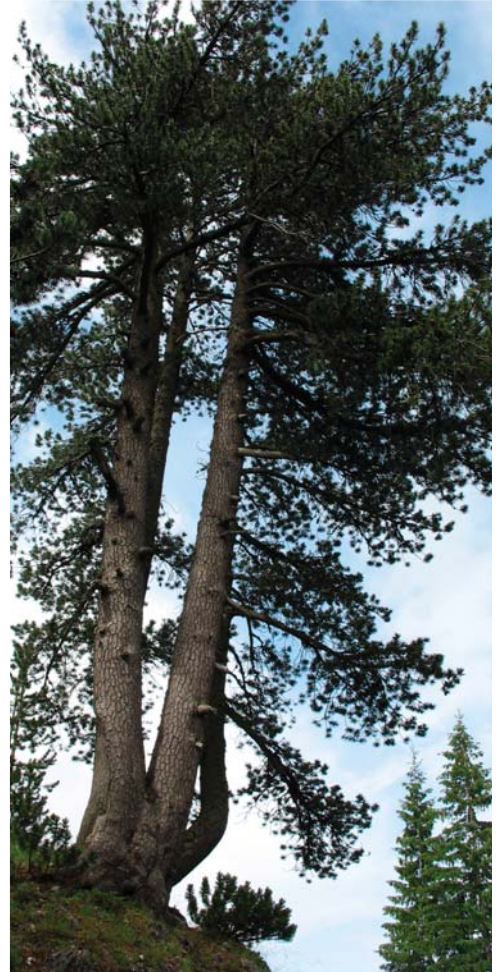




PORTLAND PARKS & RECREATION

Healthy Parks, Healthy Portland



Sacramento School Tree Walk

LEARNING LANDSCAPES



Sacramento School Tree Walk 2015 Learning Landscapes

Site data collected in Summer 2014 and Spring 2015.

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Cover photos (from top left to bottom right):

- 1) Students and PP&R Urban Forestry staff plant a blue Spanish fir.
- 2) The bluish needles of a Vanderwolf's Pyramid limber pine.
- 3) A Bosnian pine growing in its native range.
- 4) Yellow highlights on Sekkan Japanese cedar foliage.
- 5) Summit cedar is a hybrid of two rare Tasmanian conifers.
- 6) A row of newly-planted trees at Sacramento School.
- 7) The unique bark of a lacebark pine.
- 8) The brilliant silver undersides of Korean fir foliage.

ver. 4/27/2015

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The Learning Landscapes Program



Sacramento School

The Sacramento School Learning Landscape was initiated in April 2003 with a planting of eight trees. Boosted by a major planting in 2015, the collection now includes almost 50 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, the 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 study and provide ongoing care, such as structural pruning. 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.

Sacramento Elementary School Tree Walk



Learning Landscapes

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

Sacramento School Tree Walk

Tree #	Common Name	Scientific Name
1	Oregon white oak	<i>Quercus garryana</i>
2	Shademaster honey locust	<i>Gleditsia triacanthos</i> forma <i>inermis</i>
3, 4	ginkgo	<i>Ginkgo biloba</i>
5 - 9	Oregon white oak	<i>Quercus garryana</i>
10	Baker cypress	<i>Cupressus bakeri</i>
11	Yoshino Japanese cedar	<i>Cryptomeria japonica</i> 'Yoshino'
12	Sekkan Japanese cedar	<i>Cryptomeria japonica</i> 'Sekkan'
13	Vanderwolf's Pyramid limber pine	<i>Pinus flexilis</i> 'Vanderwolf's Pyramid'
14	monkey puzzle tree	<i>Araucaria araucana</i>
15	blue China fir	<i>Cunninghamia lanceolata</i> var. <i>glauca</i>
16	Wustermeyer Brewer spruce	<i>Picea breweriana</i> 'Wustermeyer'
17	Bosnian pine	<i>Pinus heldreichii</i>
18	Hungarian oak or Italian oak	<i>Quercus frainetto</i>
19, 20	Oregon white oak	<i>Quercus garryana</i>
21	Hungarian oak or Italian oak	<i>Quercus frainetto</i>
22	red-silver hybrid maple	<i>Acer x freemanii</i>
23	maple	<i>Acer</i> spp.
24	Japanese pagoda tree or Chinese scholar tree	<i>Styphnolobium japonicum</i> Syn. <i>Sophora japonica</i>
25	Chinese silver fir or cathaya	<i>Cathaya argyrophylla</i>
26, 27	weeping Alaska yellowcedar	<i>Cupressus nootkatensis</i> 'Glauc Pendula'
28	Brun's Serbian spruce	<i>Picea omorika</i> 'Brun's'
29	Fuyu Asian persimmon	<i>Diospyros kaki</i> 'Fuyu'

