



PORTLAND PARKS & RECREATION

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Creative Science School at Clark Tree Walk

LEARNING LANDSCAPES



Creative Science School at Clark Tree Walk 2015 Learning Landscapes

Site data collected in Summer 2014.

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Cover photos (from top left to bottom right):

- 1) The unusual bark of a cork oak.
- 2) A closeup of the flowers of a *Styphnolobium japonicum* 'Regent'.
- 3) The trunk and branches of a Turkish hazel tree.
- 4) The fall color of a *Metasequoia glyptostroboides*.
- 5) Upright cones on the branch of a blue Atlas cedar.
- 6) Students plant trees at CSS Clark.
- 7) An Australian snow gum displaying colorful textured bark.
- 8) The leaves of a variegated tulip tree have cream-colored edges.

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Portland Parks & Recreation

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The Learning Landscapes Program



Creative Science School at Clark

The Creative Science School at Clark Learning Landscape was initiated in December 2009 with a planting of 35 trees. The collection now includes 55 trees. This tree walk identifies trees planted as part of the Learning Landscape as well as 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.

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

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.



Creative Science School at Clark Tree Walk

Tree #	Common Name	Scientific Name
1	Legacy sugar maple	<i>Acer saccharum</i> 'Legacy'
2	Chinese red pine	<i>Pinus tabulaeformis</i>
3	Oregon white oak	<i>Quercus garryana</i>
4	white alder	<i>Alnus rhombifolia</i>
5	Pacific madrone	<i>Arbutus menziesii</i>
6	cascara buckthorn	<i>Rhamnus purshiana</i>
7	bigleaf maple	<i>Acer macrophyllum</i>
8	Douglas-fir	<i>Pseudotsuga menziesii</i>
9	western redcedar	<i>Thuja plicata</i>
10	black hawthorn	<i>Crataegus douglasii</i>
11	Oregon ash	<i>Fraxinus latifolia</i>
12	California bay	<i>Umbellularia californica</i>
13	smooth-barked Arizona cypress	<i>Cupressus arizonica</i> var. <i>glabra</i>
14	northern red oak	<i>Quercus rubra</i>
15	honey locust	<i>Gleditsia triacanthos</i> forma <i>inermis</i>
16	interior live oak	<i>Quercus wislizeni</i>
17	Jefferson American elm	<i>Ulmus americana</i> 'Jefferson'
18	giant sequoia	<i>Sequoiadendron giganteum</i>
19, 21	deodar cedar	<i>Cedrus deodara</i>
20	blue Atlas cedar	<i>Cedrus atlantica</i> 'Glaucous'
22	snow gum	<i>Eucalyptus pauciflora</i> ssp. <i>niphophila</i>
23	ginkgo	<i>Ginkgo biloba</i>
24	dawn redwood	<i>Metasequoia glyptostroboides</i>
25	bambooleaf oak	<i>Quercus myrsinifolia</i>

Tree #	Common Name	Scientific Name
26	Turkish hazel	<i>Corylus colurna</i>
27	deodar cedar	<i>Cedrus deodara</i>
28	boxleaf azara	<i>Azara microphylla</i>
29	cork oak	<i>Quercus suber</i>
30	European beech	<i>Fagus sylvatica</i>
31	Regent Japanese pagoda tree	<i>Styphnolobium japonicum</i> 'Regent' syn. <i>Sophora japonica</i> 'Regent'
32	Streetspire oak	<i>Quercus robur</i> x <i>alba</i> 'JFS-KW1QX'
33	fernleaf European beech	<i>Fagus sylvatica</i> 'Asplenifolia'
34, 35	black tupelo	<i>Nyssa sylvatica</i>
36, 37	red maple	<i>Acer rubrum</i>
38	silver maple	<i>Acer saccharinum</i>
39	gray birch	<i>Betula populifolia</i>
40, 41	London planetree	<i>Platanus x acerifolia</i>
42, 43	Himalayan whitebarked birch or Jacquemont birch	<i>Betula utilis</i> var. <i>jacquemontii</i>
44, 45	common hackberry	<i>Celtis occidentalis</i>
46	American hornbeam or blue beech	<i>Carpinus caroliniana</i>
47	Oregon white oak	<i>Quercus garryana</i>
48, 49	ginkgo	<i>Ginkgo biloba</i>
50	variegated tulip tree	<i>Liriodendron tulipifera</i> 'Aureomarginata'
51	dawn redwood	<i>Metasequoia glyptostroboides</i>
52	eastern larch	<i>Larix laricina</i>
53	tulip tree	<i>Liriodendron tulipifera</i>
54, 55	western redcedar	<i>Thuja plicata</i>
56, 57	ponderosa pine	<i>Pinus ponderosa</i>

