BIG LEAF MAPLE

A Northwest Broadleaf Tree with a Whole Lot to Offer

BY THEODORE HOSs

As the warmth of summer begins to fill our days, the canopy cover of trees provides welcome respite from the heat. With a spreading crown and thick branches covered with a profusion of foliage, mosses, lichens and ferns, the bigleaf maple (*Acer macrophyllum*) stands out as a true gem among shade trees.

Bigleaf maple is deciduous—one of the few large, broadleaf tree species native to the Pacific Northwest—and each spring it sends forth a bright-green canopy of truly enormous leaves. As our summer months pass by, it’s a perfect time to sit down under the shade of one of these gorgeous specimens and consider their place in the environment, some of their extraordinary traits, and the wonderful benefits they can provide when planted in the Seattle landscape.

SIZE MATTERS

Our planet is home to about 130 maple species, which belong to the soapberry plant family, Sapindaceae. Most maple (*Acer*) species are native to East Asia, while a smattering of them come from Europe, North Africa and North America. Wild maples have a wide range of traits and appearances. These wild types have been further bred by humans into hundreds of cultivars—emphasizing all manner of colors, leaves, sizes and growth habits—that have proved immensely popularity as ornamentals. The Washington Park Arboretum showcases about 60 maple species, along with dozens of their cultivars. It is also home to more than 400 bigleaf maples, including many immense specimens that date back well before the founding of the park.
In North America, the West Coast is not well known for its maples; the vast majority of Acer species on the continent are found growing in abundance in the mixed hardwood forests east of the Great Plains. The stylized leaf of an eastern sugar maple (Acer saccharum)—with its five-lobed, palmate, or handlike, shape—is the focal point of the Canadian flag, and many eastern regions support industry devoted to tapping into their native sugar maples, black maples (Acer nigrum), and red maples (Acer rubrum) for sugary sap to create maple syrup.

However, it is the West Coast that takes the crown for being home to the champion of the genus, with our own bigleaf maple growing larger than any other maple species in the world. In the proper conditions, it can reach over 150 feet tall, while the trunk can grow up to 12 feet in diameter. (In cultivation, trees typically range between 40 and 75 feet tall.) The leaves are also spectacular, growing up to almost two feet across—far surpassing in size not only the leaves of all other maples, but also those of most other temperate tree species.

Like the leaves of the sugar maple, they are five-lobed and palmate, but the lobes are more deeply incised. Mature foliage of the bigleaf maple is a lustrous dark green on top and pale green underneath. In the Northwest coastal forest, the leaves are an important food source for herbivorous insects, as well as mule deer, elk, mountain beavers and other rodents.

**FOREST ADAPTATION & REPRODUCTION**

Bigleaf maples are unique among Washington broadleaf trees because they can begin their life in a mature forest. Conifers cast dark shadows...
on the forest floor below, and light is hard to come by, so trees like cottonwoods, birch, alder and ash need an opening in the canopy to get established in our woods. Usually, such trees are confined to areas recently cleared of fir, hemlock and pine by disturbances such as fire, avalanche, flooding or logging. The bigleaf maple thrives in these sunny, open locations, too, but also holds its own in amongst the giants of an evergreen forest. A good place to see this in action is in the ancient old growth of the Hoh Rainforest, where bigleaf maple branches are often elegantly draped in moss. (It has been estimated that in rainforests of the Pacific Northwest, a bigleaf maple can support about one ton of mosses!)

Bigleaf maples generally begin their lives in one of two ways. One is vegetative reproduction, and it occurs when the trunk of a mature tree is damaged or destroyed. The root system of the maple can respond by sending up new shoots, forming new trunks and allowing the tree to live on. Usually, bigleaf maples that have re-sprouted in this way have many small trunks growing closely together, emerging out of the same root stock.

The second way is by sexual reproduction, when a new tree germinates from the winged seed, or samara, of a parent plant. Many small animals—including squirrels, chipmunks, and several species of birds—depend on these seeds as a food source. Once the seed germinates, it sends forth a small pair of seed leaves, ovular in shape and very unlike the leaves of the mature tree. These seed leaves are known as cotyledons. At this point in its life, compared to older plants, the young maple is relatively unprotected by chemical compounds designed to ward off predators, and so is often snacked upon by herbivores. Indeed, indigenous people of the Pacific Northwest have found that bigleaf maple samaras can be sprouted en masse, and they eat the resulting fresh growth in the same manner as you might pea or sunflower sprouts.

After a few short weeks, a new pair of leaves emerges, looking much like a smaller version of those found on a mature specimen. As a juvenile, the bigleaf maple tree can grow quickly, sometimes more than three feet per year; this pace slows to about a foot per year once it reaches about 15 years of age. Young trees have beautifully smooth, gray-green bark. With age, the bark begins to furrow and darken, embodying a look of sturdiness and contrasting nicely with the bright green of the leaves.

**SHADE BENEFITS**

In early spring, long, pendulous chains of
edible, golden-green flowers tumble below the newly emerging foliage of the bigleaf maple. (Wild-food enthusiasts add the sweet-tasting flowers to salads and use them to make fritters.) Insect pollinators include bees, flies and beetles. By fall, the flowers develop into hanging clusters of paired, winged, red-tinged green samaras, the “helicopter seeds” or “whirlybirds” that most people associate with maple fruits. The long wings of these fruits enable them to “fly” in the autumn breeze, descending to earth at an angled trajectory with a rapid spinning motion. Aside from being delightful to watch, the samaras help with the dispersal of the species.

