Buds:**½" long, conical, brownish scales.⁴**Distribution in North America:**Native from British Columbia to Idaho and California.⁵

7

Western white pine has intermediate shade-tolerance, an intermediate growth rate, and is a soft pine. Needles persist for 3 to 4 years give the tree a denser crown than Eastern white pine. Western white pine grows 100 to 175 feet in height and 2 to 5 feet in diameter. The crown consists of pyramidal whorls of horizontal branches.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_monticola2: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_monticola3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_monticola_foliage_youngcones.jpg4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_monticola_shoot.jpg5: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_monticola6: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_monticola7: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_monticola

Sugar pine
Pinus lambertiana
 Pinaceae

Needles:

5/ fascicle, 2" to 4" long; spirally twisted, bluish green in color, sharp-pointed. Needles persist for 2 to 3 years.¹

**Cones:**

10" to 26" long; 4" to 5" in diameter when open. Cones are stalked with spineless scales.²

**Twigs:**

Stout, greyish brown³

**Buds:**

5/16", oval, brownish, resinous.



6

Distribution in North America:

Native from Oregon to lower California into Mexico.⁵

Sugar pine is intermediate in shade-tolerance, has a rapid growth rate, and is a soft pine. Sap contains a sugary substance. Sugar pine is the tallest American pine, reaching 175 to 200 feet in height. Sugar pine attains a diameter of 3 to 5 feet. The pyramidal crown consists of whorls of horizontal branches, some of which are noticeably longer than others.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_lambertiana

2: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_lambertiana

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_lambertiana_pollencones.jpg

4: Photo courtesy of <http://commons.wikimedia.org/wiki/File:CalaverasBigTrees2.jpg>

5: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_lambertiana

Limber pine
Pinus flexilis
 Pinaceae

Needles:

5/ fascicle; 2" long, dark green in color, and crowded at the ends of the branchlets. Needles persist for 5 to 6 years.¹



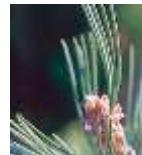
Cones:

3" to 10" cylindrical, resinous.²



Twigs:

Very flexible, green in color, and mostly glabrous.³



Buds:

3/8" long, sharp pointed.⁴



Bark:

Smooth white to light gray on young trees, old trees black with deep fissures.⁵



Distribution in North America:

Native to the Rocky Mountains from Alberta to northern Mexico, east to Texas.⁶



Limber pine is intolerant of shade, has a slow growth rate, and is a soft pine. Stems become twisted and dwarfed in exposed location. Limber pine grows 25 to 50 feet in height, and 1 to 2 feet in diameter. Growth habit is pyramidal in youth, but becomes rather flat-topped at maturity.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_flexilis

2: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_flexilis

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_flexilis_foliage_Bryce_Canyon.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_flexilis_needles.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_flexilis_Oldtreebark.jpg

6: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_flexilis

7: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_flexilis

White bark pine
Pinus albicaulis
 Pinaceae

Needles:

5 / fascicle, 1" to 2" in long, stout and stiff.¹

Cones:

2 ½" long, scales have triangular tips, unlike the cones of other pine species, they disintegrate when mature.²

Twigs:

Greyish brown, stout, persistent scars where needles have dropped.³

Buds:

To 2/5", reddish brown, oval.

Bark:

Creamy white to brownish white, scaly.⁴

Distribution in North America:

Native from British Columbia to California and Wyoming.⁵



6

White bark pine is shade tolerant, has a slow growth rate, and is a soft pine. White bark pine reaches 50 to 60 feet in height and 1 to 2 feet in diameter. On poor sites, the species may grow as a sprawling shrub.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_albicaulis

2: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_albicaulis

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_albicaulis_7874.JPG

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_albicaulis_Iron_MountainCA1.jpg

5: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_albicaulis

6: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_albicaulis

Red pine
Pinus resinosa
Pinaceae

Needles:

2/ fascicle; 5–7" long, brittle, dark green in color, sharp pointed.

**Cones:**

1 ½" to 2 ¼" long, light brown in color. Scales are unarmed.

**Twigs:**

Orange-brown in color, stout and glabrous.

**Buds:**

¾" to ½" long, resinous, and sharp pointed. Scales are fringed on margin.

**Distribution in North America:**

Native from Newfoundland to Manitoba, south to the mountains of West Virginia and westward to Michigan.¹

Red pine is intermediate in shade-tolerance and growth rate. Red pine is a hard pine. This species is sometimes called Norway pine. Red pine often invades cutover land. Grows 50 to 100 feet tall, and 2 to 3 feet in diameter. The species is an important timber tree. Red pine grows best in areas having a colder climate. The tree produces one whorl of branches each year.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_resinosa

Longleaf pine
Pinus palustris
Pinaceae

Needles:

3 / fascicle; 8" to 18" long and bright green in color.¹



Cones:

6" to 10" long, reddish-brown, prickle present on ends of scales.



Twigs:

Stout; orange-brown.²



Buds:

Large, very conspicuous, silvery fringed scales.

Bark:

Dark reddish brown in color, with scaly plates.³



Distribution in North America:

Native from southeastern Virginia to Florida, along the gulf coast, west to Texas.⁴



Longleaf pine is intolerant of shade, has a rapid growth rate, and is a hard pine. The species is considered a southern pine. Longleaf pine grows to a height of 75 to 120 feet, and reaches a diameter of 2 to 2.5 feet. Young longleaf pines grow slowly, form deep roots, and have only a tuft of foliage present near the ground. This stage of development is referred to as the grass stage.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_palustris

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Cedar_waxwings_02.JPG

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_palustris_USDAFS.jpg

4: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_palustris

5: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_palustris

Slash pine
Pinus elliottii
Pinaceae

Needles:

2 or 3 / fascicle, 7" to 10" long, and dark bluish green in color.¹

Cones:

3" to 6" long, stalked, and chestnut brown in color. Prickles are present at the ends of scales.²



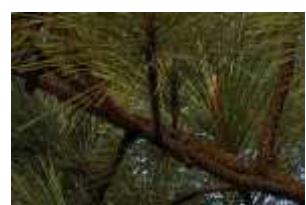
Twigs:

Orange-brown in color.³



Buds:

4/5", silvery grey brown in color, cylinder shaped.⁴



Bark:

Plated with papery, purplish layers.⁵

Distribution in North America:

Native from South Carolina, south to Florida, and west to Louisiana.

Slash pine is intolerant of shade, has a rapid growth rate, and is a hard pine. The species is considered a southern pine, and is the fastest growing of all the southern pines. Slash pine grows 80 to 100 feet tall, and reaches 2 to 3 feet in diameter. Slash pine has a dense rounded crown. It is an important timber tree.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_elliottii_foliage_Georgia.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_elliottii

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_elliottii_foliage_Georgia.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_elliottii_foliage_Georgia.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Georgia_Pinus_elliottii_trunks.jpg

6: Photo courtesy of http://commons.wikimedia.org/wiki/wiki/Pinus_elliottii

Shortleaf pine
Pinus echinata
Pinaceae

Needles:

Usually 2, sometimes 3/ fascicle; 3" to 5" long, yellow-green in color.¹

Cones:

1 ½" to 2 ½", ovoid to conical; reddish-brown. Prickles at the ends of scales curve towards the base of the cone; deciduous.

Twigs:

First green and fringed w/purple; eventually reddish brown.²

Buds:

¼" long, scales closely appressed, and brown in color.

Bark:

Dark brown in color with scaly plates.³

Distribution in North America:

Native from New Jersey south to Georgia, and west to Texas.



4



Shortleaf pine is intolerant of shade, has a moderate to rapid growth rate, and is a hard pine. The species is considered a southern pine. Shortleaf pine reaches a height of 80 to 100 feet and a diameter of 2 to 3 feet. The species forms a deep taproot. Shortleaf pine is an important timber tree and typically grows in light dry soils.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_echinata_sapling_Shawnee_National_Forest.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_echinata_sapling_Shawnee_National_Forest.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_echinata_thinned_forest_1.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_echinata_thinned_forest_2.jpg

Loblolly pine
Pinus taeda
Pinaceae

Needles:

3 / fascicle; 6" to 9" long, yellowish green in color, resinous, and stiff.¹

Cones:

3" to 6" long, conical (armed with stout sharp spine). Yellowish brown when young, becoming grey with age.²



Twigs:

Yellow-brown or reddish brown, slender, glabrous.



Buds:

$\frac{1}{4}$ " to $\frac{1}{2}$ " long, reddish brown in color, scales fringed and often reflexed.

Bark:

Scaly and black on young trees, dark brown and blocky on mature trees.³



Distribution in North America:

Native from New Jersey, south to Florida, and west to Texas.

Loblolly pine is moderately tolerant of shade, has a rapid growth rate, and is a hard pine. The species is considered a southern pine. It grows 90 to 100 feet in height and reaches 2 to 3 feet in diameter. Crown is relatively dense. Loblolly pine is the leading commercial timber tree in the southeastern U.S. The species is tolerant of a large range of site conditions. Develops a clear bole with age.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Haliaeetus_leucocephalus_nest_in_Pinus_taeda.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_taeda

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:2008-07-24_Pine_tree_at_Duke_University.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/wiki/Pinus_taeda

Pitch pine
Pinus rigida
Pinaceae

Needles:

3/fascicle; 3" to 5" long, stiff, twisted, and yellow-green in color. Needles are often present in clusters on the trunk and large limbs.



Cones:

2" to 3 ½", nearly sessile, ovoid. Scales are thick and have prickles at the ends. Bases of cones are flat.



Twigs:

Brown to orange in color, stout.



Buds:

¾" long, resinous, and reddish brown in color.

Bark:

Smooth on young trees and grooved and blocky at maturity. Dark to reddish brown.

Distribution in North America:

Native from New Brunswick to Georgia, west to Kentucky and Ontario.¹

Pitch pine is intolerant of shade, has a moderate growth rate, and is a hard pine. It grows to a height of 50 to 60 feet, and reaches a diameter of 1 to 2 feet. It generally grows on poor sites and often has a rather coarse growth form. Pitch pine typically has many epicormic shoots along the trunk and limbs, hence, the clusters of needles present along the tree's main bole and limbs.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_rigida

Virginia pine
Pinus virginiana
Pinaceae

Needles:

1 ½" to 2 ½" long, 2/ fascicle, twisted, and yellow-green in color.



Cones:

1 ½" to 2 ½" usually sessile, very sharp prickles at ends of scales. Many, many cones typically present on any given tree.



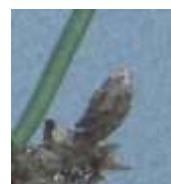
Twigs:

Green turning purplish, glaucous.



Buds:

1/3" to 1/2" long, resinous, sharply pointed.



Bark:

Reddish-brown in color, becomes scaly with age.



Distribution in North America:

Native from coastal New York, west to southern Indiana, and south to Alabama and Georgia.

Virginia pine is intolerant of shade, has a moderate growth rate, and is a hard pine. It grows to a height of 40 to 60 feet, and attains a diameter of 1 to 1.5 feet. Virginia pine is often grown for Christmas trees in the southern states. A good identification feature of this species is the abundance of cones present, even persisting on dead branches. The crown may become flat topped if grown in the open. Virginia pine is susceptible to wind throw in exposed locations.

Lodgepole pine
Pinus contorta
 Pinaceae

Needles:

2 / fascicle; 1" to 3" long, twisted, dark green in color. Needles remain on the tree for three years or more.¹

Cones:

¾" to 2", variably serotinous. A stiff prickle is present at the ends of scales.²

Twigs:

Moderately stout, orangish brown.³

Buds:

2/5", oval, somewhat resinous, brownish in color.⁴

Bark:

Black to light brown, and scaly.⁵

Distribution in North America:

Native to western North America.⁶



Lodgepole pine is intolerant of shade, has a slow growth rate, and is a hard pine. Regeneration of this species is very dependent on fire. Composed of three to four subspecies. The subspecies *Latifolia* reaches a height of 75 to 80 feet, and a diameter of 1 to 3 feet. Once used by Native Americans for dwelling poles.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_contorta

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_contorta_28290.JPG

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_contorta_28290.JPG

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_contorta_37659.JPG

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_contorta_28263.JPG

6: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_contorta

7: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_contorta

Jack pine
Pinus banksiana
Pinaceae

Needles:

$\frac{3}{4}$ " to 1 $\frac{1}{2}$ ", 2 / fascicle, frequently twisted, olive green in color. Needles persist for 2 to 3 years.¹



Cones:

1 $\frac{1}{2}$ " to 2" long, sessile, light brown, serotinous and strongly asymmetrical.²

Twigs:

Slender, flexible, and dark purple in color.³



Buds:

1/8" to 1/4" long, resinous, and dark brown in color.⁴

Bark:

Thin, brown or gray and scaly.⁵

Distribution in North America:

Native from near the Arctic Circle, south to the northern areas of New York and Minnesota.⁶



7

Jack pine is very intolerant of shade, has a rapid growth rate, and is a hard pine. It grows 70 to 80 feet tall, and reaches a diameter of 1 to 1.5 feet. It typically grows in poor soils and has a rather ragged appearance. It grows the farthest north of any North American pine species.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_banksiana_pollen_cones.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_banksiana_cones.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_banksiana_cones.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_banksiana_foliagecone.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_banksiana

6: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_banksiana

7: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_banksiana

Ponderosa pine
Pinus ponderosa
Pinaceae

Needles:

5" to 11", 3 or 2/fascicle, flexible, can be dark or yellowish green in color.



Cones:

3" to 6" long, ovoid to ellipsoid, sessile, solitary or clustered. Stiff prickle present at the ends of scales.



Twigs:

Stout, turpentine odor, glabrous. Orange-brown at first, but become almost black at maturity.

Buds:

4/5" long, covered with resin, reddish brown.



Bark:

Orange with black lining the crevasses. A pleasant, sweet smell reminiscent of baking cookies.

Distribution in North America:

Native from British Columbia to Mexico, east to South Dakota and Texas.¹

Ponderosa pine is intolerant of shade, has a rapid growth rate, and is a hard pine. It grows to a height of 150 to 180 feet, and attains a diameter of 3 to 4 feet. It typically has an open crown. Ponderosa pine is an important timber tree in the western United States. Ponderosa pine will grow on very different sites, from poor to excellent.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_ponderosa

Jeffery pine
Pinus jeffreyi
 Pinaceae

Needles:

5" to 10" long, 2 or 3 / fascicle; twisted, blue-green. Needles often persist up to nine years on branches.¹

Cones:

5" to 15" long, ovoid, chestnut brown. Prickles present on scales.²

Twigs:

Brown, tinged with purple, stout.³

Buds:

1", light brown, oval, ends of scales fringed.⁴

Bark:

Dark cinnamon red in color, with elongated plates. Has vanilla like odor.⁵

Distribution in North America:

Native from southern Oregon to southern California.⁶



7

Jeffery pine is Intolerant of shade, has a moderate growth rate, and is a hard pine. It can grow 90 to 100 feet in height on a good site. It is typically smaller in size than Ponderosa pine, and grows at higher elevations. Due to the long persisting needles, the tree often has a more dense crown than Ponderosa pine. Will tolerate climate extremes.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_jeffreyi_cones_BigBearLake.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_jeffreyi

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_jeffreyi_BLM1.jpg

4: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Jeffneedles.jpg>

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_jeffreyi_TahoeNV.jpg

6: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_jeffreyi

7: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_jeffreyi

Grey pine, Digger pine*Pinus sabiniana*

Pinaceae

Needles:3/fascicle; 8" to 12" long, gray-green; stiff.¹**Cones:**5–14" long, heavy, reddish brown scales. Scales end in a triangular shaped claw.²**Twigs:**Moderately stout, rough, grey in color.³**Buds:**

2/5", resinous, brown, oval.

Bark:Dark brown, scaly.⁴**Distribution in North America:**

Native to California, common along west slopes of the Sierra Nevada.



5

Digger pine is intolerant of shade, has a slow growth rate, and is a hard pine. It grows 40 to 60 feet in height, and attains a diameter of 1 to 2 feet. It is common for Digger pine to have a forked trunk. The seeds of Digger pine were once part of the Native American's diet.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_sabineana_00059.JPG

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_sabineana_00059.JPG

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_sabineana_00059.JPG

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_sabiniana

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_sabiniana_SacramentoValley.jpg

Monterey pine
Pinus radiata
Pinaceae

Needles:

3/fascicle (occasionally 2) 3–6" long; dark green; slender, flexible.¹

Cones:

3" to 7" long, extremely asymmetrical, serotinous. Light brown in color, small prickle present at ends of scales.²

Twigs:

Slender, greyish, and rough.³

Buds:

2/5", reddish brown, resinous,

Bark:

Fissured and brown to black in color.

Distribution in North America:

Native to central, coastal California.⁴



Monterey pine is intermediate in shade tolerance, has a rapid growth rate, and is a hard pine. It grows 40 to 100 feet in height, and reaches a diameter of 1 to 3 feet. It has a dense crown. In its native range, the tree is of little commercial value. However, it is used extensively in other locations such as New Zealand and Australia where it is grown in plantations to produce timber.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_radiata_leaves.JPG

2: Photo courtesy of http://commons.wikimedia.org/wiki/Pinus_radiata

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_radiata_fruit.JPG

4: Image courtesy of http://commons.wikimedia.org/wiki/Pinus_radiata

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pinus_radiata_BigSur.jpg

Eastern larch, Tamarack

Larix laricina

Pinaceae

Needles:

$\frac{3}{4}$ to $1\frac{1}{2}$ ", blue green, 3-angled, flat, and deciduous. Fall color is yellow.¹

Cones:

Oblong, upright, bracts shorter than scales; $\frac{1}{2}$ – $\frac{3}{4}$ ".²

**Twigs:**

Glabrous, thin, yellowish brown to reddish brown in color. Small spur shoots abundant along twigs.³

**Buds:**

Globose, dark red, somewhat resinous.⁴

**Distribution in North America:**

Native to northern North America from the Arctic Circle, south to the northern areas of Minnesota, Pennsylvania, and Illinois.

6

Eastern larch is intolerant of shade, and has a rapid growth rate. It grows 40 to 80 feet in height and reaches a diameter of 1 to 2 feet. Often grows on cold, poorly drained sites. It does not perform well on dry, hot sites.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_laricina_Volo_Bog_2.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_laricina_cones_Cormac_Ontario.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_laricina_Volo_Bog_2.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_laricina_cones_Cormac_Ontario.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_laricina_bark.jpg

6: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_laricina_Volo_Bog_1.jpg

Western larch
Larix occidentalis
Pinaceae

Needles:

1" to 1 $\frac{3}{4}$ ", green, 3-angled, deciduous.

Cones:

Oblong, 1" – 1 $\frac{1}{2}$ ", purplish to reddish brown, typically wider than long.¹

Twigs:

Orange brown in color, slender. Small spur-like shoots abundant.

Buds:

Dark brown and typically pubescent.

Bark:

Reddish-brown to cinnamon red, scaly, up to 6" thick.²

Distribution in North America:

Native to the northwestern United States, and southwestern Canada.



Western larch is intolerant of shade and has a rapid growth rate. It grows up to 150 feet tall and attains a diameter of 3 to 4 feet. It grows best on moist slopes, but will tolerate dry sites as well. It is an important timber tree.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_occidentalis_leaves_cones.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_occidentalis_trees_Okanogan.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Larix_occidentalis_16822.JPG

Red spruce
Picea rubens
Pinaceae

Needles:

½ to 5/8", 4-sided, shiny yellow-green, persisting around 5 years.



