

# Cumberland Gap National Historical Park

Kentucky, Tennessee, Virginia

National Park Service  
U.S. Department of the Interior



## Greenleaf Trail Guide



### SUMMARY

Length: 0.8 mi

Hiking Time: 45 minutes

Elevations: 1330 ft (Point A); 1260 ft (Point F)

Cumulative Elevation Change: 160 ft

Difficulty: EASY

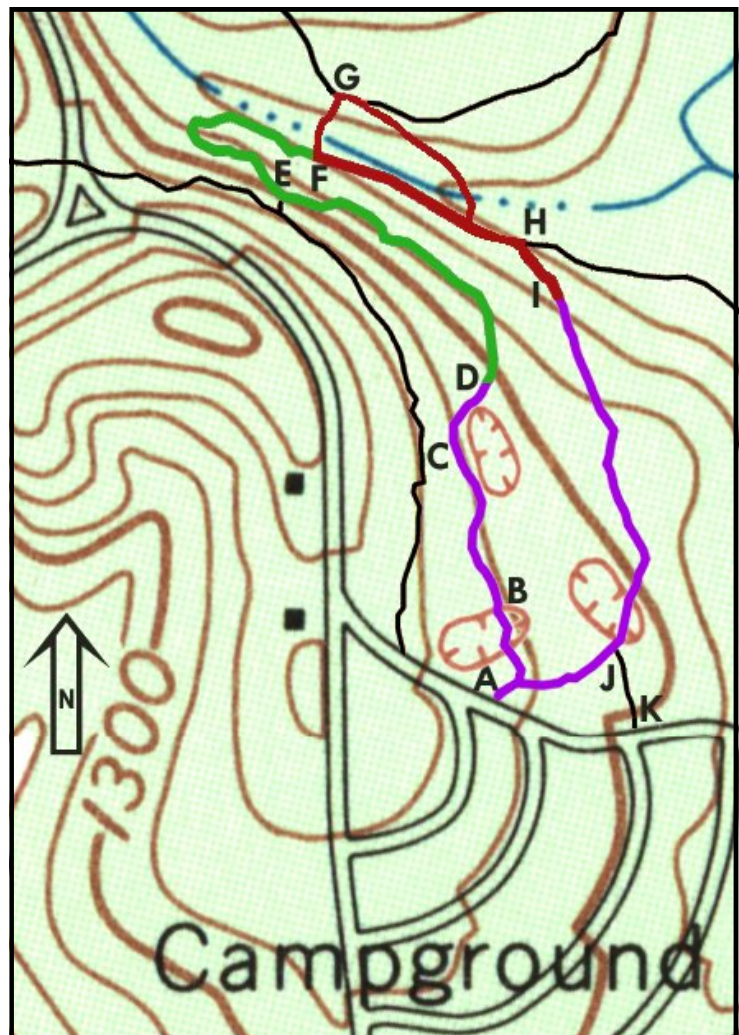
- 75% is flat and 25% is on cool northerly slopes
- Minor elevation change

### Highlights:

- Older hardwood forests on undisturbed uplands
- Younger conifer-hardwood forests on disturbed uplands
- Younger conifer-hardwood forests on disturbed bottomlands
- Influence of bedrock and soil on topography and vegetation
- Invasive, exotic species in disturbed forests
- Rich herbaceous flora on undisturbed lower slopes
- American Chestnut sprouts in undisturbed forest

### Access:

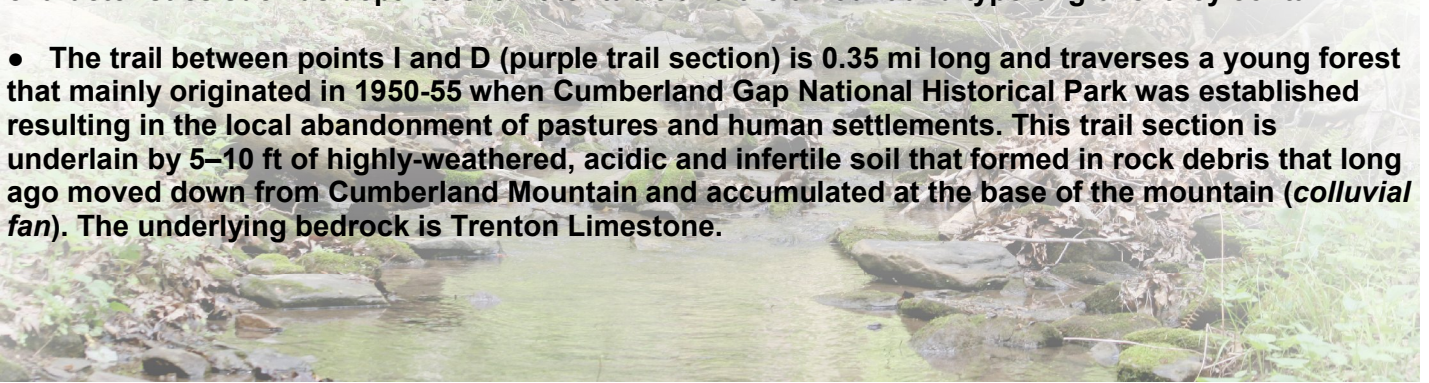
- Parking at campground entrance station
- Trailheads at northeast end of Campground row B (Point A) and at Amphitheater Entrance at northeast end of campground row C (Point K)



**Note:** Topographic map showing the streams (blue lines), the Greenleaf Trail (colored lines), and associated trails and roads (black lines).