Tree #	Common Name	Scientific Name
30	Silberlocke Korean fir	<i>Abies koreana</i> 'Silberlocke'
31	strawberry tree	<i>Arbutus unedo</i>
32	blue Japanese white pine	<i>Pinus parviflora</i> forma <i>glauca</i>
33	Vanderwolf's Pyramid limber pine	<i>Pinus flexilis</i> 'Vanderwolf's Pyramid'
34	lacebark pine	<i>Pinus bungeana</i>
35	Fuyu Asian persimmon	<i>Diospyros kaki</i> 'Fuyu'
36	summit cedar	<i>Athrotaxis x laxifolia</i>
37	Willamette Valley ponderosa pine	<i>Pinus ponderosa</i> var. <i>benthamiana</i>
38	dawn redwood	<i>Metasequoia glyptostroboides</i>
39	bald cypress	<i>Taxodium distichum</i>
40, 41	Autumn Gold ginkgo	<i>Ginkgo biloba</i> 'Autumn Gold'
42	umbrella pine	<i>Sciadopitys verticillata</i>
43, 44	blue Spanish fir	<i>Abies pinsapo</i> 'Glauc'
45	giant sequoia	<i>Sequoiadendron giganteum</i>
46	blue Atlas cedar	<i>Cedrus atlantica</i> 'Glauc'
47	White Mountain eastern white pine	<i>Pinus strobus</i> 'White Mountain'
48	incense cedar	<i>Calocedrus decurrens</i>
49	grand fir	<i>Abies grandis</i>
50	noble fir	<i>Abies procera</i>

Tree Facts, A to Z

Autumn Gold ginkgo, *Ginkgo biloba* 'Autumn Gold'

Origin: Asia - male cultivar of a tree native to 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. There are separate male and female trees. The female tree produces edible fruit about ¾" long, which has been described as "nature's stink bomb." Only one species of ginkgo tree remains in this ancient tree family that dominated forests in Oregon and elsewhere millions of years ago. In commerce since 1955, 'Autumn Gold' is symmetrically branched and will reach 45' tall by 35' wide. Nice butter yellow fall color. Leaves in autumn tend to drop all together (within a few days of each other) making fall cleanup quick rather than drawn out over weeks. Tolerant of full sun or shade, with no pests or diseases. Best growth with summer watering until well established, then drought tolerant and pest free.



Baker cypress, *Cupressus bakeri*

Origin: North America – Oregon and northern California

Broadly columnar, this native evergreen conifer may reach 90' under good conditions although the national champion exceeds 100.' It has attractive gray foliage, with scales usually covered in resin blisters. Bark is smooth when young, sometimes an attractive maroon-burgundy color. Globe-shaped, silvery cones are ½" to 1" long. Baker cypress reproduction depends on fire to open the cones and clear ground litter, so fire suppression over time can lead to a reduction in the number of these trees. The trees demand light and will decline if grown in shade. Extremely drought tolerant. Often found in serpentine soils or lava beds where few other trees can survive. It is native to Jackson and Josephine counties in southern Oregon and also grows in a few groves in northern California. Because it is found in fewer than 10 locations in the wild, Baker cypress is considered vulnerable to extinction.



bald cypress, *Taxodium distichum*

Origin: North America - From eastern Texas to Florida, reaching north to Delaware and southern Illinois

A deciduous conifer growing upright to 100' or more. Needles are soft, emerging light green. They are ½ "to ¾" long and turn russet-orange in autumn. Spherical cones are about an inch in diameter. Bark on older trees is reddish-brown and fibrous. The official state tree of Louisiana, bald cypress is synonymous with the bayous. Its range, however, extends from east Texas into southern Illinois and along the eastern seaboard to Delaware, usually in swamps. Despite being able to survive in waterlogged soils, bald cypress also grow well in drier soils and makes a fine street tree. Because the wood is durable, bald cypress was heavily logged for water tanks, ships, flooring, greenhouses, shingles and laundry equipment. Before the Ice Ages, these trees were widespread across the Northern Hemisphere but died out everywhere except the eastern U.S. Bald cypress seeds are eaten by wild turkeys, wood ducks, evening grosbeaks, squirrels and some waterfowl and wading birds.