Cones:

1 ¼ unto 2", ovoid, chestnut brown. Scales are stiff, round in shape, and have entire margins.



Twigs:

Pubescent, orangish brown in color, peg-like projections present where needles attach.



Buds:

1/3" long and reddish brown in color.



Bark:

¼ to ½" thick, reddish-brown to gray scales.



Distribution in North America:

Native to eastern North America from Nova Scotia, south to high-elevation area of North Carolina.¹



Red spruce is very tolerant of shade and has a slow growth rate. It typically grows 60 to 70 feet in height, and reaches a diameter of 1 to 2 feet. It can reach up to 120 feet in height however. It grows best in swamps and bogs to well-drained flats. It prefers acidic soils. It does not perform well in areas having hot summers. In the southern portion of its range, it occurs naturally at high elevations only.

¹: Image obtained from http://commons.wikimedia.org/wiki/Picea_rubens

Black spruce
Picea mariana
 Pinaceae

Needles:

$\frac{1}{4}$ to $\frac{1}{2}$ ", 4-sided, blue-green, glaucous.¹

**Cones:**

$\frac{3}{4}$ to $1\frac{1}{2}$ " long, ovoid, purplish to brown. Scales are round, cones may persist on the tree for many years.²

**Twigs:**

Pubescent, covered with peg-like projections where needles attach, yellow-brown to grey in color.³

**Buds:**

Short, pubescent, reddish brown in color.⁴

**Distribution in North America:**

Native from eastern Canada, west to Alaska, south to Wisconsin and the mountains of Virginia.⁶

Black spruce is tolerant of shade and has a slow growth rate. It typically grows to a height of 30 to 40 feet, and attains a diameter of about a foot. Black spruce grows in areas with cold climates and does not tolerate heat well. It is often associated with permafrost. Black spruce is generally short lived.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_mariana_cones_Yukon2.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_mariana_cones_Yukon2.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_mariana_cones_Yukon2.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_mariana_cones_Yukon2.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_mariana_Populus_tremuloides_Yukon.jpg

6: Image courtesy of http://commons.wikimedia.org/wiki/Picea_mariana

White spruce
Picea glauca
Pinaceae

Needles:

1/3 to 3/4", 4-sided, glaucous, and green to bluish green in color. Typically they are crowded on the upperside of twigs and persist for several years.



Cones:

1 1/2 to 2 1/2" narrowly oblong, light brown.



Twigs:

Glabrous, light brown in color, slender, and may be glaucous.



Buds:

1/4" long, non-resinous, and chestnut brown in color.

Bark:

Thin, ash-brown, scaly.



Distribution in North America:

Native from eastern Canada to Alaska, and as far south as Montana, Minnesota, and New York.¹

White spruce is tolerant of shade, and has a moderate growth rate. It grows to a height of 40 to 70 feet and attains a diameter of 2 feet. It generally attains a spire-like crown and is more tolerant of heat than Black spruce and Red spruce. The commonly planted Dwarf Alberta spruce is actually a cultivar of White spruce.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Picea_glaucoides

Sitka spruce
Picea sitchensis
 Pinaceae

Needles:

½ to 1 1/8", yellow-green above, glaucous below, very sharp, and flat. They are often almost silver colored.¹

**Cones:**

2–4" long, ovoid-oblong, thin.²

**Twigs:**

Not hairy, moderately stout, light brown, peg-like projections where needles attach.³

**Buds:**

5/16", brownish, rounded.⁴

Bark:

Thin, silvery gray to purplish-gray scales.⁵

Distribution in North America:

Native along the west coast, from southern Alaska, south to northern California.⁶



7

Sitka spruce is tolerant of shade and has a rapid growth rate. It grows to a height of 150 to 200 feet and attains a diameter of 3 to 6 feet. It is the largest of all *Picea*. The crown is typically composed of drooping branches. Sitka spruce grows at lower elevations. It generally has a very long life span.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_sitchensis_Wild_Pacific_Trail,_Ucluelet_4.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/Picea_sitchensis

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Sitka_Spruce.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_sitchensis_5714.JPG

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_sitchensis_Tolovana_Park_Oregon.jpg

6: Image courtesy of http://commons.wikimedia.org/wiki/Picea_sitchensis

7: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_sitchensis_Wild_Pacific_Trail,_Ucluelet_1.jpg

Engelmann spruce
Picea engelmannii
Pinaceae

Needles:

1 to 1 1/8", blue-green, rank odor, 4-sided, and prickly.¹



Cones:

1 to 2 1/2" long, ovoid-oblong, thin scales, wedge-shaped, and light brown to red-brown in color.²



Twigs:

Pubescent, moderately stout, yellowish brown.³



Buds:

3/16", rounded, brownish in color.⁴

Bark:

Very thin, loose purplish-brown scales.⁵



Distribution in North America:

Native from southwestern Canada, south to Arizona and New Mexico.⁶

Engelmann spruce is tolerant of shade and has a rapid growth rate. It reaches a height of 100 to 125 feet and a diameter of 1 to 3 feet. It grows best on moist, deep soils. Engelmann spruce is an important timber tree.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:EngelmannSpruce_7777.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_engelmannii_UGA2.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_engelmannii_foliage.JPG

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:EngelmannSpruce_7777.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_engelmannii_HyasLake.jpg

6: Image courtesy of http://commons.wikimedia.org/wiki/Picea_engelmannii

7: Photo courtesy of http://commons.wikimedia.org/wiki/File:Picea_engelmannii.jpg

Colorado blue spruce

Picea pungens

Pinaceae

Needles:

Dull green to blue-green; glaucous; sharp, pungent smell. Needles prevalent on both upper and lower surfaces of twigs.

**Cones:**

3" long, slender cylindrical. Brown in color with violet bloom.

**Twigs:**

Glabrous, stout, yellowish to orange in color.

**Buds:**

Yellow to orangish brown, scales reflexed at apex, non-resinous.

Bark:

Thin, ash-brown, scaly.

Distribution in North America:

Native to the south and central areas of the Rocky Mountains and planted extensively in the eastern United States for ornamental purposes.¹



Colorado spruce is tolerant of shade and has a moderate growth rate. It grows to a height of 80 to 100 feet, and reaches a diameter of 1 to 2 feet. Colorado spruce is quite susceptible to *Cytospora* canker which often kills off the lower branches. Considering the many alternatives, and its susceptibility to disease, it is much over planted in the eastern United States.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Picea_pungens

Balsam fir
Abies balsamea
Pinaceae

Needles:

Flattened needles, $\frac{3}{4}$ " long, shiny dark green above and silvery-blue below. A groove is present on the upper surface. Citrus like odor present when crushed.



Cones:

Resinous, upright, 2 to 3 1/2 inches long, oblong to cylindrical, green with purple tinge, with bracts shorter than the scales. Scales fall off at maturity.¹



Twigs:

Smooth, slender, and grey in color.



Buds:

1/8" to 1/4", reddish-brown and resin covered.²

Bark:

Shiny silvery gray-brown, smooth except for numerous, raised resin blisters; $\frac{1}{2}$ " thick.

Distribution in North America:

Native from eastern Canada to Alberta, south to Pennsylvania.³



Balsam fir is tolerant of shade and has a rapid growth rate. It grows to a height of 40 to 60 feet and reaches a diameter of 1 to 1.5 feet. It grows best on moist sites. Unlike *Picea*, twigs lack peg-like projections where needles attach. Bark may become broken into scaly plates on older trees. Balsam fir does not tolerate heat well and thus is limited to higher elevations in the southern portion of its range.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Abies_balsamea

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_balsamea_branch.jpg

3: Image courtesy of http://commons.wikimedia.org/wiki/wiki/Abies_balsamea

Red fir, Silvertip fir
Abies magnifica
 Pinaceae

Needles:

$\frac{3}{4}$ " – 1 $\frac{1}{4}$ ", silvery-blue to dark blue-green.¹

Cones:

6" to 9", upright, purplish brown, bracts shorter than the scales. Scales fall at maturity.²

Twigs:

Light brown in color. Peg-like projections absent.³

Buds:

Small, oval, dark brown in color.

Bark:

Smooth, chalky on young stems; thick and deeply furrowed, reddish brown on old trees.⁴

Distribution in North America:

Native to southern Oregon, and California.⁵



Red fir is moderately shade-tolerant and has a slow growth rate. It grows to a height of 100 to 150 feet and attains a diameter of 2 to 4 feet. It grows best on moist, but well-drained sites. The variety, Shasta red fir has cones with scales which are longer than the scales. It typically has a spire like crown.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_magnifica_8009.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/Abies_magnifica

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_magnifica_8009.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_magnifica_Tahoe1.jpg

5: Image courtesy of http://commons.wikimedia.org/wiki/Abies_magnifica

6: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_magnifica

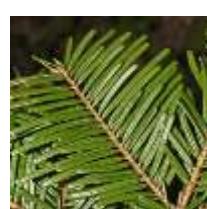
Grand fir
Abies grandis
 Pinaceae

Needles:

$\frac{1}{2}$ " to 2", yellow-green above, silvery below, 2-ranked, flat, notched at the end.¹

**Cones:**

2 $\frac{1}{2}$ ' to 4 $\frac{1}{4}$ ", upright; yellowish green to greenish purple, bracts shorter than scales. Scales fall at maturity.²

**Twigs:**

Slender, brown. Peg-like projections absent.³

**Buds:**

Rounded, resinous, purple to brown in color.⁴

Bark:

Young trees smooth, gray-brown with resin blisters; reddish brown plates on older trees.⁵



7

Distribution in North America:

Native to the northwestern United States and southwestern Canada.⁶

Grand fir is tolerant of shade and has a rapid growth rate. It grows to 125 to 150 feet in height and reaches a diameter of 2 to 4 feet. The crown of older trees is typically rounded in shape.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_grandis_5359.JPG

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_grandis_cones.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_grandis

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_grandis_01248.JPG

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_grandis_oldtrees.jpg

6: Image courtesy of http://commons.wikimedia.org/wiki/Abies_grandis

7: Photo courtesy of http://commons.wikimedia.org/wiki/Abies_grandis

Noble fir
Abies procera
 Pinaceae

Needles:

1" to 1½"; blue-green, 4-angled on upper branches and flat on lower branches.¹



Cones:

4" to 6", upright; 1 ¾" to 2 ¼" diameters; olive-brown to purple. Bracts are long.²



Twigs:

Slender, reddish brown, finely pubescent.³



Buds:

Rounded in shape, with long scales surrounding the base; resinous.⁴



Bark:

1" to 2" thick, gray, smooth with resin blisters, becoming plated with age.⁵



Distribution in North America:

Native from Washington, south to California; the Cascade Mountains in Washington and Oregon and the Siskiyou Mountains of California.⁶



7

Noble fir is tolerant of shade and has a moderately rapid growth rate. It grows to a height of 100 to 150 feet and attains a diameter of 3 to 5 feet. The twigs lack peg-like projections. It grows best on moist sites with a deep soil. Noble fir typically develops a dome-like crown.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_procera_foliage_PAN_1.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_procera_cone.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_procera_foliage_PAN_1.jpg

4: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Abies-procera-needles.JPG>

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_procera_foliage_Rainier.jpg

6: Image courtesy of http://commons.wikimedia.org/wiki/Abies_procera

7: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_procera

White fir
Abies concolor
Pinaceae

Needles:

2" to 3"; silvery-blue to silvery-green, extend at right angles from all sides of stem, flat.

**Cones:**

3" to 5", upright; oblong; olive green to purple.
Bracts are shorter than the scales.

**Twigs:**

Moderately stout, grey in color.

**Buds:**

Brown in color, large, and covered in resin.

**Distribution in North America:**

Native from California, east to Colorado and New Mexico.



White fir is tolerant of shade, and has a slow growth rate. It generally grows to a height of 125 to 150 feet and attains a diameter of 2 to 4 feet. It typically develops a dome shaped crown. White fir will tolerate drier soils than other firs. It is used as an ornamental and is sometimes seen in landscape plantings in the eastern U.S. It is also grown for Christmas trees.

Subalpine fir
Abies lasiocarpa
Pinaceae

Needles:

1" to 1 $\frac{3}{4}$ "; pale blue-green, strongly aromatic, somewhat grooved above.¹

Cones:

2 $\frac{1}{4}$ " to 4", cylindrical, purplish-gray to black; immature cones upright. Bracts are shorter than scales.²

Twigs:

Smooth, stout, greyish brown in color.³

Buds:

Small, resinous, rounded, brown

Bark:

Smooth, highly resinous. Grey to whitish in color.⁴

Distribution in North America:

Native to Alaska, south to Utah and New Mexico.⁵



Subalpine fir is tolerant of shade and has a slow growth rate. It reaches 40 to 100 feet in height and grows to 1 to 2 feet in diameter. Subalpine fir develops a characteristic spire-like crown. Subalpine firs are not well adapted to heat. They are however, quite tolerant of cold and grow at high altitudes to the timberline.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_lasiocarpa_28161.JPG

2: Photo courtesy of http://commons.wikimedia.org/wiki/Abies_lasiocarpa

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Abies_lasiocarpa_15849.JPG

4: Photo courtesy of http://commons.wikimedia.org/wiki/Abies_lasiocarpa

5: Image courtesy of http://commons.wikimedia.org/wiki/Abies_lasiocarpa

6: Photo courtesy of http://commons.wikimedia.org/wiki/File:SubalpineFir_7458.jpg

Douglas-fir
Pseudotsuga menziesii
Pinaceae

Needles:

$\frac{3}{4}$ " to 1 $\frac{1}{4}$ "; yellow-green, flattened, extending from all sides of twig, a shiny green color.

**Cones:**

3" to 4"; pendent, ovoid-cylindrical, three-pronged bracts are longer than the scales.

**Twigs:**

New twigs pubescent. Older twigs almost glabrous and greyish brown in color.

**Buds:**

$\frac{1}{4}$ " to 1/3" long, pointed at the ends, brown in color, and resinous at the base.

Bark:

6" to 24" on old trees; reddish-brown ridges.

Distribution in North America:

Native to the Rocky Mountains and along the Pacific Coast.¹



Douglas-fir is intermediate in shade-tolerance and has a rapid growth rate. It can grow up to 250 feet in height on good sites and can attain a diameter of 2 to 3 feet. It is the largest sized tree in the Pacific Northwest and is an important timber tree. It is also commonly grown for Christmas trees. Douglas-firs which grow in the inland regions, are sometimes considered as a separate species from those which grow along the Pacific Coast. Douglas-fir is sometimes planted in the eastern U.S. as an ornamental.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Pseudotsuga_menziesii

Eastern hemlock
Tsuga canadensis
Pinaceae

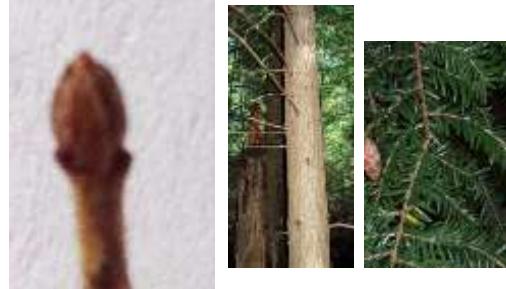
Needles:

1/3" to 2/3", dark green in color, flattened, with 2 white lines of stomata on the undersides. Needles have a short stem present.



Cones:

½" to ¾", oblong-ovoid, pendant, brown in color, with a short stem.



Twigs:

Greyish brown in color and slender; hairy when young.

Buds:

Very small, light brown in color, hairy.



Bark:

Flakey on young trees, deeply furrowed on old trees; reddish brown.

Distribution in North America:

Native from Minnesota to Nova Scotia, south along the Appalachian Mountains to Alabama.¹

Eastern hemlock is very tolerant of shade and has a slow growth rate. It generally grows to a height of 60 to 90 feet, and attains a diameter of 1 to 3 feet. The crown is often dense. Eastern hemlock can be identified by its drooping terminal leader. Often planted as an ornamental and can be trimmed into a hedge. Currently, it is threatened by the Hemlock woolly adelgid, a small insect that sucks sap from the twigs, needles, etc. Eastern hemlock prefers moist, cool sites, but will tolerate fairly warm, dry sites as well.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Tsuga_canadensis

Western hemlock
Tsuga heterophylla
 Pinaceae

Needles:

¼ to ¾", flattened, shiny green, 2 poorly defined rows of stomata on the undersides.¹



Cones:

¾ to 1", ovoid, light brown in color, no stem present.²



Twigs:

Reddish brown in color, and pubescent for up to 6 years.³



Buds:

Very small, oval, greyish brown.⁴



Bark:

Thin; deep, narrow fissure, dark red inner bark, outer bark is reddish brown.⁵

Distribution in North America:

Native from southern Alaska, south to northern California and northern Idaho.

6

Western hemlock is tolerant of shade and has a rapid growth rate. It grows to a height of 125 to 175 feet and reaches 2 to 5 feet in diameter. It is readily distinguished by its pendulous branchlet tips. Timber of Western hemlock is sold as hem/fir.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:WesternHemlock_7522.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/Tsuga_heterophylla

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Tsuga_heterophylla_foliage_cones_Change_Creek.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Tsuga_heterophylla_foliage_cones_Change_Creek.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Tsuga_heterophylla_5087.JPG

6: Photo courtesy of http://commons.wikimedia.org/wiki/Tsuga_heterophylla

Redwood
Sequoia sempervirens
 Taxodiaceae

Needles:

$\frac{1}{2}$ " to 1" long, flat, spirally arranged, dark yellow-green, two whitish bands below; bases of needles extend down the twigs from where they are attached¹

**Cones:**

$\frac{3}{4}$ " to 1", ovoid, reddish brown, with 15 to 20 peltate scales.²



Twigs:
 Slender, green.³



Buds:
 Very small and scaly.⁴

Bark:
 Reddish brown to cinnamon red, deeply furrowed, fibrous on the surface.⁵

Distribution in North America:

Native to the west coast of the United States, from southern Oregon, south to California.⁶

7

Redwood is quite tolerant of shade and has a very rapid growth rate. It grows 200 to 275 feet tall, and attains a diameter of 8 to 10 feet. Some Redwoods have grown taller than 350 feet. They are currently the world's tallest trees. The leaves are long and flat on young trees and shaded shoots, and scale-like on shoots in full sun. Redwood has the ability to sprout from stumps, which is rare in conifers. Redwood is native to an area referred to as the fog belt, where they are a valuable asset for tourism.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Sequoia_sempervirens_foliage_Mendocino.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Sequoia_sempervirens_foliage_cones_Mount_Tamalpais_1.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Sequoia_sempervirens_needles_by_Line1.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Sequoia_sempervirens1.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/Sequoia_sempervirens

6: Image courtesy of http://commons.wikimedia.org/wiki/Sequoia_sempervirens

7: Photo courtesy of http://commons.wikimedia.org/wiki/File:Coastal_redwood.jpg

Giant sequoia
Sequoiadendron giganteum
 Taxodiaceae

Needles:

$\frac{1}{2}$ " on leaders; $\frac{1}{4}$ " on lower branches, bluish green in color, awl-like in shape, but lance-shaped at the ends of branches.¹

**Cones:**

2"-3 $\frac{1}{2}$ "; ovoid with peltate scales, and persist for several years.²

**Twigs:**

Slender, green in color.³

**Buds:**

Very small, scaly.⁴

Bark:

12" to 24" thick; cinnamon red, fibrous and furrowed.⁵

**Distribution in North America:**

Native to the west side of the Sierra Nevada Mountains in California.⁶

7

Giant sequoia is very tolerant of shade and has a very rapid growth rate. It reaches a height of 250 to 300 feet and a diameter of 10 to 15 feet. Giant sequoia is the world's largest tree in terms of diameter. The General Sherman Tree is 272 feet in height and has an average basal diameter of 30.7 feet. It grows naturally in a few groves in the Sierra Nevada. The cones have between 24 and 40 scales. Giant sequoia is an important source of Tourism and may live longer than 4,000 years.

