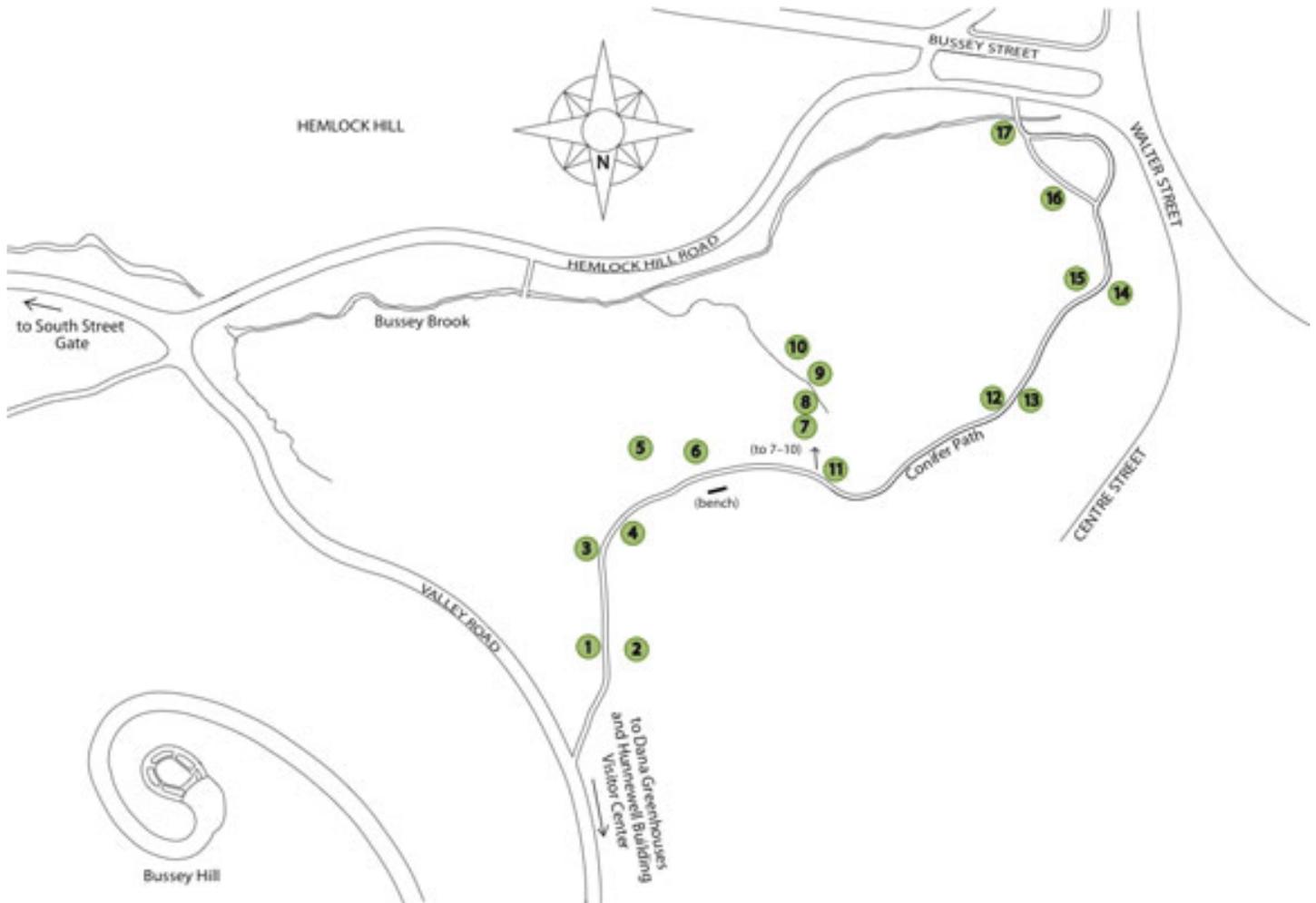


Self-guided Conifer Tour



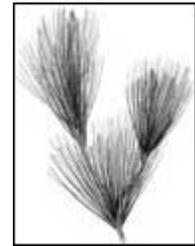
The trees featured on this tour are a small sampling of the many interesting conifers in the Arboretum's collection. Trees are marked with hanging, black labels (pictured at right) that highlight the tree's number on the tour map. Each tree also has a small, copper-colored accession label that is hung from one of the lower branches. These labels indicate when the tree became part of our collection (accession date). Although some specimens are a short distance off the path, we hope you will enjoy the opportunity to explore.



