

FORESTS AND WILDFLOWERS

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in Great Smoky Mountains National Park

In the Great Smoky Mountains, time and events have combined to create a botanical showcase that for sheer variety is matched at few other locations in the world.



Spruce-Fir Forest

Here, over 100 species of trees and 1,300 kinds of flowering plants, including both northern and southern types, meet and thrive, each finding the growing conditions it needs. Through the seasons, this varied plantlife presents a constantly changing visual display, creating a situation filled with endless opportunities for interest and enjoyment. Spring is the time for budding and blossoming, summer for growth and maturity, autumn for seeding, and winter for dormancy. Each season offers visitors a unique set of experiences.

Important to the variety of the forests and wildflowers here is the fact that the Appalachians are a northeast-southwest range along which successive generations of plants could grow further southward as the great glaciers moved into the North during the Ice Age. If the mountains had run east-west, as they do in Europe, many warm-climate species of plants would have been trapped on the north side and exterminated by the cold. Working in concert with the directional trend of the Appalachians to produce variety was yet another factor—the many types of habitats that existed, and continue to exist, within them. The height and rugged landforms of these mountains offered a wide range of growing conditions. Northern species that moved south with the cold found habitats at higher elevations even when warmth finally returned. Warm-climate species moved downslope during the Ice Age, and today have advanced again to higher elevations. Those plants suited

to especially dry, wet, or windy places found them too. In combination, these factors now make Great Smoky Mountains National Park an exceedingly important botanical preserve.

Because of events in the recent past, the park also offers another kind of variety—the contrast between virgin forest and second growth. By the time the park was established in the 1930s, the area it covers had been occupied by about 6,000 different landowners and its forest had been 60% logged over. Yet it still contained the most extensive virgin forest left in the East. Protection of that great remnant of primeval America guaranteed that visitors would be able to see the variations in size and species present in regrowth and recovery.

This folder is intended to help you understand and appreciate what may at first seem to be a confusing variety of plants. In the process of creating order out of confusion, you should first know that there are different types of forests and short self-guiding trails will introduce you to those that occur here. Wildflowers can be identified with books, or on wildflower hikes and programs sponsored by the park. Bulletin boards carry listings of these activities.

FORESTS

Forest types are determined by elevation, moisture (or dryness), and exposure.

The Cove Hardwoods Forest exists at low-to-mid elevations (to 4500 feet). In the few places missed by loggers, this forest type has huge trees of many varieties, most of them broadleaved—that is, they grow leaves, not needles. Trees of record or near-record size are common. For a sampling of this forest type, visit the Cove Hardwoods Nature Trail, located along the Newfound Gap Road at the Chimneys Picnic Area. A folder, available there, introduces the forest. Near the Cosby entrance to the park, the Albright Grove contains an especially beautiful cove forest. The Greenbrier entrance provides access to the cove forests along the Ramsey Cascades and Porters Flat trails.

The Northern Hardwoods Forest is also made up of broadleaved trees, but because this forest type grows higher up the mountains, the trees are much like those seen in the northern states at lower elevations. Beech and yellow birch are prominent species. Samples of this forest type may be seen at Newfound Gap and along the Clingmans Dome Road where the evergreen forest is interrupted at intervals by these trees.

The Spruce-Fir Forest is so distinctive that it is the forest type most easily recognized. The trees are evergreens—Fraser fir and red spruce—and they grow only on the high peaks (above 4500 feet). Against the broadleaved trees below, these evergreens are easy to see. On the high peaks, the climate is comparable to that of Maine or Quebec, and appropriately enough, similar forests grow at sea level there. In the park, the 14-mile drive from Sugarlands to Newfound Gap accomplishes the same thing in terms

of ecology as a sea-level trip to the North Country. The Spruce-Fir Nature Trail, located along the Clingmans Dome Road, will introduce you to this forest type, as will the road itself or a hike on the Appalachian Trail through most of the eastern half of the park.

Aside from elevation, there are other factors that determine forest types . . .

The Hemlock Forest dominates along streams and on moist, shady slopes up to about 4000 feet in elevation. Scattered hemlocks can also be seen in drier locations at low-to-mid elevations. In several areas, huge old hemlocks cover slopes and coves left untouched by loggers. To see large hemlocks in abundance, walk the trails leading toward Grotto Falls from the Roaring Fork Motor Nature Trail or Alum Cave Bluffs from the Newfound Gap Road.

Pine and Oak Forests

Oaks and pines tolerate the park's comparatively dry, exposed slopes and ridges better than most other tree species and, therefore, are predominant in these sites. The drier the conditions, the more open the canopy appears and the greater the abundance of pine, making it possible to divide oak and pine woods into "closed oak forests" and "open oak and pine forests". Besides pine and oak, both of these forest types also contain hickories, yellow poplar, dogwood and dense thickets of rhododendron and mountain laurel. The Pine-Oak Nature Trail in Cades Cove introduces this forest, which is characteristic of the slopes of low and middle elevations throughout the park.