1: Photo courtesy of [http://commons.wikimedia.org/wiki/File:Daniel_Fuchs.CC-BY-SA.Sequoia](http://commons.wikimedia.org/wiki/File:Daniel_Fuchs.CC-BY-SA.Sequoiadendron_giganteum.jpg)ndron_giganteum.jpg

2: Photo courtesy of [http://commons.wikimedia.org/wiki/Sequoia](http://commons.wikimedia.org/wiki/Sequoiadendron_giganteum)ndron_giganteum

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:S_giga_cone.JPG

4: Photo courtesy of [http://commons.wikimedia.org/wiki/File:Sequoia](http://commons.wikimedia.org/wiki/File:Sequoiadendron_giganteum_Marburg_002.jpg)ndron_giganteum_Marburg_002.jpg

5: Photo courtesy of [http://commons.wikimedia.org/wiki/Sequoia](http://commons.wikimedia.org/wiki/Sequoiadendron_giganteum)ndron_giganteum

6: Image courtesy of [http://commons.wikimedia.org/wiki/Sequoia](http://commons.wikimedia.org/wiki/Sequoiadendron_giganteum)ndron_giganteum

7: Photo courtesy of [http://commons.wikimedia.org/wiki/Sequoia](http://commons.wikimedia.org/wiki/Sequoiadendron_giganteum)ndron_giganteum

Baldcypress
Taxodium distichum
Taxodiaceae

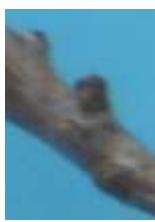
Needles:

Deciduous; $\frac{1}{2}$ " to $\frac{3}{4}$ "; two-ranked; yellow-green in summer, turning copper colored in the fall.



Cones:

$\frac{3}{4}$ " to 1"; subglobose, rugose, with a wrinkled surface.



Twigs:

Reddish brown in color, and slender.



Buds:

1/16" to 1/8" in length, greyish brown in color, and rounded in shape.

Bark:

Fibrous, scaly, reddish brown to ashy-gray.

Distribution in North America:

Native from Delaware, south to Florida, and west to southern Illinois. Primarily in the Coastal Plain.

Baldcypress is intermediate in shade-tolerance and has a slow growth rate. It reaches a height of 100 to 125 feet and attains a diameter of 3 to 5 feet. It generally grows in swamps and near water. When growing near water, it will develop woody "knees". Cones mature in one growing season. Although often associated with the southeastern U.S., Baldcypress is often planted and grows quite well in locations much further north than its native range.

Northern whitecedar
Thuja occidentalis
Cupressaceae

Needles:

$\frac{1}{4}$ " long, yellow-green, scalelike, flattened; glandular beneath.



Cones:

1/3" to 1/2" long, erect, oblong, Brown in color, with 8 to 10 woody scales.



Twigs:

Reddish brown in color, green when young, flattened into fan-like sprays, slender.



Buds:

Very, very small, yellowish, scaly.



Distribution in North America:

Native to from Nova Scotia, west to Manitoba, south to Illinois and North Carolina.



1



Northern whitecedar is intermediate in shade-tolerance and has a slow growth rate. It generally grows to a height of 40 to 50 feet and reaches a diameter of 2 to 3 feet. It prefers to grow on limestone soils. The wood of Northern whitecedar is quite resistant to decay. Northern whitecedar is used heavily as an ornamental and many cultivars exist which often appear in landscapes. Many people are more familiar with how this species appears in landscapes, than how it does in its native forest habitat.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Thuja_occidentalis

Western redcedar

Thuja plicata

Cupressaceae

Needles:

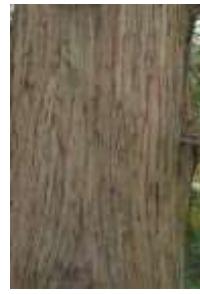
1/8" to 1/4" long, dark yellow-green, and scalelike. small branches are flattened and have a fernlike appearance.

**Cones:**

1/3" to 1/2", erect, oblong, brown in color, with 8 to 10 scales.¹

**Twigs:**

Small branches are flattened and have a fernlike appearance; twigs are reddish brown to grey, slender.

**Buds:**

Very small, scaly, yellowish in color.²

**Bark:**

Fibrous, splitting into vertical strips, reddish brown in color.

**Distribution in North America:**

Native from southern Alaska, south to California and Montana.



Western redcedar is very tolerant of shade and has a slow growth rate. It grows to a height of 150 to 200 feet and reaches a diameter of 3 to 8 feet. It is used as an ornamental and for timber. Its wood is resistant to decay and is quite durable. Many cultivars of this species exist. Western redcedar grows best on moist sites.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Thuja_plicata_43569.JPG

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Thuja_plicata_43570.JPG

Incense-cedar
Calocedrus decurrens
Cupressaceae

Needles:

1/8" to 1/2"; dark yellow-green, scalelike, glandular, in whorls of 4, aromatic.



Cones:

3/4 to 1 1/2", pendent, leathery, duck bill like in shape, brown in color, with 6 scales.¹



Twigs:

Branchlets appear in flat, vertical sprays.



Buds:

Very small, scaly.

Bark:

Gray-green when young; yellow-brown to cinnamon-red, fibrous; deeply furrowed with age.



Distribution in North America:

Native from Oregon, south to southern California.

Incense-cedar is tolerant of shade and has a slow growth rate. It reaches a height of 100 to 150 feet and attains a diameter of 3 to 4 feet. Crown is cone shaped when young, but becomes more rounded with age. Incense-cedar is an important source of pencil stock. It prefers to grow on moist, somewhat sheltered sites.

¹: Photo courtesy of http://commons.wikimedia.org/wiki/File:Calocedrus_decurrens_7947.jpg

Alaska cedar, Yellow cedar
Chamaecyparis nootkatensis
 Cupressaceae

Needles:

Scale-like; 1/16" to 1/8" long, closely appressed to the twigs, yellow-green in color.¹



Cones:

¼" to ½" long, reddish-brown, glaucous, with 4 to sometimes 6 scales.²



Twigs:

Rounded to quadrangular and pendulous, slender, green at first, turning yellowish brown, and finally brown with age.³



Buds:

Very small, scaly, and greenish yellow.⁴



Bark:

Fibrous, splitting into vertical strips.⁵



Distribution in North America:

Native from southern (coastal) Alaska, south to northern California. Also present from the Cascades to Oregon.



6

Alaska cedar is tolerant of shade and has a slow growth rate. It reaches a height of 70 to 100 feet and a diameter of 2 to 3 feet. Its pendulous branches give it a characteristic drooping appearance. Alaska cedar is an important timber species and its wood is used for cabinetry, interior and exterior finish, and furniture. The wood is yellow-brown in color. Needles lack whitish x markings on their undersides. Bark is grey in color. Alaska cedar is also planted as an ornamental.

1: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Chamaecyparisnootkatensis.jpg>

2: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Chamaecyparis-nootkatensis.JPG>

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Nootka_Cypress.jpg

4: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Chamaecyparisnootkatensis.jpg>

5: Photo courtesy of <http://commons.wikimedia.org/w/index.php?search=Chamaecyparis+nootkatensis&button=&title=Special%2ASearch>

6: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_nootkatensis_Pendula_20100926_140034.jpg

Port-Orford-cedar
Chamaecyparis lawsoniana
 Cupressaceae

Needles:

1/16", scalelike, yellow-green to blue-green with whitish x markings on the undersides.¹

**Cones:**

1/3" in diameter; reddish-brown; glaucous with 8 scales; Scales are wedge shaped.²

**Twigs:**

Appear in flat sprays, green at first, turning greyish brown, slender.³

**Buds:**

Very small, greenish in color.⁴

**Bark:**

Fibrous, splitting into vertical strips; 6–8" thick; silvery brown.⁵

**Distribution in North America:**

Native along the west coast of the U.S. from Oregon, south into northern California.

6

Port-Orford-cedar is tolerant of shade and has a moderate growth rate. It grows to a height of 140 to 180 feet and reaches a diameter of 4 to 6 feet. It is also called Lawson cypress. It is used for timber and is often planted for ornamental purposes. Crown is composed of slightly pendant branches.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_lawsoniana_002.JPG

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_lawsoniana5.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_lawsoniana_002.JPG

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_Lawsoniana_-_Stewartii_-_detail.jpg

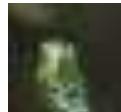
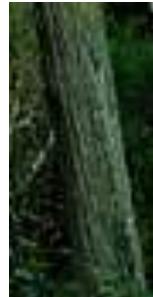
5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_lawsoniana_Dorena2.jpg

6: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_lawsoniana_Dorena2.jpg

Atlantic white-cedar
Chamaecyparis thyoides
Cupressaceae

Needles:

No longer than 1/8", dark blue-green, scalelike, whitish x markings present on the undersides.¹



Cones:

¼" in diameter; bluish-purple; glaucous, wrinkled and plump with 4 to sometimes 6 scales.²



Twigs:

Slender, not always flattened, green at first, becoming brown and smooth.³



Buds:

Very small and green.⁴

Bark:

Thin, ashy-gray to reddish-brown, shreddy.⁵

Distribution in North America:

Native along the Atlantic coast from Maine, south to Florida; Also along the Gulf Coast in Alabama and Mississippi.

Atlantic white-cedar is tolerant of shade and has a moderate growth rate. It generally grows to a height of 80 to 85 feet and reaches a diameter of 1 to 1.5 feet. It prefers to grow in fresh-water swamps near the coast. It is sometimes used as an ornamental and many cultivars exist. Its wood is quite durable.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_thyoides_detail.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_thyoides_detail.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_thyoides_GSRC2.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Chamaecyparis_thyoides_detail.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Lake_Atsion_4.jpg

6: Photo courtesy of http://commons.wikimedia.org/wiki/File:Lake_Atsion_4.jpg

Eastern redcedar
Juniperus virginiana
Cupressaceae

Needles:

1/16" (adult), 1/8" to 3/4" (juvenile), dark green, scalelike (adult) and needlelike (juvenile); fragrant.



Cones:

1/4 to 1/3" in diameter; pale green to dark blue; glaucous, fleshy and berrylike; dioecious.¹



Twigs:

Slender, green at first, becoming greyish brown and smooth with age.



Buds:

Very small, scaly, greenish yellow.

Bark:

Fibrous, 1/8 to 1/4" thick, light reddish brown.



Distribution in North America:

Native throughout the eastern U.S. and southern Ontario Canada.

Eastern redcedar is intolerant of shade and has a slow growth rate. It generally grows to a height of 40 to 50 feet and reaches a diameter of 1 to 2 feet. It prefers to grow on limestone soils, but will tolerate a fairly wide range of sites. Its aromatic, durable wood is used for furniture, interior finishing, and several other uses. It is also used as an ornamental.

¹: Photo courtesy of http://commons.wikimedia.org/wiki/File:Juniperus_virginiana_bERRIES.jpg

Pacific yew
Taxus brevifolia
 Pinaceae

Needles:

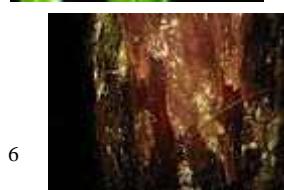
1", dark yellow-green to blue-green, pale below; Needles arranged spirally on the stem, but with the leaf bases twisted to align the leaves in two flat rows except on erect leading shoots.¹

**Fruit:**

Ovoid-oblong, green seed partially surrounded by a scarlet, fleshy aril.²

**Twigs:**

Green at first, becoming reddish brown.³

**Buds:**

Leaf buds are green, and very small.⁴

Distribution in North America:

Native along the Pacific Coast from southern Alaska, south to Monterey Bay; also grows on west facing slopes from eastern British Columbia, south into Idaho and Montana.

6

Pacific yew is tolerant of shade and has a very slow growth rate. It generally reaches a height of 20 to 40 feet and a diameter of 1 to 2 feet. Buds which develop into cones are larger and rounded. Young twigs are covered by the bases of leaves. It is not abundant in its native range. It grows on moist, rich sites. Pacific yew is a source of taxol, a chemical used in chemotherapy. It is also used as an ornamental.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:PacificYew_8538.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Taxus_brevifolia_Blue_Mts_WA.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Taxus_brevifolia1.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:PacificYew_8538.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/Taxus_brevifolia

6: Photo courtesy of http://commons.wikimedia.org/wiki/Taxus_brevifolia

Ginkgo, Yin xing

Ginkgo biloba

Ginkgoaceae

Leaves:

Deciduous, alternate, simple, flabellate (fan-shaped), 1"-2" long, 1 ½"-3" wide; one or more apical sinuses, glabrous.

Fruit:

Large, 1" diameter, dioecious; tan to yellowish in color, outer fleshy seed coat, foul odor when ripe.¹

Twigs:

Stout, brown to gray in color with stringy bark; Conspicuous spurs present along older twigs.

Buds:

Represent scaly buds, terminal bud present, leaf scars raised, half round with two bundle scar, brown in color.

Bark:

Grayish brown with ridges and darker furrows.

Distribution in North America:

Native to eastern China, but planted widely in North America as an ornamental.



Ginkgo is tolerant of shade and has a moderate growth rate. It reaches a height of 100 feet and a diameter of 3 feet. Because of the foul odor given off by the fruits, male trees are planted more frequently than female trees. A large white seed can be found inside the fruits. Leaves turn a clear yellow in the fall. Ginkgo develops a large spreading crown with age. Several cultivars exist which may appear in landscapes.

¹: Photo courtesy of http://commons.wikimedia.org/wiki/Ginkgo_biloba

Southern magnolia
Magnolia grandiflora
 Magnoliaceae

Leaves:

Alternate, 5" to 10" long, 2" to 3" wide, leathery, evergreen, bright green in color, smooth, very lustrous.¹



Flowers/Fruit:

Flowers are 6" to 9" in diameter with 6 to 12 white petals²; fruit is 3" – 8" long, an elongated aggregate of follicles, rusty, hairy; seeds are reddish orange in color.³



Twigs:

Rusty, hairy, and stout.⁴



Buds:

1/4" – 1 ½" pale to rusty, hairy; flower buds larger than leaf buds.⁵



Bark:

Light brown to gray, scaly.⁶

Distribution in North America:

Native from North Carolina, south to Florida, and west to Texas.

Southern magnolia is intolerant of shade and has a moderate growth rate. It reaches a height of 25 to 80 feet and a diameter of 2 to 3 feet. Its crown is typically pyramidal to rounded. Although often associated with only the southeastern United States, Southern magnolia will grow well in colder climates much further north than its native range. It is frequently used as an ornamental and many cultivars exist.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Magnolia_grandiflora_leaves_by_Line1.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/Magnolia_grandiflora

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Magnolia_grandiflora_BW_1.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Magnolia_grandiflora5.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Magnolia_grandiflora_fruits_and_seeds.JPG

6: Photo courtesy of http://commons.wikimedia.org/wiki/Magnolia_grandiflora

7: Photo courtesy of http://commons.wikimedia.org/wiki/Magnolia_grandiflora

Cucumber-tree
Magnolia acuminata
Magnoliaceae

Leaves:

Alternate, 6–10” long, yellow-green in color, broadly elliptical, entire; deciduous.



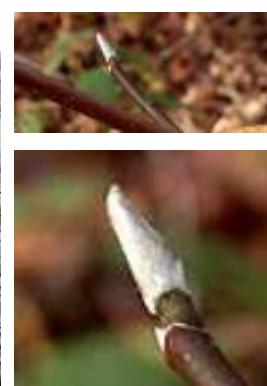
Flowers/Fruit:

Flowers are 1 to 2.5 inches long, with 3 sepals and 6 greenish yellow petals; fruit is 2 – 3” long, an aggregate of follicles, pinkish red in color, with red seeds.



Twigs:

Brown to red-brown, glabrous, with U-shaped leaf scars.



Buds:

1/4”–3/4” long, silvery-green and silky.

Bark:

Light brown with flakey ridges.

Distribution in North America:

Native from New York, south to Georgia, and westward to Illinois and eastern Oklahoma.

Cucumber-tree is intolerant of shade and has a moderately rapid growth rate. It grows 40 to 90 feet in height and attains a diameter of 3 to 4 feet. Leaves turn yellow to brown in the fall. It generally has a pyramidal shaped crown, but with age, becomes rounded and spreading. Flowers typically appear in the upper portions of the crown and are not showy. Cucumber-tree is used for timber which is sold as Yellow-poplar. Leaves, twigs, etc. emit a lemon-like odor when crushed.

Yellow-poplar, Tuliptree

Liriodendron tulipifera

Magnoliaceae

Leaves:

Alternate, 4–6" long, 4-lobed, entire margin, bright green in color, deciduous, turning a clear yellow in the fall.

**Flowers/Fruit:**

Flowers are tulip-shaped, 1.5" to 2.5" across, 2" to 3" high with 6 greenish yellow petals; fruit is 2 ½–3" long, erect, cone like aggregate of samaras; brown when mature.

**Twigs:**

Twigs moderately stout, reddish brown.

**Buds:**

Valvate, ½" long, duck-bill appearance, glabrous.

Bark:

Dark green to ash-gray with fissures, white spots on younger trees, inner bark aromatic.

**Distribution in North America:**

Native from Vermont, south to Florida, west to Wisconsin and Mississippi.

Yellow-poplar is intolerant of shade and has a rapid growth rate. It grows to a height of 80 to 150 feet and a diameter of 4 to 6 feet. Flowers appear in late spring; the greenish yellow petals have orange coloring at the bases. Crown is pyramidal and trunk is typically very straight. Yellow-poplar is one of the most important timber trees in the eastern United States. The wood is often reported as being weak and the tree, susceptible to breakage from storms, ice, etc. However, this characteristic seems variable throughout its large range.

Sassafras
Sassafras albidum
Lauraceae

Leaves:

Alternate, 4" to 6" long, varied shapes, mitten like with two, three, or no lobes, entire, elliptical; pleasant spicy odor, deciduous.



Flowers/Fruit:

Flowers are yellow to greenish-yellow, with five or six sepals¹; fruit is a blue drupe, 3/10" long.



Twigs:

Yellow-green in color.



Buds:

1/3" long, bright yellow green at first, turning reddish brown.

Bark:

Deeply furrowed, aromatic, orange-brown.

Distribution in North America:

Native from the New England states, west to Michigan, south to Texas and Florida.²

Sassafras is intolerant of shade and has a rapid growth rate. It reaches a height of 40 to 70 feet and a diameter of 2.5 to 3 feet. All parts of the plant emit a spicy odor when bruised, crushed, etc. Sassafras has a pyramidal shaped crown in youth, becoming irregular and flat-topped with age. Sassafras tea can be made from boiling the roots. Fall color can be red, orange, yellow, and all shades in between. Flowers are usually dioecious, with male and female flowers on separate trees. Sassafras often sprouts from the roots.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Sassafras_albidum

2: Image courtesy of http://commons.wikimedia.org/wiki/Sassafras_albidum

American sycamore
Platanus occidentalis
Platanaceae

Leaves:

Alternate, 5" to 8" long, palmately lobed (usually 5), blade wider than long, margin coarsely toothed, deciduous.



