



**PORTLAND PARKS & RECREATION**

Healthy Parks, Healthy Portland



## Lewis Elementary School Tree Walk

**LEARNING LANDSCAPES**



## Lewis Elementary School Tree Walk 2015 Learning Landscapes

Site data collected in Summer 2014.

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### Cover photos (from top left to bottom right):

- 1) Ripening rachis on a Japanese raisin tree.
- 2) Clusters of European hornbeam fruits.
- 3) The foliage and branches of a large blue Atlas cedar.
- 4) Volunteers caring for trees at Lewis Elementary School.
- 5) Silverleaf oak gets its name from the light undersides of its leaves.
- 6) The "flowers" of the Pacific dogwood are bracts surrounding the actual flowers.
- 7) A profusely-blooming Urban Bouquet flowering ash.
- 8) Prominent veins on cascara buckthorn leaves.

ver. 1/30/2015

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Commissioner Amanda Fritz  
Director Mike Abbate

# The Learning Landscapes Program



## Lewis Elementary School

The Lewis Elementary School Learning Landscape was initiated in February 2011, and the collection includes 20 trees. This tree walk identifies trees planted as part of the Learning Landscape as well as some other interesting specimens at the school.

## What is a Learning Landscape?

A Learning Landscape is a collection of trees planted and cared for at a school by students, volunteers, and Portland Parks & Recreation (PP&R) Urban Forestry staff. Learning Landscapes offer an outdoor educational experience for students, as well as environmental and aesthetic benefits to the school and surrounding neighborhood. Learning Landscapes contain diverse tree species. They are designed to teach students about biology and urban forestry issues, but can also be used to teach geography, writing, history and math, and to develop leadership skills.

## Community Involvement

Community-building is crucial to the success of Learning Landscapes. PP&R works with Urban Forestry Neighborhood Tree Stewards, teachers, parents, students, and community members to design, plant, establish and maintain these school arboreta. PP&R facilitates this collaboration by working with the school district, neighborhood, students and teachers to create landscapes that meet the need of the individual school community.

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*By involving students and neighbors in the tree planting, the community has ownership of the trees and a tangible connection to their school.*

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## Tree Planting Experience

Learning Landscapes are planted by the school's students under the mentorship of middle or high school students and volunteers. On planting day, tree planting leaders teach students the benefits of urban trees, form and function of trees, and tree planting techniques. This leadership aspect of Learning Landscapes gives older students and volunteers the opportunity to connect with their peers, build confidence, and develop public speaking skills. Involving students and neighbors in the tree planting fosters community ownership of the trees and builds a tangible connection between school and neighborhood. This helps ensure a high tree survival rate by reducing vandalism and encouraging ongoing stewardship of the school's trees.

## Continued Hands-on Learning Opportunities

Once planted, Learning Landscapes are used by teachers and parents for service and leadership projects. Students and teachers continue to build projects around the trees with opportunities to water, prune, weed and mulch. These dynamic landscapes change year after year, depending on student and teacher interests, as new trees are planted and added to the collection.

## How can I get involved?

Visit <http://www.portlandoregon.gov/parks/learninglandscapes> for volunteer opportunities, to view more maps, and to learn how to plan a Learning Landscape in your community.

# Lewis Elementary School Tree Walk





## Learning Landscapes

<http://portlandoregon.gov/parks/learninglandscapes>

100 Feet



-  Learning Landscapes tree
-  other tree

# Lewis Elementary School Tree Walk

Tree #	Common Name	Scientific Name
1	Emperor ginkgo	<i>Ginkgo biloba</i> 'Woodstock'
2	Musashino zelkova	<i>Zelkova serrata</i> 'Musashino'
3	columnar European hornbeam	<i>Carpinus betulus</i> 'Frans Fontaine'
4-6	Urban Boquet flowering ash	<i>Fraxinus ornus</i> 'JFS-Coate'
7	columnar European hornbeam	<i>Carpinus betulus</i> 'Frans Fontaine'
8	Musashino zelkova	<i>Zelkova serrata</i> 'Musashino'
9	Emperor ginkgo	<i>Ginkgo biloba</i> 'Woodstock'
10	trident maple	<i>Acer buergerianum</i>
11	cypress	<i>Cupressus</i> spp.
12	western hemlock	<i>Tsuga heterophylla</i>
13	northern red oak	<i>Quercus rubra</i>
14	kousa dogwood	<i>Cornus kousa</i>
15	red maple	<i>Acer rubrum</i>
16	incense cedar	<i>Calocedrus decurrens</i>
17	Japanese flowering cherry	<i>Prunus serrulata</i>
18	tulip tree	<i>Liriodendron tulipifera</i>