1 . Japanese Red Pine (Tanyosho Pine)

Pinus densiflora 'Umbraculifera'

The Japanese red pine has beautiful bark that peels in thin strips to reveal stunning oranges and subtle grays. It is often a multistemmed tree with upright, spreading branches, an uncommon feature for the genus *Pinus*. In its native habitat of Asia, *Pinus densiflora* can reach 40 to 60 feet in height. 'Umbraculifera' is a dwarf form, typically reaching 10 to 20 feet high, with a broad spread and an umbrella-shaped canopy. Needles are arranged in bundles of two, and the tan-colored cones are oval in shape. Cones persist on the tree for two or three years and open to release their seed in the second year. It is a popular tree for bonsai.



2. Lawson Falsecypress (Port Orford Cedar)

Chamaecyparis lawsoniana

This specimen is located approximately 25 feet off the path. Native to the Pacific Coast areas of California and Oregon, the Port Orford cedar prefers cool, wet winters and warm, dry summers. In optimal growing conditions, this cedar can reach a height of 165 feet. Its particular affinity for moisture suits it well for the gardens of Britain, where it is frequently used as an ornamental. In fact, there are hundreds of species and cultivars of *Chamaecyparis* suitable for a variety of landscape needs. Its needles are flattened and scale-like. Cones are rounded and blue-green in color.



3. Eastern (Canadian) Hemlock

Tsuga canadensis

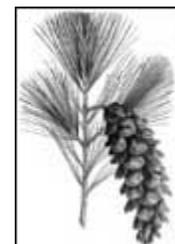
Several *Tsuga canadensis* are located where the path curves. Eastern hemlock is native to southern Canada and the eastern United States. In the wild, it thrives on the shady, cool, north slopes of hills. The Arboretum's Hemlock Hill is an indigenous stand of hemlock forest. Needles are flat, with two distinctive white bands of stomata on the undersides. Brown cones are 1/2 to 1 inch long and hang from slender stalks. Many stands of eastern hemlock are currently infested by a tiny insect called the hemlock woolly adelgid (HWA). A relative of the aphid, HWA is believed to have been introduced to the U.S. from Asia around 1924. It feeds with lethal effect by sucking the sap from the needles. HWA was first discovered at the Arboretum in 1997. These trees are part of the Arboretum's efforts to preserve native hemlocks.



4. Eastern White Pine

Pinus strobus

In precolonial New England, the eastern white pine easily reached heights of greater than 150 feet, making it very desirable to the British, who harvested it for ship's masts. Its soft, pliable needles are arranged in bundles of five. Producing cones at a very early age, the eastern white pine's edible seeds quickly germinate in open areas. The attractive cones are cylindrical in shape and exude a white resin that matures to brown.



5. Scotch Pine

Pinus sylvestris

Continuing on the path, this pine is easily recognized by its scaly, bright orange-red bark, often seen on the upper trunk and branches. The needles of the Scotch pine are gray to blue-green and occur in bundles of two. The Scotch pine's range extends across northern Europe and Asia, giving it the widest distribution of any pine in the world. It is increasingly popular as a Christmas tree.

6. Pitch Pine

Pinus rigida

Located next to the Scotch pine, pitch pine also has distinctive bark, arranged in red-brown or yellow-brown plates with deep furrows. It is a member of the "fire pine" group, due to its tightly closed cones that open only when exposed to high heat, such as a forest fire. The tree's principal use is for lumber and pulpwood, but it was once a source of resin (or "pitch"), thus the common name. These native trees grow on the sandy soils of Cape Cod, MA and dominate the unique and endangered New Jersey Pine Barrens. Needles occur in bundles of three.