Twigs:

Zigzag, stout, yellow brown to orangish brown.



Buds:

1/4" to 3/8", smooth, nearly surrounded by leaf scar.



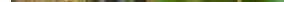
Bark:

Outer bark brown, exfoliating to expose white to light green smooth bark.



Distribution in North America:

Native from Maine, west to Minnesota, south to northeastern Mexico. and Florida.



American sycamore is intolerant of shade and has a rapid growth rate. It reaches a height of 100 to 170 feet, and a diameter of 3 to 10 feet. It typically has a pyramidal to cone shaped crown in youth, but becomes rounded, wide, and spreading with age. Fall color is usually a dull brown, but may be yellow. Twigs are smooth. Its wood, used for timber is heavy and hard. Often associated with wet conditions, it will perform well on a variety of sites. Due to its susceptibility to sycamore anthracnose, it may develop an excessive zigzag growth pattern.

Witch-hazel
Hamamelis virginiana
Hamamelidaceae

Leaves:

4" to 6" long, 2" to 3" wide, simple, alternate, dark green, with wavy, toothed margins; deciduous.

**Flowers/Fruit:**

Flowers are yellow, have 4 slender petals, and bloom late in fall; fruits are $\frac{1}{2}$ " long, a 2-beaked capsule, seeds expelled when dry.

**Twigs:**

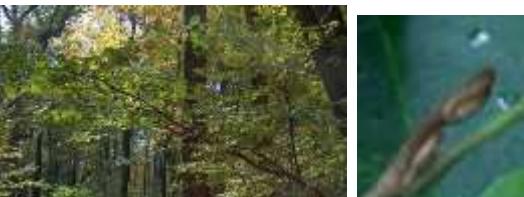
Twigs are brownish to grey, pubescent when young, becoming glabrous with age.

**Buds:**

$\frac{1}{4}$ " to $\frac{1}{2}$ " long, brown, naked, tomentose.

Bark:

Light brown, smooth, scaly, inner bark reddish purple.¹

**Distribution in North America:**

Native from southeastern Canada, south to Georgia, west to Texas and Minnesota.

Witch-hazel is tolerant of shade and has a slow growth rate. Witch-hazel is a shrub to small tree growing to a height of 15 to 30 feet, and a diameter of 6" to 12". It typically is composed of wide spreading branches, giving it a rather rounded to flat-topped crown. It grows best on moist sites near streams, but will tolerate dry upland sites as well. An extract, used in mildly astringent lotions, can be obtained from the leaves. Leaves turn yellow in the fall.

¹: Photo courtesy of http://commons.wikimedia.org/wiki/Hamamelis_virginiana

Sweetgum
Liquidambar styraciflua
Hamamelidaceae

Leaves:

5" to 7" long and wide, star-shaped, deeply palmate 5–7 lobed, margin finely serrate, alternate arrangement; deciduous.



Flowers/Fruit:

Flowers are greenish in color, not showy; fruit is 1 – 1 ½" diameter, a head of strongly beaked capsules, brown in color.



Twigs:

Shiny green to yellow-brown, aromatic, often have corky excrescences (wings).

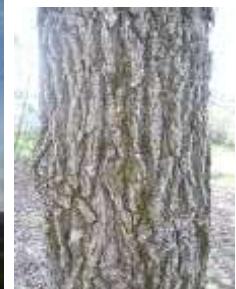


Buds:

¼" – ½" long with orange brown scales.

Bark:

Grayish-brown, deeply furrowed into narrow flakey ridges.



Distribution in North America:

Native from Connecticut, south to Florida, west to Texas and Illinois.

Sweetgum is intolerant of shade and has a rapid growth rate. It reaches a height of 80 to 120 feet and a diameter of 3 to 5 feet. Often associated with the southeastern U.S., it is the most commonly found species of tree in the Mississippi delta. It is used for timber, and is frequently planted as an ornamental. Fall color is various shades of yellow, orange, and red. It typically has a pyramidal shaped crown in youth, but becomes rounded and spreading with age.

American elm
Ulmus americana
Ulmaceae

Leaves:

4" – 6" long, alternate, oblong, coarsely doubly serrate, base unequal, pubescent below; deciduous.



Flowers/Fruit:

Flowers are reddish green in color and appear in late winter to early spring; fruit is ½" long, a samara, green at first, turning brownish matures in spring, margin of wing hairy.



Twigs:

Slender, zigzag, smooth, brown.



Buds:

¼" long, acute, chestnut brown, terminal is absent.

Bark:

Grayish flat topped ridges. In cross section alternating red and tan layers.

Distribution in North America:

Native southeastern Canada, south to Florida, west to the Rocky Mountains.

American elm is intermediate in shade-tolerance and has a rapid growth rate. It generally grows to a height of 80 to 100 feet and a diameter of 2 to 4 feet. Susceptible to Dutch elm disease. It is sometimes assumed that American elm is rare due to Dutch elm disease, however many trees exist due to most individuals surviving long enough to produce seeds for reproducing the species, and the development of resistant cultivars. Crown often becomes vase-like in shape. Leaves turn yellow to brown in the fall.

Slippery elm, Red elm*Ulmus rubra*

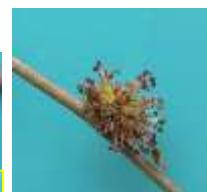
Ulmaceae

Leaves:

5" – 7" long, alternate, elliptical, coarsely double serrate, base unequal, surfaces very scabrous; deciduous.

**Flowers/Fruit:**

Flowers are brownish in color and appear in late winter to early spring; fruit is $\frac{3}{4}$ " across, a samara, greenish yellow, matures in spring with leaf opening, margin of wing smooth.

**Twigs:**

Stouter than American elm, ash gray to brown.

**Buds:**

$\frac{1}{4}$ " long, reddish to dark brown, terminal absent.

**Bark:**

Dark reddish-brown, scaly, uniform red inner bark color.

Distribution in North America:

Native from southeastern Canada, south to Florida, west to Texas and North Dakota.

Slippery elm is intermediate in shade-tolerance and has a rapid growth rate. It reaches a height of 60 to 80 feet and a diameter of 1 to 3 feet. It may develop a vase-like crown, but is often upright in form with a flat-topped or V-shaped crown. It is susceptible to the Dutch elm disease, but as with American elm, many individuals exist due to its ability to produce seed at a young age. Leaves may turn a dull yellow color in the fall, but often drop without any noticeable color. Its inner bark can be used in cough medicine.

Hackberry
Celtis occidentalis
Ulmaceae

Leaves:

2 $\frac{1}{2}$ –4" long, alternate, ovate, sharply serrate except near base, base unequal, undersurface scabrous (sandpaper like); deciduous.

**Flowers/Fruit:**

Flowers are small, greenish in color, not showy¹; fruit is 1/3" in diameter, dark purple to black drupe, maturing in the fall.²

Twigs:

Slender, zigzag, and reddish brown.

**Buds:**

Up to 1/4" long, small, sharp pointed, grey to brown in color.

Bark:

Grayish brown with corky warts or ridges.

Distribution in North America:

Native from southeastern Canada, south to Alabama, west to Oklahoma and North Dakota.³

Hackberry is intermediate in shade-tolerance, and has a moderate to fast growth rate. It generally reaches a height of 50 to 90 feet and a diameter of 1 to 2 feet. Leaves may turn yellow in the fall, but often drop without significant color change. Fruit often persists into the winter. Hackberry can be easily distinguished by its corky bark. Leaves often have galls present. Hackberry will grow on just about any site and tolerates wind, drought, and other stress well.

1: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Celtis-occidentalis-flower.jpg>

2: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Celtis-occidentalis-fruits.JPG>

3: Image courtesy of http://commons.wikimedia.org/wiki/Celtis_occidentalis

Red mulberry
Morus rubra
Moraceae

Leaves:

Alternate, 4" to 6" long, serrate, pubescent, varied form from no lobes to deeply lobed, not shiny; deciduous.¹



Flowers/Fruit:

Flowers are small, yellowish green, and appear in the spring; fruit is 1" to 1.5" long, oblong, red or purple, collection of small drupes, edible.²



Twigs:

Twigs have continuous pith, and are brown.



Buds:

¼ "long, shiny, greenish brown.

Bark:

Red-brown, scaly.

Distribution in North America:

Native from Vermont, south to Florida, west to Texas and South Dakota.

Red mulberry is tolerant of shade and has a moderate growth rate. It generally reaches a height of 50 to 70 feet and a diameter of 2 to 3 feet. It has a dense, rounded crown. Leaves turn yellow in the fall. It can be separated from White mulberry (*Morus alba*), by its leaves, which are not shiny. Red mulberry grows best on moist sites.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Morus_rubra
2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Mulberries_in_the_US.jpg

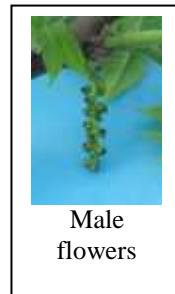
Black walnut
Juglans nigra
Juglandaceae

Leaves:

Alternate; 12" – 24" long, 15 to 23 nearly sessile leaflets, deciduous, terminal leaflet small or absent, petiole, rachis and surfaces variably hairy; deciduous, turning yellow in the fall.

**Flowers/Fruit:**

Flowers are monoecious; fruit is 1 ½" – 2", a nut, yellowish-green husk, edible seed is sweet.

**Twigs:**

Stout, grey to reddish brown.

**Buds:**

¼" to 1/3", short, blunt pubescent, grey in color.

**Bark:**

Dark brown; deep, narrow furrows, diamond-shaped pattern.

Distribution in North America:

Native from New England, south to Florida, west to Texas and South Dakota.

Black walnut is very intolerant of shade and has a moderate growth rate. It generally reaches a height of 70 to 100 feet and a diameter of 2 to 3 feet. The flowers are greenish in color, appear in spring, and are not showy; males appear in aments, and female flowers, in small spikes. Twigs have chambered pith. Black walnut is valued for its edible seeds and timber. Black walnut will grow on a variety of sites and produces a chemical called juglone which inhibits the growth of certain other species of plants.

Butternut
Juglans cinerea
Juglandaceae

Leaves:

15" to 30" long, alternate, 11 to 17 nearly sessile leaflets, deciduous; stout pubescent rachis; terminal leaf present.



Male flowers

Flowers/Fruit:

Flowers are monoecious; fruit is 1 ½" to 2 1/2", egg shaped, greenish bronze, thick husk. Very oily, edible seed.



Female flowers

Twigs:

Stout, greenish gray to reddish brown, with chambered pith.

**Buds:**

1/4" to ¾", gray brown, pubescent.

Bark:

Light gray, shallow to moderately deep furrows.

Distribution in North America:

Native from southeastern Canada, south to northern Georgia and Alabama, west to Arkansas and Minnesota.

Butternut is intolerant of shade and has a moderate growth rate. It generally reaches a height of 50 to 60 feet and a diameter of 1 to 2 feet. Butternut's flowers appear in the spring, with males appearing in aments, and the females, in spikes. Leaves may turn yellow in the fall, but often drop without noticeable coloration. Its wood is used for timber. Butternut is threatened in much of its range with a canker disease, *Sirococcus clavigignenti-juglandacearum*.

Pecan
Carya illinoensis
Juglandaceae

Leaves:

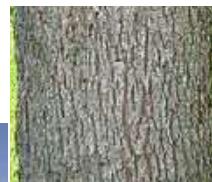
12" to 20" long, alternate, pinnately compound with 9 – 19 leaflets, serrate or doubly serrate, dark green in color; deciduous.¹



Male flowers

Flowers/Fruit:

Flowers are greenish and appear as catkins in the spring²; fruit is a nut, 1.5" to 2" long, in clusters of 3 – 12, ellipsoidal, dark brown husk with four winged sutures, maturing in autumn, edible.³



Twigs:

Moderately stout, reddish-brown, pubescent.⁴



Buds:

$\frac{1}{4}$ " – $\frac{1}{2}$ ", yellow-brown, hirsute, valvate.



7

Distribution in North America:

Native from Ohio, south to Louisiana, and west to Texas and Iowa.⁶

Pecan is tolerant of shade and has a slow growth rate. It grows quite large, reaching a height of 100 to 140 feet and a diameter of 2 to 4 feet. Leaves turn yellow in the fall. The Pecan is valued for its edible fruits and is a commercial crop in the southern United States. Many cultivars exist. Pecan commonly grows on moist sites near large streams and rivers. Pecan is cold hardy to Zone 5, but typically performs better in more southern areas. Pecan is a member of the pecan hickory group.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Carya_illinoiensis_foliage.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Carya_illinoiensis

3: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Carya_illinoiensis

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Carya_illinoiensis_foliagenuts.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Carya_illinoiensis

6: Image courtesy of http://commons.wikimedia.org/wiki/Category:Carya_illinoiensis

7: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Carya_illinoiensis

Bitternut hickory
Carya cordiformis
Juglandaceae

Leaves:

7" to 10" long, alternate, pinnately compound with 7 – 11 leaflets, serrate, glabrous above, light to dark green, terminal leaflets 2–3 times the length of the proximal leaflets; deciduous.

Flowers/Fruit:

Flowers are greenish catkins that appear in the spring; fruit is 1" long, a nut, winged along 4 sutures, bitter seed, maturing in the fall.

Twigs:

Moderately stout, greenish brown to gray-brown.

Buds:

1/3" to 3/4", valvate, mustard yellow, pubescent.

Bark:

Close and firm, grey in color.

Distribution in North America:

Native from southeastern Canada, south to Florida, and west to Texas and Minnesota.¹



Male flowers



Female flowers



Bitternut hickory is tolerant of shade and has a fairly rapid growth rate. It grows 60 to 70 feet in height and 1 to 3 feet in diameter. Leaves turn yellow in the fall. Fruits are edible, but taste very bitter, hence its common name. An excellent ID feature is the yellow buds. It develops a cylindrical crown with age. It generally grows on moist sites. Bitternut hickory is a member of the pecan hickory group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Carya_cordiformis

Shagbark hickory*Carya ovata*

Juglandaceae

Leaves:

10 – 14" long, alternate, pinnately compound with 5 leaflets, terminal leaflets 5–8" long, glabrous above, yellow-green to dark green; deciduous.

**Flowers/Fruit:**

Flowers are greenish colored catkins that appear in the spring; fruit is 1" to 2 ½" diameter, a nut, reddish brown to black husk, no wings on sutures, edible seed.¹

**Twigs:**

Stout, gray-brown to reddish brown, hairy.

**Buds:**

½–¾" long, 3 or 4 dark brown pubescent scales.

**Bark:**

Thin plates curving away from trunk, grey.

Distribution in North America:

Native from southeastern Canada, south to northern Georgia, and west to Texas and Iowa.²



Shagbark hickory is tolerant of shade and has a slow growth rate. It reaches a height of 70 to 90 feet and a diameter of 1 to 2 feet. Leaves turn yellow in the fall. The fruit matures in the fall. Shagbark hickory will tolerate a wide variety of growing conditions. The bark, with its shaggy appearance is a good identification feature. It is valued for its timber, and its fruit, although its fruit is much less important today than it was in times past. Shagbark hickory is a true hickory.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Hickory_nuts_6060.JPG

2: Image courtesy of http://commons.wikimedia.org/wiki/Category:Carya_ovata

Shellbark hickory
Carya laciniosa
Juglandaceae

Leaves:

15 – 22” long, alternate, pinnately compound with 5–9 leaflets (usually 7), yellowish green in color; hairy beneath, and on the rachis; deciduous.¹

Flowers/Fruit:

Flowers are greenish catkins that appear in the spring; fruit is 1 $\frac{3}{4}$ ” to 2 $\frac{1}{2}$ ” long, a nut with an orange to chestnut brown husk, edible, sweet seed; matures in the fall.

Flowers/Twigs:

Stout, orange-brown.

Buds:

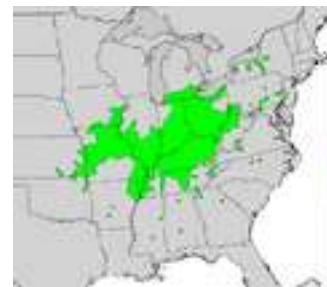
$\frac{3}{4}$ ” to 1” long, 6–8 dark brown loosely fitting scales.

Bark:

Scaly like Shagbark but straighter plates, grey.

Distribution in North America:

Native from New York, west to Kansas, and south to Mississippi and Georgia.²



Shellbark hickory is tolerant of shade and has a slow growth rate. It generally reaches a height of 80 to 100 feet and a diameter of 3 to 4 feet. Leaves turn yellowish brown in the fall. Shellbark hickory is similar to Shagbark hickory and the larger sized leaves of Shellbark hickory are a good way to distinguish between these two species. It prefers to grow on moist sites. Shellbark hickory is a member of the true hickories.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Carya_laciniosa
2: Image courtesy of http://commons.wikimedia.org/wiki/Category:Carya_laciniosa

Mockernut hickory*Carya tomentosa*

Juglandaceae

Leaves:

7 to 9 leaflets, alternate, 9–14" long, serrate, pubescent below, pubescent rachis, yellowish green in color; deciduous.

**Flowers/Fruit:**

Flowers appear in the spring as greenish colored catkins; fruit is 1 ½–2" long, a nut, dark red-brown husk, fragrant, containing an edible seed; matures in the fall.

**Flowers/Twigs:**

Stout, very pubescent, and reddish brown.

**Buds:**

½ to ¾" long, tomentose, outer scales deciduous.

**Distribution in North America:**

Native from Quebec, south to Florida, and west to Texas and Iowa.¹

Mockernut hickory is tolerant of shade and has a slow growth rate. It typically grows to a height of 70 to 90 feet and reaches a diameter of 2 feet. Leaves turn yellow in the fall.

Mockernut hickory has hard, heavy and strong wood and is used for timber. It is hardy and will tolerate a variety of growing conditions. The tomentose stems and leaves are a good ID feature of this species. It has an oval to rounded crown. Mockernut hickory will tolerate dry sites. Mockernut hickory is a true hickory.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Carya_tomentosa

Pignut hickory
Carya glabra
Juglandaceae

Leaves:

8" to 12" long, pinnately compound with 5 leaflets, dark green, hairless; deciduous.

Flowers/Fruit:

Flowers appear in greenish catkins in the spring; fruit is 1–2", a nut, slightly pear shaped, greenish brown, husk thin, with an edible seed; matures in the fall.

Twigs:

Twigs are slender, smooth, and reddish brown.

Buds:

To $\frac{1}{4}$ " to $\frac{1}{2}$ " long, glabrous, relatively slender.

Bark:

Grey, tightly woven into interlacing ridges.

Distribution in North America:

Native from Maine, south to Florida, and west to Illinois and Texas.¹



Pignut hickory is tolerant of shade and has a slow growth rate. It reaches a height of 50 to 75 feet and a diameter of 2 to 3 feet. The foliage turns yellow in the fall. The bark is almost smooth. Pignut hickory is used for timber and provides mast for wildlife. It often develops a narrow crown. Pignut hickory is tolerant of dry, upland sites. A good identification feature is the glabrous foliage and stems. Pignut hickory is a true hickory.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Carya_glabra

Water hickory
Carya aquatica
Juglandaceae

Leaves:

9" to 15" long, alternate, pinnately compound with 9 to 17 leaflets, each with serrated margins and a pointed apex; similar to pecan, deciduous.¹

Flowers/Fruit:

Flowers appear in the spring as catkins; fruit is 1" to 1.5", a nut, dark brown in color, with a four winged husk; seed is bitter, and not edible.



