

Arizona Urban Tree Map Field Guide

INTERIOR WEST CLIMATE REGION

Tree Identification Guide for the Urban
Forests of Arizona's Interior West

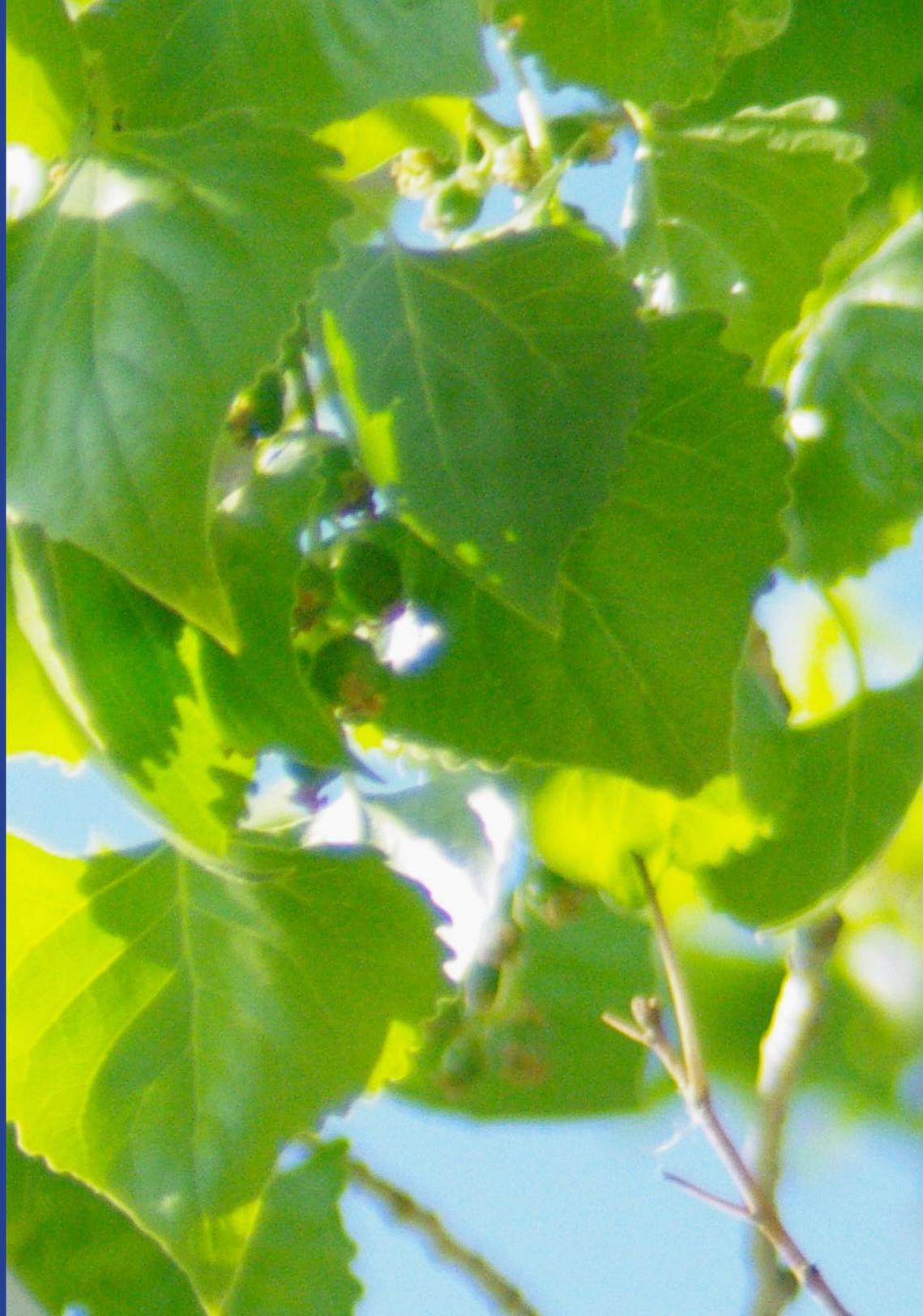


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INTRODUCTION

The Arizona Urban Tree Map (AZ UTM) is a joint project of the Arizona State Forestry Division and USDA Forest Service. The main goals of the project are to 1) support communities throughout Arizona in conducting urban forest inventories and 2) compile a database of inventory information, local forest resource information, strategies for public involvement and a sustainable plan to enable long-term urban forest management. This Tree Guide and corresponding instruction manual have been created using guidelines from the i-Tree Streets software program, which is an analysis tool for urban forest managers that uses tree inventory data to quantify the dollar value of annual environmental and aesthetic benefits: energy conservation, air quality improvement, CO2 reduction, stormwater control, and property value increase (www.itreetools.org/streets).

The i-Tree Streets program divides Arizona into three distinct climate zones (Figure 1): Southwest Desert, Interior West and North. This Tree Guide describes trees in the Interior West Climate region as listed in the i-Tree Streets program. Albuquerque is the reference city for this region.

Users doing an inventory in a city that is near the border of several climate regions should consult the USDA Forest Service community tree guides at www.fs.fed.us/psw/programs/cufr/ for the reference cities near their study area to compare characteristics (e.g. typical tree species, climate) of the reference city to match with their study area.

This Tree Guide and associated inventory materials, including instructions on how to conduct an inventory, can be found online at www.azsf.gov/azutm.

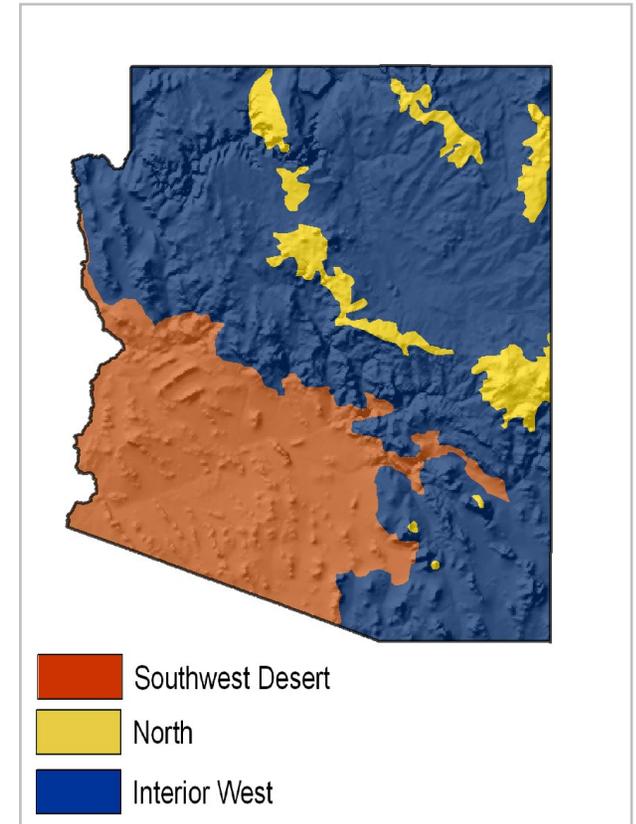


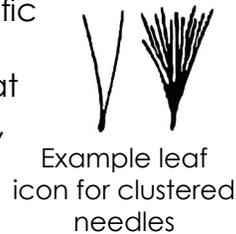
Figure 1. Interior West Climate Regions as defined by the i-Tree Streets Program

HOW TO USE THIS GUIDE

This tree field guide is designed to aid in the identification of trees commonly found in urban settings of the Interior West region of Arizona. Unlike other field guides, this book does not contain information on natural setting (e.g. habitat, range, elevation) for each species because this guide is geared for tree identification in an urban setting where trees may have been planted, pruned or supplementally watered. Instead this guide focuses on tree characteristics such as form, leaf, fruit, flower and bark to aid in identification no matter the setting.

Pages 10 and 11 contain information on broad categories of trees that can be recorded during a tree inventory if no other identification can be made. These trees are separated into deciduous broadleaf, deciduous evergreen, conifers, and palms and then further divided by tree size (small, medium, large). Following the broad categories are pages that contain information on specific trees and corresponding identifying characteristics. These pages are grouped by leaf type and then ordered alphabetically by scientific name. Each of these tree pages has a consistent

structure to make it easier to locate pertinent information. A leaf icon showing basic leaf type appears on the top right corner of each description box. The scientific name(s) is listed first in italics followed by common name(s) in parentheses. Scientific names with an 'x' in the name indicate that the species is a hybrid, or cross, between two other common tree species. Below species name is Family and Species Code, which is a two to six letter/number code in all caps. Each code is composed of the first two letters of the Genus and the first two letters of the species and a numerical identifier if needed (e.g. the code for *Pinus edlarica* is PIED2). The species code is an easy way to reference trees while in the field without having to record a lengthy scientific or common name. Below the tree name and species code is a list of information that can aid in tree identification, including family, typical height and width, form, leaf, bark, fruit, flower, and commonly associated insect and disease agents. A list of scientific names, common



names and species codes appears in the Index at the end of this guide. An expanded guide to the most likely insect and disease agents found in Arizona can be found in the Arizona Urban Tree Insect and Disease Field Guide at www.azsf.az.gov/azutm.

This information is meant to be a guide, not an exhaustive description of all tree characteristics. Using leaf type descriptions on page 4 and the dichotomous leaf key on page 5 are the easiest ways to identify a tree. The leaf key presents options related to leaf characteristics that lead to a list of trees and corresponding page numbers. To use the leaf key, determine if the leaf is scaly, needle-shaped or broad. For broad leaves, the next step is to determine if the leaves are simple or compound. Simple leaves are divided into categories based on leaf edges (smooth, serrated or lobed). Compound leaves are divided by leaflet type.

This guide does include some technical botanical terms, especially relating to leaf type. A list of technical terms and their definitions can be found in the Glossary (Pg. 58).

BASIC TREE MEASUREMENTS

Diameter at Breast Height

The most common tree measurement is Diameter at Breast Height, or DBH. DBH refers to the diameter of the trunk 4.5 feet from the ground on the uphill side of the tree and is used to estimate tree volume or weight.

There are several ways to measure DBH. A standard measuring tape does not measure DBH directly, but can be used to measure circumference. Dividing circumference by 3.14 gives the diameter. Calipers can be used, although the most popular tool is a diameter tape, or d-tape. The gradations on a d-tape are already converted from circumference to diameter, which is why it looks different than a standard measuring tape. A third option is a Biltmore stick, a graduated stick much like a yard stick. DBH is measured by holding the stick 25 inches from the eye and at breast height. The left side of the stick is flush with the left side of the tree. The number where the right side of the tree lines up with the stick is the approximate DBH of the tree.

Height

A Biltmore stick can also be used to estimate the height of a tree. Height is measured by standing about 65 feet from the tree and holding the stick upright with the back edge of the stick facing the user. The back edge of the stick will be marked with 1, 2, 3, 4, and 5 log markings, indicating the number of 16-foot logs in a tree (i.e. each log equals 16 feet). The bottom of the stick should line up with the bottom of the trunk. The height of the tree is how high the tree goes up on the stick. Another common tool is a clinometer, which uses triangulation to measure tree height.