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 first appeared in France in 1867. It 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. Lifespan is estimated at 100 to 200 years. About 75% of wild 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.



blue China fir, *Cunninghamia lanceolata* var. *glauca*

Origin: Asia – a cultivar of a species from China in temperate provinces and in Laos, northern Vietnam

A blue-needled form of the evergreen conifer China fir, this form was first described in 1931. The tree can reach 100' or more with upright growth leading to pyramidal form when mature. Needles are long, flat, broad and have pointed tips. They spiral densely around the shoot. In this variety they are a striking blue-gray color. Cones are 1" to 2" long in clusters, remaining on the tree for up to a year after seeds are shed. Outer bark is brown, the inner bark red. Unusual for a conifer, this species can resprout from the stump if cut down. *Cunninghamia* have been written about in China for centuries. They are highly prized for their fine-grained wood, which is light, soft, fragrant and easily worked. The timber is used extensively for general carpentry and housebuilding but it is in great demand for the highest grade of coffins, from which it gets the name "coffin tree." Its Mandarin name is *sha shu* or *shan mu shu*.



blue Japanese white pine, *Pinus parviflora* forma *glauca*

Origin: Asia - blue-needled form of a Japanese species

This form of the Japanese white pine has especially blue-silver foliage, making it popular as an ornamental tree. When young the tree is densely branched tree with a conical shape. As it ages it develops a graceful, irregularly spreading form 35' to 50' tall with an equal or greater width and a broad, flattened canopy. The 1 to 2.5-inch-long needles are stiff and twisted, forming glaucous blue-silver tufts of foliage at branch tips. These give the tree a fine texture. Seed cones are 1 to 4 inches long, brownish red cones, and persist on the tree for six to seven years. Bark is smooth and gray when young, becoming darker gray and scaly on older trees. Japanese white pine requires full sun but is tolerant of clay soil and salt. The species was introduced to the U.S. in 1861 from Japan. There, the tree is called *hime-no-matsu*.

blue Spanish fir, *Abies pinsapo* 'Glauca'

Origin: Europe –Mountains of southern Spain and Morocco in North Africa

This blue-needled cultivar of Spanish fir appeared in France in 1867. Spanish fir is one of the most drought-tolerant firs. A conifer, it occurs in just a few locations in southern Spain and in the Rif Mountains of Morocco. The variety *numidica* grows in NE Algeria on Mt. Babor and Thababor and is sometimes considered a separate species. The thick, stiff needles are arranged straight out all around the twig or bent upward, slightly denser toward the sides. Pollen cones are reddish purple. Seed cones are cylindrical and mature to a yellowish to purplish brown. Grayish brown bark becomes deeply ridged and furrowed with age. This cultivar has handsome blue-gray needles. Otherwise, similar in all respects to the species. Spanish fir is listed on the IUCN Red List as endangered due to climate change and fires. It is one of the few trees native to Africa that is hardy enough to grow in Portland. Drought tolerant, adapted to rocky soils, and does well in full sun.



Bosnian pine,

Pinus heldreichii Syn. *Pinus leucodermis*

Origin: Europe - in the mountains of Bosnia, Serbia, Albania, Macedonia, SW Bulgaria, northern Greece (including Mount Olympus), and locally in southern Italy

Growing 80' to 115' tall, Bosnian pine is an evergreen conifer of mountains in the Balkans, Greece and southern Italy. It can be found all the way to treeline, making it quite hardy and able to withstand strong winds. Because it also resists pests and air pollution, it is used to reforest mountains. The needles are 1.8 to 4 inches long. Cones are 2 to 3.5 inches long, with thin, fragile scales. The cones are dark blue-purple when young, maturing to brown. Bark is thick, ash-gray in young trees, later becoming ridged and furrowed with yellowish-brown, flattened and angular patches. The species was first described in 1863 as *Pinus heldreichii* by Swiss botanist K. Hermann Christ

in honor of Theodor von Heldreich from specimens Heldreich collected on Mount Olympus, Greece. A year later, an Austrian botanist described a pine from Greece which he called *P. leucodermis*. Despite minor differences, modern studies show both are the same species, making *P. heldreichii* the correct name.