In each of these forest types there are many species of trees. Nature draws few firm lines, so botanists must be content to name the forest types for the species that dominate when the forest is in a "climax" or constant-species stage. In general, the number of different species here decreases with increasing harshness of growing conditions, just as it does as you progress toward desert or arctic climates.

AUTUMN

The forest in Autumn displays the many colors that might be expected when so many species of trees are present. Autumn comes first to the higher elevations and is previewed by fire cherry trees with red leaves splashing color across ridges well before other leaves begin to change color. By early October, autumn is usually over at the mile-high level and above, but the best color is just beginning at mid-and-lower elevations. In the northern hardwood and cove hardwood forests, full autumn splendor is seen from about October 15-25. Brown, purple, red, yellow, and orange seem to compete with each other for attention. The intensity of color varies from year to year, but during this general time span, autumn color is at its best.



Catawba Rhododendron



Mountain Laurel

WILDFLOWERS

In response to warm sunshine and frequent rains, some 200 species of wildflowers bloom across the Smokies in a procession that begins in March at lowest elevations and ends when autumn arrives on the high ridges. Springtime in the Smokies is known as the season for wildflowers—and properly so—but the park is not without flowers at other seasons.

Wildflowers in the park include both native and exotic (non-native) species. Generally the native species are woodland flowers and the introduced species are field-and-roadside flowers. Among the native wildflowers, there are both common and uncommon species. And there are species that grow only at certain elevations. Of the introduced species, few are better known than dandelions, daylilies, and honeysuckle.

Here are some recommended dates to see wildflowers:

Dogwood & redbud mid-to-late April
Spring flowers late March to mid-May
Mountain-laurel May and June
Flame azalea May and June
Rose-purple rhododendron mid June
White rhododendron June and July

And here are some recommended locations to see wildflowers and shrubs:

Location	Flowers	Dates
Noah Bud Ogle Farm Trail Cove Hardwoods Nature Trail	A springtime variety (trilliums, phacelia, violets, lady's slippers, jack-in-the pulpits, showy orchis, and others)	mid-April to mid-May
Round Bottom Road Quiet Walkway above Elkmont	Heaths (rhododendron, mountain-laurel, azaleas)	June 10 to July 10
Gregory Bald Andrews Bald Silers Bald Balsam Mountain Road The Chimney Tops Trail	Goldenrod, ironweed, and asters	late September-early October



Flame Azalea

The annual Great Smoky Mountains Wildflower Pilgrimage, scheduled the last weekend in April, is usually well timed to take advantage of the most prolific blooming.

Do not pick wildflowers or remove, disturb, or destroy any plant. Forest and wildflowers in Great Smoky Mountains National Park are protected by law.

SHRUBS IN BLOOM

More than any other wildflower displays, it is the mid-June blooming of rhododendron, mountain-laurel, and azaleas that attracts visitors to the high country of the Southern Appalachians. These plants, together with sand myrtle, blueberries, sourwood, and several others are members of a plant grouping known as heaths. Over 1500 species of heaths are found in temperate regions of the world, but only in Asia do their floral displays match those found in the Southern Appalachians.