TIPS FOR MEASURING DBH

The tree tapers in such a way that the diameter at a point below 4.5 feet is actually smaller than the diameter at 4.5 feet. Measure the diameter at the smallest point.

The tree has branches or bumps that interfere with DBH measurement. Measure DBH below the branch or bump, either a foot below or the point where bumps or branches cease to affect diameter of the stem. The underlying concept is to measure the diameter that would be closest to the expected DBH if branches or other irregularities were not present.

The vertically growing tree is on a slope. Measure the diameter 4.5 feet from the ground on the upper side of the slope.

The tree leans. Measure 4.5 feet up the stem in the direction of the lean.

The tree forks below DBH or near DBH. Measure the diameter at the narrowest part of the main stem below the fork.

The tree splits into several trunks close to ground level. Measure the diameter of each trunk separately, using the principals described above. The DBH for the tree is found by adding each diameter and taking the square root of the sum.

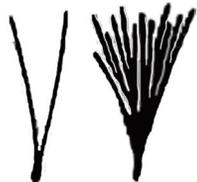
LEAF TYPES

Needles and scaly needles

Needle-like leaves are comparatively long, thin, usually evergreen and most often found on conifers. Needles may be rounded as in pines, flattened as in hemlocks, or scale-like (often triangular-shaped and appressed to the stem) as in junipers and cedars. Needles can be arranged singly or can occur in groups of 2-5 within a fascicle (bundle).



Single needle
Pg. 12



Clustered needles
Pg. 14



Scaly needles
Pg. 18

Simple undissected and simple lobed leaves

Simple leaves have a single leaf blade from their point of attachment to the stem. Some simple leaves have leaf margins that are round, elliptical or oval without indentations. These are referred to as simple undissected leaves. Others have margins that indent or are divided into incompletely separated sections (resembling clubs in a deck of cards). These are referred to as simple lobed leaves. Simple undissected and simple lobed leaves may be arranged oppositely or alternately along a stem. Opposite leaves occur directly across from each other while alternate leaves are off-set.



Simple undissected opposite
Pg. 21



Simple undissected alternate
Pg. 24



Simple lobed opposite
Pg. 38



Simple lobed alternate
Pg. 40

Compound leaves (pinnate or palmate)

A compound leaf is a single leaf that is composed of many small blades (leaflets) that resemble leaves themselves. Each compound leaf has a single point of attachment to the stem. Pinnately compound leaves are the shape of a feather, palmately compound leaves are the shape of a fan or hand.



Pinnately compound opposite
Pg. 45



Pinnately compound alternate
Pg. 49



Palmately compound opposite
Pg. 53



Palmately compound alternate
N/A

Bipinnately compound leaves

A twice compound leaf occurs when each of the leaflets (divided leaf blades) of a compound leaf is composed of an even smaller set of leaflets. Compound leaves, like simple leaves, may be arranged oppositely or alternately along a stem. Opposite leaves occur directly across from each other while alternate leaves are off-set.



Bipinnately compound opposite
N/A



Bipinnately compound alternate
Pg. 54

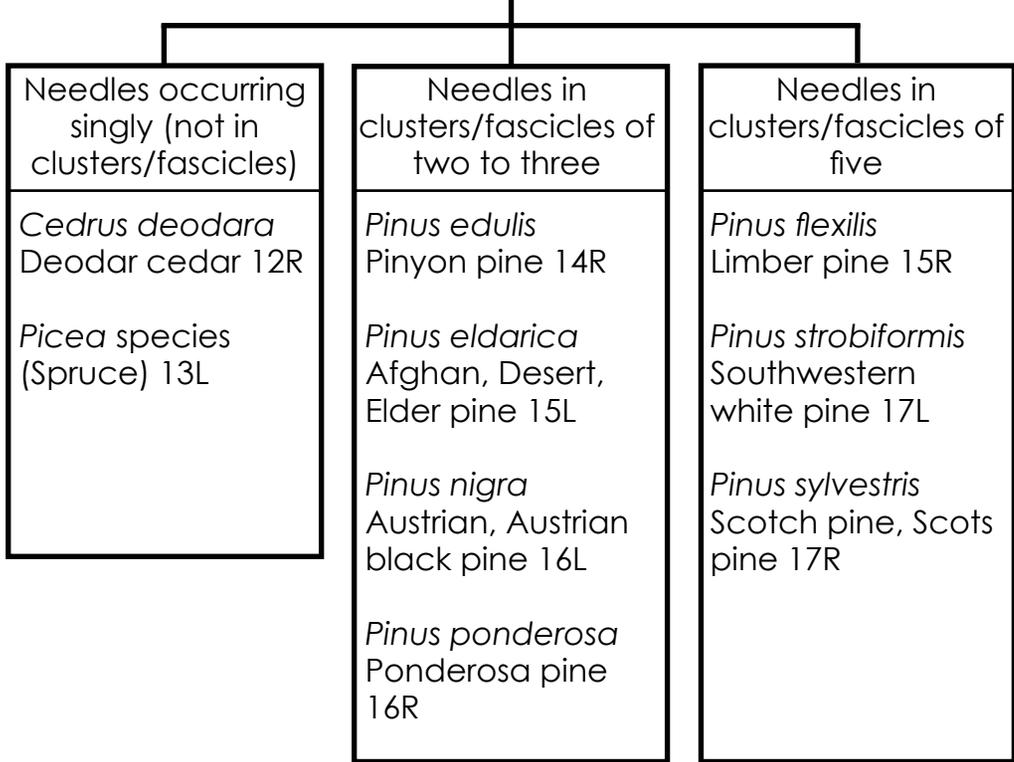
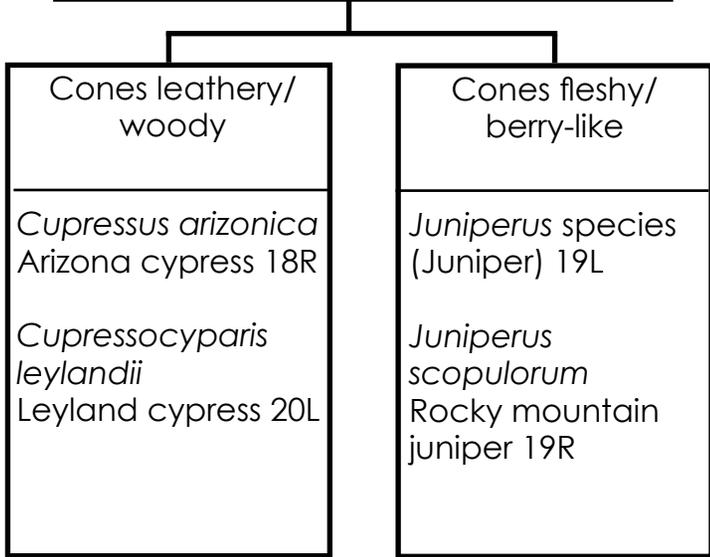
DICHOTOMOUS LEAF KEY

Scale-Leaved or Needle-Leaved Trees

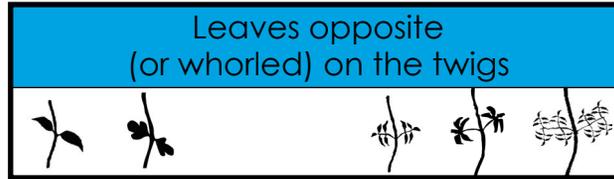
Scale-Leaved
Leaves scale-like, mostly evergreen



Needle-Leaved
Leaves needle-like

Broad-Leaved Trees



Leaves simple, undissected, not compound

Leaves compound, dissected leaf blade

Leaf edge smooth (entire leaf margin)



Catalpa species
Catalpa 21R

Catalpa speciosa
Western catalpa 22L

Chilopsis linearis
Desert willow 22R

Chitalpa species
Chitalpa 23L

Forestiera pubescens
New Mexico olive
23R

Leaf edge toothed (dentate or serrate)



Forestiera pubescens
New Mexico olive
23R

Leaves lobed (deeply incised)



Acer platanoides
Norway maple 38R

Acer saccharinum
Silver maple 39L

Leaves pinnately (feather-like) compound



Leaves palmately (hand-like) compound



None

Leaves bipinnately (leaflet divided into leaflets) compound



None

Fruit samaras (flattened wing of fibrous, papery tissue) in clusters of pairs

Acer negundo,
Boxelder 45R

Fruit samaras (flattened wing of fibrous, papery tissue) in clusters of singles (ash keys)

Fraxinus americana White ash 46L
Fraxinus angustifolia Raywood ash 46R
Fraxinus berlandieriana, Arizona/Mexican ash 47L
Fraxinus pennsylvanica, Green ash 47R
Fraxinus velutina, Velvet ash 48L
Fraxinus velutina, 'Modesto', Modesto ash 48R

Broad-Leaved Trees

Leaves alternate on the twigs



Leaves simple, undissected, not compound

Leaves compound, dissected leaf blade



See page 6

Leaf edge smooth (entire leaf margin)



Leaves lobed (deeply incised)



Leaf edge toothed (dentate or serrate)



See page 4

Leaves leathery, rigid (coriaceous)

Leaves not leathery, rigid (coriaceous)

Leaves leathery, rigid (coriaceous)

Leaves not leathery, rigid (coriaceous)

Eucalyptus globulus, Blue gum 27L
Eucalyptus microtheca, Coolibah tree 27R
Quercus species, Oak 34L
Magnolia species, Magnolia 29L

Leaves lanceolate to linear (> twice as long as wide)

Leaves not lanceolate to linear (< twice as long as wide)