Brun's Serbian spruce, *Picea omorika* 'Brun's'

Origin: Europe - a cultivar of a species native to Serbia and Bosnia in the Tara and Javor Mountains

A slow-growing cultivar of the evergreen Serbian spruce, this upright, narrowly pyramidal tree may reach 30' to 35' tall by only 10' wide when fully grown. Distinctive for its blue-green needles and profuse purple cones in spring. Does best in rich, well-drained soils with even moisture year round. This cultivar was discovered by the family-owned Brun's Nursery in northwest Germany. The tree was named the 2007 Tree of the Year by the American Conifer Society. Deer dislike the tree and won't browse it. Of the world's 29 species of spruce, Serbian spruce has one of the most limited natural distributions. It is found only at elevations between 2,625' and 5,249' in the Tara and Javor Mountains of western Serbia and adjacent Bosnia near the Drina River. Fortunately, Serbian spruce is popular in cultivation and is widely planted in parks and botanical gardens. It is hardy and better able to tolerate air pollution, clay soils and dry weather than most other spruces.



Chinese silver fir or cathaya, *Cathaya argyrophylla*

Origin: Asia - China in just 10 stands in four provinces - Guangxi, Guizhou, Hunan and SE Sichuan

One of the rarest conifers, this evergreen tree is a living fossil that once grew across Asia, Europe and Canada but became restricted to China during the Ice Ages. Trees have long, straight trunks to at least 90-100'. Considered a relative of the Douglas-fir and larches, its needles are arranged spirally around each

branch. Oval to elliptical seed cones emerge green before turning dark brown. Bark is dark gray with irregular flaking. First discovered by botanists in 1938, World War II interrupted further research. It was not until 1955 that the tree was recollected and properly examined by Chinese and Soviet botanists, who recognized it as the same tree as Russian and European fossils from 10 to 30 million years ago. There may be fewer than 1,000 mature specimens in the wild. Although mostly protected in reserves, the tree has poor seed production and few surviving young saplings, making it one of the eight most endangered conifers in China. Flying squirrels and pheasants eat the seeds.

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, turning 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. Since 2005 dawn redwood has been Oregon's official state fossil. The trees resist verticillium wilt.



Fuyu Asian persimmon, *Diospyros kaki* 'Fuyu'

Origin: Asia - cultivar developed in Japan

Fuyu is the most commonly encountered variety of Asian persimmon in the Portland area because it is self-pollinating and non-astringent. The orange-

colored fruits resemble flattened tomatoes. They can be eaten while still firm, unlike other varieties which are too astringent to be eaten before becoming fully soft. Fuyu has glossy leaves and makes a spreading 15' to 20' tall tree. The glossy green leaves turn orange and gold in fall. Fruits mature in October-November and make an attractive display after the leaves drop. Persimmons need full sun to have strong wood growth and ripen their fruit. Fuyu usually bears fruit within a few years of planting, with good crops expected within 5 to 10 years.

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. Fossils have been found east of the Cascades. 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). Giant sequoias grow vigorously in western Oregon and have few pests or diseases. Sequoias are resistant to verticillium wilt.

ginkgo, *Ginkgo biloba*

Origin: Asia - China

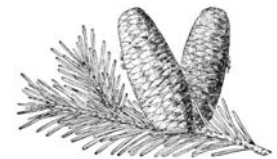
Ginkgo is a pyramidal to rounded deciduous tree growing 60' to 100' tall. The bark has vertical scales, becoming deeply furrowed in maturity. The branches are alternate with leaves emerging from prominent ½" long nodes along the stem. Each node displays a whorl of approximately 5-7 fan-shaped leaves that flow upwards or towards the ground. There

are separate male and female trees. The female tree produces edible fruit about ¾" long, which has been described as "nature's stink bomb," with a stench that's 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. Ginkgos have few pest or disease problems.

grand fir, *Abies grandis*

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

Grand fir is abundant in moist forests in both coastal lowlands and mountains up to 5,500 feet. Grand firs have stiff, horizontal branches in whorls from



a straight central leader growing 100' to 150' or higher (more than 200' in Olympic National Park). Unlike other conifers, grand firs can develop twin new leaders if the top dies. Gray or reddish-brown bark is furrowed and divided into narrow, flat plates. Cones are 4" long, green to reddish and covered with smooth scales, sitting upright on the branches. The soft, white wood is pulped to make high-quality paper. Native Americans people living along the Columbia River used the flat branches for bedding and floor mats. A brown dye from the bark was used in making baskets by the Straits Salish tribe.