Tree #	Common Name	Scientific Name
19	elm	<i>Ulmus</i> spp.
20	Japanese flowering cherry	<i>Prunus serrulata</i>
21	casara buckthorn	<i>Rhamnus purshiana</i>
22	silverleaf oak	<i>Quercus hypoleucoides</i>
23	Japanese raisin tree	<i>Hovenia dulcis</i>
24	casara buckthorn	<i>Rhamnus purshiana</i>
25	bigleaf maple	<i>Acer macrophyllum</i>
26	Green Vase zelkova	<i>Zelkova serrata</i> 'Green Vase'
27	Persian ironwood	<i>Parrotia persica</i>
28-30	Apollo sugar maple	<i>Acer saccharum</i> 'Barrett Cole'
31	zelkova	<i>Zelkova</i> spp.
32	red maple	<i>Acer rubrum</i>
33	pine	<i>Pinus</i> spp.
34	blue Atlas cedar	<i>Cedrus atlantica</i> 'Glauca'
35	eastern redbud	<i>Cercis canadensis</i>
36	Pacific dogwood	<i>Cornus nuttalli</i>
37	magnolia	<i>Magnolia</i> spp.
38	flowering plum	<i>Prunus cerasifera</i>

## Tree Facts, A to Z

### Apollo sugar maple, *Acer saccharum* 'Barrett Cole'

*Origin: North America*

Sugar maples grow to 70' tall with a round canopy and straight trunk. Mature trees have furrowed, plated bark. Leaves (about 5" wide) have 3 or 5 lobes, and turn yellow to crimson in fall, although color is not as pronounced in Portland as in the northeast United States and Canada. Winged seeds (about 1" wide)

form a 45-degree angle. In winter, sugars stored in roots move to the buds, producing a sugary sap. Native Americans were the first to tap this sap. Forty gallons of sap are boiled to make one gallon of syrup. Maple syrup is a valuable commodity and livelihood for rural residents. Both Vermont (1949) and New York State (1956) claim the sugar maple as their official state tree. Acid rain and global warming may push sugar maples north. Sugar maples can reach 300–400 years of age in native forests, producing strong wood. In cities, trees are more susceptible to drought and disease. Like all

maples, this species is subject to verticillium wilt. Apollo is a narrowly columnar form of sugar maple maturing at 30'. Fall color is yellow-orange to red. Supposedly less appealing to Japanese beetle and better able to withstand hot summers.

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**bigleaf maple, *Acer macrophyllum***

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*Origin: North America - Oregon and Washington west of the Cascades, northern California, and British Columbia, Canada*

The largest leaves of any maple are found on this Pacific Northwest native. The species name means "big leaf", which is an apt description for the 5-lobed leaves 8" to 12" across. They turn yellow to rich gold in fall. Like Norway maples, the leaf stems exude a milky sap when cut. The greenish flowers hang in showy clusters in early spring and are insect pollinated. The tree's deep taproot helps it find water in dry summers. The tree produces prolific amounts of seed, some of which are eaten by Douglas squirrels, finches and evening grosbeaks. The many not eaten readily germinate and send up thousands of seedlings. These grow with astonishing speed, which is one reason bigleaf maple has been able to invade disturbed areas. Suppression of fire has benefitted bigleaf maples, which have encroached on formerly fire-maintained savannas at the expense of Oregon white oaks. The tree grows from southern British Columbia into northern California, from sea level to 3,000'.



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**blue Atlas cedar, *Cedrus atlantica* 'Glauca'**

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*Origin: Africa - Atlas Mountains of Morocco and Algeria*

This blue-green cultivar of a heat and drought-tolerant conifer species from North Africa is more commonly seen in Portland than the regular species. Grows slowly to 60' or more and about 30' wide, with a roughly pyramidal shape, and branches angled slightly upward. Greenish-purple cylindrical male flowers shed pollen in early fall. Female flowers are green and sit at the branch tips. Rounded cones are 3 1/2" long and sit upright on the branches. They ripen

to light brown and disintegrate while on the tree. The small, wide-winged seeds have a sharp tip. Older trees develop massive trunks and main branches. Grayish-brown bark is shallowly fissured with flat, scaly ridge plates. This tree's lifespan is estimated at 100 to 200 years. About 75% of Atlas cedars were lost to logging, overgrazing, fires and land clearing between 1940 and 1982. With worsening droughts due to climate change, the tree is now considered endangered in the wild.