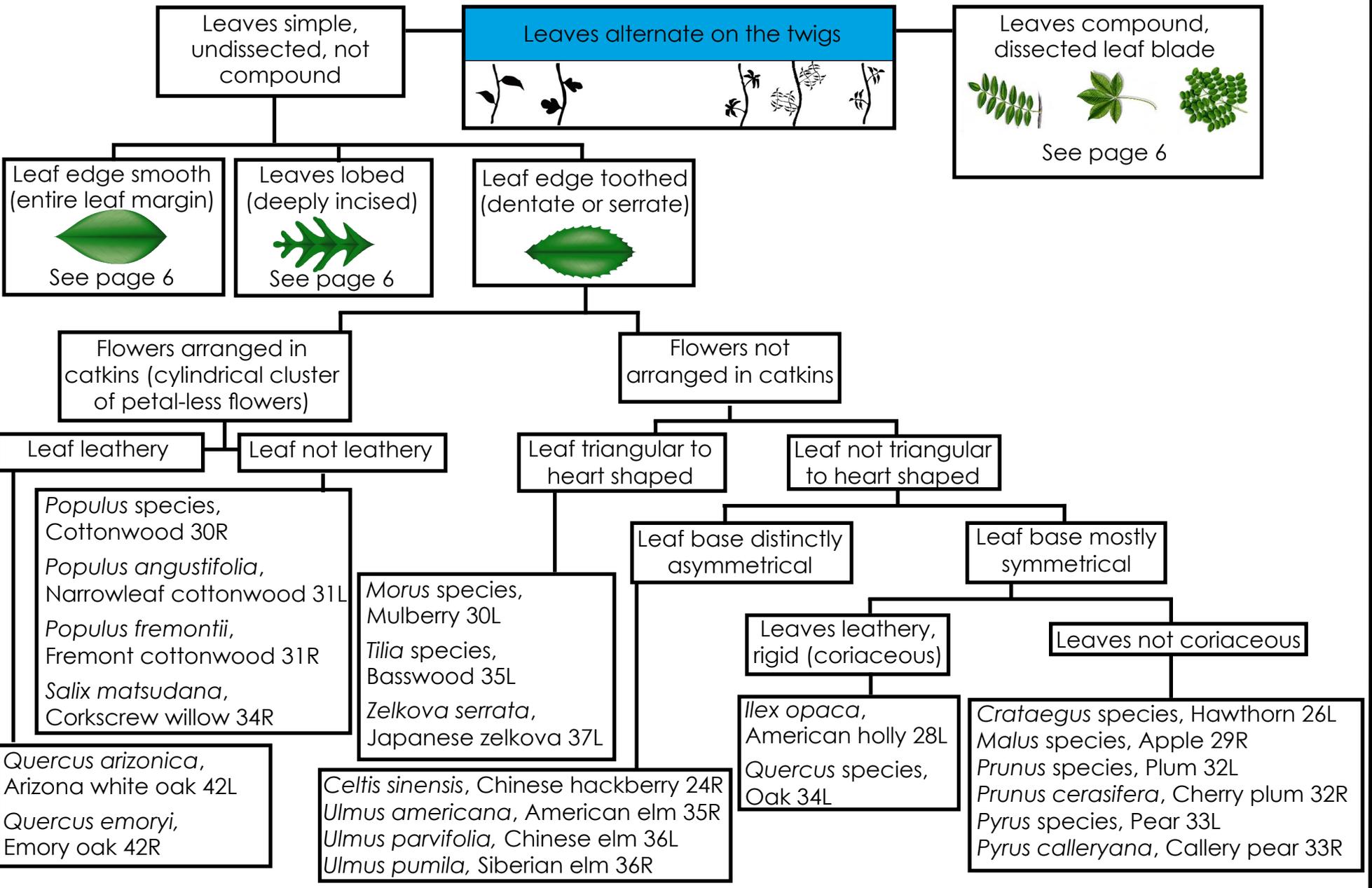
Cercis canadensis, Eastern redbud 25L
Cercis reniformis, Southwestern redbud 25R
Maclura pomifera, Osage orange 28R

Chilopsis linearis, Desert willow 22R
Chitalpa species, Chitalpa 23L
Elaeagnus angustifolia, Russian olive 26R

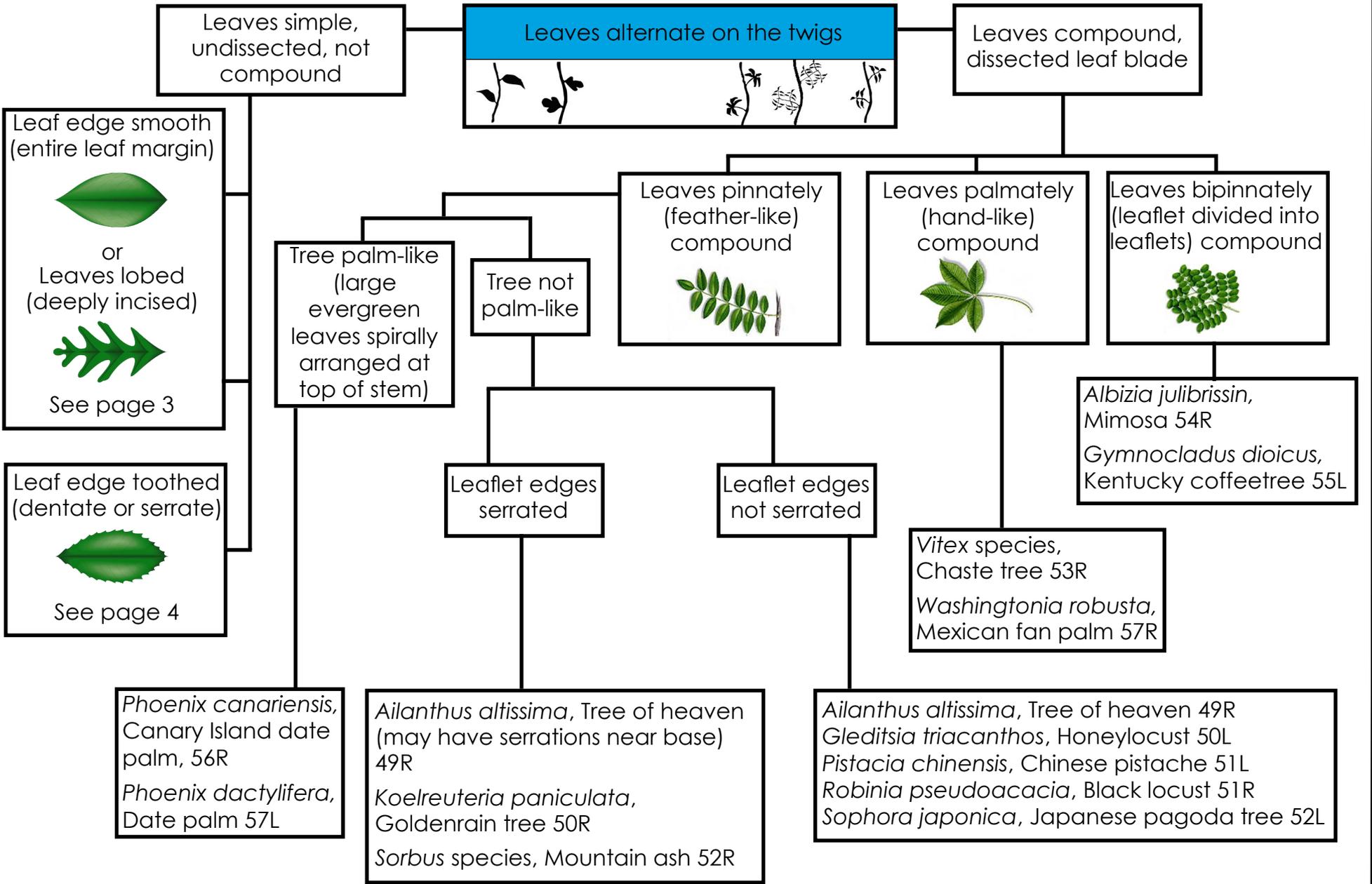
Crataegus species, Hawthorn 26L
Morus species, Mulberry 30L
Platanus hybrida, London planetree 40R
Platanus wrightii, Arizona sycamore 41L

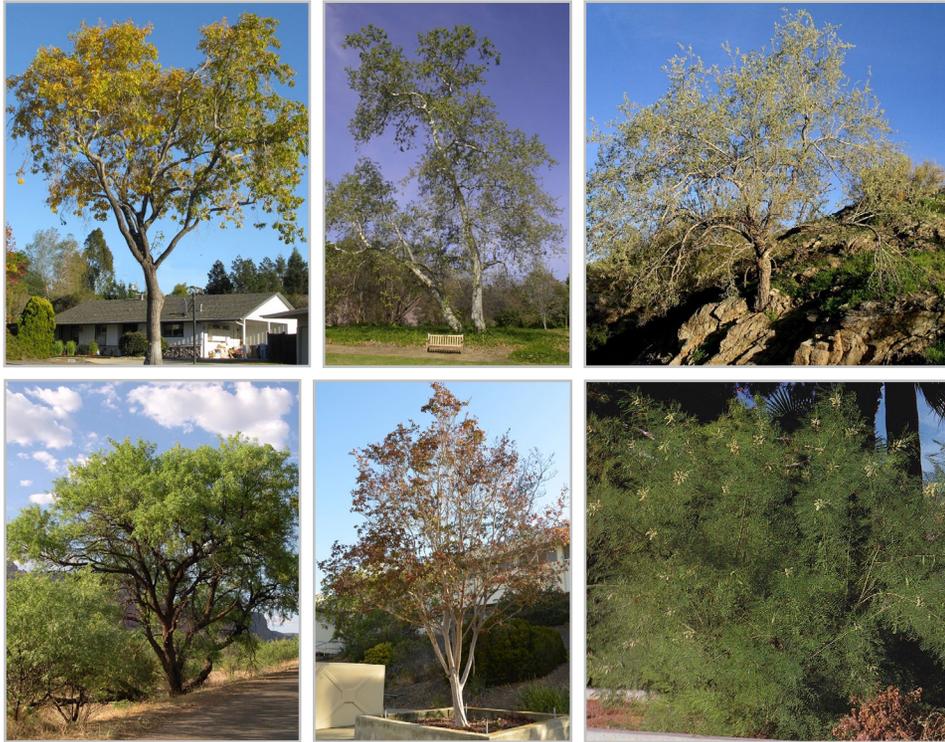
Quercus species, Oak 34L, 41R
Quercus macrocarpa, Bur oak 43R
Quercus shumardii, Shumard oak 44L

Broad-Leaved Trees



Broad-Leaved Trees





Broadleaf Deciduous General Tree Category Species code: BDL, BDM, BDS

Broadleaf deciduous trees have broad, flat leaves and are normally leafless at some time during each year. In comparison, conifers (and some others) have leaves resembling needles.

- Large (BDL):** greater than 40' at maturity. Examples: sycamore, cottonwood, ash, mulberry, *Populus*, walnut.
- Medium (BDM):** 20-40' at maturity. Examples: palo verde, most mesquite, *Albizia*, and some *Acacia* species.
- Small (BDS):** less than 20' at maturity. Examples: *Prunus*, *Pyrus*, crape myrtle, Texas ebony, pomegranate, *Vitex*, some *Acacia* species.

Broadleaf Evergreen General Tree Category Species code: BEL, BEM, BES

Broadleaf evergreen trees have broad, flat leaves that are normally retained year round. In comparison, conifers (and some others) have leaves resembling needles.

- Large (BEL):** greater than 40' at maturity. Examples: Many *Eucalyptus* species, silk oak, Indian laurel.
- Medium (BEM):** 20-40' at maturity. Examples: Olive, weeping fig, Chinese privet, African sumac.
- Small (BES):** less than 20' at maturity. Examples: Citrus, oleander, Texas mountain laurel, California pepper tree, some *Acacia* species.





Conifer Evergreen General Tree Category Species code: CEL, CEM, CES

Conifer evergreen trees bear cones (in lieu of fruits and flowers) and have needle-like or scaly leaves that are normally retained year round. Scaly/needle-leaved flowering plants that are not conifers are included in this category.

Large (CEL): greater than 40' at maturity. Examples: Afghan pine, aleppo pine, atlas cedar, deodar cedar, athel tree, *Casuarina*, Italian cypress.

Medium (CEM): 20-40' at maturity. Examples: Canary Island pine, pinyon pine, Mexican pinyon pine.

Small (CES): less than 20' at maturity. Examples: Hollywood juniper, Arizona cypress.

Palm Evergreen General Tree Category Species code: PEL, PEM, PES

Palm evergreen trees have well developed, usually unbranched, erect trunks and normally retain their leaves year round. Leaves are large, simple or most often fan or feather shaped. Flowers (3 part) and fruit (drupe or nut-like) form on a panicle hanging between leaves.