Hungarian oak or Italian oak, *Quercus frainetto*

Origin: Europe - the Balkans, including Serbia, Romania, and Bulgaria as well as parts of Turkey, Hungary and Italy

This deciduous broadleaf tree is most attractive in summer when the dark green, glossy leaves create a distinctive foliage effect. This tree grows upright to 50' by 25'. Fall color is a light brown to gold. Bark on mature trees is light gray and furrowed. Tolerates heat and drought. The tree was first scientifically described

by Italian botanist Michele Tenore (1780-1861), who founded the botanic garden at the University of Naples. It has been in cultivation since 1838. Lifespan is generally 150 years but some individuals can live to be 400 years old.

incense cedar, *Calocedrus decurrens*

Origin: North America – Oregon south into California and northern Baja California, Mexico.

Incense-cedar is an evergreen conifer with a single straight trunk and able to grow 185' tall in the wild. Trees are usually densely branched and 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. The decay-resistant wood is light, soft and fragrant, giving rise to the tree's common name. Primarily used to make pencils but also fenceposts or shingles. Trees can live 350 to 500 years. Only two other species in the genus are known – both in Asia. Small incense-cedars create dense cover for small birds, particularly during winter. Many raptors roost or nest in large incense-cedars. In California, spotted owls are known to nest in incense-cedars. A wood wasp lays its eggs in the smoldering wood right after a forest fire.

Japanese pagoda tree or Chinese scholar tree, *Styphnolobium japonicum* Syn. *Sophora japonica*

Origin: Asia - China (despite the name the tree was introduced to Japan)

A deciduous broadleaf tree long cultivated in China and Japan. Grows to 50-70' tall with equal spread. Twigs are greenish, turning light brown. Bark on older trees is thinly furrowed. Bipinnately compound dark green leaves cast a light shade. In cool climates, trees don't bloom for several years after planting. In late summer (Aug.-Sept.) pea-like white flowers in numerous showy racemes appear. These are followed by 6-12"



long pods that turn yellow and then grayish-brown. Although in the pea family, this tree cannot fix nitrogen from the air as it lacks the necessary rhizobia bacteria. Tolerates air pollution, heat and drought. Lifespan is usually 50 to 75 years but can be 250 years. Called *huai shu* in China (demon tree), it was considered ill luck to use the wood for homes. The last Ming Emperor, Chongzhen (ruled 1627-1644), hung himself from this tree when revolting peasants broke into the Forbidden City. It is the official city tree of Beijing. Trees are subject to a canker disease.

lacebark pine, *Pinus bungeana*

Origin: Asia - China

Small to medium evergreen conifer usually 30' to 50' tall but capable of reaching 80' in the wild. In nature lacebark pine often has multiple, leaning trunks. Key feature is pale, mottled bark. In western Oregon the bark is usually shades of green and gray, but in more continental climates the patches are gray, silver and red. Sparse needles are in bundles of three, stiff, rigid, sharp-pointed and about 3 1/2" long. The cones are a light brown and 2 1/2" long with short, reflexed spines. The seeds are eaten in China. In both China and Korea the trees are frequently planted at temples because of their decorative bark and because they symbolize longevity. The tree was first scientifically described by German botanist Joseph Gerhard Zuccarini (1797-1848) and first brought to Europe by Alexander von Bunge (1803-1890), who collected plants for two years in China. Bunge was an ethnic German born in Ukraine who lived most of his life in Estonia.



maple, *Acer* spp.

Origin: found across Europe, northern Africa and North America, with most species concentrated in Asia

There are many species of maples and interspecific hybrids, as well as a dizzying array of cultivars. Maples were once placed in their own family, the Aceraceae, but botanists have reclassified them into the soapberry family, Sapindaceae, along with horsechestnuts and goldenrain trees. All maples are subject to the disease

verticillium wilt. Maples should not be planted where trees have died of this disease. Maples are also the food preferred by the larvae of Asian longhorned beetle, a new pest menacing maples on the East Coast.

monkey puzzle, *Araucaria araucana*

Origin: South America - Andes Mountains of Chile, Argentina

This conifer is instantly recognized by its unique shape. The tree can grow up to 164' but rarely exceeds 80'. The branches are in horizontal whorls, producing a dense, evergreen dome. This is confined to the top of the tree as lower branches are shed. The overlapping leaves are glossy, dark green and ovate to 2" long and ¾" wide. They are rigid and viciously spined, completely obscuring the shoot. Bark is gray and wrinkled. Flowers are 4" long, the males brown and females green-brown. The fruit is an ovoid brown cone up to 6" long. The cones disintegrate on the tree and shed the heavy edible seeds. This species grows in hill country and volcanic slopes up to 5,000' in Chile and Argentina. Monkey puzzle trees appeared in Portland at the turn of the 20th century, often brought by sailors traveling from South America. In 1905, many seedlings were given away at the Lewis & Clark centennial exposition. Many large monkey puzzle trees are growing in Portland as a result of these early distributions. The tree has been adopted as the symbol of the Chilean national parks system.