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**cascara buckthorn, *Rhamnus purshiana***

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*Origin: North America - Oregon, Washington, northern Idaho, British Columbia and California*

In the wild a multi-stemmed shrub but in street plantings a single-trunked tree 30' to 40' tall. The thin bark varies from dark brown to ashy gray, often with chalky white patches. The bark has a strong laxative effect. In bad economic times many people have supplemented their income by harvesting cascara, stripping the bark in the spring when the sap is running so it can be made into a commercial laxative. The development of synthetic laxatives has cooled the market for wild bark. Small greenish flowers are born in clusters among the leaves in spring. They are followed by dark purple fruits about 1/3" of an inch long. These contain a bitter chemical with a strong laxative effect. Although birds and raccoons will feed on the fruit, they are considered inedible for humans. Elliptic leaves have parallel veins in a chevron from midvein to leaf edge, with blades 2 1/2" to 6" long. They turn yellow to golden brown in autumn. Occasionally a tree will have hints of orange to red.



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**columnar European hornbeam, *Carpinus betulus* 'Frans Fontaine'**

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*Origin: Europe*

European hornbeam is normally a broadly spreading, deciduous tree, with a dense, oval crown growing to 100' tall. Rarely is this wild form seen. The cultivar Frans Fontaine was selected for maintaining an upright branching habit and narrow, columnar growth into

maturity. May reach 35-40' tall but not more than 15'-20' wide. Like the species, leaves are ovate and oblong, up to 4" long and 2½" wide. Leaves are pointed, double-toothed with conspicuous, parallel veins. Tolerant of clay soil. It is easily recognized by its shape: from a distance, trees are dense, bark is pale gray, fluted, and becomes fissured with age. Foliage is dark green in the summer, turning yellow in autumn. Male catkins are 2" long, yellowish, and droop; female catkins are small, green, and grow from the tips of the shoots. Fruit is a nut with three-lobed bracts turning yellowish brown and clustered in pendulous catkins up to 3" long. Hornbeam is native from southeast England to the Caucasus and is commonly planted in Europe along roadsides and for hedges.

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**cypress, *Cupressus* spp.**

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*Origin: distributed across North America, Europe, Africa and Asia and widely cultivated*

The number of species in this genus varies from 16 to 25 depending on different taxonomic groupings. All are evergreen conifers found in Eurasia, North Africa and North America. The two northernmost species in the world - *C. bakeri* and *C. nootkatensis* - both occur in Oregon.

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**eastern redbud, *Cercis canadensis***

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*Origin: North America - eastern USA from southern Wisconsin south to eastern Texas and from Florida north to Pennsylvania and extreme southern Ontario in Canada*

Eastern redbud is a small tree growing up to 30' tall. The gray bark furrows and flakes with age revealing a light brown underbark. The leaves (3-4" long) are heart shaped with some varieties exhibiting a purple-brown hue. The tree gets its names for its fantastic spring display of bright pink flowers and emerging pinkish-green leaflets. The fruits are a green pea shaped pod about 2-3" long. Redbud is native to North America and northeast Mexico. Trees are highly tolerant of different soils as well as drought. Some say that the flowers can be eaten fresh in a salad or fried.



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**elm, *Ulmus* spp.**

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*Origin: distributed across North America, Europe and Asia, and planted as a park tree in southeast Australia*

Tall, stately deciduous trees. Species from North America and Europe have been devastated by Dutch elm disease, which is spread by elm leaf beetles. Asian species are resistant and those (and their hybrids) have been introduced to replace those lost to disease.