Large (PEL): exceeds 40' at maturity. Examples: Date palm, Canary Island date palm, California fan palm.

Medium (PEM): 20-40' at maturity. Examples: Queen palm, pindo palm.

Small (PES): less than 20' at maturity. Example: Mediterranean fan palm.



SINGLE NEEDLES



***Cedrus deodara* (Deodar cedar)**

Family: Pinaceae

Species code: CEDE

Height: Up to 80' **Width:** 40'

Form: Broad pyramidal crown that becomes wider with age

Leaf: Evergreen needles; dark green but may have some silvery bloom giving them a blue-green color; 1-2 " long

Bark: Initially smooth and gray-brown, later developing short furrows with scaly ridge tops

Fruit: Upright cones, 3-4" long; initially green and purplish, later turning a reddish brown

Flower: Cones in place of flowers

Common Insects/Disease: Beetle borers, *Phytophthora* and sooty mold





***Picea* species (Spruce)**

Family: Pinaceae **Species code:** P11

Height: 60-130' **Width:** 20-25'

Form: Erect with a conical shape and whorled branches

Leaf: Single needle attached to the branches in a spiral fashion, each needle on a small peg-like structure; dark green, blue-green or silver-gray

Bark: Dark brown to red brown and scaly or gray and furrowed

Fruit: Male cones are large (1.5-3" long) and yellowish-brown

Flower: Female cones are reddish brown to purple and found upright in the tops of trees

Common Insects/Disease: Aphids, beetle borers and scales

CLUSTERED NEEDLES



***Pinus edulis* (Pinyon pine)**



Family: Pinaceae

Species code: PIED

Height: Up to 45' **Width:** 20-30'

Form: Small, spreading almost bushy tree with an irregular, rounded crown

Leaf: Evergreen needles, 1-2" long, usually fascicles of 2; coarse, stiff, thick, and curved; blue-green or yellow-green

Bark: Scaly or with small plates; red-brown to gray

Fruit: Short stalked, ovoid brown cones with thick scales; 2" long

Flower: Males are red, cylindrical and in clusters near ends of branches; females are purplish and found at branch tips

Common Insects/Disease: Aphids and scales





***Pinus flexilis* (Limber pine)**



***Pinus flexilis* (Limber pine)**

Family: Pinaceae **Species code:** PIFL
Height: 30-50' **Width:** 15-20'
Form: Often multiple, plume-like tops with drooping branches
Leaf: Evergreen needles, 2.5-4" long; fascicles of 5; dark green and rigid with lengthwise rows of pores
Bark: Initially thin, smooth and gray-white; later darkens to brown or black with deep fissures and square plates
Fruit: Moderate sized woody cone with a short stalk; cones turn from green to brown as they ripen
Flower: Male cones are small and reddish; female cones are bright reddish-purple
Common Insects/Disease: Aphids and white pine blister



Family: Pinaceae **Species code:** PIEL2
Height: 30-50' **Width:** 15-25'
Form: Symmetrical and cone-shaped
Leaf: Sheath of paired evergreen needles, 3-6" long; fascicles of 2 or 3; thin and irregularly twisted; bright green to blue green
Bark: Gray and fissured
Fruit: Reddish brown cone, 5-6" long
Flower: Insignificant
Common Insects/Disease: No significant





***Pinus ponderosa* (Ponderosa pine)**



Family: Pinaceae **Species code:** PIPO
Height: 50-100' **Width:** 25-30'
Form: Flat top or short conical crown
Leaf: Yellow-green needles; 5-10" long; fascicles of 3 (or 2); crushed needles yield turpentine odor (can be citrus-like)
Bark: Dark (nearly black) on young trees, developing cinnamon colored plates and deep furrows; can smell like butterscotch
Fruit: Red-brown oval cones; 3-6" long; sessile (no stalk)
Flower: Males are yellow-red, cylindrical and in clusters near ends of branches; females are reddish and at branch tips
Common Insects/Disease: Aphids, ips, beetle borers, pitch canker and mistletoe

***Pinus nigra* (Austrian pine, Austrian black pine)**



Family: Pinaceae **Species code:** PINI
Height: 50-100' **Width:** 20-30'
Form: Erect to spreading dense crown that eventually develops a flat top
Leaf: Flexible, evergreen needles 4-6" long; fascicles of 2; thick and dark green
Bark: Brown to gray, developing gray-brown ridges and dark brown furrows
Fruit: Ovoid yellow-brown cones; 2-3" long
Flower: Males are cylindrical, yellow and in large clusters along twigs; females are oval and yellow to purple
Common Insects/Disease: No significant





***Pinus strobiformis* (Southwestern white pine)**



Family: Pinaceae **Species code:** PIST2
Height: 100' **Width:** 50'
Form: Conical crown when young, later broader with flat top
Leaf: Thin evergreen needles, 2-3" long; fascicles of 5; serrated near tips; bluish-green
Bark: Gray-brown and smooth; becoming furrowed with scaly, rounded ridges
Fruit: Yellow-brown cone; 5-9" long; thick scales bend backwards with a narrow tip
Flower: Males are pale yellow; females are green to reddish
Common Insects/Disease: White pine blister rust and dwarf mistletoe

***Pinus sylvestris* (Scotch pine, Scots pine)**



Family: Pinaceae **Species code:** PISY
Height: 30-70' **Width:** 25-30'
Form: Often twisted or poorly formed trunk, rounded crowns
Leaf: Evergreen needles, 1.5-3" long; stout, twisted, fascicles of 2; blue-green with stomatal (porous) bands
Bark: Orange-brown and scaly or peeling when young and in upper crown; gray or red-brown furrows at maturity
Fruit: Yellow-brown, ovoid cones, 1.5-2.5" long; slightly stalked; the cone tip has a blunt spine
Flower: Males are cylindrical and yellow in large clusters; females are oval and yellow-green to purple
Common Insects/Disease: Aphids, fusarium and *Phytophthora*



SCALY NEEDLES



***Cupressus arizonica* (Arizona cypress)**



Family: Cupressaceae **Species code:** CUAR

Height: Up to 75' **Width:** Up to 45'

Form: Varies from a conical to irregular spreading canopy

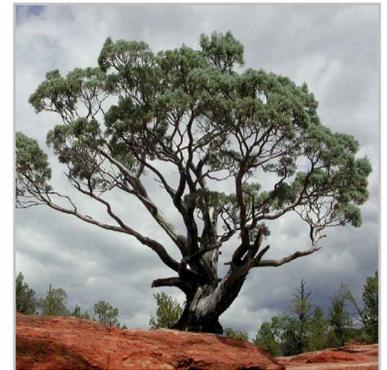
Leaf: Tight and crowded scaly needle in opposite pairs resulting in a square twig; glandular and often resinous; gray-green to silvery blue; often quite waxy and bad-smelling when bruised

Bark: Smooth when young; may become rough, furrowed, and fibrous when older

Fruit: Brown seeds with horned appearance

Flower: Yellow; insignificant

Common Insects/Disease: Leaf blight





***Juniperus scopulorum* (Rocky mountain juniper)**



Family: Cupressaceae **Species code:** JUSC

Height: 20-50' **Width:** 8-20'

Form: Small tree or large shrub; shape is variable but often short with a round crown

Leaf: Small; tight against the branches; green to gray-green

Bark: Thin and quite scaly with long narrow ridges; reddish brown but turns gray when aged and weathered

Fruit: Round, bluish, berry-like cones

Flower: Occur at branch tips; roundish and small (.125")

Common Insects/Disease: Aphids, beetle borers and spider mites



***Juniperus* species (Juniper)**



Family: Cupressaceae **Species code:** JU

Height: 20-50' **Width:** 8-20'

Form: Erect or spreading oval shape

Leaf: Scale-like; blue-green or silver-gray

Bark: Variable; can be blocky, rough and scaly to exfoliating; ridged or striated; light green, gray or red-brown

Fruit: Small (.25-.5") fleshy, brown or red cone that can look berry-like

Flower: Insignificant

Common Insects/Disease: Aphids, beetle borers, spider mites, spittlebugs and rust





x *Cupressocyparis leylandii* (Leyland cypress)



Family: Cupressaceae **Species code:** CULE

Height: 50-70' **Width:** 15-25'

Form: Narrow, oblong crown

Leaf: Fine, scale-like evergreen needles arranged in pairs; individual leaves .0625-.125" long; green to bluish-green

Bark: Red-brown and scaly; gray weathered strips when older

Fruit: Round, small, brown cone; .5-75" diameter

Flower: Males are small (.125") red-brown terminal cones; females are slightly larger, round and yellow-green; not showy

Common Insects/Disease: Caterpillars and branch blight

**SIMPLE UNDISSECTED
OPPOSITE LEAVES**



Catalpa species (Catalpa)



Family: Bignoniaceae **Species code:** CA3

Height: Up to 80' **Width:** Up to 40'

Form: Spreading with a high canopy and rounded shape

Leaf: Generally cordate (heart-shaped); medium to dark green

Bark: Light green, gray to reddish brown; generally scaly

Fruit: Long and bean-like, hanging capsules

Flower: Very showy; white with yellow and purple spots on the inside; 5 fuzzy petals form an overall bell shape

Common Insects/Disease: Caterpillars, anthracnose, powdery mildew and *Verticillium*





Catalpa speciosa (Western catalpa)



Family: Bignoniaceae **Species code:** CASP
Height: 40-60' **Width:** 20-40'
Form: Spreading, crooked branches and an irregular crown
Leaf: Whorled, cordate, 5-12" long; pinnately veined with smooth edges; soft and flexible feeling; light green to green above and soft pubescence below
Bark: Gray to reddish brown with irregular, shallow fissures
Fruit: Long bean-like, hanging capsules
Flower: Very showy, white (yellow and purple spots on insides), 5 fuzzy petals form an overall bell shape
Common Insects/Disease: Caterpillars, anthracnose and Verticillium

Chilopsis linearis (Desert willow)



Family: Bignoniaceae **Species code:** CHLI
Height: 30' **Width:** 10'
Form: Spreading low or high canopy; multi-stemmed; often with a twisted crown
Leaf: Alternate and opposite or whorled on the same stem; linear, often slightly curved; 3 - 5" long
Bark: Gray-brown with lighter colored cracks and splits
Fruit: Long and thin, slightly twisted brown capsule; 6 - 12"
Flower: Bell shaped and 1" long; white to pale lavender with purple and yellow streaks inside throat
Common Insects/Disease: Fall webworm and Western tent caterpillar





Chitalpa species (Chitalpa)



Family: Bignoniaceae **Species code:** CH31

Height: 25' **Width:** 25'

Form: Small, open, airy and upright tree; usually low canopy

Leaf: Variable alternate leaf arrangement, sometimes whorled or ternate (3 leaflets); leaves lanceolate (tapered) and smooth sometimes slightly reflexed; 2-5" long

Bark: Light green and scaly

Fruit: Very large (over 3" long); brown, beige or mostly green capsule; fruiting in Fall