Tree Facts, A to Z

American hornbeam or blue beech, *Carpinus caroliniana*

Origin: North America - Ontario, Canada south through the eastern USA to Florida

A broadly oval small deciduous tree to 20-25'. Narrow leaves 4" to 5" long have doubly toothed margins and 8-12 straight parallel veins. Fall color ranges from gold to excellent shades of orange and in some specimens fiery red. Bark is smooth, light gray or grayish-brown and often sinuous, giving rise to its other common names of blue beech or musclewood. American hornbeam grows along streams in its native habitat, so it appreciates summer watering in Portland to look its best. In cultivation since 1812 but much rarer in Portland than the fastigate European hornbeams.



bambooleaf oak, *Quercus myrsinifolia*

Origin: Asia - China, Japan, Korea, Laos, Vietnam, and north Thailand

An evergreen broadleaf oak 35-45' typically but capable of reaching 65'. Lance-shaped (hence the name "bamboo-leaf" oak), unlobed leaves are an olive-green. They emerge with a violet-purplish hue that quickly fades to green. The tree has proven remarkably resistant to snow and ice, without major breakage issues. This is the most cold tolerant of all Asian evergreen oaks. The Chinese name is *xiao ye quing gang*. Long cultivated in China and Japan. First scientifically described in 1850 by German-Dutch botanist Karl Ludwig von Blume (1796-1862). In Western cultivation since 1854.

bigleaf maple, *Acer macrophyllum*

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'.

black hawthorn, *Crataegus douglasii*

Origin: North America - Oregon, Washington,

A widespread little tree in moist fields and along streams at lower elevations in Oregon and Washington. Distinguished by slender thorns 1/2" to 1" long, they are one of the few native Northwest trees (the other notable example being vine maple) which have orange to red fall color. Flowers in spring are white, resembling those of apple trees. The small, black fruits are 1/2" long and contain three to five rock-hard seeds. The fruits are important food for birds, bears and other mammals. In semi-arid country, black hawthorn is the preferred nesting tree for magpies, who weave their stick pile nests in nearly every tree as the thorns discourage intruders.



black tupelo, *Nyssa sylvatica*

Origin: North America - eastern USA from eastern Texas and eastern Missouri across the South and north to New York, New England and southern Ontario, Canada

Black tupelo is an 80' tall broadleaf deciduous tree native to the eastern United States. The leaves are smooth and long (up to 6"), emerging as clusters and

twisting at different angles from the ends of branches. Trees are dioecious, with males and females occurring on different plants. A cluster of blue berries (smaller than ½") emerge from the end of the leaf clusters. These flowers and fruits are important food sources for bees and birds. The leaves turn from green to fiery red and yellow in autumn. The berries are said to taste bitter to humans but are an important food source for birds. This species likes wet habitats and is being planted more frequently as a street tree in Portland, especially in bioswales.

blue Atlas cedar, *Cedrus atlantica* 'Glauca'

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 ½" 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 percent 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.



boxleaf azara, *Azara microphylla*

Origin: South America - Chile

The hardiest azara, this native of wet forests in Chile grows quickly in cultivation in Oregon to a 20-25' tree. Cold winter winds can cause leaves to blacken and fall, but established trees typically recover in spring and releaf. Bark is cream to light beige-brown in color, relatively smooth. Leaves are small, round

and resemble those of boxwood, hence the tree's common name in English. Tiny golden flowers appear in late winter along the branches. Although inconspicuous, they have a delicious, vanilla-scent when smelled up close. Tolerates shade. Prefers regular water in summer. Also seen in a variegated form, *A. macrophylla* 'Variegata.'

California bay, *Umbellularia californica*

Origin: North America - from southern Oregon through coastal California

California bay, also called Oregon myrtle, is a broadleaf evergreen native to southwest Oregon, south along the Coast Range and in Sierra Nevada to southern California. It grows up to 175'. Thick, glossy, dark green leaves are 3-4" long, and are extremely pungent and reminiscent of bay leaves. The fruit look like olives and is highly prized by birds. The wood is pale brown with dark brown streaks in the grain. It is valued for veneers, high quality furniture and craft work and many tourist shops sell myrtle wood crafts. The natural oils in it give the wood a superb polished finish. The leaves of this tree can be used in cooking as a substitute for bay leaf but have a much stronger flavor. Native American tribes used the leaves to repel fleas and to treat headaches and poison oak dermatitis.

cascara buckthorn, *Rhamnus purshiana*

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.