Twigs:

Somewhat slender, brownish, and lenticellate.

Buds:

¼" to ½", yellowish brown in color, valvate, and pubescent.



Bark:

Greyish brown, scaly, with reddish inner bark.

Distribution in North America:

Native from southern Virginia, south to Florida, west to Texas and Missouri.²

Water hickory is intermediate in shade tolerance and has a slow growth rate. It is similar to pecan. It reaches a height of 70 to 100 feet, and a diameter of 1 to 2 feet. Fall color is yellow. The fruit is conspicuously flattened once the husk splits away. Water hickory grows well in floodplains, and is quite tolerant of flooded sites. It is a member of the pecan hickories.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Carya_aquatica
2: Image Courtesy of http://commons.wikimedia.org/wiki/Category:Carya_aquatica

Nutmeg hickory
Carya myristiciformis
Juglandaceae

Leaves:

7 to 9 leaflets, 7 ½ to 14" long, alternate, pinnately compound with 7 to 9 leaflets, dark green in color above, lighter green to greyish and hairy beneath; stems hairy; deciduous.¹

Flowers/Fruit:

Flowers are greenish and appear in catkins in the spring; fruit is 1" to 1.5", a nut, yellowish brown, four winged, with a thin husk; seed edible.²

Twigs:

Twigs are slender and brown.

Buds:

To 1/5", valvate scales, yellow brown in color, oval to conical, with small, greyish spots.

Bark:

Thin, finely scaly, and reddish brown in color.³

Distribution in North America:

Native from South Carolina, south and west to Texas and northeastern Mexico.



Nutmeg hickory is tolerant of shade in the seedling and sapling stage, but mature trees are intolerant of shade. Its growth rate may be slow, but is somewhat unknown due to lack of study. Its leaves turn yellow in the fall. The fruit matures in the fall. Nutmeg hickory occurs in mostly scattered populations throughout its range. It prefers moist soils. Nutmeg hickory is a member of the pecan hickory group.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Carya_myristiciformis

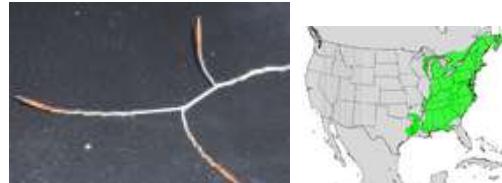
2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Carya_myristiciformis_USDA.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Carya_myristiciformis_USDA.jpg

American beech
Fagus grandifolia
Fagaceae

Leaves:

2 $\frac{1}{2}$ –6" long, alternate; elliptical; dark green, simple and sparsely-toothed; deciduous, turning yellow and brown in the fall.



Flowers/Fruit:

Flowers are greenish and monoecious; fruit is $\frac{1}{2}$ – $\frac{3}{4}$ " long, edible, a sharply-angled nut, with a three-winged, prickly husk.



Twigs:

Slender, narrow stipule scars encircling the twig.

Buds:

$\frac{3}{4}$ " – 1" long, slender, lance-shaped, brown, very sharp pointed.



Bark:

Thin, smooth, blue-grey.

Distribution in North America:

Native from southeastern Canada, south to northern Florida, and west to Wisconsin and Texas.¹

American beech is tolerant of shade, and has a slow to sometimes moderate growth rate. It reaches a height of 60 to 100 feet and a diameter of 2 to 3 feet. Leaves often persist into winter, especially towards the inner parts of the crown. These leaves are dead, and are typically a light brown in color. American beech generally grows on moist, undisturbed sites. Winter twigs have two rows of overlapping scales on the buds. American beech often develops large cavities with age due to its susceptibility to rot.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Fagus_grandifolia

American chestnut
Castanea dentata
Fagaceae

Leaves:

5 $\frac{1}{2}$ –8", alternate, dark green; oblong-lanceolate, coarsely and sharply serrate, with bristle-tipped teeth, glabrous, deciduous.



Flowers/Fruit:

Flowers are monoecious, cream colored and appear in catkins (staminate) in late spring –early summer; fruit is 2 – 2 $\frac{1}{2}$ " long, brown, husk covered with branched spines; each fruit contains 2 to three edible seeds.



Twigs:

Olive green to chestnut brown, glabrous.



Buds:

$\frac{1}{4}$ ", ovoid, brown 2–3 visible scales.



Bark:

Dark brown, shallowly fissured.



Distribution in North America:

Native from southern Maine, south to northern Georgia, and west to Alabama and Michigan.¹

American chestnut is intermediate in shade-tolerance and has a rapid growth rate. It once grew to a height of 120 feet and reached a diameter of up to 4 feet. However, currently, American chestnut rarely attains a height of more than 30 feet and a diameter greater than 8" to 10" due to the chestnut blight (*Cryphonectria parasitica*) which has reduced American chestnut to stump sprouts throughout its native range. Leaves turn yellow to brown in the fall. Twigs are lenticellate. Nuts make delicious and nutritious food.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Castanea_dentata

Tanoak*Lithocarpus densiflorus*

Fagaceae

Leaves:

2.8–5.9" long, alternate, dark green on upper surface, greyish and pubescent below, oblong, repand-dentate to entire; leathery and evergreen.¹



4

Flowers/Fruit:

Flowers are monoecious; fruit is 0.8" long, a bitter acorn with a shallow cap covered with hairy scales; brown in color.²

**Twigs:**

Pubescent, becoming reddish brown.³

Buds:

Greyish brown, in clusters at ends of twigs.

**Bark:**

Heavy rounded ridges separated by deep narrow fissures.

Distribution in North America:

Native along the Pacific Coast from southern Oregon to central California

Tanoak is tolerant of shade and has a moderate growth rate. It reaches a height of 60 to 100 feet and a diameter of 1 to 3 feet. The name refers to its tannin-rich bark used for tanning leather. The staminate flowers are cream colored, appear in catkins, and are similar to those of American chestnut. The twigs are glaucous. Tanoak generally has a pyramidal crown shape. Acorns mature in 2 years.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Lithocarpus_densiflorus_leaves1.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Lithocarpus_densiflorus

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Lithocarpus_densiflorus_leaves4.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Lithocarpus_densiflorus_dead2.jpg

White oak
Quercus alba
Fagaceae

Leaves:

5–9" long, alternate, very dark green above, paler below; oblong-obovate, 7–9 rounded lobes, margins of lobes entire, deciduous.

Flowers/Fruit:

Flowers are monoecious and greenish brown (staminate in catkins); fruit is $\frac{1}{2}$ – $\frac{3}{4}$ " long, an acorn, cap with bumpy scales covers $\frac{1}{4}$ length of acorn; chestnut brown in color.

Twigs:

Moderately stout, purplish grey to greenish red.

Buds:

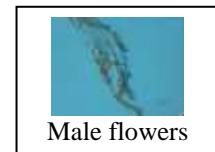
1/8" long, globose to ovoid, reddish brown, clustered.

Bark:

Light ash-grey, scaly with irregular plates.

Distribution in North America:

Native from Maine, south to northern Florida, and west to Texas and Minnesota.



White oak is intermediate in shade-tolerance and has a slow growth rate. It generally reaches a height of 80 to 100 feet and a diameter of 3 to 4 feet. It is used for timber which is important for barrel making, furniture, and many other purposes. White oak has a long life span of up to 600 years. Like other members of the white oak group, acorns mature in one year, and tyloses are present in the wood. The leaves turn brown to red, to even wine-colored in the fall. Foliage is often marcescent.

1: Image courtesy of http://commons.wikimedia.org/wiki/File:Quercus_alba_range_map.svg

Bur oak
Quercus macrocarpa
 Fagaceae

Leaves:

6–12”, alternate, dark green, obovate to oblong, 5–9 lobed with upper lobes larger than lower, pubescent on lower side; deciduous.

Flowers/Fruit:

Flowers are monoecious, and greenish brown (staminate in catkins); fruit is $\frac{3}{4}$ – $1\frac{1}{2}$ ” long, an acorn, broadly ovoid, downy at apex, fringed cap covers $\frac{1}{2}$ of acorn, brown.

Twigs:

Twigs are stout, yellowish brown, pubescent.

Buds:

1/4” to 1/8” long, greyish yellow, obtuse, tawny pubescent.

Bark:

Greyish brown with ridges and furrows.

Distribution in North America:

Native from Nova Scotia southwest to Texas, and northwest to South Dakota and Manitoba.¹



Bur oak is intermediate in shade-tolerance and has a slow growth rate. It reaches a height of 70 to 80 feet and a diameter of 3 to 4 feet. Leaves turn brown to yellow in the fall. Twigs sometimes have corky wings present. Bur oak will tolerate a variety of growing conditions, but prefers to grow on bottomland sites. Although the bark of Bur oak is similar to that of White oak, it is generally darker in color. Bur oak is used for timber. Bur oak is a member of the white oak group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_macrocarpa

Post oak
Quercus stellata
Fagaceae

Leaves:

Thick, 4–6", alternate, oblong, dark green, deeply 5 lobed, cruciform appearance, hairy beneath; deciduous.

**Flowers/Fruit:**

Flowers are monoecious, greenish brown (staminate in catkins); fruits is $\frac{1}{2}$ " to 2/3" long, an acorn, brown, slightly striped, 1/3 of acorn enclosed in cap, scales hairy.

**Twigs:**

Tawny, tomentose, grey and lenticellate.

**Buds:**

1/8" long, with chestnut brown pubescent scales.

Bark:

Reddish brown, with scaly ridges, similar to white oak.

Distribution in North America:

Native from Massachusetts, south to Florida, and west to Texas and Iowa.¹

Post oak is intermediate in shade-tolerance and has a slow growth rate. It reaches a height of 50 to 80 feet and a diameter of 1 to 2 feet. The leaves turn yellow to brown in the fall. Post oak will tolerate a variety of growing conditions and frequently grows on dry sites. It generally develops an irregular crown of contorted branches. The cruciform appearance of the leaves is an excellent identification feature. Post oak is a member of the white oak group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_stellata

Chestnut oak
Quercus prinus
Fagaceae

Leaves:

4 – 8” long, alternate, shiny dark green obovate to elliptical, crenate margin, yellow stem; deciduous.



Flowers/Fruit:

Flowers are monoecious, yellowish brown; fruit is 1 – 1 ½”, an acorn, dark brown, ovoid, 1/3 to ½” of length covered by a thin cap with bumpy scales.



Twigs:

Twigs are orange to reddish brown, glabrous.



Buds:

1/4” long, covered with bright chestnut brown scales.



Distribution in North America:

Native from Maine, south to Georgia and Alabama, west to Illinois and Michigan.

Chestnut oak is intermediate in shade-tolerance and has a slow growth rate. It reaches a height of 50 to 80 feet and a diameter of 1 to 2 feet. The leaves turn yellow to brown in the fall. Staminate flowers appear in catkins. Mature Chestnut oaks can easily be identified by the conspicuous ridges and furrows of the bark. The wood of Chestnut oak is used for timber. It grows on a variety of sites, but is typically found on dry ridges, and dry, rocky sites. Chestnut oak is a member of the white oak group.

Swamp chestnut oak
Quercus michauxii
Fagaceae

Leaves:

5–8" long, alternate, dark green on upper surface, paler beneath, obovate-oblong, dentate, pubescent below, deciduous.



Flowers/Fruit:

Flowers are monoecious; fruit is 1– 1 ½" long, an acorn, ovoid to oblong, less than 1/3 enclosed in a bowl-shaped cap with hairy, wedge-shaped scales.

Twigs:

Moderately stout, reddish brown to orange brown.¹



Buds:

¼" long, acute, covered with thin red scales.

Bark:

Irregularly furrowed or scaly.²

Distribution in North America:

Native from New Jersey, south to Florida, and West to Texas and southern Illinois.³

Swamp chestnut oak has intermediate shade-tolerance and a slow growth rate. It generally reaches a height of 60 to 80 feet and a diameter of 2 to 3 feet. Its flowers are greenish to yellow brown, with the staminate flowers appearing in catkins. The leaves turn red to brown in the fall. The bark is ash grey, with some red coloration. Swamp chestnut oak grows on bottomlands and moist uplands. The wood is hard, strong, and used for timber. Swamp chestnut oak is a member of the white oak group.

1: Photo courtesy of <http://commons.wikimedia.org/wiki/File:QuercusMichauxiiLeaf.jpg>

2: Photo courtesy of <http://commons.wikimedia.org/wiki/File:QuercusMichauxiiLeaf.jpg>

3: Image courtesy of <http://commons.wikimedia.org/w/index.php?search=Quercus+michauxii&title=Special%3ASearch>

Chinkapin oak
Quercus muehlenbergii
Fagaceae

Leaves:

4" to 7" long, alternate, shiny green above, paler and pubescent beneath, obovate to oblong, coarsely serrate, deciduous.

**Flowers/Fruit:**

Flowers are monoecious; fruit is $\frac{1}{2}$ " long, brown to black, an acorn with a thin bowl-shaped cap which encloses 1/3 of the nut, and is covered with appressed scales.

**Twigs:**

Twigs are slender, orange-brown, and glabrous.

**Buds:**

1/8" long, orange brown, sharp pointed.

**Bark:**

Ashy gray, rough and flakey, much like white oak.

Distribution in North America:

Native from Vermont, south to northern Florida, and west to New Mexico and Wisconsin.¹

Chinkapin oak has intermediate shade-tolerance and a slow growth rate. It typically reaches a height of 50 to 80 feet and a diameter of 1 to 3 feet. Leaves turn red to brown in the fall. The flowers are green to yellow-brown and staminate flowers appear in catkins. Chinkapin oak prefers to grow on dry slopes and outcrops. Teeth of leaves are gland tipped. With age, Chinkapin oak develops an irregular crown. Chinkapin oak is a member of the white oak group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_muehlenbergii

Valley oak
Quercus lobata
Fagaceae

Leaves:

3" long, oblong to ovate, 7–11 deep lobes, finely pubescent, deciduous.¹

Flowers/Fruit:

Flowers are monoecious²; fruit is 1–2 ¼" long, an acorn, green at first turning brown, elongated-conic, 1/3 enclosed in a fringed cap.

Twigs:

Twigs are slender, pubescent, grey.³

Buds:

To 1/5", light brown, pubescent, oval.

Bark:

Greyish, thick and ridged like alligator hide.⁴

Distribution in North America:

Native to the West Coast, through much of California.



Male flowers



5



Valley oak has intermediate shade-tolerance and a moderately rapid growth rate. It reaches a height of 80 to 120 feet and a diameter of 3 to 5 feet. It generally has a wide spreading crown and a short trunk. It is also called California white oak. The leaves turn yellow in the fall. Valley oak is very long lived and typically grows in hot valleys and foothills throughout its native range. Valley oak is a member of the white oak group.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_lobata

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Quercus_lobata-2.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Quercus_lobata-9.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Lopez_Lake_Tree.jpg

5: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_lobata

Northern red oak

Quercus rubra

Fagaceae

Leaves:

5–8" long, alternate, dark green, oblong, 7 – 11 toothed lobes, separated by sinuses extending midway to mid rib, lobes bristle tipped, deciduous.

**Flowers/Fruit:**

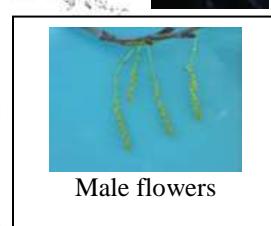
Flowers are monoecious; fruit is $\frac{3}{4}$ " – 1", an acorn, brown, subglobose, somewhat hairy, enclosed $\frac{1}{4}$ of way by shiny, shallow cap.

**Twigs:**

Twigs are glabrous, reddish brown.

Buds:

$\frac{1}{4}$ " long, ovoid, with reddish brown smooth scales.

**Distribution in North America:**

Native from Nova Scotia, south to Alabama, and west to Oklahoma and Minnesota.¹

Northern red oak has intermediate shade-tolerance and a rapid growth rate. It reaches a height of 60 to 90 feet and a diameter of 1 to 3 feet. Flowers appear in the spring, with the staminate flowers in yellowish brown catkins. The leaves turn yellow to red, to brown in the fall. The pattern of alternating dark brown and lighter grey coloring of the bark gives the appearance of vertical stripes on the trunks of older trees. Northern red oak is a very important timber species. Northern red oak is a member of the red oak group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_rubra

Black oak
Quercus velutina
Fagaceae

Leaves:

5–7", alternate, dark green and shiny above, paler, greyish and pubescent below, obovate to ovate, 5–7 toothed lobes, separated by sinuses of varying depth, lobes bristle tipped; deciduous.

Flowers/Fruit:

Flowers are monoecious; fruit is $\frac{1}{2}$ – $\frac{3}{4}$ " long, an acorn, brown, ovoid, striate, enclosed $\frac{1}{4}$ of way by brown cap with hairy scales.

Twigs:

Twigs are stout, reddish brown, glabrous.

Buds:

$\frac{1}{4}$ – $\frac{1}{2}$ " long, sharp-pointed, tan, tomentose.

Bark:

Thick, black, deeply furrowed, inner bark bright orange.

Distribution in North America:

Native from Maine, south to Northern Florida, and west to Texas and Minnesota.¹



Black oak has intermediate shade-tolerance and a rapid growth rate. It generally reaches a height of 50 to 70 feet and a diameter of 1 to 3 feet. The leaves turn yellow to brown (sometimes orangish red) in the fall. The staminate flowers are a yellowish brown color and appear in catkins. The deep furrows in the bark are intersected by horizontal fissures, giving the bark a blocky appearance. Black oak is used for timber, sold as red oak. Black oak is tolerant of a variety of growing conditions. Black oak is a member of the red oak group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_velutina

Shumard oak
Quercus shumardii
Fagaceae

Leaves:

6–8" long, alternate, obovate to oval, 7–9 toothed lobes, dark green, separated by moderately deep sinuses, lobes bristle tipped, deciduous.¹

Flowers/Fruits:

Flowers are monoecious; fruit is $\frac{3}{4}$ – $1\frac{1}{4}$ " long, an acorn, ovoid, covered with a thick, shallow, saucer-shaped cap.

Twigs:

Moderately stout, gray to gray-brown, glabrous.

Buds:

$\frac{1}{4}$ " long, ovoid, sharp pointed, angles, gray to gray-brown scales.

Bark:

Thick, broken into pale to whitish scaly ridges, deep, dark furrows.

Distribution in North America:

Native from Pennsylvania, south to Florida, and west to Texas and Michigan.²



Shumard oak is intolerant of shade and has a rapid growth rate. It generally reaches a height of 70 to 90 feet and a diameter of 2 to 5 feet. The leaves turn red to brown in the fall. The flowers are yellowish brown in color, with staminate flowers appearing in catkins. Shumard oak is one of the largest southern red oaks and is used for timber. It will grow on a variety of sites. It generally has a pyramidal crown when young, but becomes broad and spreading with age. Shumard oak is a member of the red oak group.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Shumard_oak_leaves.JPG
2: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_shumardii

Southern red oak
Quercus falcata
Fagaceae

Leaves:

5–9" long, alternate, obovate, shallowly 3–lobed or deeply 5–7 lobed, falcate, tomentose underside; deciduous.

Flowers/Fruits:

Flowers are monoecious; fruit is $\frac{1}{2}$ " long, subglobose, an acorn, orange-brown, enclosed less than 1/3 by shallow, pubescent cap.¹

Twigs:

Twigs are dark red, glabrous or pubescent.