Flower: 15-40 florets in a terminal raceme; white to pale or dark pink and often with distinct purple veins

Common Insects/Disease: Aphids and *Verticillium*

Forestiera pubescens (New Mexico olive)



Family: Oleaceae **Species code:** FOPU2

Height: Up to 15' **Width:** 5-8'

Form: Dense, thicket forming shrub with drooping branches

Leaf: Obovate to elliptical, 1-2" long; smooth to serrated edge; green above and slightly paler below

Bark: Smooth and light brown to gray

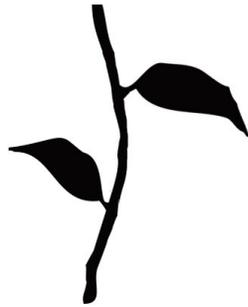
Fruit: Elliptical, dark blue, waxy drupe .25" long occurring in a tight cluster close to the stem

Flower: Very small and lacking petals; light yellow-green; appears in axillary clusters before the leaves

Common Insects/Disease: No significant



**SIMPLE UNDISSECTED
ALTERNATE LEAVES**



***Cellis sinensis* (Chinese hackberry)**



Family: Cannabaceae **Species code:** CES14

Height: 40-65' **Width:** 35-50'

Form: Rounded or umbrella shape with an irregular crown

Leaf: Oval or elliptic and medium green; 4" long with wavy, toothed edges; underside has a sand-papery texture

Bark: Mottled light gray; mature bark is rough

Fruit: Small round orange or purple drupe, less than .5"

Flower: Insignificant and not showy

Common Insects/Disease: No significant





Cercis canadensis (Eastern redbud)



Family: Fabaceae **Species code:** CECA
Height: 30' **Width:** 10-20'
Form: A large shrub or small tree with a short, often twisted trunk and spreading canopy
Leaf: Alternate, simple and cordate (heart shape); 3-5" long and wide with a smooth edge; thin and papery
Bark: Initially smooth and brown; later ridged and furrowed to scaly and dark gray
Fruit: Flattened, dry legumes; brown when dry
Flower: Very showy pea-like flower; pink to light purple
Common Insects/Disease: Caterpillars, scales, anthracnose, crown rot, *Phytophthora* and *Verticillium*

Cercis reniformis (Southwestern redbud)



Family: Fabaceae **Species code:** CERE2
Height: 25' **Width:** 15-20'
Form: Upright with a rounded or vase shape
Leaf: Cordate to ovoid shape; very shiny, thick leathery dark green leaves; rounded or notched tips; 2-3" wide
Bark: Smooth and light brown; matures to brown or black
Fruit: Elongated, purple seedpods that are 1-4" long with a dry, hard outer covering
Flower: Lavender, deep pink to red or purple flowers appear in profusion on tree limbs in Spring
Common Insects/Disease: Treehoppers, scale insects, cankers and *Verticillium*





Crataegus species (Hawthorn)



Family: Rosaceae **Species code:** CR
Height: Up to 25' **Width:** Equal to or less than height
Form: Generally very dense shrubs or small trees
Leaf: Highly variable; generally 2-4" long, serrate and lobed or unlobed; thorns beneath; green above and paler below
Bark: Smooth, gray-brown turning darker and scaly with age
Fruit: Small pomes (.25" diameter); yellow to red when mature
Flower: Usually small white flowers with 5 petals produced in clusters near the end of the twig
Common Insects/Disease: Depending on species, aphids, beetle borers, scales, spider mites, fire blight, powdery mildew, rust and sooty mold

Elaeagnus angustifolia (Russian olive)



Family: Elaeagnaceae **Species code:** ELAN
Height: Up to 40' **Width:** 15-20'
Form: Upright and rounded or shrub shape
Leaf: Linear to lanceolate with a smooth edge; scaly; 1 - 3" long and .5" wide; green to almost gray above and silvery below
Bark: Smooth and gray when young, becoming irregularly ridged and furrowed with age
Fruit: Berry-like achene .5" long; silvery reddish brown; sweet and edible but quite dry
Flower: Bell-shaped and very fragrant; yellow to green
Common Insects/Disease: *Phytophthora* and *Verticillium*





***Eucalyptus microtheca* (Coolibah tree)**



Family: Myrtaceae **Species code:** EUMI2
Height: 30-40' **Width:** Generally greater than height
Form: Variably upright and irregular in spread
Leaf: Disjunct, narrowly lanceolate (tapered); 3-6" long and 1" wide; dull grey-green in color
Bark: Dark grey; thick and furrowed
Fruit: Small seed capsules
Flower: Small creamy flowers
Common Insects/Disease: Beetle borers



***Eucalyptus globulus* (Blue gum eucalyptus)**



Family: Myrtaceae **Species code:** EUGL
Height: Up to 200' **Width:** 60-80'
Form: Large tree with a straight trunk
Leaf: Alternate (may be opposite on young branches); ovoid to pointed; 4-8" long; often curved and drooping
Bark: Reddish-brown and rough; peels in long loose strips; inner bark smooth and creamy white to yellow-green
Fruit: Dry, heavy capsules, .5-1" long, looks like a child's wooden top; bluish and warty when fresh, later turning brown
Flower: Round, 2" across, with very long creamy white stamens, no petals, making it look like a round bottle brush
Common Insects/Disease: Beetle borers and thrip





Maclura pomifera (Osage orange)



Family: Moraceae **Species code:** MAPO

Height: Up to 65' **Width:** 30-40'

Form: Irregular crown with stiff, spiny branches and short trunk

Leaf: Pinnately veined; 2-5" long; oblong to ovoid with an acuminate tip and smooth margins; shiny upper surface

Bark: Orange-brown; scaly ridges with irregular furrows

Fruit: Large, round multiple of drupes 4-5" in diameter; resembles "brains" on outer surface; distinctive citrus smell

Flower: Females in dense, round, clusters; males in somewhat rounded racemes; neither showy

Common Insects/Disease: Aphids, scales, spider mites and *Verticillium*



Ilex opaca (American holly)



Family: Aquifoliaceae **Species code:** ILOP

Height: 30-40' **Width:** Generally greater than height

Form: Thick crown and pyramidal form

Leaf: Elliptical, 2-4" long; spiny toothed edge; thickened and leathery; shiny dark green above, much paler below

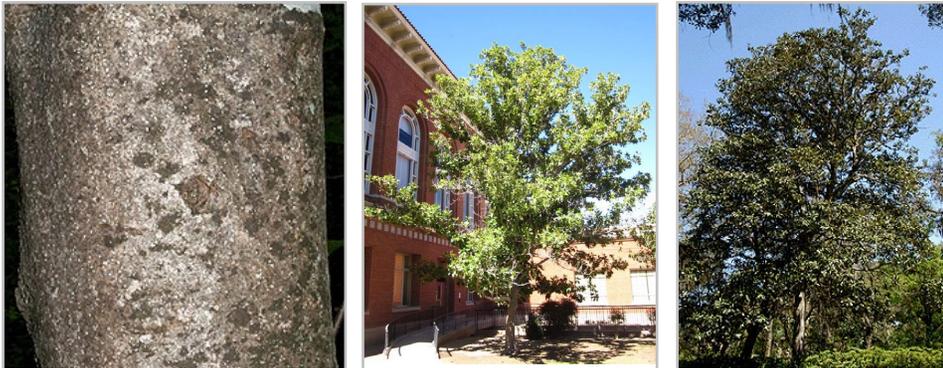
Bark: Light gray and smooth regardless of size

Fruit: Berry-like red drupe; rarely yellow when ripe; .25" diameter; containing ribbed nutlets

Flower: Dull green-white; male flowers on 3-7 flowered clusters, female flowers are solitary with a pleasant odor

Common Insects/Disease: Leaf miner, scales, spider mites, anthracnose, canker and powdery mildew





Magnolia species (Magnolia)



Family: Magnoliaceae **Species code:** MA1
Height: Variable; 20-80' **Width:** 10-40'
Form: Columnar to oval shape; generally with a straight trunk
Leaf: Obovate or elliptical; usually large (can be from 2.5-30" long); margin can be smooth or wavy; green to dark green
Bark: Smooth and often mottled; reddish brown to gray
Fruit: Cone-like group of follicles up to 3" long; bright red when mature, later dark brown; individual seeds bright red
Flower: White flowers 3-4" across with 12-20 petals
Common Insects/Disease: Depending on species, aphids, scales, spider mites and *Verticillium*

Malus species (Apple)



Family: Rosaceae **Species code:** MA2
Height: 13-40' **Width:** 20-25'
Form: Erect or spreading with a low, oval or umbrella canopy
Leaf: Simple, alternate leaf with a serrated edge; 1-4" long
Bark: Gray, brown or reddish-brown; young trees are smooth while older trees have knotty bark
Fruit: Prolific red, yellow or mostly green pome (typical apple)
Flower: Flat-topped cluster of 5 petals; may be white, pink or red with a darker bud emerging in April or May
Common Insects/Disease: Aphids, beetle borers, codling moths and psyllid, brown rot, canker, crown rot, powdery mildew, scab and sooty mold





Morus species (Mulberry)



Family: Moraceae **Species code:** MO
Height: Up to 50' **Width:** Equal to or less than height
Form: Generally branches low with a spreading crown
Leaf: Simple or lobed (more often lobed on young shoots); serrated edge
Bark: Gray to gray-brown; younger trees often orange-brown with lenticels; can be smooth or scaly
Fruit: Resembles blackberries; immature fruits are white, green, or pale yellow; fruits can turn pink, red or dark purple
Flower: Small, green male catkins are narrow (.75-2" long); female flowers are plump (.25-1" long)
Common Insects/Disease: Beetle borers, caterpillars, spider mites, white fly, chlorosis and crown rot

Populus species (Cottonwood)



Family: Salicaceae **Species code:** PO
Height: 60-100' **Width:** 20-100'
Form: Large open-crowned tree with massive trunk and branches
Leaf: Simple, lanceolate (tapered) and glossy; 2-3" across; light to medium green
Bark: Thick gray or brown bark with deep horizontal grooves
Fruit: Females produce fluffy, white, cotton-like covered seeds
Flower: Dioecious; catkins on males
Common Insects/Disease: Wood decay, fall webworm, leaf blight, Western tent caterpillar and epidermal miners





***Populus fremontii* (Valley cottonwood ,Fremont cottonwood)**



Family: Salicaceae **Species code:** POFR
Height: 20-90' **Width:** 30-50'
Form: Erect or spreading single stem
Leaf: Cordate (heart-shaped); 1.2-2.8" long with an elongated tip; white veins, coarse crenate teeth on edges
Bark: Smooth when young, becoming deeply fissured with whitish cracked bark on older trees
Fruit: Wind dispersed achene (like hanging patches of cotton)
Flower: Long drooping catkin blooms from March to April
Common Insects/Disease: Aphids, beetle borers, anthracnose, fall webworm, western tent caterpillar, mistletoe