Chinese red pine, *Pinus tabuliformis*

Origin: Asia - North Korea and China from Liaoning west to Inner Mongolia and Gansu, south to Shandong, Henan, Shaanxi, and Yunnan, and Sichuan in the west

Evergreen conifer usually 50' to 70' tall. Gray-brown bark fissures at an early age, turning reddish-brown on upper part of tree (hence the common name). Shiny gray-green needles, usually in pairs or bundles of three, are 6" long. The broadly oval cones are 3.5" long and ripen to brown. They have broad scales, each with a prickle. Tree tends to be flat-topped with age, as branching is fairly horizontal. Found widespread in China on dry, sunny slopes from 300' to 8,000' elevation. The tree's name in Mandarin is *you song*. The wood is used for general construction. The pulpwood produces certain resins that are used as artificial vanilla flavoring (vanillin). The bark is a source of tannin. The resin is used to make turpentine and related products, and is used medicinally to treat a variety of respiratory and kidney and bladder ailments, wounds, and sores. Medicinal use of the pine needles also takes place. The needles contain a natural insecticide and a source for dye

common hackberry, *Celtis occidentalis*

Origin: North America - from the Great Plains east to the Atlantic seaboard as far south as northern Georgia and east-central Texas

Hackberry is an alternate-branching, deciduous tree growing 50-80' tall. The leaves are 2" to 4" long, pointed and toothed with three main veins branching out at an uneven base. Young bark is smooth and light gray, but it soon develops corky warts and abundant warty ridges. It bears numerous sweet red then purple pea-sized berries that birds love and supports

a wide range of galls and mites on the foliage. The hackberry is closely related to elms, but is resistant to Dutch elm disease. The canopy spreads wide like an elm, but is more "O"-shaped rather than "V"-shaped. This tree thrives in towns and cities, but is frequently referred to as "the unknown tree," because its values are understated compared to other majestic urban trees. The name "hackberry" is thought to derive from *hagberry*, a Scottish name for a cherry species.

cork oak, *Quercus suber*

Origin: Europe - Portugal, Spain and North Africa in Morocco and Algeria

In its native home in Portugal and Spain, outer bark of this evergreen 30-60' oak is carefully peeled off every 8 to 10 years and made into cork. The light-brown bark is corky, porous and fissured. Yellow-green catkins appear in late spring but aren't especially showy. Gray-green leaves 1-3" long are hairy, with felted undersides and sparsely toothed or lobed edges. They drop all year long. Acorns are rounded, 1" to 1 1/2" long, with heavy recurving scales. Needs good drainage but tolerant of many soils, heat and drought. Trees live an estimated 300 to 500 years. Spaniards call the tree *alcornoque*. Originally, Andalusia's woodlands consisted mainly of mulberry trees, which nurtured silk worms for the region's famed silks. The gradual transition from mulberry to cork oak is still something of a mystery. Some believe it was deliberate planting, while others think that the mulberry lost its territory as cheaper imported silks prevailed and the longer-lived cork oak became more profitable to grow.

dawn redwood, *Metasequoia glyptostroboides*

Origin: Asia - central China

Dawn redwood grows to about 120' tall, smaller than both the coast redwood and giant sequoia. The deciduous stems are in an opposite branching pattern, while previous year shoots and buds are spaced spirally around the branches. New leaves (about 1" long) are lime green, turning darker green through the summer and orange in fall. The cones (about 1" round) are green earlier in the season



and turn to brown before ripening. Dawn redwood flourished in North America in the Miocene age (5 to 25 million years ago) and left a fossil record embedded in rocks across the Oregon landscape. However, the tree was thought to be extinct until a small grove was discovered in China in the 1940s. Seeds were collected and sent to arboreta around the country to reintroduce the species, and Portland's Hoyt Arboretum became the first location in North America to grow a tree to produce seeds in millions of years. Dawn redwood is Oregon's state fossil.

deodar cedar, *Cedrus deodara*

Origin: Asia - the Himalayas, including Pakistan, northern India, Nepal and Afghanistan

Deodar cedar is one of the true cedars and is often planted as an ornamental tree in parks and private properties. This evergreen tree averages between 40–70' in height with a straight trunk and swooping horizontal branches. The needles are green to blue-green and are singular or form in clusters that spiral along the shoots. Needles are about 1½" long and very sharp. The resinous cones are 3–5" long and sit on top of the branches like little nests. Ancient cultures have regarded deodar cedar as sacred. All of the true cedars come from areas of ancient civilization everywhere from Africa to Nepal. In North America, deodar cedar continues to be planted widely as an ornamental. It is the national tree of Pakistan.