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**Emperor ginkgo, *Ginkgo biloba* 'Woodstock'**

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*Origin: Asia - male cultivar of a Chinese tree*

Ginkgo is a pyramidal to rounded deciduous tree growing 60' to 100' tall. The bark has vertical scales, becoming deeply furrowed in maturity. The branches are alternate with leaves emerging from prominent ½" long nodes along the stem. Each node displays a whorl of approximately 5-7 fan-shaped leaves. Male and female trees are separate. The female tree produces edible fruit about ¾" long, which has been described as "nature's stink bomb," with a stench often compared to rancid butter, funky cheese, wet dog, or vomit due to the butyric acid in the fruit. Only one species of ginkgo tree remains in this ancient tree family that dominated forests millions of years ago. Emperor is a well-branched, uniformly oval male clone with a strong central leader. Grows to 50' tall by 35' wide. Yellow fall color. Supposedly from a tree found growing at Tanzhe Temple in Beijing. Tanzhe is one of the oldest Buddhist temples in China, founded some 1,700 years ago. This cultivar was introduced in 1994. Like all ginkgos, not susceptible to verticillium wilt or other pests or diseases.



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**flowering plum, *Prunus cerasifera***

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*Origin: Asia - western Asia*

The cherry plum, or flowering plum, is a small, deciduous tree. The species name *cerasifera* means that it bears cherry-like fruit, which happen to be edible. They usually cannot be recognized until their

incredibly early flowers appear before winter is over, or until fruit of some sort appears. Some varieties bear red fruit, while others bear yellow or purple. Leaves are broad and boat-shaped with long, tapering points and fine saw-toothed edges. Depending upon the variety, leaves may be green or purple. Young plants are often used as understocks for grafting other ornamental trees.

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**Green Vase zelkova, *Zelkova serrata* ‘Green Vase’**

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*Origin: Asia - Japan, Korea, China, Kuril Island of Russia*

The most common species of zelkova in Portland is Japanese zelkova, *Z. serrata*. It has simple, serrate-edged leaves that are tapered at the tips. The small flowers are greenish and lack petals. The female flowers are borne in the leaf axils while the male flowers cluster at the base of the shoots. Green Vase is a cultivar of *Zelkova*



*serrata* introduced by Princeton Nurseries in 1983 because of its resistance to Dutch elm disease, good red fall color and improved winter hardiness. While resistant, it is not completely immune to Dutch elm disease. Green Vase can grow 60-80' tall with a 40-50' spread. As the name suggests, the shape is upright and then spreading. Rapid growth in both height and girth. Slightly toothed oblong-elliptic leaves are up to 4" long. Wingless drupes ripen in fall but are inconspicuous. Prefers rich, moist loams. Some young Green Vase zelkovas have been subject to a strange bark-splitting issue, which can be fatal.

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**incense cedar, *Calocedrus decurrens***

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*Origin: North America – from Oregon south into California and northern Baja California in Mexico.*

Evergreen conifer with single straight trunk and capable of reaching 185'. Usually densely branched, columnar in form (broader in nature but with narrow forms common). The needles are held in flattened sprays. Golden-yellow pollen is shed in winter and early spring. Oblong cones have 3 alternating pairs of scales with a bump just below the tip. Bark is smooth

on young trees but becomes fibrous and reddish-brown with age. Highly decay-resistant wood is light, soft and fragrant, giving rise to the tree's common name in English. Primarily used to make pencils but also used in the Far West to make fenceposts or shingles. Trees can live 350 to 500 years. Only two other species in *Calocedrus* are known – both in Asia.

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**Japanese flowering cherry, *Prunus serrulata***

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*Origin: Asia - northern and central China, Korea and Japan*

Usually seen in one of the innumerable cultivar forms, flowering cherry typically grows 20' to 35'. One of the most variable characteristics of flowering cherry is the flowers. They can be anything from white to pink, single or double, from 1/2" to 2 1/2" across. Usually they are quite showy but last only a short time in spring. Fall color is usually good - from orange to red. Surface roots tend to lift sidewalks. The foliage is susceptible to numerous blights and diseases including viruses, cankers and borers, which shorten the life of the tree. 'Kwanzan' is the hardiest and one of the most popular cultivars grown in Portland, having deep-pink, double flowers.

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**Japanese raisin tree, *Hovenia dulcis***

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*Origin: Asia - Korea, China, Japan and above 3,000' in Thailand*

An oval-shaped deciduous broadleaf tree rising to 30' (occasionally to 40') with a spread of about 20'. Not common in Portland, this fast-growing tree is relatively pest and disease free and offers clean, attractive foliage all summer. Deep green leaves are 4-6" long by 3-5" wide. However, fall color



is non-existent. Cream-colored to greenish-white flowers appear in summer and are not especially showy but reportedly are fragrant. These are followed by the small fruits. The structure holding the fruits (technically called a rachis) tastes sweet and is eaten raw or cooked. The flavor of the structures when dried gives rise to the tree's common name in English. Wood



of this tree in Asia is used to make furniture and for construction lumber. The Chinese name for the tree is *bei zhi ju*.