***Populus angustifolia* (Mountain cottonwood, Narrowleaf cottonwood)**



Family: Salicaceae **Species code:** POAN
Height: 60' **Width:** 20-30'
Form: Narrow crown and a single stem
Leaf: Alternate, simple and lanceolate (willow-like); 2-5" long; finely serrated; shiny green above and paler, blotchy orange below
Bark: Light gray with many lenticels when young; later dark with furrows and ridges; often thick and rough
Fruit: Small (.25") 2-valved, dry capsule on a catkin; each capsule contains numerous small, cottony seeds
Common Insects/Disease: Aphids





Prunus species (Plum)



Family: Rosaceae **Species code:** PR
Height: Generally between 12-30' **Width:** Equal to height
Form: Low crown with spreading branches; some with thorn-like side branches
Leaf: Simple and alternate; usually lanceolate (tapered), unlobed and often with nectaries (glands) on the leaf stalk
Bark: Smooth and marked by lines running around the stem
Fruit: Fleshy drupe (a "prune") with a single large, hard-coated seed (a "stone")
Flower: White to pink, may be red; 5 petals and 5 sepals
Common Insects/Disease: Aphids, beetle borers, spider mites, rust, sooty mold and *Verticillium*

Prunus cerasifera (Cherry plum, Purple leaf plum)



Family: Rosaceae **Species code:** PRCE
Height: 15-30' **Width:** 15-25'
Form: Single stem; upright yet compact with a low canopy
Leaf: Ovoid, elliptic or obovate; thin with serrate edges up to 2.5" long
Bark: Dark brown and furrowed
Fruit: Small berries
Flower: White, showy, fragrant flowers
Common Insects/Disease: Aphids, beetle borers, caterpillars, scales, spider mites, rust, sooty mold and *Verticillium*





Pyrus species (Pear)



Family: Rosaceae **Species code:** PY
Height: 10-35' **Width:** A third the height
Form: Conical, oval, often with tall narrow crowns
Leaf: Simple alternate leaves, 1-6" long; broad oval to narrow lanceolate, some glossy green, others with fine white hair; almost all deciduous
Bark: Dark brown to gray-green; blocky or furrowed
Fruit: Pomes, .5-2" diameter in the wild; cultivated forms can be 7" long and rounded or pear-shaped
Flower: Most white, some pale yellow or pink, 1-2" diameter
Common Insects/Disease: Aphids, beetle borers, spider mites, rust, *Phytophthora*, sooty mold and pitch canker

***Pyrus calleryana* (Callery pear)**



Family: Rosaceae **Species code:** PYCA
Height: 50' **Width:** 30'
Form: Oval or rounded shape with an erect or spreading canopy
Leaf: Alternate and ovoid; glossy dark green becoming red, gold or purple in Fall
Bark: Dark brown to light green; blocky or furrowed
Fruit: Brown, gold or green pome; .25-.5" diameter; fruiting in Summer
Flower: Showy, fragrant and white; bloom in Spring or Winter
Common Insects/Disease: White fly and sooty mold





Quercus species (Oak)



Family: Fagaceae **Species code:** QU
Height: 20-100' **Width:** Equal to height
Form: Over 600 species with much variability; often a wide, spreading tree; can also be shrubby
Leaf: Ovoid to linear with serrated or smooth margins; often dark green and shiny above, paler below
Bark: Gray to brown; fissured, scaly, some corky, some smooth
Fruit: Acorn
Flower: Often inconspicuous and borne on catkins
Common Insects/Disease: Beetle borers, caterpillars, insect galls, leaf miner, scales and oak wilt

Salix matsudana (Corkscrew willow)



Family: Salicaceae **Species code:** SAMA
Height: 30-40' **Width:** 20-50'
Form: Upright with round crown of drooping twisted branches
Leaf: Lanceolate and finely serrated; 3-5" long, often twisted; shiny green above, nearly white beneath
Bark: Smooth gray-brown with diamond shaped lenticels, later becoming shallowly fissured and rough
Fruit: A 1" cluster of small, light brown capsules containing numerous small fuzzy seeds
Flower: 1-1.5" long catkins; pale yellow-green and fuzzy
Common Insects/Disease: Aphids, beetle borers, caterpillars, spider mites, anthracnose, branch blight, canker, crown rot, *Phytophthora* and sooty mold





Ulmus americana (American elm)



Family: Ulmaceae **Species code:** ULAM
Height: 100' **Width:** Equal to height
Form: Trunk often divided into large, ascending, arching limbs, ending in drooping branchlets
Leaf: Ovoid to oblong; 3-5" long, 1-3" wide; serrate edge; green and mostly smooth above, paler and downy below
Bark: Dark gray with ridges, diamond-shaped fissures; outer bark shows buff and red-brown patches when sectioned
Fruit: Round, flat, papery, wafer-like samaras; .375-.5" wide
Flower: Drooping clusters of 3-5
Common Insects/Disease: Aphids, beetle borers, scales, Dutch Elm, *Phytophthora*, sooty mold and *Verticillium*



Tilia species (Basswood)



Family: Tiliaceae **Species code:** TI
Height: 30-80' **Width:** 20-50'
Form: Conical, oval or umbrella shaped
Leaf: Ovoid to cordate; 2-6" long; serrate and pinnately veined; green above, paler below
Bark: Smooth, gray-green when young; turning gray-brown with long, shallow furrows and flat topped ridges
Fruit: Round nutlet (.25") in a cluster; gray-brown hair
Flower: Monoecious; pale yellow; located below leafy wing in a long branched cluster in early to mid-summer
Common Insects/Disease: Aphids, spider mites, scales, sooty mold and *Verticillium*





***Ulmus parvifolia* (Chinese elm)**



Family: Ulmaceae **Species code:** ULPA
Height: 40-60' **Width:** 25-40'
Form: Single stem with an open canopy; umbrella topped with small branches that are weeping
Leaf: Small, lustrous green, single-toothed leaves (.75-2" long and .75-1.25" wide)
Bark: Mottled greys with tans and reds
Fruit: Samara; elliptic to ovoid; 4-5" long and 2.25-3.25" wide
Flower: Greenish yellow in late Summer
Common Insects/Disease: Aphids, beetle borers, caterpillars, scales, Dutch Elm disease, sooty mold and *Verticillium*

***Ulmus pumila* (Siberian elm)**



Family: Ulmaceae **Species code:** ULPU
Height: 50-100' **Width:** Equal to height
Form: Umbrella or vase shaped; limb breakage and sprouting along trunk common
Leaf: Elliptical to ovoid; 1-2.5" long with a serrated edge; dark green, smooth above, paler and smooth below
Bark: Irregularly furrowed; light gray-brown; often streaked with lighter stains
Fruit: Thin, wafer-like samara, nearly round, notched at top, .5" diameter; pale green, later turning light brown
Flower: Small, pale green clusters in early Spring
Common Insects/Disease: Aphids, beetle borers, scales, Dutch Elm, *Phytophthora*, sooty mold and *Verticillium*





***Zelkova serrata* (Japanese zelkova, Sawleaf zelkova)**



Family: Ulmaceae **Species code:** ZESE
Height: 65-80' **Width:** Equal to height
Form: Low branching with a vase-shape; tight branch angles
Leaf: Ovoid, 1.5-2.5" long; pinnately veined with a serrate edge; dark green above, paler below
Bark: Smooth, red-brown to gray when young with numerous lenticels; exfoliates into red-brown patches when older
Fruit: Small triangular drupe, .25" long; green, later turning brown, maturing mid to late Summer
Flower: Yellow-green, not showy; in tight clusters on new stems
Common Insects/Disease: Spider mites and Dutch Elm disease

SIMPLE LOBED OPPOSITE LEAVES



Acer platanoides (Norway maple)



Family: Aceraceae

Species code: ACPL

Height: Up to 80' **Width:** 40'

Form: Usually with a dense rounded crown

Leaf: Palmately veined; 5-7 lobed with long pointed teeth; dark green above, paler below; exudes milky white sap from the petiole when detached; purple (nearly black) leaf variety known as Crimson King is widely planted

Bark: Gray-brown and slightly corky

Fruit: Wide spaced 2-winged samaras, 1.5-2" long in clusters

Flower: Bright yellow-green in color and somewhat showy

Common Insects/Disease: Aphids, anthracnose, sooty mold, *Phytophthora* and *Verticillium*





***Acer saccharinum* (Silver maple)**



Family: Aceraceae **Species code:** ACPL

Height: 40-100' **Width:** 50'

Form: Trunk usually short, dividing into several sub-trunks; long slender branches sweep downward and then curve upwards

Leaf: 5 deeply palmate sinuses; margins coarsely serrate; 2.5-5" long; light green above, pale, silvery white below

Bark: Light gray and smooth when young; breaks into long thin strips that are loose at ends when older

Fruit: Very large samara (1.5-2.5" long); divergent wings

Flower: Greenish to reddish flowers appear in dense clusters

Common Insects/Disease: Aphids, beetle borers, scales, branch blight, sooty mold and *Verticillium*

**SIMPLE LOBED
ALTERNATE LEAVES**



***Platanus hybrida, P. hispanica, P. occidentalis x orientalis* (London planetree)**



Family: Platanaceae **Species code:** PLAC

Height: 100' **Width:** 50'

Form: Slightly pyramidal to round crown

Leaf: Palmately veined; 5-9" long and wide; 3-5 lobed and coarsely toothed; medium green above, paler below

Bark: Light brown, exfoliating into olive and yellow patches

Fruit: Spherical; 1-1.5" diameter; ripening to brown; usually hanging in pairs on long, thin stalks

Flower: Not showy; usually two flowers per stalk

Common Insects/Disease: Sycamore anthracnose





Platanus wrightii (Arizona sycamore)



Family: Platanaceae **Species code:** PLWR2
Height: 50-100' **Width:** Up to 55'
Form: Single vertical trunk produces a high number of branches that grow in every direction
Leaf: Somewhat star-shaped with 3-5 pointed lobes; 6-9" long; swollen petiole base; green above, pale green and fuzzy below
Bark: Exfoliating white with patches of brown
Fruit: Seeds that hang on flowers from stalks
Flower: Red flowers that grow in bunches of 2-4
Common Insects/Disease: Leaf miner, scales, spider mites and anthracnose

Quercus species (Oak)



Family: Fagaceae **Species code:** QU
Height: 20-100' **Width:** Equal to height
Form: Over 600 species with much variability; often wide, spreading, tree; can also be shrubby
Leaf: Lobed leaf; often dark green and shiny above, paler below; ovoid to linear with serrated or smooth edges; some evergreen, some deciduous
Bark: Gray to brown, fissured, scaly, some corky, some smooth
Fruit: Acorn
Flower: Often inconspicuous, borne on catkins
Common Insects/Disease: Beetle borers, caterpillars, insect galls, leaf miner, scales and oak wilt





Quercus emoryi (Emory oak)



Family: Fagaceae **Species code:** QUEM
Height: Up to 60' **Width:** Equal to height
Form: Shrub to medium sized tree, typically with a short trunk and a round crown with stout limbs.
Leaf: narrowly ovate to broadly lance shaped, 1-3" long, entire or toothed margin, leathery and stiff.
Bark: Dark gray, becoming quite thick and splitting into irregular furrows and scaly ridges.
Fruit: Acorn
Flower: Species is monoecious; males in long drooping catkins, yellow-green; females very small spikes in leaf axils,
Common Insects/Disease: Root rot