## OVERVIEW

- The trail between points D and F (green trail section on map) is 0.25 mi long and winds down a northeast slope to the creek, passing through an old and diverse mixed hardwood forest. Except for the absence of American Chestnut in the main canopy (see later discussion of American Chestnut and Chestnut Blight), this stand is a good example of the type of *Mixed Mesophytic Forest* that occurred here before European colonization. This trail section is underlain chiefly by Reedsville calcareous shale and siltstone and by rich soils formed from these rocks.
- The trail connecting points F, G, H and I (red trail section) is 0.2 mi long and runs through a highly-disturbed bottomland forest. This forest contains a variety of tree species and ages that reflects the long and ongoing history of human use and disturbance. This trail section is underlain by stream deposits (*alluvium*) and by loamy and fertile soils that are highly variable in terms of characteristics such as depth to the water table and the amount and type of gravel they contain.
- The trail between points I and D (purple trail section) is 0.35 mi long and traverses a young forest that mainly originated in 1950-55 when Cumberland Gap National Historical Park was established resulting in the local abandonment of pastures and human settlements. This trail section is underlain by 5–10 ft of highly-weathered, acidic and infertile soil that formed in rock debris that long ago moved down from Cumberland Mountain and accumulated at the base of the mountain (*colluvial fan*). The underlying bedrock is Trenton Limestone.



## TRAIL DESCRIPTION

### Trail Section between points I and D (purple)

Tree species that are adapted to invade recently abandoned land (*pioneer species*) characterize the forest along this section of trail. Yellow-poplar is dominant, occupying about 50% of the area, and occurs with other pioneer species such as Virginia Pine, Sweet Birch, Eastern Redcedar and Black Locust. Other characteristic species of the upper tree canopy are White Oak, Black Cherry, Persimmon, Blackgum, White Ash, Hickory, Sugar Maple and Red Maple. Flowering Dogwood and Redbud are common in the lower tree canopy and Spicebush in the shrub layer. There are also some planted White Pine and Hemlock near the campground and amphitheater. Although relatively young pioneer trees dominate this section of the trail, there are a scattering of large-diameter trees with bushy crowns and branch stubs on the lower part of the trunks. These trees are old and occurred along fence lines, around structures or as shade trees in pastures during the period of human occupation. An example of these older trees is seen in the grove of large, open-grown Shumard Oak that occurs at the top of the hill about 350 ft south of point I on the east side of the trail. Chinkapin Oak – a species usually found only on limestone soils - is also widespread along this section of trail, mostly as saplings and small trees. This is interesting, since Chinkapin Oak does not occur on the rich soils over siltstone and shale along section D – F of the trail, but somehow seems to “sense” the limestone bedrock, 5-10 ft below the surface, along this section of trail.



Southern red trillium

Aggressive non-native species that spread rapidly and often displace native species (*invasive exotic species*) are common along this section of trail. The most obvious and abundant invasive exotic species are Autumn Olive (shrub), Multiflora Rose (shrub or vine) and Japanese Honeysuckle (vine).

## TRAIL DESCRIPTION (CONTINUED)

Although the topography is generally flat along this section of trail, shallow sinkholes and depressions occur at a number of locations as a result of the dissolution and collapse of the limestone bedrock (*karst topography*). At point J, the amphitheater is situated in a shallow subsidence depression, and the trail crosses the eastern edge of another subtle depression at point B. A deeper and more obvious sinkhole occurs on the east side of the trail at point C. The moist micro-environment of the sinkhole at point C is indicated by the occurrence of Sweetgum, a tree species characteristic of wet sites, and by the dense shrub layer of Spicebush.

In addition to the young and uniform forest of pioneer species, evidence of intense and recent human use of this area may be seen in the form of old metal and glass artifacts, abandoned paths and fence lines, and the occurrence of stone piles – stones that were removed from fields and garden plots and stacked in piles in order to facilitate cultivation and planting.