noble fir, *Abies procera*

Origin: North America - Oregon and Washington

Noble fir is the largest of the true firs. The crown is conical and rounded at the tip. Bark is blistered on young trees, turning purplish gray to reddish brown on mature trees, with flattened ridges. Needles are white on both surfaces and curve at the base like a hockey stick. Unlike other firs, each needle runs parallel to the twig for about 1/8" before it curves away. Branches are short and nearly horizontal. Barrel-shaped cones sit upright and are 4" to 6" long. Cones have thin scales with rounded "shoulders," and fall apart in the late fall after the seeds have ripened. The cones are wrapped in paper-thin bracts separating seeds from the cone scales. While all



conifers have bracts, the noble fir is the only species having bracts large enough to be visible outside the cone. Noble firs are among true firs, or balsam firs, so named because of tiny pockets of resin (balsam) in their bark. They were used extensively to reforest Mt. St. Helens after its 1980 eruption.

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 clearing of land for agriculture and cessation in the 19th century of underbrush burning by Native Americans. The tree's nickname, Garry oak, is after Nicholas Garry, the deputy governor of Hudson's Bay Company who helped botanist David Douglas with his plant hunting expeditions in Oregon.



red-silver maple hybrid, *Acer x freemanii*

Origin: North America - a hybrid between two species native to the eastern USA

Acer x freemanii is used to describe all hybrids between the red maple (*A. rubrum*) and silver maple (*A. saccharinum*), whose natural range overlaps in many parts of the Midwest. Trees can exhibit a wide range of characteristics of one or the other parent or be intermediate between the two. Identification is further complicated because these naturally occurring hybrids can then backcross again with either parent, with a third species of maple, or with another red-

silver hybrid. Many cultivars of these hybrids have been selected for fall color and leaf shape, with the added bonus of faster growth due to their hybrid vigor. Maples of all kinds are overplanted in Portland, representing one tree in four citywide, a number considered dangerous because of the vulnerability to explosive pest or disease outbreaks. The most serious would be Asian longhorned beetle. These voracious pests, which are currently being battled on the East Coast, prefer maples above all other host trees.

Sekkan Japanese cedar,
Cryptomeria japonica 'Sekkan'

Origin: Asia - cultivar of a species native to Japan

Introduced to the USA in 1970, this cultivar has chartreuse to yellow or cream-colored needles. Sekkan is a conical or pyramidal evergreen conifer growing 30-40' tall and 20' wide. Fibrous bark is reddish-brown, sometimes peeling in vertical strips. Needles are pointed scales that completely cover the shoot. Pollen cones cluster near the tips of twigs. Single seed cones appear at the tips of twigs and are nearly round but with a slight point. The cones have 20-30 spirally-arranged, wedge-shaped scales. Widely used in Japan for reforestation, such that cases of hay fever spike during the cryptomeria pollen season in March and April.

Shademaster honey locust, *Gleditsia triacanthos*
forma *inermis* 'Shademaster'

Origin: North America - a thornless cultivar of the species

Shademaster is a thornless cultivar with few if any of the long fruiting pods found on predominantly female trees. Upright form to 50' tall and 25' to 35' wide. Reportedly with a better central leader than the cultivars Imperial or Moraine. Honey locust is one of the last trees to leaf out in spring and one of the earliest to lose its leaves in fall, making it less useful for intercepting spring and autumn rains. Its pinnately compound leaves with their small individual leaflets cast a light, dappled shade that allows for growing



grass and other plants underneath. Fall color is briefly golden before the leaflets drop. Best grown in full sun. Named for Johann Gottlieb Gleditsch (1714-1786), who was director of the Berlin Botanic Garden.

