



A GUIDE TO THE NORTH GROVE TRAIL OF CALAVERAS BIG TREES

∞ CALAVERAS BIG TREES STATE PARK ∞

They (the Calaveras giants) were the first discovered and are the best known. Thousands of travelers from every country have come to pay them tribute of admiration and praise.

-John Muir

Welcome to the North Grove of Sierra Redwoods in Calaveras Big Trees State Park.

The Trail

The trail through the North Grove is a gentle, well-marked loop about 1.5 miles (2.4 km) long. Look for the numbered trail markers that correspond to the numbers in this guide. Allow one to two hours for your walk through this magnificent, historically significant grove.

Before You Start

On this trail you will be walking among the world's largest living things. Since the beauty of the North Grove is enjoyed by thousands of people every year, your help is needed in protecting the Big Trees and their environment in these ways:

- **STAY ON THE ESTABLISHED TRAIL AND BOARDWALKS.** This protects the shallow redwood root systems from erosion and soil compaction.
- **DO NOT CLIMB ON THE TREES.** The protective bark is easily damaged.
- **LEAVE ALL NATURAL OBJECTS WHERE THEY ARE FOUND.** Pine cones are an important food source for squirrels, and even a twig is important in returning nutrients to the soil.
- **TAKE ALL LITTER WITH YOU.** Litter is not only ugly, it is also harmful to wildlife.

This online trail guide can be printed by you or purchased at the Calaveras Big Trees State Park Visitor's Center, open daily during summer or on weekends in winter.

Thank you for your help.

The Big Stump

In the spring of 1852, a backwoods hunter named Augustus T. Dowd was chasing down a wounded grizzly bear into an unfamiliar forest. Suddenly he was stopped in his tracks by an unbelievable sight—a tree of monstrous proportions that was easily three times larger than any he had ever seen. Dowd spent the rest of the day exploring the area before returning to his campsite in the hills above Murphy's gold mining camp. Dowd was a colorful character, and his story of the big tree was initially met with skepticism. He finally coaxed a group of men to make the 20-mile trip into the mountains to see the tree for themselves.

Almost immediately, visitors began traveling up the rough trail to what became known as the Calaveras North Grove. Word of the "Tree Giants" soon spread throughout the world. Although Dowd was not the first person to have seen them, it was his discovery that sparked the worldwide fascination with the mammoth trees.

In 1853, the year after Dowd's discovery, the very tree he had first seen was stripped of its bark and felled by ambitious speculators. Since no saw was large enough, the tree was felled with other tools of that era, such as long-handled pump augers and wedges. You can see the marks made by the augers on the fallen part of the tree. It took five men 22 days to drill all the holes, but the perfectly symmetrical tree did not fall for several days.

The bark was assembled into the original form of the tree for the traveling exhibit, but was destroyed by fire one year later. The stump was planed smooth to serve as a dance floor, and a two lane bowling alley and bar were built on the fallen trunk. Although these attracted many visitors, others—including Dowd—protested the destruction of this majestic tree. John Muir, one of our country's earliest preservationists, was so angered by these events that he wrote *The Vandals Then Danced Upon the Stump!*

Pictured on the next page is a drawing of this tree as it may have looked before it was felled. Called the Discovery Tree, it was the largest tree in the North Grove. It was over 25 feet (7.3 m) in diameter at the base, and 300 feet (91 m) tall. When the rings were counted, it was found to be only 1,244 years old—relatively young for such a large redwood. Its recent annual growth rings were large, indicating that it was growing very quickly. It is believed by many that if this tree had been allowed to live, it might rival the largest of the Sierra redwoods.





Tourism In California Began Here.

The first Mammoth Grove Hotel was built not long after the discovery of the trees. The hotel pictured above, sat where the main parking lot for the North Grove Trail is today. The hotels were the scene of many gatherings of famous people. The hotel pictured above burned in 1943.

In 1931 the new California State Park System purchased the North Grove and created Calaveras Big Trees State Park. Today the park sees about 200,000 guests annually.

Small plants thrive in the moist forest floor.



Trail Plant has a light colored bottom side and a darker top. It is easy to see the arrow shape of the leaf. When animals or humans walk through it, it points the way that was traveled.