### Trail Section between points D and F (green)

At point D, about 200 ft down slope from point C, the forest changes dramatically. The young, uniform stand of mostly pioneer tree species is replaced by an old forest composed of a great variety of species and trees with a wide range of diameters, heights and ages (*high biodiversity*). The upper tree canopy includes large individuals of White Oak, Red Maple, Yellow-poplar, Hickory, American Beech, Yellow Buckeye, Northern Red Oak, Sweet Birch, Slippery Elm, Blackgum, White Ash, Sugar Maple, Scarlet Oak, Chestnut Oak, and Black Oak. Many dominant trees are 2-3 ft in diameter at breast height and over 100 ft tall. Species occurrence varies slightly along the slope with oaks (especially Chestnut and Scarlet) increasing in importance in the upslope direction and Yellow Buckeye and Beech increasing downslope. The lower tree canopy includes Sourwood, Umbrella Magnolia, Flowering Dogwood, Hophornbeam and Pawpaw; the shrub layer includes American Chestnut, Witch-Hazel, Strawberry Bush and Spicebush. This area has a discontinuous but distinctive evergreen ground cover that includes Christmas Fern, Little Brown Jug, Striped Pippissewa and Partridgeberry. Except for the absence of American Chestnut in the upper tree canopy, this

forest is almost identical to that described as the “mixed mesophytic forest of lower elevations of valleys” by E. Lucy Braun in her classic study “Forests of the Cumberland Mountains.”



**A chestnut leaf**

E. Lucy Braun found Chestnut to occur as a canopy dominant in every type of forest from the dry ridge tops to the ravines and the alluvial bottomlands. By 1940, all mature Chestnut trees had been killed by the Chestnut Blight, an introduced fungal disease. Although the tops died, the roots of the original

trees survived and continue, to this day, to produce sprouts. The sprouts, in turn, grow into sapling-size trees and photosynthesize enough to keep the roots alive, then they become infected by the Chestnut Blight and die - and the roots sprout again.

American Chestnut sprouts are abundant along this section of trail especially between points D and E. Many other tree species harbor, but are not killed by, the Chestnut Blight fungus including White Oak, Black Oak, Chestnut Oak, Red Maple and Shagbark Hickory. Scarlet Oak is the best known reservoir of Chestnut Blight, and about 15% of mature trees have a distinctive swollen base with an open wound (*canker*) that indicates the presence of Chestnut Blight infection (see photo).

The forest along this section of the trail is essentially free of invasive exotic species (as of 2007). Given the abundance and proximity of invasive exotic species on both the disturbed upland and disturbed bottomland, their absence here suggests that this forest ecosystem is healthy and that the biodiversity of this old natural forest protects it from exotic invasion.



**Basal swelling on Scarlet Oak**

## TRAIL DESCRIPTION (CONTINUED)

At point E, a connector trail goes uphill to join the Lewis Hollow Trail. Point F is on a boardwalk over a meander bend of the creek. The old undisturbed forest is on the steep slope to the SW and the young disturbed forest is on the floodplain to the NE. In the meander bend the stream is cutting into the hillside (*cutbank*) exposing siltstone and shale bedrock that can be seen in the creek bed dipping downward at an angle of 15-20° in a northerly direction, i.e. away from the hill and towards the boardwalk. These dipping rock layers form natural conduits draining water from the hillslope to the stream in the vicinity of the boardwalk. This functions as a natural irrigation system which causes the soils at the base of the cool and protected hillslope to be exceptionally fertile and well-watered which, in turn, supports a luxurious and diverse herbaceous flora. Spring wildflowers are especially abundant in this area.

Most of this trail section is on terrain that is too steep for pasture and other types of intensive human use, so the surrounding forest survived more-or-less intact while the flat upland and bottomland areas were severely disturbed. Although not deforested, this area has undoubtedly been affected by human activities such as timber harvest and grazing of hogs.

### Trail Section between points F, G, H and I (red)

Point G is the junction with Honey Tree Trail; Point H is the junction with the service road leading to Station Creek. The forest of this bottomland, although mostly young, is patchy and variable due to a long and complicated history of disturbance by both stream processes (deposition and erosion) and human activities. The upper canopy is occupied by tree species typically found on both uplands and bottomlands including Yellow-poplar, White Ash, Black Cherry, American Beech, Sugar Maple, Slippery Elm, Northern Red Oak, Black Walnut, Sweetgum, Sycamore, Sweet Birch and Virginia Pine. Red Mulberry, Flowering Dogwood, American Hornbeam, Hophornbeam and Pawpaw occur in the lower tree canopy, while Spicebush, Witch-hazel, Sumac, Redbud and Hazelnut occur in the shrub layer. Since bottomlands are, by definition, well-watered and since the alluvial soils are enriched by nutrients deposited by the stream, the herbaceous layer is lush at all seasons.

There are a lot of disturbed patches and “edges” in the bottomland due to natural erosion of the stream banks and to the occurrence of old roads, trails, abandoned structures and clearings. There is also an abundance of old stone foundations, stone piles and human artifacts throughout the area. Japanese Honeysuckle and Multiflora Rose are common and abundant here, especially in the form of vines climbing trees and draped over smaller vegetation. The steep hillslope SW of the trail between points F and I is a transition zone between the undisturbed upland forest and the disturbed bottom land forest, and the “edge effect” can be seen along the base of this hill in the form of patches of jonquils (daffodils), planted by former residents, and now persisting as wild plants after abandonment of the settlements.