Buds:

1/8– $\frac{1}{4}$ " long, reddish brown, sharp pointed, pubescent.

Bark:

Dark brown to black, thick, rough ridges, scaly.

Distribution in North America:

Native from New Jersey, south to Florida, and west to Texas and Oklahoma.²



Southern red oak is intolerant of shade and has a rapid growth rate. It reaches a height of 90 to 100 feet and a diameter of 1 to 3 feet. The leaves are dark green above, paler beneath, and turn brownish in the fall. Foliage is typically marcescent. The flowers are brownish in color, with staminate flowers appearing in catkins. Inner bark is cream colored. Southern red oak prefers poor, dry sites. Its wood is used for timber. It develops a wide spreading, round crown. Southern red oak is a member of the red oak group.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_falcata
2: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_falcata

Scarlet oak
Quercus coccinea
Fagaceae

Leaves:

4–7" long, alternate, dark green, shiny, 5 to 9 lobed with wide, deep, C-shaped, circular sinuses; lobes bristle tipped; deciduous.



Flowers/Fruit:

Flowers are monoecious; fruit is $\frac{1}{2}$ –1" long, oval, an acorn, reddish brown, $\frac{1}{2}$ enclosed in bowl-like cap with thick, smooth, scales, circular grooves at apex.



Twigs:

Twigs are slender, reddish brown, and smooth.



Buds:

$\frac{1}{8}$ – $\frac{1}{4}$ " long, covered with reddish brown scales.

Bark:

Dark brown to black, scaly, similar to *Quercus rubra* above 3'.

Distribution in North America:

Native from Maine, south to northern Florida, west to Arkansas and Wisconsin.¹



Scarlet oak is intolerant of shade and has a rapid growth rate. It grows to a height of 50 to 75 feet and a diameter of 1 to 3 feet. Flowers are yellowish brown and appear in the spring (staminate flowers appear in catkins). Leaves turn red in the fall, and foliage is often marcescent. Buds are often pubescent at the ends. Scarlet oak develops an irregular to rounded crown and typically retains dead branches along its bole and in the lower portions of its crown. Scarlet oak is a member of the red oak group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_coccinea

Pin oak
Quercus palustris
Fagaceae

Leaves:

3 – 5" long, alternate, dark green, shiny, obovate to oval, usually 5 lobed with deep sinuses, bristle-tipped; deciduous, turning red to brown in the fall.

Flowers/Fruit:

Flowers are monoecious; fruit is $\frac{1}{2}$ " long, an acorn, brown, hemispherical, pale brown, striate, enclosed in thin saucer like cap.

Twigs:

Twigs are slender, reddish brown, and smooth.

Buds:

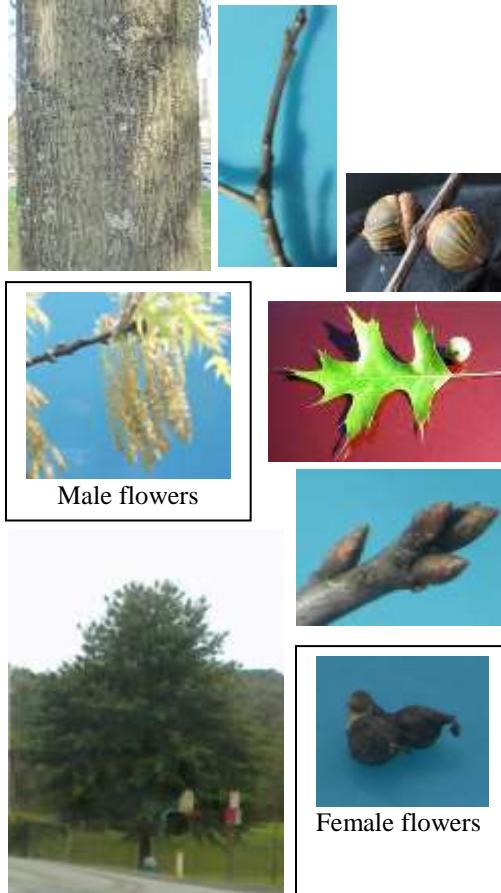
1/8", reddish brown, sharp pointed and glabrous.

Bark:

Grayish brown, smooth.

Distribution in North America:

Native from Massachusetts, south to North Carolina and west to Oklahoma and Iowa.



Pin oak is intolerant of shade and has a rapid growth rate. It reaches a height of 50 to 80 feet and a diameter of 1 to 3 feet. Shallow furrows are often present on the bark of older trees. Flowers are yellowish brown in color, with staminate flowers appearing in catkins. An excellent way to differentiate between Pin oak and Scarlet oak is that Pin oak lacks C-shaped sinuses in its leaves. Pin oak is frequently planted as an ornamental, but has poor timber quality. Pin oak is a member of the red oak group.

Nuttall oak
Quercus nuttallii
Fagaceae

Leaves:

4–8" long, alternate, glabrous, dark green, obovate, 5 to 7 lobed, lobes bristle tipped, separated by deep sinuses; deciduous.¹



Flowers/Fruit:

Flowers are monoecious; fruit is $\frac{3}{4}$ – $1\frac{1}{4}$ ", reddish brown, an acorn, striate, $\frac{1}{4}$ – $\frac{1}{2}$ enclosed in deep thick cap.²



Twigs:

Twigs are moderately slender, gray-brown to reddish brown, glabrous.

Buds:

To $\frac{1}{4}$ ", slightly angled, gray-brown scales, somewhat pubescent.



Bark:

Dark gray-brown, broken into broad, flat ridges.³

Distribution in North America:

Native from southern Illinois, southeast to Alabama, and west to Texas and Missouri.

Nuttall oak is intolerant of shade and has a rapid growth rate. It typically grows to a height of 60 to 80 feet and a diameter of 1 to 3 feet. Leaves turn reddish in the fall. Flowers are yellowish brown and appear in the spring, with the staminate flowers in catkins. Nuttall oak prefers to grow in wet, bottomland flats. Nuttall oak loses all of its leaves in the fall, unlike many *Quercus* spp. Nuttall oak belongs to the red oak group and is used for timber.

1: Photo courtesy of <http://www.ag.auburn.edu/hort/landscape/dbpages/101.html>

2: Photo courtesy of http://www.southerngrowers.com/nuttall_oak.html

3: Photo courtesy of <http://www.ag.auburn.edu/hort/landscape/dbpages/101.html>

Blackjack oak
Quercus marilandica
Fagaceae

Leaves:

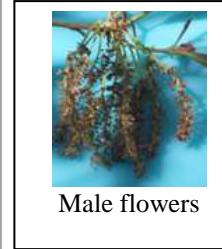
3" to 6" long, alternate, quite variable, shallowly 3-lobed, tawny, dark green, leathery, pubescent below; deciduous.



Female flowers

Flowers/Fruit:

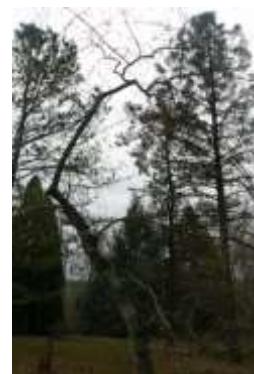
Flowers are monoecious; fruit is 3/4", oblong, an acorn, 1/2 enclosed in thick bowl-shaped cap, with hairy, reddish brown scales.



Male flowers

Twigs:

Twigs are stout, greyish brown, somewhat pubescent.



Buds:

1/4", angled, similar to black oak but reddish brown.

Bark:

Black, very rough, blocky.

Distribution in North America:

Native from New York, south to Florida, and west to Texas and Iowa.¹

Blackjack oak is intolerant of shade and has a slow growth rate. It reaches a height of 20 to 40 feet and a diameter of 1 foot. Flowers are brownish with staminate flowers in catkins. Fall foliage is yellowish brown. Lobes of leaves are bristle tipped. The hard, durable wood may be used for timber, if it grows large enough. Blackjack oak typically grows on poor, dry sites. Blackjack oak has a spreading crown with an irregular branching pattern. Blackjack oak is a member of the red oak group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_marilandica

Turkey oak
Quercus laevis
Fagaceae

Leaves:

3" to 12" long, quite variable in size and shape, dark green, 3-7 bristle tipped lobes; deciduous.¹

Flowers/Fruit:

Flowers are monoecious; fruit is 1", oval, an acorn, brown; 1/3 enclosed in a thin bowl-shaped cap.²

Twigs:

Twigs are stout, dark brown.

Buds:

up to 1/2", narrow, rusty pubescent, greyish brown.³

Bark:

Rough, nearly black, scaly.⁴

Distribution in North America:

Native the Atlantic coastal plain from Virginia, south to Florida, and west to Louisiana.⁵



Turkey oak is intolerant of shade and has a moderate growth rate. It grows to a height of 20 to 40 feet and a diameter of 1 to 2 feet. Turkey oak typically has an irregular crown. It generally grows on sandy, dry sites. The name derives from the resemblance of the leaves to a turkey's foot. Fall color is reddish brown. Flowers appear in the spring with staminate flowers in catkins. Turkey oak is a member of the red oak group.

1: Photo courtesy of <http://commons.wikimedia.org/wiki/File:AmericanTurkeyOakLeaves.jpg>

2: Photo courtesy of <http://dendro.cnre.vt.edu/dendrology/syllabus/factsheet.cfm?ID=167>

3: Photo courtesy of <http://dendro.cnre.vt.edu/dendrology/syllabus/factsheet.cfm?ID=167>

4: Photo courtesy of <http://dendro.cnre.vt.edu/dendrology/syllabus/factsheet.cfm?ID=167>

5: Image courtesy of <http://commons.wikimedia.org/w/index.php?search=Quercus+laevis&title=Special%3ASearch>

Willow oak
Quercus phellos
Fagaceae

Leaves:

2 –5” long, alternate, 1/3 – 1” wide; linear-lanceolate, light to dark green, entire margin, with a bristle at the end; deciduous to semi-evergreen.

Flowers/Fruit:

½” or shorter, an acorn, brownish with black bands, ¼ of nut enclosed by a thin cap.¹

Twigs:

Flowers are monoecious; twigs are slender, red to reddish brown.

Buds:

1/8 ”, sharp pointed, chestnut brown scales.

Bark:

Thick rough ridges, almost black.

Distribution in North America:

Native from New York, south to Florida, and west to Texas and Oklahoma.²



Female flowers



Male flowers



Willow oak is intolerant of shade and has a rapid growth rate. It reaches a height of 80 to 100 feet and a diameter of 2 to 4 feet. Leaves, if deciduous, turn yellowish brown in the fall. Flowers are yellowish brown with staminate flowers in catkins. Willow oak has a pyramidal crown in youth, but becomes dense and rounded with age. Willow oak is frequently planted as an ornamental, and will tolerate a variety of growing conditions. It prefers to grow on bottomland sites. It is a member of the red oak group.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_phellos

2: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_phellos

Water oak
Quercus nigra
Fagaceae

Leaves:

2–4" long, alternate, often 3-lobed, usually entire, semi evergreen in warm climate areas; variable in size and shape.¹

Flowers/Fruit:

Flowers are monoecious²; fruit is $\frac{1}{2}$ ", an acorn, dark brown, hemispherical, black striate, enclosed at base by thin, hairy, saucer-like cap.³

Twigs:

Twigs are slender, dull red, and smooth.⁴

Buds:

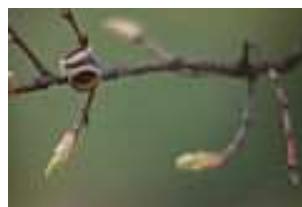
1/8 – 1/4", sharp pointed, covered with brown scales, hairy.

Bark:

Gray-black, rough scaly ridges.

Distribution in North America:

Native from southern New Jersey, south to Florida, west to Texas and southeastern Missouri.⁵



Water oak is intolerant of shade and has a rapid growth rate. It grows to a height of 60 to 70 feet and a diameter of 2 to 3 feet. Flowers are yellowish brown, with staminate flowers appearing in catkins. Fall foliage, if present, is yellow. Water oak is typically found in bottomland sites. It generally has a rounded growth form. Uses include timber and ornamental. Water oak is a member of the red oak group.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_nigra

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Quercus_nigra_Water_Oak_catkins.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_nigra

4: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_nigra

5: Image courtesy of http://commons.wikimedia.org/wiki/Quercus_nigra

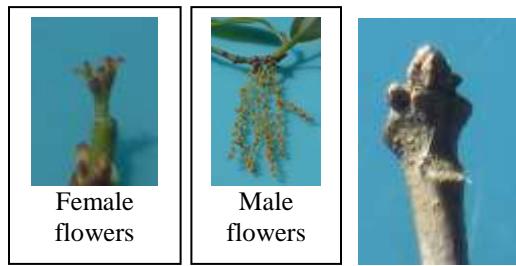
Shingle oak
Quercus imbricaria
Fagaceae

Leaves:

4- 6" long, alternate, oblong to elliptical, entire, pubescent below, tipped with needle-like bristle; deciduous.

**Flowers/Fruit:**

5/8", an acorn, dark brown, subglobose; enclosed 1/3 to 1/2 in by hairy, thin red-brown cap.

**Twigs:**

Twigs are slender, dark green to greenish brown, shiny.

Buds:

1/8", ovoid, pointed, brown.

**Bark:**

Gray-brown, broken into broad low, ridges.

Distribution in North America:

Native from Pennsylvania, south to Alabama, west to Arkansas and Nebraska.

Shingle oak is intermediate in shade-tolerance and has a slow growth rate. It reaches a height of 40 to 70 feet and a diameter of 1 to 3 feet. Flowers are yellowish brown in color, staminate flowers in catkins. Leaves turn yellow, brown, and may be reddish in the fall. Leaves are typically marcescent. Shingle oak has a rounded to oval shaped crown. It was once used to make shingles. Shingle oak generally grows on moist sites. It is a member of the red oak group.

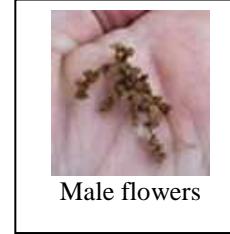
Live oak
Quercus virginiana
Fagaceae

Leaves:

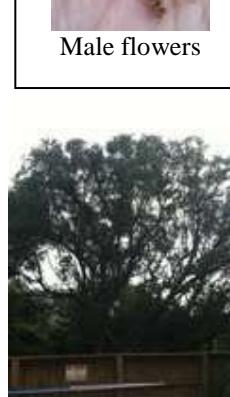
2 –5” long, alternate, oblong, entire, dark glossy green, paler and pubescent below; evergreen, persisting until spring when they are replaced by new leaves.

**Flowers/Fruit:**

Flowers are monoecious; fruit is $\frac{3}{4}$ ”, dark brown to black; 1/3 enclosed in turbinate cap

**Twigs:**

Twigs are slender and grey.

**Buds:**

1/16 to $\frac{1}{4}$ ” long, red-brown.

**Distribution in North America:**

Native along the Atlantic Coast from Virginia, south to Florida, and west into Texas, Oklahoma, and Mexico.¹

Live oak is intolerant of shade and has a rapid growth rate. Live Oak grows to a height of 50 to 80 feet and a diameter of 3 to 4 feet. Flowers appear in the spring, are yellowish brown in color, with staminate flowers in catkins. Live oak has a wide spreading crown (60 to 100 feet) of arching branches that are often covered in Spanish moss (*Tillandsia usneoides*). The acorns of Live oak mature in one season. It is often used as an ornamental in the southern U.S. Live oak is a member of the red oak group.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Quercus_virginiana

Yellow birch
Betula alleghaniensis
Betulaceae

Leaves:

3 – 4 ½” long, alternate, ovate, doubly serrate, dark green above, stem hairy; deciduous.



Flowers/Fruit:

Flowers appear in the spring, and consist of yellowish catkins; fruit is ovoid, sessile, an erect strobile, 1 – 1 ½”, brown.



Twigs:

Slender, yellow brown, with wintergreen odor.



Buds:

Terminal absent, laterals chestnut brown, ¼” long, appressed against the twig.



Bark:

Young trees-golden gray to bronze, peeling into long, thin strips; older-reddish brown plates.



Distribution in North America:

Native to southeastern Canada, south along the Appalachian Mountains to northern Georgia, west to the lake states and Minnesota.

Yellow birch is moderately tolerant of shade and has a slow growth rate. It reaches a height of 70 to 100 feet and a diameter of 1 to 2 feet. Leaves turn Yellow in the fall. In the southern Portion of its range, it is found at only high elevations. It is found on moist uplands throughout its range. Its wintergreen odor is less pronounced than that of Sweet birch (*Betula lenta*). Yellow birch is used for lumber.

Black birch, Sweet birch*Betula lenta*

Betulaceae

Leaves:

2 $\frac{1}{2}$ –5", alternate, ovate, sharply double serrate, dark green, stem hairy; deciduous.

**Flowers/Fruit:**

Flowers are $\frac{1}{2}$ to 1" long catkins; fruit is ovoid, brown, short-stalked, an erect strobile, 1 – 1 $\frac{1}{2}$ "; matures in late summer to fall.

**Twigs:**

Twigs are slender, reddish brown, glabrous, aromatic (wintergreen).

Buds:

Terminal absent, laterals $\frac{1}{4}$ " lustrous, sharply pointed, chestnut brown.

**Distribution in North America:**

Native from Maine, south to Alabama, west to Kentucky and New York.¹

Black birch is moderately shade-tolerant and has a slow growth rate. It reaches a height of 60 to 80 feet and a diameter of 2 feet. The pinkish to yellow brown flowers appear in mid spring. Small branches are lined with small spur shoots, each having two leaves during the growing season. Leaves turn golden yellow in the fall. Throughout the southern portion of its range, Sweet birch grows only at higher elevations. It will tolerate dry to moist sites. With age, Sweet birch will develop an oval to rounded crown.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Betula_lenta_range_map.svg

Paper birch
Betula papyrifera
Betulaceae

Leaves:

2–3", alternate, dark green, ovate to oval, coarsely doubly serrate, acute apex; deciduous



Flowers/Fruit:

Flowers are yellowish brown catkins which appear in the spring; fruit is pendent, cylindrical, a stalked strobile, 1 – 1 ½" long, brown.



Male flower



Twigs:

Slender, dull reddish-brown to orange-brown, lenticellate.



Buds:

Terminal bud absent, laterals ¼ to ½" long, ovoid, gummy, chestnut brown, glabrous.



Bark:

Chalky to creamy white, separating into thin, papery strips.



Distribution in North America:

Native from Greenland, south to Pennsylvania, west to Idaho and Alaska.¹



Paper birch is intolerant of shade and has a rapid growth rate. It reaches a height of 70 to 80 feet and a diameter of 2 feet. The Alaska variant is named as *Betula neoalaskana*. The leaves turn yellow in the fall. Smaller branches are lined with small spur shoots. Older trees develop dark, deeply furrowed bark at the base of the trunk. The fruits mature in late summer to autumn. Paper Birch develops an open crown with age. It generally grows on moist sites, and areas that have been burned. Paper birch is often planted as an ornamental.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Betula_papyrifera

River birch
Betula nigra
Betulaceae

Leaves:

1.5 to 3" long, alternate, rhombic-ovate, deeply double serrate, broadly wedge-shaped base, dark green; deciduous.



Flowers/Fruit:

Flowers are in catkins and appear in the spring; fruit is a cylindrical, erect, pubescent strobile with deciduous scales, matures late in spring.