Silberlocke Korean fir, *Abies koreana* 'Silberlocke'

Origin: Asia - cultivar of a species native to Korea

Korean fir was first introduced into cultivation in the West in 1908 and named in 1920. This evergreen conifer is noted for its attractive violet-purple (almost blue) cones, 2" to 3" long and 1" wide. The pale bark is gray, and breaks into blocks on older trees. Korean fir is found in only four small areas in Korea, on Mt. Gaya, Chiri and Togyu on the mainland and on Mt. Halle on Jeju Island. The Mt. Halle population is facing threats from encroaching pine and bamboo invasives. Development of a ski resort in Togyu National Park destroyed 30-40% of the Korean firs in that area. Climate change now represents the most significant threat to wild trees, which are listed as endangered on the IUCN's Red List. In 1986, German plant breeder Gunter Horstmann introduced 'Silberlocke'. Growing 20' to 30' tall, Silberlocke has recurved needles that are silver underneath. The tree quickly became popular and is probably more planted than the species. The cylindrical seed cones are a handsome bluish-purple when young, and purplish-brown when mature.

strawberry tree, *Arbutus unedo*

Origin: Europe - Ireland, Iberia, France, Italy to the Balkans, Greece and North Africa

A shorter relative of our native madrone, the strawberry tree of Europe matures at about 20-25'. Both it and madrone are broadleaf evergreens in the same family as rhododendrons. Both have bell-shaped white flowers in large clusters that bloom in fall and winter. The bark of strawberry tree is gray-brown and does not peel like madrone. Strawberry trees also have slightly larger fruit than madrone. These emerge green before turning orange and red when fully ripe, usually in fall. Insignificant when fresh, the fruit is readily eaten by birds. In Europe the fruit is used to make a variety of jams, foods and liqueurs. Ancient Romans considered the tree as sacred, and sticks from this tree were used to chase away people suspected of being witches. In Spain, Madrid's coat-of-arms features a bear eating the fruit

of this tree. Strawberry tree was among the exotics Thomas Jefferson planted at his Monticello estate. The tree usually lives 60 to 90 years.

summit cedar, *Athrotaxis x laxifolia*

Origin: Australia - alpine lands of Tasmania

A hybrid between two rare Tasmanian evergreen conifers - the Tasmanian pencil pine (*Athrotaxis cupressoides*) and King Billy pine (*A. selaginoides*). All three represent ancient conifers that once grew on the supercontinent of Gondwana. The genus died out in Antarctica, South America and New Zealand, persisting only in the temperate forests of Tasmania. The foliage lies in a dense spiral against the cylindrical branches, overlapping like scales. The tree's crown is cylindrical and upright, branching out in all directions. Seed cones are borne at the end of branches. Wood is soft, weak, fairly light with yellowish sapwood and pink to reddish-brown heartwood. Although its wood is not economically important, the tree is decreasing from other threats. Fires have drastically reduced the range of all *Athrotaxis* trees in Tasmania. The trees are officially listed as endangered, with only 1,000 mature trees of *A. x laxifolia*. Like all gymnosperms, this tree is resistant to verticillium wilt.



umbrella pine, *Sciadopitys verticillata*

Origin: Asia - a relict species restricted to the islands of Honshu and Kyushu in Japan.

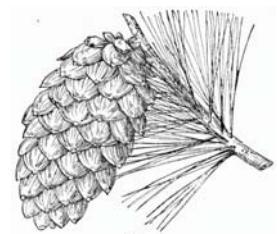
An evergreen conifer with distinctive dark green needles in whorls from the main trunk and branches. Slowly grows 30' to 40' (in the wild they can reach 150'). Needles can turn bronze in winter, although they remain dark green in the cultivar 'Wintergreen.' Fossil cones, needles and pollen of *Sciadopitys* dating back more than 200 million years have been found. Studies have shown that much of the amber around the Baltic was from resin flowing from umbrella pines millions of years ago. Over time, umbrella pine became extinct in Europe and elsewhere, becoming restricted to Japan. There it is found in moist mixed forests, most abundantly, in the mountains of central Honshu. Long cultivated in Japan, it is called *koyama*

there. It is considered near-threatened due to forests where it occurs being replanted to monocultures of Japanese cedar. The white wood is durable, water resistant, fragrant, and often used to make serving vessels. It was introduced to the West in 1860.

Vanderwolf's Pyramid limber pine, *Pinus flexilis* 'Vanderwolf's Pyramid'

Origin: North America - cultivar of a species native to the western USA

This is a densely branched cultivar of a conifer native to the Rocky Mountains and western U.S. and Canada. Slow-growing to 20'-30'. Crown is cone-shaped. Flexible branches give the tree its name of limber



pine. These branches often persist low on the trunk. Curved, dark-green needles are in bundles of 3 to 6 (most often 5) and 2.5" long, persisting on the tree for 5 to 6 years. The 5" long cones have thick scales and are bright green when young, aging to brown. Needles are in dense clusters crowded at the end of long, curving branches. In Vanderwolf's Pyramid, they are streaked with silver. Young trees have pale gray, fairly smooth bark. Bark on older trees is gray with thin, scaly plates and ridges.