Douglas-fir, *Pseudotsuga menziesii*

Origin: North America - from British Columbia south to Oregon, Washington, California, Idaho and western Montana with a subspecies in the Rocky Mountain states and into northern Mexico

Not a true fir, Douglas-fir may grow up to 250' tall and 10' in diameter, although specimens have been found that are 330' tall. Young trees sometimes emit long columns of sap through the bark. The needles (about 1" long) are green above and blue-green underneath with two white lines running parallel to

the length. Needles are dense and scattered around the stem. The cones are about 3½" long with distinct bracts sticking out. Some say the bracts look like a pitchfork or the hind legs and tail of a mouse. The tree also has a strong pine-like scent which can be smelled by crushing the needles or walking through a forest dominated by Douglas-fir. Douglas-fir has been the state tree of Oregon since 1939 and has been used as the main source of construction lumber for Oregon and the rest of the United States. Douglas-fir is also harvested for Christmas trees.

eastern larch, *Larix laricina*

Origin: North America - from Alaska east across Canada to Newfoundland and in the USA in Minnesota, Wisconsin, Michigan, New York and New England

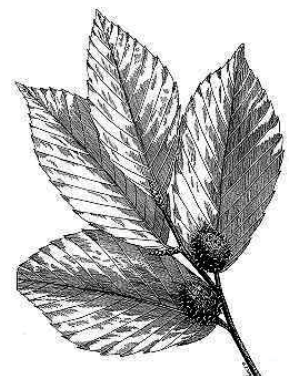
Larches, also called tamarack, are deciduous conifers. Eastern larch grows up to 60' tall. Trees are extremely hardy and straight, with conical shapes. Needles are borne on woody pegs in clusters of 20–40. Mature bark is furrowed and flakes off in irregular shapes leaving reddish-orange patches. In the spring, larch needles are paler than other conifers, turning yellow in the fall. Cones are small and tulip-like, occurring in small bunches and having very few scales. The native western larch (*Larix occidentalis*) is similar but grows to about three times the height and has cones that are larger and upright on the branches.

European beech, *Fagus sylvatica*

Origin: Europe - England, western and central Europe to Scandinavia

One of the largest and most stately deciduous trees, European beech can easily reach several hundred years of age and grow to 100' tall. Trees grow out and upward, creating a full, oblong shape. The bark is smooth and gray; older trees have prominent folding in the bark around branches, knots, or wounds, resembling elephant legs.

Carving into the smooth bark of beech trees can harm the active growing layers and make it more



susceptible to disease. Branching is opposite, with thick, prominently margined leaves. Leaf edges are generally toothed and wavy. The nuts, enclosed in hairy husks about ½" long, are an important wildlife food and have been harvested by people as well. European beech has been cultivated for particular shapes and colors, including weeping, slender, and purple varieties. Beeches are also subject to infestation by the beech wooly aphid, which appear as hairy white patches, usually on the underside of leaves. These rarely cause serious harm.

fernleaf European beech,
Fagus sylvatica 'Asplenifolia'

Origin: Europe - England, western and central Europe to Scandinavia

Rarely seen in Portland, this old cultivar has deeply dissected green leaves providing a ferny appearance. Leaves turn brown in fall. Broadly oval shaped tree with typical smooth, gray, "elephant-hide" bark. Grows to 50' tall by 40' wide.

giant sequoia, *Sequoiadendron giganteum*

Origin: North America - California in the Sierra Nevada

Giant sequoias are the world's largest tree by volume. The tallest can reach over 250' - shorter than the world's tallest trees - their coastal redwood cousins. Long lived trees, the oldest (as determined by ring count) was 3,500 years old. Millions of years ago the trees were widespread around the planet, growing in the Arctic during warmer periods in Earth's history. The trees eventually died out everywhere but in the Sierra Nevada of California. Restricted in nature now to only a few dozen isolated groves in a narrow elevational band between 4,500 and 7,100 feet, the trees were first discovered by Western scientists in the 1850s. Bark is fibrous. Needles are in flat sprays, sometimes with a decided bluish-gray color. Cones are small (1.6 to 2.8 inches long).