Wild Strawberries produce small berries that are greatly sought after by small animals and birds. They are produced in the spring and are quickly eaten by the animals in the forest.

1 By looking downstream, you can see the cuts made in the log of the Discovery Tree where the supporting beams were placed for the bar and bowling alley.

Looking across the Discovery Tree log, you can see a large standing Sierra redwood (*Sequoiadendron giganteum*), and another lying on the ground. Called the Sentinels, these trees were the first to greet visitors to the North Grove when the original road passed between them during the late 1800s and early 1900s. Due to a huge burn scar, and erosion around the roots from Big Tree Creek, one of the Sentinels fell on Thanksgiving Day in 1919.

2 Sierra redwoods (also known as Giant Sequoias) are the largest objects ever to have lived on the earth. The fossil record of the redwood family dates back 180 million years to the age of the dinosaurs, and individuals can live over 3,000 years. Once widespread, they now grow naturally only in 75 groves on the western slope of the Sierra Nevada.

Grove Overlook Trail

The trail to the right is a slightly longer, alternative route that will bring you back to the North Grove Trail just beyond #13. It climbs part of the way up the ridge to provide views of the upper levels of the trees. There are no interpretive markers on the Grove Overlook Trail.

3 The section of wood lying on the ground is big enough to be a fallen tree, but instead is a piece of branch that dropped off a nearby redwood. From the ground, redwood branches may not appear to be incredibly large, but some have been found to measure over six feet (1.8 m) in diameter.

4 During a September night in 1965, the central tree in this group fell. Weakened by heavy winds, it crashed down with such force that many people thought it was an earthquake. The long life span of these trees is partly due to the stable structure, symmetrical trunks and wide bases. However, if the trunk is weakened by large burn scars, or the root system affected by erosion or fungus, they can topple in a heavy wind. Falling over is one of the few things that can actually kill a Sierra Redwood. A large tree such as this has been estimated to weigh about 2,600 tons (2,340 tonnes)—about as much as a small ocean-going freighter or 18 blue whales.

As you walk past these trees, you can see that mature Sierra Redwoods have a shallow spreading root system rather than a taproot. The roots extend only six to eight feet (1.8-2.4 m) below the soil surface, yet can grow outwards to encompass an entire acre (0.4 ha). This allows the smaller feeder roots to collect water and nutrients from the rich Sierran soil to support the growth of these huge trees. Redwood seedlings spend the first few years of life developing a strong root system before putting energy into their above-ground development. Several plants are growing in the soil left behind in the roots of this fallen tree.



5 Known as the Empire State, this majestic old tree is now probably the largest Sierra redwood in the North Grove. Its base diameter is 30 feet (9 m), while 4.5 feet (1.36 m) above the ground the tree is about 20 feet (6 m) in diameter, and at 48 feet (14.6 m) above ground it is still 16 feet (4.9 m) in diameter. Though there may be taller trees in the grove, this one has the greatest mass.

6 This tree twists noticeably to the right. Spiral growth is a common characteristic of tree trunk development, although bark patterns often hide this fact. Trees with spiral growth are more flexible, and therefore better able to withstand wind stress and snow loading. Spiral growth patterns are prevalent throughout the natural world, taking shape in such forms as snail shells, sheep horns, and even entire galaxies. Can you find any other spiral patterns in the forest?

7 The huge base of the Granite State Tree hardly seems like a living, growing organism, yet the activity of life is quietly occurring throughout this tree except in the coldest part of winter. Tiny feeder roots beneath your feet and up to 150 feet (45 m) out from the base of the tree are collecting water and nutrients from the soil. Water and nutrients are being transported up towards the crown through the sapwood. Sunlight energy is being converted to sugar through the process of photosynthesis in the green foliage. These sugars are being carried down through a thin layer of wood just beneath the bark to nourish the entire tree.

8 The Siamese Twins started life so close together that the first 50 feet (15 m) of their trunks have merged and now appear to be one tree. Large burn scars were created by burning fuel that was caught between the two trees.

Look for a horizontal cut in the bark on the tree to the right of the twins. This was probably the location of one of the marble name plaques which were placed on many of the trees starting in the early 1860s. Bark and wood also were collected from the trees as souvenirs such as pincushions, candle holders, and carved animals. In some groves bark was removed and shredded for house insulation.