7. Dawn Redwood

Metasequoia glyptostroboides

The dawn redwood is one of the Arboretum's most famous trees. This specimen is unusual for its multistemmed nature; most dawn redwoods are single-stemmed. *Metasequoia* had been known only from fossil records until a small group of trees was found in China's Szechuan Province in 1941. Five years later, the Arboretum funded an expedition to collect its seed and subsequently introduced this conifer into cultivation. Thanks to the Arboretum's early efforts to distribute seeds to other botanic gardens, the dawn redwood currently enjoys widespread popularity. A deciduous conifer, dawn redwood has lovely, amber-colored, fall foliage.



8. Blue Atlas Cedar

Cedrus atlantica 'Glauca'

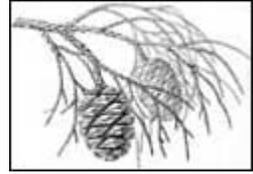
A North African native, the blue atlas cedar has blue-green needles arranged in whorls on short spurs. The male cones, usually more numerous in the lower portion of the tree, shed clouds of pollen in the fall. Female cones are located in the upper portion of the tree. This tree's open-growth habit becomes more dense and pyramidal with maturity. The blue atlas cedar is a true cedar, being a member of the genus *Cedrus*. This is an important distinction because the term "cedar" is often used as a common name. One example is a New England native, eastern red cedar (*Juniperus virginiana*), which is not a cedar, but a juniper.



9. Giant Sequoia (Giant Redwood)

Sequoiadendron giganteum

Giant sequoia, a West Coast native, is recognized as the world's largest tree species in terms of total volume. This Arboretum specimen was accessioned in 1972; by 1998, it measured 59.8 feet high. In its native habitat of the Sierra Nevada Mountains of California, the giant sequoia may reach a height of 300 feet, but 60 feet at maturity is typical on the East Coast. Needles are short, overlapping, and scale-like with sharp points (often described as awl-like). The bark is a rich reddish-brown. Down the hill, look for a young cultivar of *Sequoiadendron giganteum* 'Hazel Smith'. Its blue-green foliage makes it a standout.



10. Oriental Spruce

Picea orientalis

Opposite *Sequoiadendron giganteum* 'Hazel Smith' stands a grouping of *Picea orientalis*. Densely branched and pyramidal in shape, the oriental spruce can attain a height of over 120 feet in its native habitat, Asia Minor's Caucasus Mountain Range. However, in the northeast U.S., this species can take 60 or more years to reach 60 feet in height. Its needles are soft, dark green, four-sided, and short (1/4 to 1/2 inch long). Cones are reddish-purple when young, turning brown when mature. This specimen was brought to the Arboretum in 1873.



11. Japanese Cryptomeria

Cryptomeria japonica

Although this beautiful conifer is not widely known, it is easy to grow and hardy up to zone 5, preferring acid soil and a sunny location with protection from high winds. Japanese cryptomeria's lovely, reddish-brown bark exfoliates in long strips. The awl-shaped needles are spirally arranged and turn bronze in winter. The wood is strongly rot resistant and is used for buildings, bridges, ships, lampposts, furniture, utensils, and paper manufacturing.



12. Serbian Spruce

Picea omorika

On the very edge of the path, Serbian spruce's narrowly columnar form is easily recognized. This spruce has a particularly graceful look with a very slender trunk, drooping branches that ascend at the tips, and a narrow top. Its bark is thin and coffee-brown scales peel off in platelets. The cones are purple when young and cinnamon-brown when ripe. Needles are flat and dark green with silver bands on the underside. Serbian spruce is resistant to most pests and quite drought tolerant. The species name, *omorika*, means spruce in Serbian. Characteristic of the genus *Picea*, the cones of the Serbian spruce are pendulous.



13. Nikko Fir

Abies homolepis

In its native habitat of Japan, Nikko fir may reach 130 feet in height. This magnificent specimen measures 91 feet high and the diameter of its trunk is 44.5 inches at breast height. Nikko fir has dense branches and a pyramidal shape. This specimen has been pruned over time. Its needles spread outwards and upwards and are slightly notched at the tip. Its common name is taken from a town in central Honshu, Japan, which is known as a pilgrimage center.