Quercus arizonica (Arizona white oak)



Family: Fagaceae **Species code:** QUAR
Height: Up to 60' **Width:** Equal to height
Form: Short trunk and a spreading, irregular crown
Leaf: Oblong, 1.5"-3.5" long, entire or toothed margin, leathery and stiff, heart shaped base, dull yellow-green to blue-green above, dull and very fuzzy beneath.
Bark: Light gray, initially thin and lenticeled, becomes quite thick with shallow fissures and scaly ridges.
Fruit: Acorn
Flower: Monoecious; males in long drooping catkins, yellow-green; females very small spikes in leaf axils,
Common Insects/Disease: Beetle borers, insect galls, oak wilt





Quercus gambelii (Gambel Oak)



Family: Fagaceae **Species code:** QUGA
Height: up to 65' **Width:** Up to 20'
Form: A small to medium sized tree or a thicket-forming shrub.
Leaf: Alternate, simple, deciduous. Pinnately lobed with 5-9 rounded lobes; 3-6" inches long and 2-3" inches wide with leathery texture.
Bark: Young bark is thin and light colored, turning darker and rougher with age.
Fruit: Single or clumped acorns about 1 inch long.
Flower: Male catkins about 1" long; female catkins tiny and in small clusters borne in the leaf axils.
Common Insects/Disease: Beetle borers, caterpillars, insect galls, leaf miner, scales and oak wilt

Quercus macrocarpa (Bur oak)



Family: Fagaceae **Species code:** QUMA1
Height: 60-80' **Width:** 30'
Form: Erect and spreading
Leaf: Obovate and lobed; 6-12" long; green above, paler and fuzzy below
Bark: Gray to brown and scaly; vertically ridged on large trees
Fruit: Acorns (1.5" long); half enclosed in warty cap with long-fringed margin
Flower: Male flowers are yellow-green, in 2-4" long catkins; female flowers are green tinged with red and appear singly on short spikes
Common Insects/Disease: Aphids and spider mites





***Quercus shumardii* (Shumard oak,
Shumard red oak)**



Family: Fagaceae

Species code: QUSH

Height: 65' **Width:** 30'

Form: Oval, round or umbrella shaped; erect or spreading

Leaf: Elliptic and lobed; medium to dark green; red, gold, orange or multicolored in Fall

Bark: Dark or light gray and fissured

Fruit: Brown acorn (.5-1.5" long); fruiting in Fall or Winter

Flower: Insignificant

Common Insects/Disease: Beetle borers, caterpillars, insect galls, leaf miner and scales

**PINNATELY COMPOUND
OPPOSITE LEAVES**



Acer negundo (Boxelder)



Family: Aceraceae

Species code: ACNE2

Height: Up to 60' **Width:** Up to 50'

Form: Poor form often with multiple trunks

Leaf: 3-5 leaflets (sometimes 7); 2-4" long; edge coarsely serrate or somewhat lobed; shape variable but leaflets often resemble a classic maple leaf; light green above and paler below

Bark: Thin with shallow interlacing ridges; gray to light brown

Fruit: Paired V-shaped samaras, 1-1.5" long

Flower: Yellow-green in drooping racemes

Common Insects/Disease: Aphids, beetle borers, branch blight, fusarium, powdery mildew and *Verticillium*

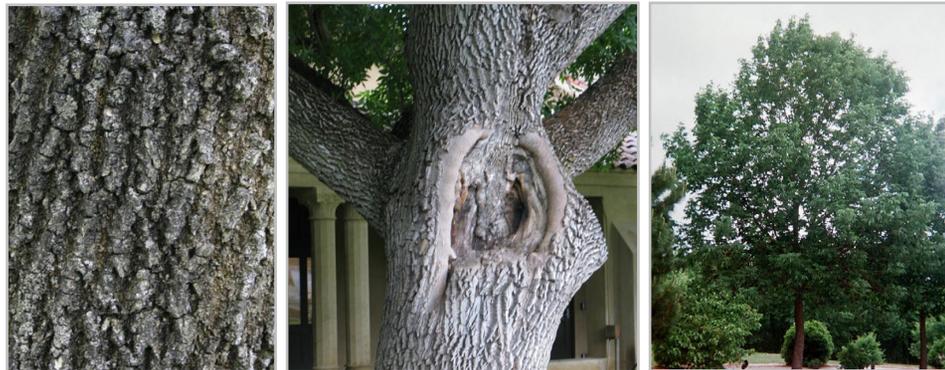




Fraxinus angustifolia (Raywood ash)



Family: Oleaceae **Species code:** FRAN2
Height: 80' **Width:** Up to 50'
Form: Upright with a broadly oval crown
Leaf: Whorled or sometimes opposite, pinnately compound; 8-12"; 7-11 lanceolate leaflets are 2-3" long and finely serrated, tapering to a sharp point; shiny dark green
Bark: Brown and smooth when young, becoming ridged and furrowed with age
Fruit: Single-winged, straight samara, 1-1.5" long by .5" wide
Flower: Insignificant maroon male flowers in tight clusters; light green females in looser clusters
Common Insects/Disease: Beetle borers and scales



Fraxinus americana (White ash)



Family: Oleaceae **Species code:** FRAM
Height: 80' **Width:** Up to 50'
Form: Typically a straight, clear trunk with an oblong crown
Leaf: 7 serrate to smooth edged leaflets that are ovoid to somewhat lanceolate; 8-12" long; green above and slightly paler below
Bark: Ashy gray to brown in color with interlacing corky ridges forming obvious diamonds
Fruit: A one-winged, dry, flattened samara
Flower: Light green to purplish
Common Insects/Disease: Caterpillars, scales, white fly, anthracnose, sooty mold and *Verticillium*





***Fraxinus berlandieriana* (Arizona ash, Mexican ash)**



Family: Oleaceae **Species code:** FRBE
Height: 30' **Width:** 25'
Form: Short trunk with spreading branches and a rounded crown
Leaf: Pinnately compound; gray-green to bright green
Bark: Light brown when young, matures to dark brown
Fruit: Wind dispersed samara (simple fruit with a flattened wing of papery tissue)
Flower: Greenish but insignificant
Common Insects/Disease: Webworms

***Fraxinus pennsylvanica* (Green ash)**



Family: Oleaceae **Species code:** FRPE
Height: 70' **Width:** 25'
Form: Poorly formed trunk and an irregular to round crown
Leaf: Pinnately compound odd leaf; medium to dark green
Bark: Dark brown or dark gray; furrowed, ridged or scaly
Fruit: Beige, brown, yellow or mostly green winged seed
Flower: Light green to purplish with no petals; females occurring in loose panicles, males in tighter clusters
Common Insects/Disease: Beetle borers, scales, anthracnose
Varieties: Patmore (FRPE2) is smaller with a more pyramidal canopy and a strong central leader; Marshall (FRPE3) has a less ordered branch structure and less symmetrical canopy





Fraxinus velutina (Velvet ash)



Family: Oleaceae **Species code:** FRVE
Height: 50' **Width:** 20-50'
Form: Single stem splitting into several large branches
Leaf: Pinnately compound; usually 3-5 leaflets per leaf; leaflets .75-2.5" long; glossy green above, soft and velvety below
Bark: Light gray and fissured
Fruit: Yellow or mostly green winged seed
Flower: Produced in small clusters in early Spring
Common Insects/Disease: Beetle borers, fall webworm, spider mites, white fly, anthracnose, mistletoe and *Verticillium*

Fraxinus velutina 'Modesto' (Modesto ash)



Family: Oleaceae **Species code:** FRVE_G
Height: 50' **Width:** 20-50'
Form: Erect or spreading with a high canopy
Leaf: Pinnately compound odd; glossy light green; gold in Fall
Bark: Light gray and furrowed
Fruit: Yellow or mostly green winged seed
Flower: Insignificant
Common Insects/Disease: Beetle borers, psyllid, spider mites, white fly, anthracnose, mistletoe, rust, sooty mold and *Verticillium*



**PINNATELY COMPOUND
ALTERNATE LEAVES**



***Ailanthus altissima* (Tree of heaven)**



Family: Simaroubaceae

Species code: AIAL

Height: Up to 70' **Width:** Less than height

Form: A short to medium sized tree with heavy, open branches; lower branches on larger trees tend to droop

Leaf: 1-3' long with 11-41 leaflets; leaflets are 2-6" long, pointed at the tip with large, glandular teeth near the base; green above and below

Bark: Thin and light brown to gray

Fruit: An oblong, twisted samara; 1-1.5" long with the seed in the center; hanging in long clusters

Flower: Small yellow-green flower in long 6-12" clusters

Common Insects/Disease: *Verticillium*





***Koelreuteria paniculata* (Goldenrain tree)**



Family: Sapindaceae **Species code:** KOPA
Height: 30' **Width:** 30'
Form: Round crown
Leaf: Pinnately (or partially bipinnate); irregular serrations or lobes on leaflets; 8-14" long; 9-15 leaflets
Bark: Silvery gray, flat ridge tops with brown shallow furrows
Fruit: Papery, triangular capsule in clusters; 1-2" long; containing three hard, black, globular seeds; initially yellow-green, later turning brown
Flower: Bright yellow with some orange; 10-15" long, many branched, terminal panicles; individual flowers about .5" wide
Common Insects/Disease: Beetle borers, scales and *Verticillium*



***Gleditsia triacanthos* (Honeylocust)**



Family: Fabaceae **Species code:** GLTR
Height: Up to 80' **Width:** Equal to or less than height
Form: Typically short trunk and an airy, spreading crown
Leaf: Pinnate and 5-8" long with 15-30 leaflets or bipinnate with 4-7 pairs of minor leaflets; leaflets are .5-1.5" long
Bark: Gray-brown to bronze; smooth with many horizontal lenticels, later breaking into long, narrow, curling plates
Fruit: 6-8" long, flattened, red-brown, leathery pod that becomes dry and twisted
Flower: Small, greenish yellow, displayed on 2-3" long narrow, hanging clusters; not showy, but very fragrant
Common Insects/Disease: Caterpillars, insect galls, pod gall midge, spider mites and mistletoe





***Pistacia chinensis* (Chinese pistache)**



Family: Anacardiaceae **Species code:** PICH
Height: 50-100' **Width:** 20-50'
Form: Umbrella top, coarse branch architecture, oval to rounded high canopy
Leaf: Alternate and 1.5" long with leaflets in 6-10 pairs; leaflets reaching 1-2 .5" long and .75" wide
Bark: Dark brown, light gray or light green; furrowed or scaly
Fruit: Female produces a small, round (.25" diameter) orange to red nut
Flower: Red
Common Insects/Disease: *Phytophthora* and *Verticillium*

***Robinia pseudoacacia* (Black locust)**



Family: Fabaceae **Species code:** ROPS
Height: 65' **Width:** Equal to height
Form: Straight trunk with crown of crooked branches
Leaf: Pinnately compound odd, 8-14" long ; 7-19 elliptic to ovate leaflets, 1" long with smooth edges
Bark: Gray or light brown; thick, fibrous, heavily ridged and furrowed; resembles woven rope
Fruit: Flattened legume, light brown, 2-4" long; contains 4-8 kidney-shaped, smooth, red-brown seeds
Flower: Showy, fragrant, white; 1" long and pea-like; in long (5") hanging clusters
Common Insects/Disease: Aphids, beetle borers, fusarium, *Phytophthora* and *Verticillium*