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**kousa dogwood, *Cornus kousa***

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*Origin: Asia – Japan, Korea*

A deciduous broadleaf tree growing 20-30' with equal spread. Less prone to anthracnose than the native Pacific dogwood (*Cornus nuttallii*) or eastern dogwood (*C. florida*). The species' true flowers are small and yellow-green, but are surrounded by four showy white bracts that sit above the leaves and appear in May after the leaves come out (American dogwoods flower before or as the leaves come out). There are many hybrids, cultivars and a Chinese subspecies, and some of these have pink-tinged bracts around their flowers. Gumball-sized, deep pink, puckered fruits appear in fall. These are eaten by monkeys in Japan and Korea. Bark on older trees flakes in patches to create a nice mottled cream and gray effect. Fall color is usually orange to red. Trees do not tolerate drought very well and need summer irrigation to thrive.



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**magnolia, *Magnolia* spp.**

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*Origin: distributed across North and South America, Europe and Asia, with diversity centered primarily in Asia*

There are many deciduous magnolia species, and even more cultivated varieties. Some species are native to the United States while others were introduced from Asia. Common characteristics are a large, simple leaf that is light to dark green, though not as dark or waxy as the evergreen magnolia. The flowers range in color and commonly include fuchsia, pink, purple, yellow, cream, white, or other variations. The flowers are large (ranging from 1-4" long) and can be quite showy in spring. Some magnolia species need specific moisture or acidic conditions to grow. The wood of many magnolias is highly shrink resistant and shock absorbent, takes stain and glue well, and varnishes easily. A number of magnolia species are used in

making furniture and veneers. Magnolia wood is also used to make cherry boxes, popsicle sticks, tongue depressers and broom handles.

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**Musashino zelkova, *Zelkova serrata* 'Musashino'**

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*Origin: Asia - Japan, Korea, China, Kuril Island of Russia*

The most common species of zelkova in Portland is Japanese zelkova, *Z. serrata*. It has simple, serrate-edged leaves that are tapered at the tips. Zelkovas have a dense, oval head, but Japanese zelkovas tend to be more vase shaped and spreading. Musashino grows to 45' tall and was selected for its extremely narrow, columnar growth habit to only 15' wide. Same leaf shape and bark characteristics as the species. Fall color is yellow. The small flowers of all zelkovas are greenish and lack petals. The female flowers are borne in the leaf axils while the male flowers cluster at the base of the shoots. Zelkovas are resistant to verticillium wilt.

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**northern red oak, *Quercus rubra***

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*Origin: North America - eastern Canada and eastern USA from the eastern edge of the Great Plains east to the Atlantic and south to Alabama, Georgia and Arkansas*

Northern red oaks are a tall (up to 150') tree native to eastern North America. Their bark has narrow fissures. The branches and canopy often begin high up on the tree, making it easy to walk beneath them. The branch arrangement is alternate.



The leaves (up to 8" long) are thick and waxy. They are light lime green in spring, turning dark green in summer, and gold to crimson red in fall. Each leaf is deeply lobed, with each lobe ending in a fine, almost prickly point. The acorns are round and robust with a thin cap. The acorns, which take two years to mature, are an important food source for wildlife, especially squirrels that like to bury and store acorns in the fall. The wood is fast growing and hardy, and is used in cabinetry, furniture and flooring. Northern red oak is often planted in parks and urban areas as a large shade tree. It is the state tree of New Jersey and the provincial tree of Canada's Prince Edward Island.

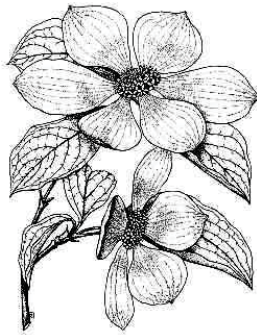
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**Pacific dogwood, *Cornus nuttalli***

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*Origin: North America – Oregon, Washington and British Columbia, Canada*

A native deciduous tree in the wild to 65' tall. The bark is thin, gray, and smooth, later becoming an alligator hide of small squarish blocks. Leaves are simple, opposite, ovate, 3–5" long with smooth, wavy margins and curved veins. Foliage turns bright red in autumn. The white "petals" are actually bracts that surround a button-like cluster of a dozen or more true flowers. Fruits are a cluster of bright red berries. British Columbia honors the tree as its floral emblem and forbids unauthorized digging or cutting. The berries soaked in brandy were prescribed for acid stomach and dogwood extracts served as colic and diarrhea treatments. Piano keys and thread spindles were more recent common uses for the wood. Pacific dogwood is highly susceptible to anthracnose, which first appeared near Vancouver, WA, in 1979 and has killed many trees.