And it’s a well-traveled species! It can be found all along the West Coast from British Columbia down into the mountains of Southern California, preferring moist forests, canyons and riverbanks. Interestingly, bigleaf maple seldom occurs on the eastern side of the Cascades or Sierra Nevada Mountains, due to the cold in those regions. The tree’s lack of extreme cold tolerance is unusual, given that most North American maples are well suited to frigid winters.

As hinted above, the summertime benefits of bigleaf maples for people may be felt chiefly in the form of the shade they cast. Those big leaves block out a lot of sun and, in the city especially, this can make a big difference. Urban areas often experience what is known as the “heat island effect,” which occurs when the asphalt, concrete and buildings of the city soak up and store heat during warm weather. Areas with high concentrations of development can be much warmer than adjacent areas with more vegetation. In Seattle, for example, city temperatures can be more than 17 degrees Fahrenheit warmer than the surrounding landscape, presenting a significantly higher health risk to residents on hot summer days.

Trees like the bigleaf maple help reduce this effect by shading their surroundings and releasing water into the air through their leaves. The ability of trees to cool their surroundings is incredible. Studies have found that increasing forest cover in urban areas can decrease temperatures by as much as 10 degrees Fahrenheit. Homes with shady trees planted nearby consume less energy, and neighborhoods with a good urban forest canopy generally have cleaner air as well.

FALL AND (SWEET) WINTER INTEREST
One effect of deciduous maples mixing with the many evergreens in the forests of Washington state is the lovely addition of a fiery flare of color in autumn. Bigleaf maple drapes itself in an orange-yellow hue before dropping its tremendous leaves to the ground below, where they provide valuable nutrients to the soil as they break down over the winter months. Even in winter, these trees maintain a spectacular appearance, supporting on their branches a whole miniature forest of epiphytic (tree-dwelling) mosses, ferns and liverworts.

Winter is also a special time in the world of maples because it provides the cold conditions needed to engage in the pursuit of one of the best sugary treats nature offers: maple syrup. The process known as maple tapping was first developed by indigenous peoples of the Midwest and Northeast, who continue to practice into modern times. When European colonists arrived, they learned the methods of tapping from the indigenous peoples on whose land the maple forests grow. Today, the industry brings in more than $120 million dollars a year in the United States, with much of the syrup produced in the states of Vermont and New York.

The syrup industry in the Pacific Northwest is still in its infancy, but like its eastern cousins, the bigleaf maple can produce the sap needed to make the delicious treat. Conditions have to be just right for the process to work properly, and since freezing temperatures are part of the equation, tapping is seldom possible in the lowland areas of the Puget Sound. However, the foothill forests of the Cascades have great potential to support maple tapping—and to generate profits for forest owners who might otherwise sell off their trees for logging.

IN CITY PARKS AND GARDENS
When you tally up the shade benefits, natural beauty, and positive environmental impact of
the bigleaf maple, it's clear that the tree is an excellent choice for planting in the Emerald City. However, because the maple grows quite large with time, it needs to be provided with adequate space. Realistically, the straight species may only work well for city parks and folks with large gardens.

Several cultivars of the bigleaf maple have been developed that address the needs of homeowners with more limited space. These include 'Seattle Sentinel', selected by legendary Arboretum director Brian Mulligan back in 1951, when he noticed it growing on a city street. The branches point upwards, creating a beautiful, tall, columnar shape that is quite different from the spreading nature of the straight species. 'Mocha Rose' takes on yet another growth habit, spreading its boughs but growing only to about 20 feet in height. It also features a lovely red blush on its new leaves. Though similar in size and form to the straight species, 'Aureum' offers leaves with a yellow tone. Likewise, 'Kimballiae' is a large, spreading tree, but it sports fantastic, deeply lobed leaves, giving the tree a lacy appearance. Both 'Seattle Sentinel' and 'Kimballiae' can be found in the Arboretum, in the old nursery area and Witch-Hazel Collection, respectively.

The next time you find yourself enjoying the shade of a bigleaf maple, take a moment to remember all the features and traits that make these magnificent trees so special and, if you have a place for one at home, be sure to consider it as an excellent addition to a Pacific Northwest garden.

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INDIGENOUS USES OF BIGLEAF MAPLE
Along with eating the sprouted seeds, Native American tribes of the West Coast have many uses for Acer macrophyllum. The wood is prized for carving artwork and utensils, such as bowls and canoe paddles. (Indeed, the species is called the "paddle tree" by many indigenous tribes.) The bark is used to make rope and baskets, and the large leaves are used for serving and storing food. Medicinal uses include infusing the bark to make a tonic for sore throats and chewing the shoots to help with gastrointestinal issues.

CONSERVATION CONCERN AND HOW TO HELP
Since 2011, there have been alarming reports of bigleaf maple decline from around the region. Symptoms include thinning and entire crown dieback. Branches sometimes have clumps of unnaturally small leaves and heavy seed crops and leaves may appear chlorotic (yellow-ish) — with tips and edges that resemble leaf scorch. The specific cause is unclear, but a recent study by scientists at the University of Washington found no disease or insect pest involvement. They concluded that the decline is likely related to increased urbanization and extreme summer droughts. Researchers at Washington State University have started a citizen-science project called Bigleaf Maple Health Watch, using the iNaturalist mobile device app. You can help them gather data by reporting healthy and unhealthy bigleaf maples in its native range. For full details, visit ppo.puyallup.wsu.edu/plant-health-concerns/maple.

SOURCES
USDA Forest Service profile of Acer macrophyllum: wfs.usda.gov/database/feis/plants/tree/acemac/all.html