weeping Alaska yellowcedar, *Cupressus nootkatensis* 'Glauca Pendula' Syn. *Xanthocyparis nootkatensis* 'Glauca Pendula'

Origin: North America - cultivar of a species native from western Oregon to Alaska

An extremely narrow, weeping form of Alaska yellowcedar, this cultivar's main side branches arch outward and the secondary branches hang straight down. Although the species can grow to over 100' in the wild, this cultivar is usually only 20' to 30' tall in cultivation. Flat sprays of soft, green foliage with a dark-gray hue. Sphere-shaped seed cones are 2 1/2" to 5" long, dark reddish or purplish-brown when mature. Cones have two or three pairs of scales, each usually with a narrow, triangular point on the face and wrinkles radiating from there outward. This evergreen conifer has undergone a change in genus from *Chamaecyparis* to *Cupressus* as more became

known from its DNA about its genetic origins. Native from extreme northern California north through western Oregon and Washington all the way to Alaska, it is the world's northernmost cypress.

White Mountain eastern white pine,

Pinus strobus 'White Mountain'

Origin: North America - cultivar of a species native from Newfoundland to Manitoba in Canada, south to Georgia and west to Illinois and Iowa

This cultivar of the eastern white pine is noted for its narrowly columnar form and silvery blue-green foliage. Grows rapidly at first to 30', then slows to eventually reach 70' tall by 30' wide. Cones are 3" to 8" long and a light brown color, cylindrical with a pointed apex. Needles are borne in bundles of five and are soft to the touch. The species was highly prized for ships masts by the British, who reserved the best trees for the Royal Navy. Trees readily reseed abandoned fields. Eastern white pines are susceptible to white pine blister rust, which also kills western white pines. They are also intolerant of air pollution.

Willamette Valley ponderosa pine,

Pinus ponderosa var. *benthamiana*

Origin: North America - the variety of ponderosa pine native to Portland and the Willamette Valley and extending south through California almost to the border with Mexico

When the first white pioneers ventured into the Willamette Valley they described a savanna of oaks and pine. The pine in question was a ponderosa pine, which has been



recognized as a distinct variety genetically different from those in eastern Oregon since 1847. Land clearing for agriculture and urban development coupled with fire suppression has caused 99 percent of this original savanna to disappear, often overwhelmed by encroaching Douglas-firs. Straight-growing trees, Willamette Valley ponderosa pines typically grow 150' to over 200' tall, and are the tallest of the species. In fact, the world's tallest pine was discovered in 2011 to be a ponderosa pine standing more than 260' tall. The long needles are held in bundles of

three. The twigs and bark are orange-gray, breaking into blocky plates on older trees, with shallower fissures than on eastern trees. The heartwood is yellow or light brown with straight grains and uniform texture with little tendency to warp or twist.

Wustermeyer Brewer spruce,

Picea breweriana 'Wustermeyer'

Origin: North America - a cultivar of a species native to southern Oregon and northern California

Brewer spruce has one of the most limited distributions of any North American conifer, growing only in the mountains of southwest Oregon and northwest



California between 40 and 42 degrees North latitude. The thin bark restricts it from fire-prone areas, and limits its range to where heavy winter snows fall - from 2,300' to 6,900' in Oregon and from 4,500' to 7,500' in northern California. The tree's narrow shape and flexible, drooping foliage are an adaptation to this environment. The weeping form and blue-green needles have made the tree one of the most popular Northwest trees for gardens in England and Scandinavia, yet the tree is virtually unknown in Portland, although there is a nice grove at Hoyt Arboretum. Cylindrical cones are 2" to 6" long and 1/2" thick. Female cones are borne near the top of the tree. Needles are spirally arranged around the branchlet and tend to point forward. 'Wustermeyer' is a short cultivar of the species.

Yoshino Japanese cedar,

Cryptomeria japonica 'Yoshino'

Origin: Asia - cultivar of a species native to Japan

This cultivar of Japanese cedar makes a loose pyramid 30' to 40' tall with slightly pendulous branches. Its width is 15' to 20'. Densely foliated, with short, light green to blue/green needles. The needles take on a bronze hue in winter but discolor less than the species and quickly return to green in spring. The trunk remains straight with relatively small-diameter lateral branches. Branches are spaced far enough apart to see the attractively peeling reddish-brown bark. This cultivar was introduced around 1928 by a Yokohama, Japan nursery.