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**Persian ironwood, *Parrotia persica***

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*Origin: Asia – Alborz Mountains of Iran, Talish Mountains of Azerbaijan and the Caucasus*

Native to Iran's Alborz Mountains, where it forms part of the lush Caspian-Hyrceanian forest, and the Caucasus. A deciduous tree, Persian ironwood grows 20' to 45' high and often spreads as wide. Leaves are dark green in color and veined. Fall color varies from pure yellow to shades of orange, red or purple; multiple colors are often on the same tree. Small red shaving-brush flowers without petals appear in late winter but aren't showy. Slow growing, Persian ironwoods have strong wood; their branches rarely break in wind or ice storms. With age, patches of bark flake off, giving their trunks a lovely cream and gray mottling. Generally free from pests and diseases. Persian ironwood is in the same family as witch hazels. Rare in Portland before the 1990s, it has become a widely planted this century due to its

drought tolerance, strong wood, lack of messy fruits and good fall color.

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**pine, *Pinus* spp.**

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*Origin: Unknown*

There are about 100 species of pine, native to every continent except Australia and South America. A quarter of the world's pine species are found in the Western USA. Pines are successful because of their ability to survive and endure in harsh environments, from sandy soils to rocky areas, and from cold, mountainous lands to regions with frequent fires. Pines vary widely in bark texture and color, cone shape and color and length of needles, as well as in number of needles held in each bundle. They are economically important trees, providing softwood timber for paper pulp, and construction. Seeds of some 29 species (especially *P. pinea* in the Mediterranean region) are collected as food, in some cases preventing natural regeneration in the wild. Other pines provide commercially important resins and turpentine. The German word for pine is *kiefer*. The French call pines *pin*. The Chinese name for pine is *song*. The Japanese call pines *matsu*. Greeks call pine *pitys*.

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**red maple, *Acer rubrum***

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*Origin: North America – eastern Canada, eastern USA from Minnesota to Maine south to Florida and east Texas*

In urban environments, red maple is a fast grower up to 40', but in the wild it may reach three times that height. It has a roundish to diamond-shaped crown. Bark is smooth, luminous gray with patterned lines, and furrowed when old. New twigs are shiny, reddish, and have white flecks. Leaves are opposite, 3–5" long with three major lobes, turning brilliant red, orange-red or yellow in the fall. The tree explodes into deep red flowers before the leaves emerge in spring. Fruit is a double-winged samara, joined at an angle usually larger than 45 degrees with bulbous seeds which are reddish at first and brown when ripe in the summer. Red



maple is toxic to horses, and the alluring scarlet leaves cause massive destruction of horses' red blood cells when ingested. Trees adapt to local conditions and over generations, northern trees have become more cold-tolerant while southern trees have become more heat-tolerant. Neither is very drought tolerant.

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**silverleaf oak, *Quercus hypoleucoides***

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*Origin: North America –Chihuahua and Sonora in Mexico to Arizona, New Mexico and west Texas*

Evergreen oak typically growing to 30' but on good soils can reach 50-60'. The tree's lance-shaped leaves are dark gray above and silver underneath. Male flowers are 4-5" long catkins appearing in spring. Female flowers are stemless or short-stalked. Acorns are 1/2 to 2/3 of an inch long, with the bottom third covered in a scaly cup. The smooth bark of young trees becomes deeply furrowed and cracked in black or dark gray plates. Trees have strong central leaders and round, dense foliage. They grow at 5,000-7,000' in elevation in northern Mexico's Sonora and Chihuahua states, and across the border in the mountains of New Mexico, Arizona and West Texas. A promising street tree for its drought tolerance and rapid growth.