ginkgo, *Ginkgo biloba*

Origin: Asia - China

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 that flow upwards or towards the ground. There are separate male and female trees. The female tree produces edible fruit about ¾" long, which have 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. The tree was at one point thought to be extinct, and it is rumored that Chinese monks saved some of the last ginkgo trees from a large fire. Ginkgos are often planted in cities for their unique beauty and hardiness to urban conditions.



gray birch, *Betula populifolia*

Origin: North America - from Nova Scotia, Canada west to Ontario and south to Pennsylvania and New Jersey with outliers in Virginia, Indiana and mountains of North Carolina

A pioneer species typically found on disturbed sites with exposed, well drained soils. Gray birch is a moderate sized tree with fast growth (2' to 5' a year) on fertile soils. The bark of young plants is white, but not as bright or as papery as that of paper birch (*B. papyrifera*) or Himalayan birch (*B. utilis* var. *jacquemontii*). Beyond the pole stage of growth the bark quickly develops black and rough patches, with white remaining between them. Gray birch has strong terminal growth but with relatively small-diameter branches. The leaves are narrowly triangular with larger serrations along the edge than paper birch. Fall color is a bright yellow. Subject to bronze birch borer but less prone to being killed by it than paper birch.

Himalayan whitebarked birch or Jacquemont birch, *Betula utilis* var. *jacquemontii*

Origin: Asia - western Himalayas, including Kashmir in India and Pakistan

Most often seen in a form which has the whitest bark of any birch grown in Portland. The bark is smooth, bright white and exfoliates in horizontal strips to reveal cream underbark. It does not develop black, blocky plates like many European and American birches. Upright growth 40' to 65'. Leaves are ovate, slightly hairy and with serrate margins. They turn yellow in autumn. Once considered resistant to bronze birch borer, it has proven to be as susceptible to fatal attacks as other birches. Grows at elevations up to 14,800' in Nepal and Kashmir. Its name in Sanskrit is *bhojpatra*. First described by western scientists in 1825. The name *jacquemontii* honors French plant explorer Victor Jacquemont (1801-1832), who died tragically while plant hunting in the Himalayas. The bark has been used for over 2,000 years as writing paper, as well as bandages, umbrella covers, packing material, and roof construction. Widespread cutting for firewood has reduced the tree's numbers considerably.

honey locust, *Gleditsia triacanthos* forma *inermis*

Origin: North America - central USA from eastern Kansas and Oklahoma though Illinois, Indiana and Ohio east to Virginia and southern New England, plus southern Ontario, Canada

A thornless variety that varies in height from 30' to 70' tall with a comparable spread. The national champion thornless honey locust is 104' - taller than the 78' national species champion. Virtually every cultivar grown in cities is derived from this variety, usually from northern seed sources that have winter hardiness. The pinnately or bipinnately compound leaves are 6 to 8 inches long, with small leaflets 1/3 to 1" long. These cast a light shade, permitting grass to grow well beneath the trees. The leaflets turn yellow



and drop early in the fall. Generally this form is open-spreading but most cultivars of it have a narrower form. Once considered trouble-free, the tree was often used to replace elms lost to Dutch elm disease in the 1950s through 1970s. Widespread planting has caused the emergence of serious pest issues, particularly in the Midwest where trees are attacked by the aggressive canker *Thyronectria*.

interior live oak, *Quercus wislizeni*

Origin: North America - California on upland slopes below 5,000' and in the Mexican state of Baja California

An evergreen oak native to California and noted for its drought and heat tolerance. Can reach 70' but is usually shorter. Often as broad as they are tall and densely branched. Leaves are leathery, elliptical, and up to 3 inches long. They can be smooth, toothed or spiny like a holly. On young trees, bark is smooth and light gray, becoming fissured and darker with age. Narrow acorns are cone-shaped and 3/4 to 1 1/2 inches long. They sit deeply in their cup and take up to two years to ripen. Many birds and animals eat the acorns and shelter in this tree. The trees survive in areas receiving as little as 15" of rain annually or up to 50".



Jefferson American elm, *Ulmus americana* 'Jefferson'

Origin: North America

Once one of the most common street trees in cities from the Great Plains to the Atlantic seaboard, the appearance of Dutch elm disease from 1930 onward has felled most of the urban American elms of this species. Because American elms were not as densely populated in Portland as in other U.S. cities, the tree still persists here as plantings dating from the late 19th and early 20th centuries. Tall (to 140') and classically vase shaped, these majestic trees have deep green, heavily veined leaves 3" to 6" long with doubly serrate margins. Flowers emerge before the leaves and are followed by thousands of seeds surrounded by papery wings that flutter from the tree. Aside from Dutch elm disease, the tree is susceptible to elm leaf beetle, phloem necrosis, and other pests and diseases.