9 The small trees with the dark green needles near the trail are western yew. The North Grove is the only place where Sierra redwood and western yew grow together. This is near the southernmost extent of the yew's distribution, and close to the northernmost extent of the Sierra redwood distribution.

Yew is also unusual in that each individual plant is either male or female. This type of plant is called dioecious, meaning "two houses." Most other conifers are monoecious, with male and female parts on the same plant, or "one house." In the fall look for the small salmon colored berry-like fruits that grow on the female plants.



Female Yew Tree with Berry

10 Look back down the trail and up to see the Old Batchelor standing on the hill. The massive, gnarled branches tell us that this tree is quite old. With increasing age and girth, it becomes more difficult for a Sierra redwood to support the growth of a top. The Old Batchelor's top has died, and will eventually be knocked off by wind, lightening, or heavy snows, leaving the tree with a rounded crown more typical of a very old Sierra redwood.

Notice how the woodpeckers have chosen a particular section of bark in which to drill their holes. This could be due to previous damage to the tree that has resulted in thin bark growing in this area, making it easier for woodpeckers to excavate.

You are about to cross Big Tree Creek, which drains the North Grove basin. Although tiny, this creek is able to support a population of native trout. Sierra redwood groves are always located near a reliable source of water.

Display: *The Small World of a Big Tree*

11 The display panel at this stop describes the variety of life that is found in the vertical world of the redwoods. After reading the panel, take a few minutes to relax on the reclining bench and observe the life supported by these trees. Some people think that this is the best way to see a Sierra redwood.

These two trees are named the Mother and Son because of their difference in size, but they probably began life at the same time. The Mother has been more successful, while the Son has lost much of its top to wind or lightning.

Snow Plants

In the early spring, you often can see the bright red snow plant, so named because it is the first plant to appear as the winter snows begin to melt. Snow plants lack the chlorophyll that causes most plants to be green, and do not photosynthesize, instead resembling a thick stalk of red asparagus. Through recent research botanists have discovered that snow plants attach themselves to the roots of conifers. Although little is known about this relationship, it may be mutually beneficial, enabling the trees to absorb more water and nutrients from the soil. *Please do not disturb this rare, protected plant.*

Photo used with permission from Roy Tennant.

Photo by Roy Tennant.



12 John M. Wooster, one of the early explorers to visit the grove, left evidence of his visit in 1850. That was two years before Dowd's "discovery," but Wooster failed to make his discovery known. The several earlier discoveries of Sierra redwoods went unnoticed, largely due to the preoccupation with the California Gold Rush and the struggle to survive in the California wilderness.

This tree, named "Hercules," was one of the largest in the grove. It was blown down during a violent windstorm in December, 1861. Knowing that it has been lying here for over a century gives us valuable perspective on the age of other fallen trees in this grove.

13

The “Father of the Forest” fell to earth long before Euro-Americans discovered the grove. The process of decomposition occurs very slowly in the redwoods because of the tannin in their heartwood. You can think of this tree as a huge time-release vitamin capsule, slowly replenishing the soil. Already it has made an excellent seed bed for mosses, shrubs, and a dogwood tree. Walk inside the tree and see if you can figure out what caused it to be hollow.

14

The large growths on these trees are called burls. They form in response to disease and injury. This group has also been affected by fire. Fuel often builds up between closely growing trees, causing large burn scars when ignited.

Watch for stands of mountain dogwood and hazelnut, both important food sources for squirrels and chipmunks. Hazelnut is the shrub with soft, fuzzy, tooth-edged leaves. In the fall you may see tadpole-shaped hazelnuts hanging from the branches. Mountain dogwoods grace the grove with showy white flowers in the spring, red-orange berries in late summer and brilliant foliage in the fall.



Mountain Dogwood in summer
Cornus nuttallii



Baneberry (Poisonous)
Actaea Spicata

Hazelnut
Corylus Cornuta var. Californica

Spring
Flowers
& Late
summer
seeds.



Flower photo by Dick James



15

The huge blackened snag in front of you is named the Mother of the Forest, and is one of several trees in this grove that were severely harmed by human activity. When speculators removed the bark from this tree in 1854, it was mortally wounded. The layer of tissue just under the bark carries manufactured sugars throughout the tree. With this layer removed, the tree could not survive for long. With the outer layer of protective bark gone, the tree lost all of its resistance to fire, as can be seen by the wood charred in the fire of 1908. If you look closely you can still see the horizontal saw marks in the wood that were made in removing the bark. A display telling the story of this tree can be found after #17.

