

Muir Woods

National Monument • California

Golden Gate
National Recreation Area

National Park Service
U.S. Department of the Interior



Color photographs by James M. Morley

William Kent's Legacy Until the 1800s many northern California coastal valleys were covered with coast redwood trees like those found in Muir Woods National Monument. The forest along Redwood Creek in today's Muir Woods was spared from logging because it was hard to get to. Because this area contained one of the Bay Area's last uncut stands of old-growth redwood, Congressman William Kent and his wife Elizabeth Thacher Kent bought 295 acres here for \$45,000 in 1905. To protect the redwoods the Kents do-

nated the land to the Federal Government. President Theodore Roosevelt proclaimed it a national monument in 1908. He suggested naming the area after Kent, but Kent wanted it named for conservationist John Muir.

John Muir: Philosopher, Scientist, Author Young John Muir's family emigrated from Scotland to Wisconsin in 1848. Muir showed a lively interest in nature, and, after brief studies at the University of Wisconsin, he left school for what he would call "the University

of the Wilderness." During his lengthy wanderings Muir contemplated the relationship between humans and the rest of nature, concluding that all life forms have inherent value and a right to exist. He believed humans are no greater or lesser than other forms of life. His writings brought broad public acceptance of conservation as an environmental ethic. Muir has inspired generations of advocates to work to protect wilderness, wildness, and natural areas.

Life of the Redwood Forest

Each season at Muir Woods has its own character. Fall is the warmest: ladybugs swarm, and water striders are active in Redwood Creek, and the leaves of big-leaf maple turn yellow and drop. In winter, steelhead (migratory rainbow trout) and silver salmon migrate up Redwood Creek to spawn, and toyon berries turn vibrant red. In spring, birds nest, wildflowers dot Redwood Canyon, and black-tailed deer birth spotted fawns. Summer is the season of fog, azaleas, aralias, buckeyes, Steller's jays, and chipmunks.

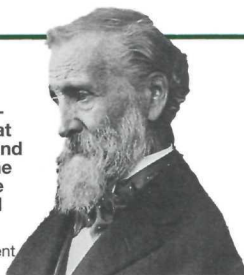


Black-tailed deer

Animals Notice the relative silence in these woods. Animal life in a redwood forest is limited because the shaded conditions provide scarce food. Many animals feed at night, as owls and bats do, or in early morning and around dusk, as deer do. Mammals most often seen are Sonoma chipmunks and black-tailed deer. You may hear Steller's jays scolding

"This is the best tree-lover's monument that could possibly be found in all the forests of the world. You have done me great honor, and I am proud of it."

—Muir to William Kent



or ravens cawing. Migrating warblers, kinglets, and thrushes live here part of the year. Winter wrens live here year-round. Reptiles and amphibians include western garter snakes, rubber boas, and Pacific giant salamanders. Also look for bright banana slugs.

Trees Coast redwood trees dominate this forest. With them grow Douglas fir, big-leaf maple, tanbark oak, and bay laurel. At the canyon's lower end red alders line the stream, and buckeyes cluster nearby. Shaded bays growing toward the light may assume contorted shapes or even topple over.

Plants of the Forest Floor Ferns are common forest associates of redwoods. Most common here are sword fern, ladyfern, California polypody, and bracken fern. Moss and lichen grow on rocks and trees but are not parasitic. Redwood sorrel carpets much canyon floor. Abundant mushrooms and fungi appear after rains. Magnificent shelf fungi are seen year-

round on both live and dead trees. Vermilion hygrophorous and oyster mushrooms appear only seasonally. Fields of primitive horsetail plants grow near the creek's banks.

Redwood Creek Redwood Creek originates high on the slopes of Mt. Tamalpais



Steller's jay

and nearly bisects the park. It runs year-round, providing nearby trees and animals with water, and is host to diverse aquatic creatures, including fish, insects, and salamanders. In summer the creek slows to a trickle connecting quiet pools, but winter rainstorms turn it into a raging torrent. Rain-swollen, Redwood Creek breaks through the sand barrier at Muir Beach, and adult steelhead and silver salmon move up the creek to spawn.