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**trident maple, *Acer buergerianum***

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*Origin: Asia - Taiwan and eastern China inland to Sichuan province*

Trident maple can be easily remembered for the three lobes like Neptune's trident on the shiny, bright-green leaves. Leaves tend to hang down and are 1.5" to 3.5" long. They are paler underneath. Trident maple is deciduous with an upright, rounded crown 30-35' up to 50' or taller in good soils. Greenish-yellow flowers are not showy. Bark is gray to gray-brown. With age the bark can exfoliate to reveal gray, orange and brown patches. More drought tolerant than many maple species. Nice but variable fall color, from butter yellow to orange, scarlet and burgundy. Long cultivated in Asia and used widely there as a street tree there and



a subject for bonsai, with numerous cultivars. It is still somewhat uncommon in Portland. First scientifically described in 1865 by a French botanist.

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**tulip tree, *Liriodendron tulipifera***

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*Origin: North America - eastern USA across all the southern states and north to Michigan, New York and southern Ontario, Canada*

The tulip tree is the tallest broadleaf native tree in eastern North America, ranging from Florida to Nova Scotia. It has a pyramidal form and grows 100-150' tall but can reach 200' tall! Bark is light gray and corky, with older specimens demonstrating an intricate lattice pattern of vertical ridges.



It is a valuable timber tree that is easy to spot by its nearly square leaves, which grow to 6" or longer. The leaves are dark green above and bluish-white beneath, turning yellow to gold in autumn. The flowers are 2.5" long and consist of six pale-green tepals (sepals that look like petals) arranged like a tulip surrounded by three horizontally-spread, green tepals. The beautiful flowers are frequently overlooked because their greenish color blends with the foliage. The fruit is a conical, pale brown cluster. It is the state tree of Kentucky, Tennessee and Indiana.

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**Urban Boquet flowering ash,**

*Fraxinus ornus 'JFS-Coate'*

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*Origin: Europe*

This broadleaf deciduous tree generally grows 30-40' tall but has reached 60' in Seattle and up to 80' in optimal conditions in the wild. Fragrant beige flowers appear in April to early May and are followed on female trees by copious winged seeds called samara or "keys." Unlike maples, these have only one wing. The long, narrow, pinnate leaves are in opposite pairs. Since medieval times, a sugary extract has been obtained by cutting the bark. This substance was equated by Europeans with the biblical manna, hence the tree's other common name, manna ash. An approved city street tree for parking strips 4' to 5 1/2' with

powerlines. Ash trees are members of the olive family and are related to lilacs. Urban Bouquet is a seedless selection that grows 35' tall by 25' wide. Showy clusters of creamy white, fragrant flowers cover its branches in May and June. This selection blooms heavily and reliably on an upright oval frame. Fall color is yellow with purple overtones.

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**western hemlock, *Tsuga heterophylla***

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*Origin: North America - Alaska to California*

Narrow, pyramidal conifer growing slowly to 100'. Some trees in Olympic National Park are over 200' tall. Short needles give a soft, fine effect. Branches tend to hang down, giving a weeping appearance. Gray bark. Western hemlock grows from Alaska's Kenai Peninsula through coastal British Columbia, Washington and Oregon to the coastal redwood forests of northern California. It can be found as far east as northwest Montana and northern Idaho in valleys receiving at least 32" of rain a year. It grows from sea level to 5,000'. The tree is similar to mountain hemlock but has smaller cones, less than an inch long versus 1.5" to 3" long for its mountain



relative. Western hemlock occurs at lower elevation and does not range as far south in the Cascades as mountain hemlock. Being shade tolerant, western hemlock eventually becomes the dominant tree in undisturbed forests. The wood is used in construction, pilings, poles, gym floors and wood pulp. Washington's official state tree since 1947.

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**zeldkova, *Zelkova* spp.**

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*Origin: Asia*

The most common species of zeldkova in Portland is Japanese zeldkova - *Z. serrata*. However, there are a few other species - *Z. carpinifolia* from the Caucasus, and *Z. sinica* and *Z. schneideriana* from China. All have simple, serrate-edged leaves. The species from eastern Asia are more tapered at the tips, while those of *Z. carpinifolia* are somewhat blunter. The Caucasian zeldkova's bark is typically smooth and gray but will flake on older trees. The tree has a dense, oval head. Japanese zeldkovas tend to be more vase-shaped and spreading. The small flowers of all zeldkova species are greenish and lack petals. The female flowers are borne in the leaf axils while the male flowers cluster at the base of the shoots. *Z. sinica* has fewer veins and larger, smoother fruits than the other species.