Twigs:

Twigs are slender, reddish brown, with warty excrescences.



Buds:

Terminal absent, laterals $\frac{1}{4}$ " long, brown.

Bark:

Salmon-pink, papery, becoming dark greyish brown and scaly with age.

Distribution in North America:

Native from Massachusetts, south to Florida, and west to Texas and Minnesota.¹

River birch is moderately shade-tolerant and has a slow growth rate. It grows 50 to 80 feet in height and 3 feet in diameter. River birch generally has a pyramidal shaped crown in youth, but becomes rounded to irregular. The tree often splits into several stems close to the ground. The leaves turn a butter yellow color in the fall. River birch typically grows on moist sites. Its range extends much further south than any other native birch species, and it is the only birch native to eastern Texas. River birch is commonly used as an ornamental.

¹: Image Courtesy of http://commons.wikimedia.org/wiki/Category:Betula_nigra

Red alder
Alnus rubra
 Betulaceae

Leaves:

3–6", alternate, ovate to elliptical, doubly serrate, dark green above, with brownish hairs beneath, petiole grooved; deciduous, turning brownish in the fall.¹



Flowers/Fruit:

Flowers consist of catkins which appear in the spring²; fruit is oblong to ovoid, brown, a stalked strobile $\frac{1}{2}$ – $1\frac{1}{4}$ ".³



Twigs:

Moderately stout, bright red to reddish brown.

Buds:

$\frac{1}{3}$ – $\frac{1}{2}$ ", stalked, 2–3 red, pubescent scales.⁴



Male flowers

Distribution in North America:

Native to the west coast from southern Alaska, south to California.⁶

Red alder is intolerant of shade and has a rapid growth rate. It reaches a height of 50 to 75 feet and a diameter of 1 to 2 feet. The staminate catkins are reddish to green-brown in color. Red alder develops a dome shaped crown. Red alder grows on moist sites and cut-over lands. Red alder establishes disturbed sites, and improves the site for later successional species by adding organic matter and nitrogen to the soil. Red alder is used for timber and is the most important hardwood species in the Pacific Northwest area of the U.S.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Red_alder_leaves.jpg
 2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Alnus_rubra_9819.JPG
 3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Alnus_rubra_0020.JPG
 4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Alnus_rubra_0020.JPG
 5: Photo courtesy of http://commons.wikimedia.org/wiki/File:Pacific_spirit_ubc.jpg
 6: Image courtesy of http://commons.wikimedia.org/wiki/File:Alnus_rubra_range_map.svg

American hornbeam
Carpinus caroliniana
Betulaceae

Leaves:

1 – 3” long, alternate, elliptical, doubly serrate, dark green and glabrous above, somewhat hairy beneath, with veins running parallel to each other from the center towards the margin; deciduous.



Flowers/Fruit:

Flowers are catkins that appear in early spring; fruit is a 3-lobed, leafy involucre; subtends a small nut, appears in 3 to 6” long clusters.



Twigs:

Slender, red to brown, and lenticellate.

Buds:

1/16 to 1/4” long, brown, false terminal.

Bark:

Blue-gray, smooth, and thin; twisted trunk.

Distribution in North America:

Native from southeast Canada, south to Florida, and west to Texas and Manitoba.¹

American hornbeam is very tolerant of shade and has a slow growth rate. It reaches a height of 25 to 40 feet and a diameter of 1 to 2 feet. The catkins are greenish yellow-brown in color. The fruits are green throughout the summer, but turn brown when mature in the fall. Leaves turn yellow to reddish in the fall. The twigs, although red to brown when young, turn grey with age. The buds are aligned close against the twigs. American hornbeam will grow on moist to dry sites, and is often found alongside streams.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Carpinus_caroliniana_range_map.jpg

Eastern hophornbeam
Ostrya virginiana
Betulaceae

Leaves:

2 to 5" long, doubly serrate, dark green and somewhat hairy above, lighter green and more hairy beneath; deciduous

Flowers/Fruit:

Flowers are monoecious. Fruit is a nut enclosed in oval, flattened, papery sacs, in clusters which are 1.5 to 2.5" in length; yellow green, turning brownish when mature in the fall.

Twigs:

Slender, zig-zag in appearance, brownish.

Buds:

1/8 to 1/4" long, brown, round, yellowish green, false terminal.

Bark:

Greyish brown with shaggy strips.

Distribution in North America:

Native from Ontario, south to Florida, and west to Texas and Manitoba.¹



Eastern hophornbeam is tolerant of shade and has a slow growth rate. It reaches a height of 20 to 40 feet and a diameter of 1 to 1.5 feet. The leaves turn yellow in the fall. The flowers, which are catkins, appear in the spring and are yellowish brown in color. The staminate catkins are preformed and are visible throughout the winter, before expanding in the spring. The clusters of fruits resemble hops. The growth form is generally rounded in shape. Eastern hophornbeam will grow on moist to dry rocky sites.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Ostrya_virginiana_range_map.jpg

American basswood*Tilia americana*

Tiliaceae

Leaves:

5–6" long, 3–4" wide, alternate, dark green above, margin coarsely serrate, base unequal; deciduous

**Flowers/Fruit:**

Flowers are small, yellowish white, very fragrant, and in clusters; fruit is 0.3", clustered, attached to bract, nut-like, brownish grey and tomentose.

**Twigs:**

Green to red becoming greyish brown with age, smooth, zigzag.

**Distribution in North America:**

Native from southeast Canada, south to North Carolina, and west to Oklahoma and Manitoba.¹

American basswood is tolerant of shade and has a rapid growth rate. It reaches a height of 60 to 90 feet and a diameter of 2 to 3 feet. The leaves turn yellow to brown in the fall, but may drop without any significant coloration. The very fragrant flowers appear in early summer and would likely go unnoticed without the intense odor given off. Twigs lack terminal buds. American basswood generally has a rounded crown. It develops a clear bole in the forest and is used for timber. It typically grows on fertile, moist sites.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Tilia_americana_range_map.svg

White basswood
Tilia heterophylla
Tiliaceae

Leaves:

3.5 to 6" long, alternate, dark green and glabrous above, covered in whitish brown tomentose beneath, dentately toothed, with a long, thin apex; deciduous

Flowers/Fruit:

Flowers are small, whitish yellow, and appear in clusters; fruit is 1/3", nutlike, attached to a bract, greyish brown and tomentose.

Twigs:

Twigs are zigzag, reddish brown, and smooth.

Buds:

1/4", terminal bud absent, and reddish burgundy in color.

Bark:

Greyish brown with scaly ridges.

Distribution in North America:

Native from West Virginia, south to Florida, and west to Arkansas and Missouri.



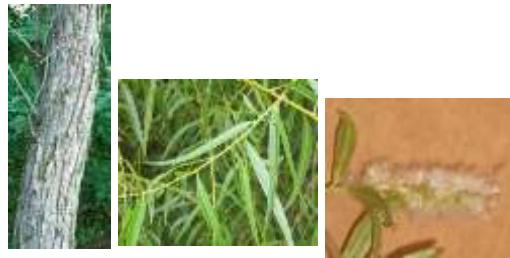
White basswood is tolerant of shade and has a rapid growth rate. It may grow to a height of 80 feet and a diameter of 1.5 to 2.5 feet. The leaves may turn yellow to brown in the fall, but often drop with little color present. The flowers appear in early summer and, like those of American basswood, are extremely fragrant. Outer scales of buds have hairs along the margins. It generally grows best on moist, well drained sites. White basswood has a rounded crown, a clear bole in forested settings, and is used for timber.

Black willow*Salix nigra*

Salicaceae

Leaves:

3–6”, alternate, dark green, lanceolate, finely serrate, base obtuse, large stipules present; deciduous.

**Flowers/Fruit:**

Flowers are catkins, appearing in the spring; fruit is $\frac{1}{4}$ ” long, a capsule, glabrous, reddish brown.

**Twigs:**

Slender, purplish green to pale orange brown, smooth.

**Buds:**

Reddish-brown, $\frac{1}{16}$ ” long, terminal absent, one scale covering the bud.

Bark:

Brown to black with deep fissures.

Distribution in North America:

Native from southeast Canada, south to Florida, and west to Texas and Minnesota; also appearing from California, southeastward into Mexico.¹

Black willow is very tolerant of shade and has a rapid growth rate. It reaches a height of 30 to 40 feet and a diameter of 1 to 1.5 feet. The leaves may turn yellow in the fall, but often drop with no significant coloration. Staminate catkins are yellowish in color, while pistillate catkins are whitish grey. The small fruits appear in 3-6” long clusters and mature during the summer. The twigs and small branches are very flexible and difficult to break, except for branch unions, where they are quite brittle. Prefers to grow on wet sites.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Salix_nigra

Quaking aspen
Populus tremuloides
 Salicaceae

Leaves:

1 $\frac{1}{2}$ –3" in diameter, alternate, suborbicular to broadly ovate, finely serrate margin, dark green, flattened petioles; deciduous

**Flowers/Fruit:**

Flowers are dioecious, catkins; fruit is $\frac{1}{4}$ " long, a capsule, light green, narrowly conical.

**Twigs:**

Twigs are slender, lustrous, reddish brown.

**Buds:**

Around $\frac{1}{4}$ ", conical, sharp-pointed, 6 – 7 reddish brown imbricated scales.

**Bark:**

Smooth, greenish white to cream, gray, furrowed at bottom; "aspen eye" present.

Distribution in North America:

Native from eastern Canada, south to West Virginia, northwestward to Alaska, and then south into Mexico.¹

Quaking aspen is very intolerant of shade and has a rapid growth rate. It reaches a height of 30 to 70 feet and a diameter of 1 to 2 feet. The leaves quake in the slightest breeze due to the flattened petioles and turn yellow to orange in the fall. The flowers are greyish brown and appear in the very early spring. The fruits are borne in long thin clusters, and mature in late spring to early summer. Bark often develops an "aspen eye" due to the persistent dark colored branch scars. Quaking aspen is the most widely distributed tree in North America.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Populus_tremuloides

Bigtooth aspen
Populus grandidentata
Salicaceae

Leaves:

3 to 4" long, alternate, larger than quaking aspen, coarsely toothed, dark green, flattened petioles; deciduous.

**Flowers/Fruit:**

Flowers are catkins and are dioecious; fruit is $\frac{1}{4}$ to $\frac{1}{2}$ ", a capsule containing many small seeds, light green in color, occurring in thin, 4 to 6" long clusters; matures in the spring.

**Twigs:**

Twigs are stout, dull brownish gray.

**Buds:**

$\frac{1}{4}$ to $\frac{1}{2}$ ", pointed, gray, puberulous.

Bark:

Olive green, brown, furrowed at base.

Distribution in North America:

Native from southeast Canada, south to North Carolina, west to Tennessee, and northwestward to southeast Manitoba.

Bigtooth aspen is intolerant of shade and has a rapid growth rate. It reaches a height of 50 to 70 feet and a diameter of 1 to 2 feet. The leaves turn yellow to orange in the fall. The flowers are reddish yellow, to greyish brown in color and appear in very early spring. Bark is somewhat variable, with some trees having deeply furrowed dark colored bark. Bigtooth aspen will tolerate a variety of sites. It is more tolerant of heat, and is longer lived than Quaking aspen. It often has an irregular shaped crown and is used for pulpwood.

Eastern cottonwood

Populus deltoides

Salicaceae

Leaves:

3–6” long, 4 – 5” wide, alternate, deltoid, serrate, glabrous with glands near the base, flattened petioles; deciduous.

Flowers/Fruit:

Flowers are catkins that appear in early spring and are dioecious; fruit is $\frac{1}{4}$ – $\frac{1}{3}$ ” long, a capsule, green, ovoid, 3 or 4 valved.

**Twigs:**

Twigs are stout, angular, yellowish brown, glabrous.

**Buds:**

To $\frac{3}{4}$ ”, ellipsoid to conical, brown, resinous.

**Bark:**

Young – smooth, light greenish yellow, Older – ash-gray, thick ridges.

**Distribution in North America:**

Native from southeast Canada, south to Florida, and west to Texas and Saskatchewan.¹

Eastern cottonwood is very intolerant of shade and has a rapid growth rate. It reaches a height of 75 to 100 feet and a diameter of 3 to 4 feet. The leaves turn yellow in the fall, but may drop without significant coloration as well. The catkins are yellowish to red in color. The fruits mature in the late spring to early summer, and are borne in 5 to 11” clusters. Each fruit is filled with tiny cottony seeds. Buds are shiny. Eastern cottonwood generally has a rounded to irregular crown shape. It typically grows in floodplains and sandy soils.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Populus_deltoides

Black cottonwood
Populus trichocarpa
Salicaceae

Leaves:

5– 6” long, ovate, dark green and glabrous above, finely crenate, and have round stems; deciduous.



Flowers/Fruit:

Dioecious flowers are catkins¹; fruit is 1/3 – ½” long, a capsule, 3- valved, green, and pubescent.



Twigs:

Twigs are slender, orange-brown to light yellow-brown, lenticellate.

Buds:

¾”, conical, 6 or 7 visible imbricated scales, resinous, fragrant.

Bark:

Young – tawny yellow to gray; Older – dark gray, deep furrows.

Distribution in North America:

Native from southern Alaska, south to northern California, eastward to include the Inland Empire.²

Black cottonwood is very intolerant of shade and has a rapid growth rate. It reaches a height of 80 to 125 feet and a diameter of 2 to 4 feet. Leaves turn yellow in the fall. The flowers appear in the early spring. Black cottonwood will grow on moist sandy and even gravelly sites. It generally has a conical to irregular crown shape. Its timber is used for pulp.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Black_cottonwood_male_catkin_and_leaf_buds.JPG

2: Image courtesy of http://commons.wikimedia.org/wiki/File:Populus_trichocarpa_range_map.svg

Tree of heaven
Ailanthus altissima
 Simaroubaceae

Leaves:

Large (1–3' long), alternate, pinnately compound, 13 to 35 stalked leaflets, leaflets are dark green with 2 to 4 teeth (glands at ends); deciduous.

**Flowers/Fruit:**

Flowers are dioecious¹; fruits are 1 to 1.5" long, brown when mature, winged samaras, and persist on the tree in dense clusters throughout the fall and into the winter months.²

**Twigs:**

Stout, smooth, brown in color.³

**Buds:**

1/8", finely pubescent, dome shaped, brown.⁴

Bark:

Smooth and light grey, becoming rougher with light brown fissures as the tree ages.⁵

Distribution in North America:

Native to China, but has naturalized throughout much of the U.S. and some areas of Canada.

Tree of heaven is intolerant of shade and has a very rapid growth rate. It reaches a height of 50 to 80 feet and a diameter of 2 to 3 feet. The leaves turn yellow in the fall, but often drop with no significant coloration. Flowers are yellowish green and appear in the late spring to early summer in 8 to 16" clusters. The fruits are green to orange before maturing in the late summer to fall. The twigs may be lightly pubescent. Tree of heaven is considered a non-native, invasive species due its weedy habit and competition with desirable native plants. All plant parts have a bad odor.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Arbre_%C3%A0_Sofia.jpg

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Ailanthus_altissima_RJB.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/File:Ailanito_-_particolare.jpg

4: Photo courtesy of http://commons.wikimedia.org/wiki/File:Ailanthus_altissima%27s_scar.JPG

5: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Ailanthus_altissima

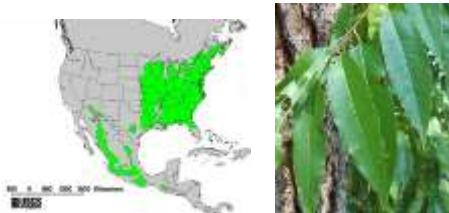
Black cherry, Wild black cherry

Prunus serotina

Rosaceae

Leaves:

2–6" long, alternate, dark green, narrowly oval to oblong, finely serrate, incurved teeth, pubescent along midrib; deciduous.

**Flowers/Fruit:**

Flowers are white, 1/3" in diameter, and borne in 4 to 6" long racemes; fruit is 1/3 – ½", a drupe, red at first, black when ripe, maturing in late summer, edible, bitter.¹

**Twigs:**

Reddish brown, with many lenticels, bitter taste.

**Buds:**

¼", ovate, chestnut brown, 3 bundle scars, shiny.

**Bark:**

Young – reddish brown with narrow horizontal lenticels, Older – black with plate-like scales.

**Distribution in North America:**

Native from southeast Canada, south to Florida, and west to Texas and Minnesota.²



Black cherry is intolerant of shade and has a rapid growth rate. It reaches a height of 50 to 80 feet and a diameter of 1 to 3 feet. Petioles have several small glands present around the leaf base. Leaves turn yellow to orangish in the fall. The flowers appear in the late spring, and have five small petals. While the pitted fruits are edible, wilted leaves, twigs (stems), and seeds are poisonous. Black cherry is also native from the southwest U.S., southward through Mexico, and into Guatemala. Black cherry often has a clear bole, and is a valuable timber tree.

1: Photo courtesy of [http://commons.wikimedia.org/wiki/File:Amerikaanse_vogelkers_vruchten_\(1\)_Prunus_serotina.jpg](http://commons.wikimedia.org/wiki/File:Amerikaanse_vogelkers_vruchten_(1)_Prunus_serotina.jpg)

2: Image courtesy of http://commons.wikimedia.org/w/index.php?title=File:Arealo_de_Malfrua_prunuso.pdf&page=1

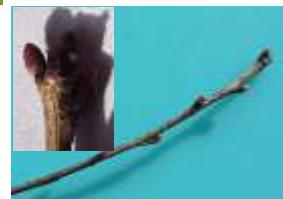
Pin cherry
Prunus pensylvanica
 Rosaceae

Leaves:

2 to 5" long, alternate, lanceolate, yellow-green, smooth above, finely serrated, less shiny than black cherry; deciduous.

**Flowers/Fruit:**

Flowers are $\frac{1}{2}$ " across, and appear on $\frac{1}{2}$ to 1" long stems in clusters of 4 to 5¹; fruit is $\frac{1}{4}$ " through, a drupe, bright red, rounded, edible, sour, maturing in the summer.

**Twigs:**

Twigs are reddish, slender, prominent orange lenticels present and bitter taste.

**Buds:**

1/8", ovate, chestnut brown, 3 bundle scars.

**Distribution in North America:**

Native from Labrador, south to western North Carolina, and northwestward to British Columbia.²

Pin cherry is intolerant of shade and has a rapid growth rate. It reaches a height of 25 to 40 feet and a diameter of 1.5 feet. The leaves turn yellow to red in the fall and the stems have 1 to 2 glands near the base of the leaf. The flowers are white and appear in mid spring. Short spurlike twigs are present on smaller branches. Pin cherry is very short lived, generally inhabits disturbed sites, and then succeeds to more permanent species. It typically has a conical crown in youth, but becomes rounded to irregular with age.

1: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Prunus_pensylvanica

2: Image courtesy of http://commons.wikimedia.org/wiki/File:Prunus_pensylvanica_range_map.svg

Hawthorn, Thorn apple*Crataegus spp.*

Rosaceae

Leaves:

1 to 4" long, alternate, may be serrated, toothed, or lobed, generally dark green and smooth above; deciduous.

**Flowers/Fruit:**

Flowers are generally white, 0.3 to 1" across, and in clusters; fruit is 0.3 to 0.8", a pome, color ranges from yellow to red, and matures in the fall.

**Twigs:**

Orangish to grey-brown, 0.5 to 5" long thorns.