This selection of the American elm was made from a single tree planted in the 1930s on the National Mall in Washington, D.C. From among hundreds of elms on the Mall, Jefferson appeared to have the best tolerance of Dutch elm disease. Tree grows to 70' x 50'. It was released commercially in 2005 by the National Arboretum. The original tree was 68' tall at 70 years. Jefferson leafs out earlier and retains its leaves a bit later than the species. Seeds of this tree are generally not fertile, reducing reseeded. Bark is dark gray and fissured as the tree ages.

Legacy sugar maple, *Acer saccharum* 'Legacy'

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, they are subject to verticillium wilt. Legacy is a cultivar that is densely-branched and symmetrical. Chosen for its fuller crown and greater tolerance to heat and wind. Grows fast to reach 50' tall by 25' wide. The thick, waxy, dark-green leaves are shiny and up to 1.5 times thicker than the species, which helps them resist tattering in windstorms and burning during the dry summer months. In the fall, the entire tree transforms to bright red with touches of orange and golden yellow. The leaves may cling late into winter after their color fades.



London planetree, *Platanus x acerifolia*

Origin: Europe - a hybrid between the North American Platanus occidentalis and European Platanus orientalis

London planetree is a deciduous tree growing to 115' tall. The bark peels back in plates, revealing light gray, yellow, and even orange hues of underlying bark. Shedding bark is a way for the tree to shed pollutants and breathe with new bark again. Older trees develop bumps that make the bark look like dripping candle wax. The thick leaves (about 5–8" long) are fuzzy beneath when young and have a similar shape as maple leaves. There are three to five main lobes radiating out from the center of the stem. The edges of leaves are toothed, tapered, and pointy. The spiky round fruits (about 1" diameter) are also unique, spaced out along a stem like beads on a necklace. London planetree may be the most popular urban street and park tree planted across the United States and Europe. Tree populations that are clones tend to become diseased easily. London planetree also grows quickly and has been grown for timber, especially for a particular expensive type of wood known as lacewood.



northern red oak, *Quercus rubra*

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.

Oregon ash, *Fraxinus latifolia*

Origin: North America - Oregon and Washington to northern California

Oregon ash is a native, medium-sized deciduous tree growing to 80' tall. Bark becomes grayish-brown with vertical fissures. Leaves are opposite, pinnately compound with 5–7 leaflets that have nearly no petiole. They are olive-green above and paler and wooly beneath. Male and female flowers appear on separate trees. The fruit is a single samara, 1–2" long, hanging in dense clusters. Heavy crops are produced at 3 to 5 year intervals. Fall color is a non-descript yellow to brown. Oregon ash is the only ash native to the Pacific Northwest. Although it can grow at elevations up to 5,000', it is more typically seen as a lowland tree along rivers and seasonally flooded areas. Trees growing under favorable conditions may reach 200 to 250 years of age. The wood has a high heat value when burned, making it good firewood. Oregon ash is susceptible to the emerald ash borer, an insect pest which may wipe out native stands of this tree as it has been doing to other ash species in the U.S.

Oregon white oak, *Quercus garryana*

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

Oregon white oak is a deciduous tree growing up to 90' tall. Branches are dense and wide, with limbs of solitary trees reaching to the ground. The leaves (3–6" long) are thick and shiny with rounded lobes. A distinguishing feature is the presence of galls on the underside of leaves or small twigs. The galls are the home of little wasps that lay their eggs inside oak leaves. The fruit of the Oregon white oak is an acorn about 1" long that protrudes from a narrow cap. These trees prefer open grassland habitats where they cannot be shaded out by other species. Oregon white oak was once one of the

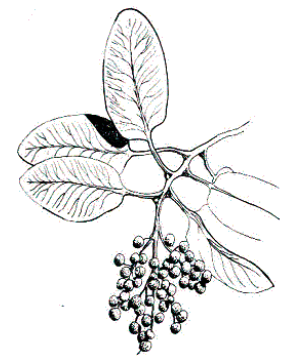


predominant trees in the Willamette Valley, but has declined to only 1% of its original range due to land development for farms and cities, and a reduction in wildfires. The tree's nickname, Garry oak, is after Nicholas Garry, the secretary of Hudson's Bay Company who helped botanist David Douglas.