16

You are now in an area that was burned in the 1908 fire. The fire created ideal growing conditions for Sierra redwood seedlings, and today there is a healthy stand of young redwoods here. Look for their reddish bark and feathery, juniper-like foliage. Some of the young redwoods are already close to 100 feet (30 m) tall with diameters over two feet (60 cm), while others of the same age are still small and scraggly. Eventually the smaller trees will die, leaving only the faster growing individuals. These trees have reached the age when they can begin producing cones with viable seeds.

17 The old road is a side route of the Carson-Emigrant Trail. Snowshoe Thompson sometimes used this route during his 20 years of carrying mail from Murphys to Carson City. During the winters of 1856-1876 he regularly skied the 90 miles (144km) over the Sierra crest carrying 60 pounds (27kg) of mail and little else. This is also called the Camel Trail, as a group of nine Bactrian camels imported from Mongolia passed through here in 1861 on their way to Walker, Nevada.

Display: *A Sacrificial Tree*

18 From here you have a view into the heart of the grove, which has been at this site for thousands of years. Notice the rounded crowns and large branches that are typical of the older redwoods. The large trees you see here could be anywhere from 800 to 3,000 years old.

Display: *Relics of the Past*

19 A common practice of earlier times was to name individual “Big Trees” after important people. This beautiful, symmetrical tree was named for Abraham Lincoln just after his death in 1865. If you could name some of these trees, what would you choose?

On the ground around the tree you will see many of the egg-shaped female redwood cones. It takes two years for each cone to mature. The much smaller male cones in the tree tips contain pollen that is blown around the grove during the spring. The pollen must come into contact with new female cones for the seeds to be fertilized. The seeds resemble a flake of oatmeal with 6,000 weighing just one ounce (215 seeds/g)

After they mature, the cones can stay on the tree over 20 years until they are acted upon by some outside agent, such as fire, wind, snow, harvesting by Douglas squirrels (also called chickarees), or insect activity. A large tree may bear as many as 40,000 cones of the tiny seeds; these trees have the potential of producing enormous numbers of seedlings, but only if the conditions are right.



Female Cone & Seeds



Male Cones and Leaves

20

You may have noticed that not all the trees here are redwoods. Sierra redwoods do not grow in pure stands as do the coast redwoods, but exist as part of the Sierra mixed-conifer forest. This is an interrelated community of plants and animals that live between about 2,000 and 7,000 feet elevation on the western slope of the Sierra Nevada. Plant and animal distribution in the Sierra Nevada is controlled by altitude, rainfall, temperature, slope, aspect and soil type. Since much of this community has been logged elsewhere, the large conifers found in the grove are now rare outside parks and preserves. The most common trees of this community are illustrated below. How many can you find?



Sugar, or White Pine Cone and seeds. Notice the leaves have five short needles each. Spell it when you find it **S-U-G-A-R** or **W-H-I-T-E** one needle for each letter in the name.



White Fir Cone and Leaves



Incense Cedar Foliage



Ponderosa, or Yellow Pine Cone, Seeds and leaves with three long needles each.



21

The Calaveras North Grove was a popular, easily accessible destination for tourists starting as early as the late 1950s. As the roads to Yosemite improved, Yosemite Valley and the nearby redwood groves began to attract increasing numbers of visitors. Because of this competition, when the Wawona Tunnel Tree in Yosemite was carved out in the late 1800s, the owners of the North Grove responded by doing the same to this tree.

The pioneer cabin tree was chosen because of its extremely wide base and large fire scar. Because of the huge cut, this tree can no longer support the growth of a top, which you can see lying on the ground if you walk through the tunnel. The opening also has reduced the ability of the tree to resist fire. A few branches bearing green foliage tell us that this tree is still managing to survive.

22 Although the thick redwood bark does not burn easily, this large fire scar shows that with enough heat, the bark will burn. You can tell that this scar is in the process of healing because of the bark growing over the blackened wood.