**Buds:**

Small, rounded, reddish brown, smooth.

**Distribution in North America:**

Various species native throughout North America.

Hawthorn is fairly tolerant of shade and has a medium growth rate. *Crataegus spp.* generally reach a height of 20 to 35 feet and a diameter of 0.5 to 1 feet. The leaves vary greatly in shape and have stipules present. Fall coloration is usually not significant. It is not uncommon for the colorful fruits to persist into the winter. Flowers may appear with or before the leaves in early to late spring, depending on species. Hawthorn may be either a shrub or a small tree. There are as many as 1,000 species worldwide.

Black locust
Robinia pseudoacacia
Fabaceae

Leaves:

7 to 15" long, pinnately compound, alternate, 5 to 11 leaflets, leaflets 1 ½–2" long, dark bluish green, entire; deciduous.

**Flowers/Fruit:**

Flowers are white, 0.5 to 1" across, fragrant, and appear in drooping 3 to 8" racemes; fruit is a flat, brown glabrous legume, 2–4", maturing in late summer and persisting into winter.¹

**Twigs:**

Angular, brown, zigzag with stipular spines.

Buds:

1/16", brown and downy, terminal absent.

Bark:

Reddish-brown to black, deeply furrowed.

Distribution in North America:

Native from Pennsylvania, south to Alabama, and west to Oklahoma and Missouri.²



Black locust is intolerant of shade and has a rapid growth rate. It reaches a size of 60 to 80 feet and a diameter of 2 to 4 feet. The leaves may turn yellow in the fall, but often drop with no coloration. The showy, fragrant flowers appear in mid to late spring. The buds may be indented into the twigs and may not be visible. Stipular spines are generally 0.5 to 1" long. Although Black locust has a rather small native range, it has naturalized over much of North America. It typically has an irregular crown and spreads by root sprouts.

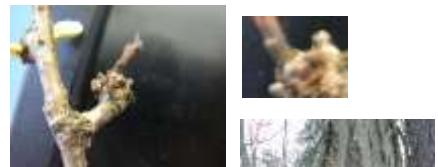
1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Robinia_pseudoacacia_seeds.jpg

2: Image courtesy of http://commons.wikimedia.org/wiki/File:Robinia_pseudoacacia_range_map.jpg

Honeylocust
Gleditsia triacanthos
 Fabaceae

Leaves:

5 to 20" long, alternate, both pinnately and bipinnately compound, 15–30 nearly sessile leaflets, leaflets are 0.5 to 1.5" long, dark green; deciduous.

**Flowers/Fruit:**

Flowers are small, greenish, and borne in 2 to 3" long raceme; fruit is a reddish to brownish twisted legume 7–18" long.

**Twigs:**

Twigs are zigzag, greenish-brown, smooth.

**Buds:**

Small, greyish may be naked or have scales.

**Bark:**

Grayish brown to black, ridged and furrowed, lenticellate, clusters of branched thorns.

Distribution in North America:

Native from Pennsylvania, south to Louisiana, and west to Texas and Nebraska.¹

Honeylocust is intolerant of shade and has a rapid growth rate. It reaches a height of 70 to 80 feet and a diameter of 2 to 3 feet. Typically, both pinnately and bipinnately compound leaves appear on the same tree. Leaves turn yellow in the fall. The flowers, although inconspicuous, are fragrant and appear in mid spring. Fruits mature in the late summer to fall. Honeylocust lacks terminal buds. Ridges of bark often peel away from the trunk. Both twigs and bark have 1 to 4" long, branched thorns. Crown shape is generally flat-topped to irregular, sometimes rounded.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Gleditsia_triacanthos_range_map.jpg

Flowering dogwood

Cornus florida

Cornaceae

Leaves:

2.5 to 6" long, opposite, oval, dark green, glabrous above, acuminate, margins wavy, 6 to 7 pairs of conspicuous veins; deciduous.

**Flowers/Fruit:**

Flowers are $\frac{1}{4}$ " wide, greenish to yellow, and in clusters; fruit is $\frac{1}{4}$ to $\frac{1}{2}$ " through, a shiny, bright red drupe, appearing in clusters of 2 to 4 in late summer to fall.

**Twigs:**

Slender, purplish with a glaucous coating.

**Buds:**

Flower buds globose; leaf buds acute.

**Distribution in North America:**

Native from southern New England, south to Florida, and west to Texas and Michigan.

Flowering dogwood is tolerant of shade and has a medium growth rate. It reaches a height of 15 to 40 feet and a diameter of 0.5 to 1.5 feet. Leaves usually turn red in the fall, but may turn yellow to orange. The flowers themselves are not showy, it is the 4 white to pink, 1.5 to 2" long, bracts that catch the attention of passersby. Flowers appear in mid spring. Both flower and leaf buds are greyish to purple; leaf buds opposite and valvate. Bark is smooth when young. Often used as an ornamental. Crown is usually flat-topped.

Blackgum, Black tupelo*Nyssa sylvatica*

Nyssaceae

Leaves:

Alternate, simple, 4–6" long, shiny, dark green, entire, infrequently one or two large marginal teeth on distal half; deciduous.

**Flowers/Fruit:**

Flowers are small, greenish, and appear in mid spring; fruit is a drupe, dark blue to black, 1/3 to 2/3", up to 3 drupes on a stalk, maturing in late summer.

**Twigs:**

Twigs are slender, greyish brown, glabrous with diaphragmed pith.

**Buds:**

1/8 to 1/4", yellow-brown, scales brownish at ends.

**Distribution in North America:**

Native from Maine, south to Florida, and west to Texas and Michigan.¹

Blackgum is tolerant of shade and has a rapid growth rate on good sites. It reaches a height of 60 to 90 feet and a diameter of 2 to 3 feet. The leaves turn yellow, orange, to red in the fall. Small branches have many small spur-like twigs present. Blackgum generally has a conical crown when young, but becomes irregular to flat-topped with age. Blackgum will grow on many different sites. It has little timber value. Used as an ornamental.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Nyssa_sylvatica_range_map.svg

Water tupelo
Nyssa aquatica
Nyssaceae

Leaves:

5–7" long, 2–4" wide, alternate, margin entire, acuminate, dark green above, paler and downy below; deciduous.¹

Flowers/Fruit:

Flowers are greenish, small, and appear in early spring; fruits are 1", pendent on slender stalks, reddish purple, a ridged nutlet inside.

Twigs:

Twigs are stout, reddish brown.

Buds:

To ¼", yellowish, terminals rounded, laterals smaller and not conspicuous.

Bark:

Thin, brownish gray with scaly ridges.²

Distribution in North America:

Native from southern coastal Virginia, south to Florida, and west to Texas and Illinois.



3



Water tupelo is intolerant of shade and has a rapid growth rate. It reaches a height of 80 to 100 feet and a diameter of 3 to 4 feet. Trunks have a swollen base that tapers up to a long, clear bole, and its root system is periodically under water, due to its habitat preference of floodplains. The leaves may have a few teeth along the margin and turn yellow in the fall. Small branches have spur-like twigs. Crown shape is narrow. Water tupelo is used for timber. It will tolerate heavily flooded soils and inhabits swamps.

1: Image courtesy of http://commons.wikimedia.org/wiki/Category:Nyssa_aquatica

2: Photo courtesy of http://commons.wikimedia.org/wiki/File:Nyssa_aquatica_tree.jpg

3: Photo courtesy of http://commons.wikimedia.org/wiki/Category:Nyssa_aquatica

American holly*Ilex opaca*

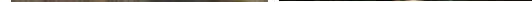
Aquifoliaceae

Leaves:

2 to 4" long, thick, leathery, dark green, spine toothed, elliptic; evergreen.

**Twigs:**

Twigs are grayish to light brown, smooth.

**Buds:**

Very small, 1/8 to 1/16" long, gray, and pubescent.

Bark:

Grayish white, smooth to warty.

Distribution in North America:

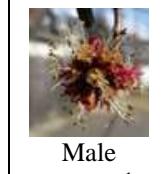
Native from southern New England, south to Florida, and west to Texas and Missouri.

American holly is tolerant of shade and has a slow to moderate growth rate. It reaches a height of 40 to 50 feet and a diameter of 1 to 2 feet. Leaves are evergreen, previous year's leaves drop each spring as new foliage emerges. Flowers are dioecious. Twigs have noticeable, but small lenticels. American holly has a dense, pyramidal crown in the open and an irregular crown in the forest. It will grow on a variety sites, but frequently grows on gravelly sites. It is often used as an ornamental and is the state tree of Delaware.

Red maple
Acer rubrum
 Aceraceae

Leaves:

Orbicular, 3 to 6" across, opposite, palmately 3–5 lobed (usually 3), margin serrate, light green above, white below; deciduous.



Male flowers¹



Flowers/Fruit:

Flowers are green to yellow, to red, 5 petals; fruit is a double samara, matures late spring, wings ~3/4" long, greenish to reddish brown when mature.



Twigs:

Slender, dark red, lustrous, minute lenticels.



Buds:

To 1/4", blunt and greenish to reddish in color; flower buds are rounded.



Female flowers²

Bark:

Smooth, light gray to long, narrow scaly plates.



Distribution in North America:

Native from southeastern Canada, south to Florida, and west to Texas and Minnesota.

Red maple is intermediate in shade-tolerance and has a rapid growth rate. It reaches a height of 75 to 90 feet and a diameter of 1 to 3 feet. The leaves turn various shades of yellow, orange, and red in the fall. Flowers appear before the leaves in very early spring. The fruits are strongly V-shaped. Red maple is the most common and widespread tree throughout the eastern United States. Red maple is commonly planted as an ornamental and many cultivars exist. It is also used for timber and is marketed as soft maple.

1: Photo courtesy of http://commons.wikimedia.org/wiki/File:Acer_rubrum_inflorescence_07.JPG

2: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Acer-rubrum-4829.jpg>

Silver maple
Acer saccharinum
Aceraceae

Leaves:

Opposite, 5 to 7" across, P. 82 deeply palmately 5-lobed, margin serrate, pale green above, silvery underneath; deciduous.

Flowers/Fruit:

Flowers are brownish red¹; fruit is a double samara, widely divergent, wings 1 ½–2" long, reddish brown when mature.

Twigs:

Twigs are red to brown, have fetid odor, lenticellate.

Buds:

To ¼" long, narrow to rounded, red in color.

Bark:

Silvery gray, smooth when young; breaking into long, thin scaly grey plates with age.

Distribution in North America:

Native from southeast Canada, south to northern Florida, and west to Oklahoma and Minnesota.²



Silver maple is intolerant of shade and has a rapid growth rate. It reaches a height of 60 to 80 feet and a diameter of 2 to 4 feet. The deciduous leaves generally turn yellow in the fall. The flowers appear in very early spring, well before the leaves. Flower buds are noticeably larger than leaf buds. The fruits mature in the late spring. Silver maple has a rounded to vase shaped crown and a trunk that often splits into multiple stems not far above the ground. It has been overused as an ornamental and will tolerate a wide array of growing conditions, preferring wetlands.

1: Photo courtesy of <http://commons.wikimedia.org/wiki/File:Acer-saccharinum-flowers.JPG>

2: Image courtesy of http://commons.wikimedia.org/wiki/File:Acer_saccharinum_range_map.svg

Boxelder
Acer negundo
Aceraceae

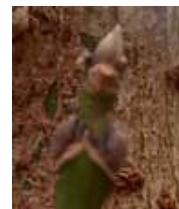
Leaves:

5 to 7" long, opposite, pinnately compound with 3–7 leaflets, variable size and shape, light to dark green, margin coarsely serrate or lobed; deciduous.



Flowers/Fruit:

Flowers are yellow green; fruit is a double samara, slightly convergent wings, 1 – 1.5" long, yellow brown when mature.



Twigs:

Stout, green to purplish green, lenticellate.



Buds:

To 1/8", ovoid, 4 visible bluish white tomentose scales.



Bark:

Light brown, narrow ridges and shallow fissures.



Distribution in North America:

Native to most of the U.S., southern Canada, and into Mexico.¹

Boxelder is tolerant of shade and has a rapid growth rate. It grows to a height of 50 to 75 feet and a diameter of 2 to 4 feet. The leaves turn yellow in the fall, but often drop without turning color. The fruits, which appear in clusters, mature in late summer and persist into the winter. Flowers are dioecious and appear in early spring. Twigs are smooth, emit a foul odor when broken and are often shiny. Boxelder has a rounded crown and a short trunk. It will tolerate adverse growing conditions and is often regarded as a weed.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Acer_negundo_range.PNG

Sugar maple
Acer saccharum
Aceraceae

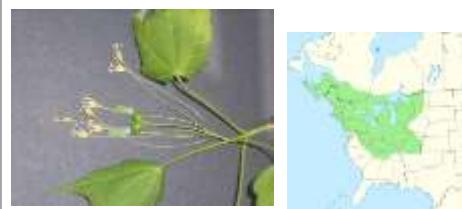
Leaves:

3 to 6" across, opposite, palmately 5-lobed, margins of lobes entire, bright green above, pale and smooth below; deciduous.



Flowers/Fruit:

Flowers are greenish yellow; fruit is a double samara, 1" long wings, reddish to yellowish brown, matures in fall.



Twigs:

Twigs are shiny, brownish, and lenticellate.



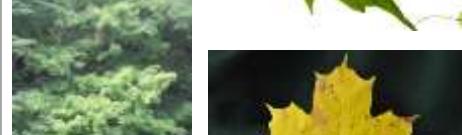
Buds:

To ¼" long, brown, acute, and sharply pointed.



Bark:

Gray, becoming furrowed, sometimes scaly; often develops curving plates with age.



Distribution in North America:

Native from southeast Canada, south to northern Georgia, and west to Missouri and Manitoba.¹



Sugar maple is extremely tolerant of shade, and has a moderate growth rate. It reaches a height of 75 to 100 feet and a diameter of 2 to 4 feet. The leaves turn various shades of yellow, orange, and red in the autumn. Flowers are borne on long stalks in drooping clusters and appear with the leaves in the spring. The wings of the fruits are parallel to only slightly divergent. Sugar maple has a rounded to oval shaped crown. It generally grows best on cool, moist, but well drained sites. It is used for timber, ornamental purposes, and syrup.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Acer_saccharum_range_map.svg

Staghorn sumac
Rhus typhina
Anacardiaceae

Leaves:

12 to 24" long, alternate, pinnately compound, 11–31 leaflets, leaflets 2 to 4" long, margin coarsely serrate, green above, greyish beneath, pubescent rachis; deciduous.



Flowers/Fruit:

Flowers are greenish white, 1/8" across, and borne in upright, 6 to 8" long clusters; fruits are small, hairy, red drupes born in upright, 6 to 8" long, compact, cone-shaped dense clusters.



Twigs:

Twigs are very hairy, stout, and brown.

Buds:

Hairy, white, surrounded by U-shaped leaf scar.



Bark:

Brown with raised lenticels, smooth.

Distribution in North America:

Native from southeast Canada, south to northern Georgia, and northwest to Iowa and Minnesota.

Staghorn sumac is intolerant of shade and has a rapid growth rate. It reaches a height of 25 to 35 feet and a diameter of 6 to 12". The leaves turn various shades of yellow, orange, and red in the fall. Flowers are dioecious. The fruits persist through the winter. Twigs and leaves emit a white sap when bruised. Terminal buds are absent. Bark becomes scaly with age. Staghorn sumac is a short lived plant that typically inhabits disturbed sites, fields, etc. It is used as an ornamental. Beware of a related plant—poison sumac.

Yellow buckeye
Aesculus flava
Hippocastanaceae

Leaves:

8 to 14" long, P. 91 opposite, palmately compound, 5 leaflets, leaflets 4 to 7" long, serrated, elliptical, smooth, dark green; deciduous.



Flowers/Fruit:

Flowers are whitish yellow, and appear in upright, 5 to 7" long clusters; fruits are 1 to 2", P. 93 a brown capsule, smooth husk covering seed.



Twigs:

Twigs are stout, brownish grey, and have large leaf scars.



Buds:

To 2/3", non-resinous, brown.

Bark:

Gray, breaking into fine scales.



Distribution in North America:

Native from western Pennsylvania, south to northern Georgia, west to western Tennessee, and northeast to central Ohio.

Yellow buckeye is intermediate in shade-tolerance and has a rapid growth rate. It reaches a height of 60 to 90 feet and a diameter of 2 to 3 feet. The leaves drop very early in the fall and turn yellowish. Often, the leaves drop in late summer, due to disease, and turn no significant color. Leaves and twigs lack the fetid odor of Ohio buckeye. The flowers appear in the spring after the leaves and have stamens shorter than the petals. Yellow buckeye prefers moist sites. It has an oval to rounded crown.

White ash
Fraxinus americana
Oleaceae

Leaves:

7 to 14" long, opposite, pinnately compound; 5–9 leaflets, leaflets 2 to 5" long, ovate or elliptical, dark green, margin serrate or entire; deciduous.

**Flowers/Fruit:**

Flowers are green to brownish purple, in panicles; fruits are a lanceolate samara, 1–2", wing not greatly narrowed at seed cavity, yellowish brown.

**Twigs:**

Twigs are stout, dark green to gray-green.

**Buds:**

To $\frac{1}{4}$ " ovoid, with 4–6 brownish scales.

**Bark:**

Gray to brown, furrowed into diamond shaped areas separated by narrow interlacing ridges.

Distribution in North America:

Native from southeast Canada, south to Florida, and west to Texas and Minnesota.¹

White ash is intermediate in shade-tolerance and has a rapid growth rate. It reaches a height of 75 to 90 feet and a diameter of 2 to 3 feet. Leaves are greyish on the undersides and turn shades of yellow, orange, red, and purple in the fall. Leaflets are stalked on the rachis. Flowers are dioecious and appear in the spring. Fruits are borne in drooping clusters and mature in the fall. Twigs are lenticellate with numerous bundle scars. Lateral buds are inserted in the V notch of a shield-shaped leaf scar. It has a rounded to oval crown.

¹: Image courtesy of http://commons.wikimedia.org/wiki/Category:Fraxinus_americana

Green ash*Fraxinus pennsylvanica*

Oleaceae

Leaves:

6 to 11" long, opposite, pinnately compound; 7–9 leaflets, leaflets 2 to 6" long, stalked, ovate or elliptical, margin serrate or entire, shiny, yellow-green above, pale below; deciduous.

Flowers/Fruit:

Flowers are green to purplish; fruit is a narrowly lanceolate samara, 1–2", wing narrowed toward seed cavity, yellowish brown.

Twigs:

Stout, flattened at nodes, gray to greenish brown.

Buds:

To $\frac{1}{4}$ ", conical to ovate, rusty brown, pubescent; lateral bud on top of straight-topped leaf scar.

Bark:

Greyish to brown with diamond pattern.

Distribution in North America:

Native from southeast Canada, south to Florida, and west to Texas and Saskatchewan.¹



Green ash is intolerant of shade and has an intermediate growth rate. It reaches a height of 60 to 80 feet and a diameter of 2 to 3 feet. The leaves turn yellow in the fall. Flowers are dioecious, are borne in panicles, and appear in the spring. Fruits are born in drooping clusters and mature in the fall. Bark is not as deeply furrowed as White ash. Green ash grows best on wet sites, but will tolerate adverse growing conditions. It has a rounded to oval crown and has been heavily used as an ornamental.

¹: Image courtesy of http://commons.wikimedia.org/wiki/File:Fraxinus_pennsylvanica_range_map.svg

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