Sorbus species (Mountain ash)



Family: Rosaceae **Species code:** SO
Height: 35-65' **Width:** 30-50'
Form: Spreading and erect with an oval shape
Leaf: Most species pinnately compound odd; some simple alternate; gray green or medium green; red, orange or multicolored in Fall
Bark: Light green or light gray and furrowed
Fruit: Prolific, small (.25" diameter); orange or red pomes in panicles; fruiting in Fall, Winter or Summer
Flower: Showy, white flowers in panicles
Common Insects/Disease: Canker, fire blight, rust and sooty mold

Sophora japonica (Japanese pagoda tree)



Family: Fabaceae **Species code:** SOJA
Height: 50' **Width:** 50'
Form: Spreading, high canopy; rounded, umbrella or vase shaped
Leaf: Pinnately compound odd, ovoid to lanceolate (tapered) leaflets; dark green
Bark: Dark brown and furrowed
Fruit: Prolific, green pods (3" long) that turn brown
Flower: Showy, fragrant and white
Common Insects/Disease: Spider mites and cankers



**PALMATELY COMPOUND
OPPOSITE LEAVES**



Vitex species (Chaste tree)



Family: Verbenaceae **Species code:** VIAG

Height: 15-25' **Width:** 10-20'

Form: Spreading with a low canopy

Leaf: Palmately compound opposite; 2-6" across; usually 5 leaflets per leaf (sometimes 7), leaflets mostly lanceolate with smooth edges; dark and shiny green above and pale pubescent below; very aromatic when crushed

Bark: Dark or light gray; blocky, furrowed or smooth

Fruit: Small, black drupe

Flower: Spikes of lavender, white or pink flowers

Common Insects/Disease: No significant



**BIPINNATELY COMPOUND
ALTERNATE LEAVES**



***Albizia julibrissin* (Mimosa)**



Family: Fabaceae

Species code: ALJU

Height: 15-40' **Width:** 20'

Form: Spreading with a low, rounded canopy

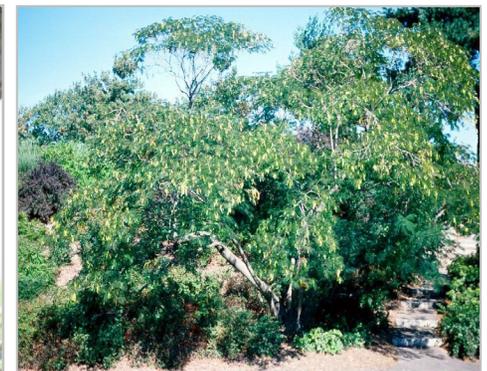
Leaf: Fern-like, 5-8" long and 3-4" wide; alternate along the stems; finely divided into 6-12 pairs of pinnae, each with 20-30 pairs of leaflets

Bark: Dark greenish grey; striped vertically when older

Fruit: Flat brown pod containing several seeds; 3.9-7.75" long and .75-1" wide

Flower: Fragrant pink with white base, 1.5" long resembling pom-poms; arranged in panicles at ends of branches

Common Insects/Disease: Caterpillars and fusarium





***Gymnocladus dioicus* (Kentucky coffeetree)**



Family: Fabaceae

Species code: GYDI

Height: 80' **Width:** 40-50'

Form: Medium sized tree with a wide spreading crown

Leaf: Very large (1-3' long) with numerous 1.5-2" ovoid leaflets; smooth edges; green above, slightly paler below

Bark: Dark grayish brown and scaly; developing deep fissures with scaly ridges

Fruit: Reddish brown, flat thickened pod; 3-8" long

Flower: Males and females in long (3-4") branched clusters; whitish; appearing in late spring

Common Insects/Disease: No significant

PALM TREES

**PINNATELY
COMPOUND
ALTERNATE LEAVES**



**PALMATELY
COMPOUND
ALTERNATE LEAVES**



***Phoenix canariensis* (Canary Island date palm, Pineapple palm)**



Family: Arecaceae **Species code:** PHCA
Height: 60' **Width:** 20-30'
Form: Erect feather palm
Leaf: Long, sometimes half-twisting pinnately compound fronds up to 20'; medium green; evergreen
Bark: Light brown and fibrous
Fruit: Orange or yellow clusters of drupes; .5-1.2"
Flower: Waxy yellow to white clusters on stalks
Common Insects/Disease: Fusarium





Washingtonia robusta (Mexican fan palm)



Family: Arecaceae **Species code:** WARO
Height: 80-100' **Width:** 10-15'
Form: Erect fan palm
Leaf: Large fan-shaped, palmately compound fronds; dark green; evergreen foliage
Bark: Red-brown and furrowed or smooth
Fruit: Black drupes (.25-.5") develop on streamers
Flower: Streamers with sprays of tiny white flowers
Common Insects/Disease: Crown rot



Phoenix dactylifera (Date palm, Arab date)



Family: Arecaceae **Species code:** PHDA4
Height: 60' **Width:** 25'
Form: Erect, feather palm, multi-trunked if left untrained
Leaf: Pinnate frond up to 15' long; gray-green; evergreen
Bark: Gray-brown, fibrous and corky
Fruit: Large, brown drupe (1.5-3")
Flower: Small yellow flowers on spreading stalks
Common Insects/Disease: No significant



GLOSSARY

Achene: simple dry fruit containing one seed produced by many species of flowering plants

Alternate: leaf attachments are singular at nodes, and leaves alternate direction, to a greater or lesser degree, along the stem

Axillary: the upper (adaxial) angle between a leaf and a stem; often the location of a bud

Bipinnate: pinnately compound leaves in which the leaflets are themselves pinnately compound

Catkin: a slim, cylindrical flower cluster, with inconspicuous or no petals, usually wind-pollinated; contain many, usually unisexual flowers, arranged closely along a central stem which is often drooping

Conifer: mostly needle-leaved or scale-leaved, chiefly evergreen, cone-bearing gymnospermous trees or shrubs such as pines, spruces, and firs

Cordate: heart-shaped, with the petiole or stem attached to the cleft

Deciduous: a tree that sheds leaves annually

Dioecious: a species that has male and female reproductive parts on different plants

Drupe: any fruit consisting of an outer skin, a usually pulpy and succulent middle layer, and a hard and woody inner shell usually enclosing a single seed, as a peach, cherry, plum, etc.

Elliptic: leaf margins curve with the widest section in the middle

Evergreen: having green leaves throughout the entire year, the leaves of the past season not being shed until after the new foliage has been completely formed

Fascicle: a bundle or cluster of leaves or flowers

Fissured: a long narrow opening; a crack or cleft; a natural division or groove

Floret: a small flower

Follicles: dry open fruit which splits on one side only; may contain one or many seeds

Glandular teeth: leaf edge, or margin, has teeth that bear glands

Lanceolate: tapering from a rounded base toward an apex; lance-shaped; pointed at both ends

Legume: fruit or seed from a plant in the family Fabacea (or Leguminosae); a pod, such as that of a pea or bean, that splits into two valves with the seeds attached to one edge of the valves

Lenticel: one of the small, corky or spongy pores or narrow lines on the bark of woody plants that allows the interchange of gases between the interior tissue and the surrounding air

Linear: elongated leaf shape with parallel edges

Lobed: leaf shape with deeply indented edges

Monoecious: male and female flowers occur on the same plant

Nectaries: a gland-like organ, located outside or within a flower, that secretes nectar

Nutlet: a small nut

Oblong: leaves almost resemble a rectangle, except that their corners are rounded; at least twice as long as they are wide

Obovate: leaves are shaped like an egg, with the broader end of the leaf farthest from the petiole

Opposite: leaves occur one on each opposite side of the stem; attachments are paired at each node

Ovoid: egg-shaped with the broader end at the base

Palmate: consisting of leaflets or lobes radiating from the base of the leaf

Palmately lobed: indented with the indentations reaching to the center

Palmately veined: several primary veins diverging from a point

Panicles: a branched cluster of flowers

Petiole: the stalk attaching the leaf blade to the stem

Pinnae: leaflets or segments in ferns

Pinnate: featherlike compound leaf divided into many small leaflets, arranged in rows along either side of an axis

Pinnate compound: once-divided leaf blades having leaflets arranged on both sides of a rachis (main axis of a compound structure)

Pinnate odd: leaflets occur on each side of the petiole with a single leaflet at the tip of the petiole

Pinnately veined: secondary veins paired oppositely

Pome: fleshy fruit with a thin skin, not formed from the ovary but from another part of the plant; seeds are contained in chambers in the center of the fruit as in apple and pear

Pubescence: fine covering of down or soft short hairs

Raceme: a type of flower that is unbranched and indeterminate and bears flowers on short floral stalks along the axis

Resin (resinous): a substance exuded by certain plants particularly when wounded

Samara: type of dry fruit where one seed is surrounded by papery tissue that helps carry the seed away from the tree as the wind blows; often found in large groups on the tree

Sepals: one of the four basic parts of a flower; found below the petals and often small and green; when flowers do not have petals the sepals may be big and colorful

Serrate: saw-toothed with asymmetrical teeth pointing forward

Sessile: flowers or leaves are attached directly to the base and therefore lack a petiole, or stalk

Simple leaf: a single, undivided blade; as opposed to a compound leaf where the blade is divided into leaflets

Sinus: a space or indentation between two lobes or teeth on a leaf

Stamen: the pollen-producing reproductive organ of a flower; typically consists of a stalk called the filament and an anther

Stoma (plural stomata): a pore found in the leaf and stem epidermis that is used for gas exchange

Ternate: consisting of three leaflets or whorls of three leaves

Whorl: three or more leaves attach at each point or node on the stem

INDEX OF SCIENTIFIC AND COMMON NAMES

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ACSA1	<i>Acer saccharinum</i>	Silver maple	39L
AIAL	<i>Ailanthus altissima</i>	Tree of heaven	48R
ALJU	<i>Albizia julibrissin</i>	Mimosa	53R
CASP	<i>Catalpa species</i>	Catalpa	21R
CA3	<i>Catalpa speciosa</i>	Western catalpa	22L
CEDE	<i>Cedrus deodara</i>	Deodar cedar	12R
CESI4	<i>Celtis sinensis</i>	Chinese hackberry	24R
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Special thanks to the pilot inventory communities:

City of Bisbee
Lake Havasu City
City of Mesa
Town of Prescott Valley
Town of Pinetop-Lakeside
Arizona State Parks: Oracle State Park
University of Arizona Campus Arboretum

Publication information: Arizona State Forestry Division – Urban and Community Forestry (April, 2015). Arizona Urban Tree Map Field Guide: Interior West Climate Region. Retrieved from <http://azsf.gov/azutm>

Major funding provided by the USDA Forest Service State and Private Forestry Program. Collaborators include the University of Arizona Campus Arboretum and the School of Natural Resources and the Environment.

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