Sierra redwoods evolved in the presence of fire, and not only have adapted to it, but depend on it in several ways. Heat from fire causes the cones to open and release the seeds. Fire clears the ground of duff, litter, and brush so the tiny seeds can reach the mineral soil and receive plenty of sunshine.

A tree that lives 2,000 years may live through 100 fires. Sierra redwoods are able to survive these fires because of their protective bark, branches that grow high above the ground, and widened bases that cause other burning trees to roll off if they fall against them.

With the settlement of the West, these frequently occurring fires began to be suppressed. This led to higher amounts of fuel on the ground, resulting in uncontrollable and destructive forest fires. At Calaveras Big Trees, we are trying to recreate the pre-settlement conditions with the use of prescribed burning throughout the park. A prescribed burn is a carefully planned and administered fire, set only when the conditions allow it to be easily controlled. Not only does this reduce the danger of huge wildfires, but has resulted in large areas of Sierra Redwood seed germination.

23 This group of redwoods, named for the Three Graces of Greek Mythology (Aglaia, Euphrosyne, and Thalia), may have started life together when fire or a falling tree provided access to the mineral soil and sunlight needed by the tiny seeds. There are two types of redwoods in California: Sierra redwoods—the world's largest living things; and coast redwood—the world's tallest living things. Although these trees are related, they differ in many ways. One difference is that the Sierra redwoods reproduce only by seed, while the coast redwoods can also reproduce by sprouting from their roots, burls and stumps.

24 These Sierra redwoods are two of the largest in this grove, with diameters of over 17 feet (5.2m) at 4.5 feet (1.36m) above the ground. The very largest trees grow in the southern part of their range in Sequoia and Kings Canyon National Parks, where they reach heights of up to 310 feet (94m) and diameters of up to 30 feet (9m). Try comparing those dimensions with the size of a room in your house, your classroom at school, or the length of a football field.

25 This group of trees is named for Desire Fricot, a leader in the campaign to establish lasting protection for the Sierra redwoods. The North Grove is now a state park due to the foresight and hard work of early preservationists such as Fricot. Although discovered in 1852, it did not come under the protection of the State Park System until 1931. During the intervening years, the ownership of the grove changed hands several times, until it was purchased by a lumberman named Robert P. Whiteside in 1900. Although he made a gentleman's pledge not to log the grove, the public began to press for government protection. We are among the later generations for whom this forest of giants was preserved.

26

This platform was built near this group of redwoods so that you can have a close-up view of these ancient giants. Gently touch the soft, fibrous bark. This thick protective material is one of the keys to the long life span of Sierra redwoods. It often grows to be two feet (60cm) thick, lacks resin, and contains high amounts of the chemical tannin, thereby providing protection from fire. Tannin also protects against diseases that affect other types of trees in this area.

Sierra redwood bark is used by animals in several ways. Torn strips of bark are used as nesting material by Douglas Squirrels, as well as several types of birds. Carpenter ants chew tunnels in the bark that are used as brood chambers for their larvae. Red-breasted sapsuckers drill holes in the thin bark near the tree tops and return later to feed on the insects caught in the sap. Several types of animals roll in the tannin-filled bark dust at the base of the trees—this is thought to repel parasites such as lice and fleas.

We hope that you have enjoyed your walk through the Big Trees in the Calaveras North Grove. We think you will agree that the words John Muir wrote about the North Grove in 1876 still hold true today:

To the free mountaineer all the woods are accessible alike from the firs that girdle icy Shasta to the giant forests of the Tule; but the... timebound must follow ways and means, and I know of none better than those of Calaveras... a flowery glade in the very heart of the woods, forming a fine center for the student, and a delicious resting place for the weary.

For more information about the Sierra redwoods of the park in general, please feel free to contact the park staff or stop by the Visitor Center where exhibits and publications about the park are on display. Two of the publications used in writing this guide may be purchased in the Visitor Center. These excellent books are: *The Enduring Giants* by Joseph Engbeck; and *Giant Sequoias*, by Harvey, Shellhammer, Stecker, and Hartesveldt.

This guide was originally written by Wendy Harrison, Interpretive Specialist for the Calaveras Big Trees Association. Parts of this guide are based on previous work by Joseph Engbeck, Research Writer for the California Department of Parks and Recreation.

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North Grove Area