14. Holford Pine

Pinus x holfordiana

Holford Pine is easy to find thanks to the eye-catching 6-to-8 inch cones suspended from its branches. Needles are blue-green, 5 to 7 inches long, and branches are usually pubescent (covered with down or hairs). In 1904, natural cross-pollination between *Pinus ayacahuite* (Mexican white pine) and *Pinus wallichiana* (Himalayan pine) resulted in a generation of seedlings. Thirty years later when the first cones were produced, it became clear that the young trees were distinctly different from both parents. The parent plants were located in the Westonbirt Arboretum in Gloucestershire, England, originally owned by Robert Holford, for whom the hybrid was named.



15. White Fir

Abies concolor

The Arboretum has beautiful specimens of white fir, which can reach heights of 150 feet and are native to the southwestern United States. Though they tolerate heat, drought, and cold, they do not resist hurricane conditions well. The hurricane of 1985 and the April Fool's Day blizzard of 1997 resulted in the loss of several magnificent Arboretum specimens. The bark of white fir has deep furrows and thick, irregular ridges. Its blue-green, pale blue, or silvery-blue needles are particularly long for a fir.

16. European (Common) Larch

Larix decidua

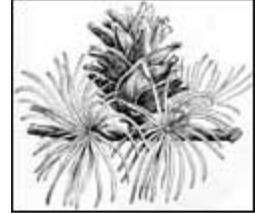
Several European larches are located where the path slopes. This graceful tree has drooping branchlets that carry short, feathery, deciduous needles, which turn a stunning clear yellow in the fall. Needles are single when the tree is young and grow in whorls as the tree ages. In youth, the European larch can grow 2 1/2 feet per year, but growth slows over time. Separate male and female cone-like structures appear in spring along with the bright green newly emerging foliage. Although *Larix decidua* is grown mainly as an ornamental, in its native European forests its durable wood is harvested for a variety of wood products. Compare the European larch with the other species of larch located in this area.



17. Golden Larch

Pseudolarix amabilis (synonym *Pseudolarix kaempferi*)

This deciduous conifer is broadly pyramidal with wide spreading, horizontal branches that display whorls of soft needles. The 2-to-3 inch cones are quite attractive, maturing to a golden brown from summer's green or purplish color. Since the cones are usually high up on the tree, they are not always obvious. As its common name suggests, the golden larch displays golden-yellow fall color. Native to eastern China, the specimens at the Arnold Arboretum are among the best in the U.S.



More about conifers

The conifer collection at the Arnold Arboretum is a wonderful place to observe cone-bearing plants. Enjoy a walk along Conifer Path and take advantage of the opportunity to learn about this diverse and beautiful group of plants. Just like flowering plants, conifers form seeds. However, instead of being enclosed in fleshy fruits, the seeds of conifers are protected in cones. These "seed cones" are the female reproductive structures of conifers. Conifers also have "pollen-bearing cones," which are the male reproductive structures. These differ from the female cones in that they are not woody; they are also smaller. Male and female cones can occur on the same plant or on separate plants. Accurate identification of conifers requires an examination of the cones; however, one can also develop a general knowledge of the different types of conifers by examining their needles. Most conifers are evergreen; however, species such as dawn redwood (*Metasequoia glyptostroboides*) and golden larch (*Pseudolarix amabilis*) are deciduous, which means that they lose their needles each fall and develop a new set each spring.

True cedars (*Cedrus* sp.) and larches (*Larix* sp.) bear short needles arranged in clusters or whorls. Pines (*Pinus* sp.) have needles arranged in fascicles: small bundles of two, three, or five needles bound together at the base by a sheath. The rest of the needle-leaved evergreens have single needles set individually along the twig or branchlet. Spruce (*Picea* sp.) needles are sharp, set on stout twigs singly in spiral lines, and each needle sits on a sharp, woody peg, that protrudes from the twig. Fir (*Abies* sp.) needles are similar in arrangement to those of spruce but without woody pegs. Hemlock (*Tsuga* sp.) needles are soft, blunt, and flat, growing from a tiny stem. The cones of pine, spruce, and hemlock are pendulous. In contrast, fir cones as well as cedar cones are always held erect on the branches and shatter when ripe.

Cover: *Metasequoia glyptostroboides* photograph by Istvan Rácz and Zsolt Debreczy