Pacific madrone, *Arbutus menziesii*

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

The Pacific madrone is a native broadleaf evergreen that can grow up to 100'. Young bark is chartreuse and smooth, while the older bark is dark brownish-red and peeling. Leaves are simple, alternate, oblong, 3–5" long, and are dark green on top and light green or golden-scaly below. Margins are smooth or finely serrated. Stems and trunks tend to lean and twist. Flowers are white, urn-shaped, and fragrant in large drooping clusters. The fruit is orange-red, pea-sized with a pebbly surface, and appears in the fall. British plant hunter Archibald Menzies first described the species based on trees seen on the Olympic Peninsula in 1792. A Straits Salish story describes the madrone as the tree used by the survivors of the Great Flood to anchor their canoe to the top of Mount Newton (B.C.) To this day, the Saanich people do not burn madrone in their stoves because of the important service this tree provided long ago.



ponderosa pine, *Pinus ponderosa*

Origin: North America - from British Columbia, Canada south through the Northwest and other Western states east to Nebraska and south to northern Durango and Tamaulipas states in Mexico.

Ponderosa pine is the most widely distributed pine in North America after lodgepole pine. In 1826 David Douglas first named the tree *ponderosa* after the ponderous, or heavy, wood. These evergreen trees grow up to 180' tall and may live 500 years or more in the wild. Needles are 5–10" long and grow

in bundles of three. Cones are egg-shaped and 3-5" long. As ponderosa pines age, their bark turns from a dark brown to a yellow or orange hue, giving older trees the nickname "yellow bellies" or "punkins." For a sweet surprise, cuddle up with a yellow belly and smell the cracks in the bark—it's reminiscent of baking cookies with sweet tones of vanilla and butterscotch. Lumber is valued for light construction and millwork. The seeds are consumed by a wide range of wildlife.

red maple, *Acer rubrum*

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.

Regent Japanese pagoda tree, *Styphnolobium japonicum* 'Regent' Syn. *Sophora japonica* 'Regent'

Origin: Asia - China

A cultivar of the deciduous Japanese pagoda tree noted for blooming years earlier than the common species. Otherwise, similar in all respects to the regular species, blooming in August-September with white flowers in clusters up to 15" long. Grows to 50-70' tall



with equal spread. Twigs are greenish, turning light brown as they mature. Bark on older trees is thinly furrowed. Bipinnately compound dark green leaves cast a light shade. These are followed by 6-12" long, "stringbean" pods that turn yellow and then grayish-brown. Although a member of the pea family, this tree cannot fix nitrogen from the air as it lacks the necessary rhizobia bacteria. Tolerates air pollution, heat and drought. May bloom better in hot, dry summers than in cool, wet ones. Can get a fatal canker disease.

silver maple, *Acer saccharinum*

Origin: North America - eastern Canada, eastern USA from Minnesota to Maine south to Georgia and Arkansas

Silver maple grows to 75' tall with thick opposite branches. Bark is a silver gray and becomes shaggy and pulls away in strips as the tree ages. The sporadically toothed leaves (average 3-5" long) have five main lobes with two deep clefts that extend past the middle of the leaf's length between the middle lobe and adjoining lobes. Leaves are dark green on top and silver green on the bottom. On a windy day fluttering leaves reveal a pleasing contrast between their green fronts and silvery backs. Leaves turn lemon yellow to orange-pink in autumn. The winged seed is wide-open "V" shaped and more long and narrow than other maples. Silver maples grow fast and large, though their wood is fairly brittle. Trees tend to lose limbs easily, especially in winter. Silver maples are becoming less popular as plantings in urban areas because of their weak wood and vast root systems.



smooth-barked Arizona cypress, *Cupressus arizonica* var. *glabra*

Origin: North America - this variety is found only in north-central Arizona

An evergreen conifer, sometimes given species status as *C. glabra* but mostly considered a variety of *C. arizonica*. Found in canyons in and around Sedona, Arizona. Very smooth, non-furrowed bark, which can appear in shades of pink, cherry, and reddish-brown. Resin glands on nearly all needles. Foliage and cones as for the species.

snow gum, *Eucalyptus pauciflora* ssp. *niphophila*

Origin: Australia – Mountains of Victoria and New South Wales above 5,000'

Snow gums are the hardiest eucalyptus trees for the Pacific Northwest. An evergreen broadleaf tree, they have flat, thin, lance-shaped leaves bluish-gray in color. Bark is smooth and peels in attractive white and gray strips and patches, although strips can vary in color from light brown to cream. Flowers are white. Trees require full sun. They normally reach 25' to 35'. Snow gums form pure forests at the treeline of Australia's highest mountains in New South Wales and Victoria. Two especially hardy subspecies of snow gum – *niphophila* and *debeuzevillei* – were recognized in 1973. The tree is considered vulnerable to global warming, since there is limited land in Australia at the cooler elevations it needs. Usually disease and pest free in Portland.