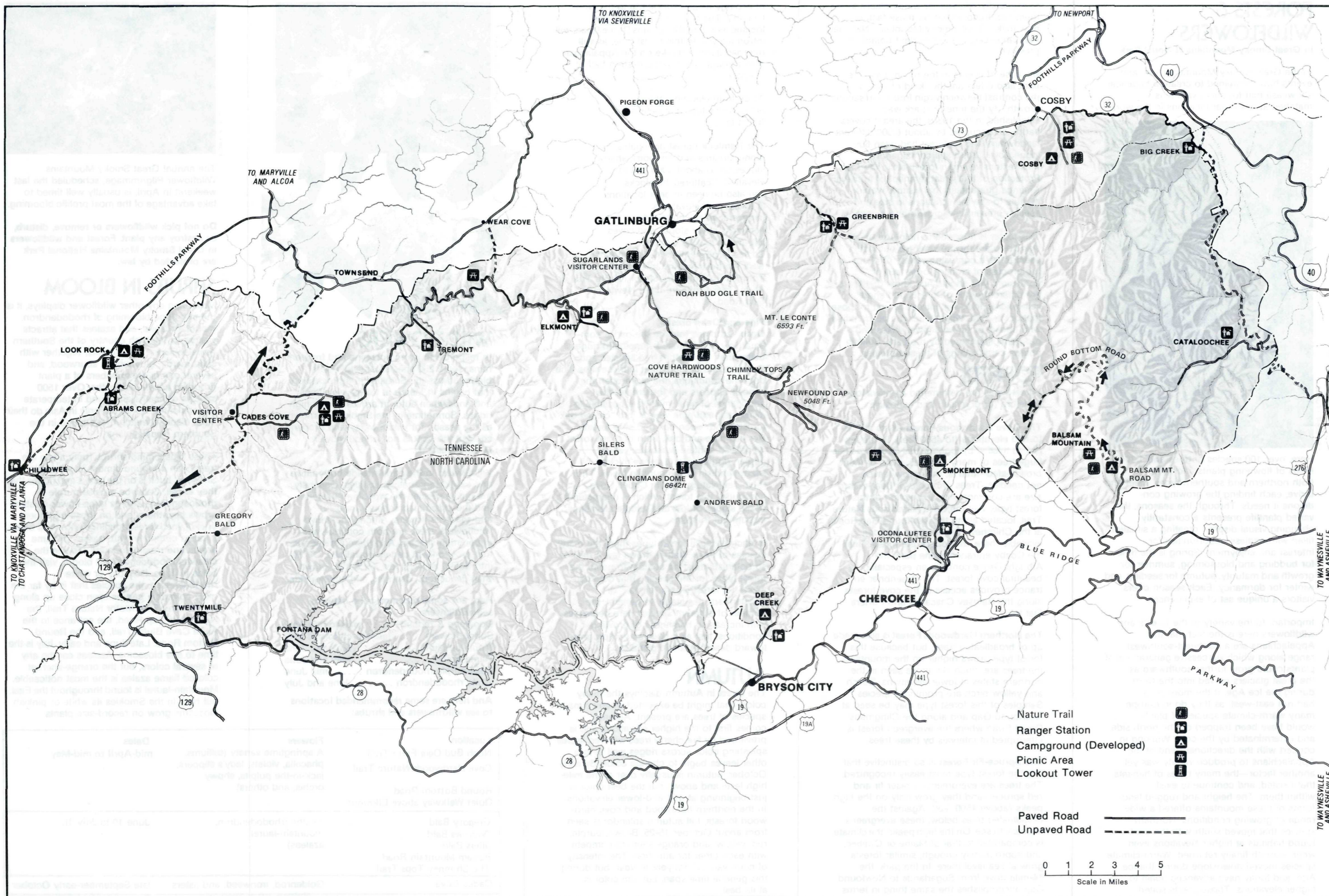
These blossoming shrubs (only a few are trees) can be found almost anywhere in the Smokies, but it is on the peaks and ridges that they excel. Catawba or rose-purple rhododendron, with its large flower clusters, grows best there, and on those infrequent, unexplained forest openings known as balds, it keeps company with masses of flame azalea and mountain-laurel. To see the catawba rhododendron in bloom, visit the balds in June. Rosebay or white rhododendron, the species that is by far the most common, can be seen close up along the Roaring Fork Motor Nature Trail, the Newfound Gap Road, the entrance to the Alum Cave Bluffs Trail, and the Round Bottom Road. Late June and early July is the time to see blossoms. Azaleas can be any of several colors, but the orange-sherbet colored flame azalea is the most noticeable. Mountain-laurel is found throughout the East, but here in the Smokies its white or pinkish blossoms grow on record-size plants.

Great Smoky Mountains National Park

Administration

Great Smoky Mountain National Park is administered by the National Park Service, U.S. Department of the Interior. A superintendent, whose address is Gatlinburg, TN 37738, is in immediate charge.

This folder is published by the Great Smoky Mountains Natural History Association, a nonprofit organization cooperating with the National Park Service in the interpretive programs of Great Smoky Mountains National Park. The association offers at nominal cost publications intended to develop a broad public understanding of park geology, ecology, natural and human history, and resource management.



FLOWERING TREES

With the arrival of spring, flowers bloom everywhere in the Smokies. Trees produce flowers, even though their blossoms are not popularly called "wildflowers," and they too are an integral part of springtime. Flowering trees are especially noticeable in the Smokies because these mountains are home to the greatest broadleaf forests in the world—and all the broadleaf trees here produce flowers. Many of the blossoms are quite showy. Three examples follow . . .

Yellow-poplar (tuliptree). This is one of the most abundant species in the Smokies. The trees grow well on old farms or other cleared areas, and in the great shadowy cove forests they are among the oldest and largest trees. The flowers, which resemble tulips, bloom in May.

Flowering dogwood. A favorite ornamental as well as a forest native, this tree produces especially beautiful and profuse blossoms. Dogwoods are found everywhere at lower elevations.

Allegheny serviceberry. These small white-flowering trees are among the first to blossom and may be noticed at low elevations in March during warm years. This species, which grows at all elevations here, is sometimes called sarvis tree, shadbush or Juneberry.

Publications for sale at visitor centers include excellent tree and wildflower identification books. These publications are useful not only in the park, but in many locations in the East.



Cove Hardwoods Forest