Streetspire oak,

Quercus robur x alba 'JFS-KW1QX'

Origin: Europe/North America hybrid

Even more narrow than Crimson Spire, this is a newer hybrid between the English oak *Quercus robur* and the American white oak *Q. alba*. An upright deciduous tree, its leaves turn red in autumn and drop cleanly away in fall. Although upright in form to only 15' wide by 45' high, this cultivar has wider crotch angles, which avoids included bark and makes the branches less prone to break off in storms. Leaves turn a pleasant rust-red in autumn and are also resistant to powdery mildew.

tulip tree, *Liriodendron tulipifera*

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.

Turkish hazel, *Corylus colurna*

Origin: Asia – from northern Iran west to Turkey and the Balkans

An upright to oval deciduous broadleaf tree that can reach 50' to 80' high and 25-35' wide. Related to the hazelnut of commercial orchards but a distinct species. It's important to provide even moisture until well established but good drought tolerance on mature trees. Trees do best in full sun. Leaves are ovate to obovate and have hair on the veins underneath. Fall color yellow but not especially effective. Insignificant yellow male flowers to 3" in early spring are followed by clusters of 3 to 6 nuts in summer. These are hairy and spiny. Nuts are edible but relatively small compared to the casing. Bark on mature trees will flake to reveal a mottled orange-brown inner bark. Fairly uncommon in Portland.

variegated tulip tree,

Liriodendron tulipifera 'Aureomarginata'

Origin: North America

This cultivar is a variegated form of the typical tulip poplar from the southeastern USA. The leaves have an attractive pale yellow to chartreuse border with darker green centers. Monrovia Nurseries introduced this



cultivar in 1986. It reportedly reaches 70' to 80' tall by 30' to 50' wide (the species can be 90' to 150' tall or more). It is somewhat slower growing than the

species. All tulip trees do best with even moisture, especially in Portland's dry summers. They prefer rich, loamy soils. Flowers are 3" across and shaped like tulips. They are chartreuse with orange stamens and appear in late spring. Fall color is yellow. Aphids can be a problem, especially in summer when trees experience drought stress.

western redcedar, *Thuja plicata*

Origin: North America - British Columbia, Canada south through Washington, Oregon, northern Idaho and northwest Montana south to northern California; also in the Alaska Panhandle

Western redcedar can grow up to 200' tall and greater than 10' in diameter. This evergreen has flat, waxy, scale-like leaves that resemble the pattern of ferns.



On the underside of the leaves is a white chalk-colored pattern of "X" shaped marks. The branches usually hang down from the trunk in a hook-like fashion. The bark is dark brown, fibrous, and peels off easily in small strips. The cones (about 1/2" long) form at the tips of the scale-like leaves and open upon maturity. Western redcedar has been used for outbuildings and sheds because the wood is resistant to rot. Native Americans used the wood for canoes and totem poles. The bark can be harvested and was used for blankets, clothing, ropes, nets and even baby diapers. Western redcedar is the official provincial tree of British Columbia.

white alder, *Alnus rhombifolia*

Origin: North America - Oregon, Washington, Idaho, western Montana, California and British Columbia, Canada

White alder is very similar to red alder. The leaf edges of white alder are flat, not curled. Leaves are 3-6" long with veins. The leaf point on white alder is more rounded than on other alders. White alder bark is also distinguished by being reddish brown, scaly or platy on the lower trunk,



compared to the smooth gray, white-lichen covered red alder bark. Both white and red alder are the only native Pacific Northwest trees that have microorganisms on their roots that help them take nitrogen from the air and fix it underground, enriching the soil. White alder grows 50' to 60' tall but can reach 100'. Yellowish male catkins 1-4" long hang down in early spring. Many people are allergic to alder pollen, which spreads on the wind. Female flowers are a hard, woody dark brown capsule 1/2" to 3/4". These hang on the tree year-round. Grows at elevations between 300 and 7,900 feet. Alders grow quickly but tend to be short lived, often not more than a few decades.