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Visiting Muir Woods

Muir Woods National Monument, 12 miles north of Golden Gate Bridge, is reached by U.S. 101 and Calif. 1. Parking is limited: try visiting on weekdays, mornings, or late afternoons. Approach roads are steep and winding; vehicles over 35 feet long are prohibited. No public transportation serves the park. Jackets are advised: day-time temperatures average 40° to 70°F. A visitor center and self-guiding nature trail are provided. A gift shop offers snacks and souvenirs. Find gasoline and services in Mill Valley five miles away. The park is open 8 a.m. to sunset year-

round. Ages 17 and up pay an entrance fee.

Muir Woods is part of Golden Gate National Recreation Area and one of more than 380 National Park System areas preserving the nation's natural and cultural heritage. Visit the National Park Service at our website: www.nps.gov

More Information Muir Woods National Monument, Mill Valley, CA 94941-2696 415-388-2595 TTD 415-556-2766 www.nps.gov/muwo

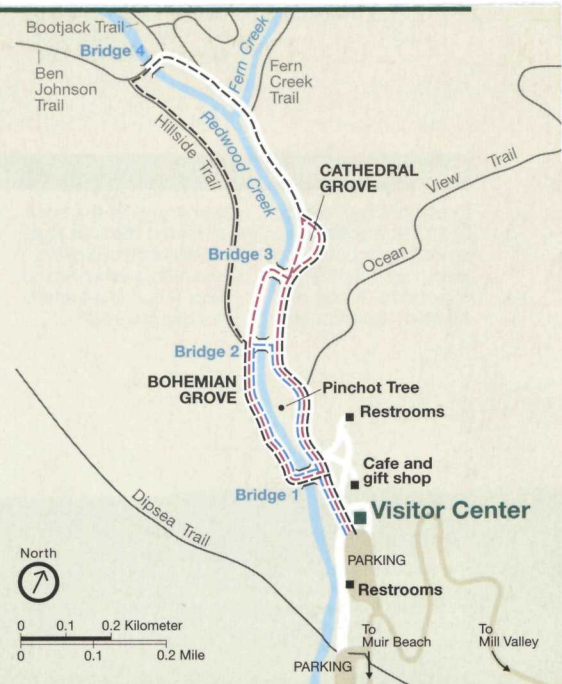
Protect Your Park Muir Woods National Monument is a natural

area. Please help us preserve and protect it. • Don't mar or remove flowers, trees, or other natural features. • Help keep wildlife healthy: don't feed or disturb animals. Fishing is prohibited in Redwood Creek. • Pets are not permitted, except service dogs. • No smoking on trails. • Picnicking and camping are not allowed here, but facilities are provided nearby. • No horses or bicycles, except on fire roads. • Portable radios are prohibited.

Danger: Poison oak and stinging nettles are common. • During high winds branches or trees may fall.

Loop Walks Walk in Redwood Canyon to enjoy the forest. The 560-acre park includes six miles of trails. The main, canyon floor trails are paved and mostly level. Bridges 1 to 4 (see map) make short loop walks possible. Unpaved trails out of the canyon connect with trails in Mt. Tamalpais State Park.

All paved trails are wheelchair accessible.
 Paved trail
 1/2 hour, 1/2 mile loop walk
 1 hour, 1 mile loop walk
 1 1/2 hour, 2 miles loop walk
 Extended trails (unpaved)

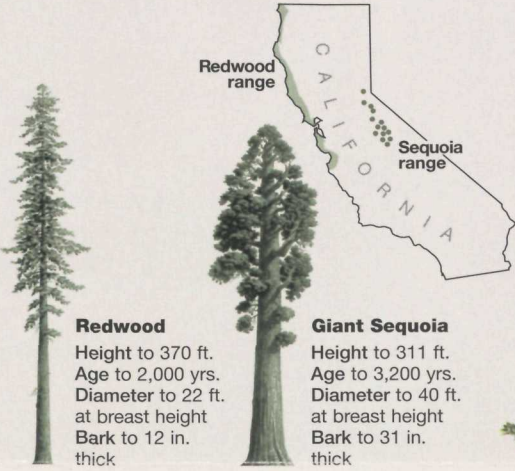


California Redwoods

Redwood-like trees covered much of the Northern Hemisphere 140 million years ago. As the climate changed, the range of the redwood retreated. Now there are two species of redwood in California, with very limited ranges. The coast redwood (*Sequoia sempervirens*) grows on a thin and discontinuous 500-mile strip of Pacific coast from southern Oregon to Monterey. Most old-growth coast redwoods have been cut, but some are protected in Redwood National and State Parks, many California and Oregon state parks, and here in Muir Woods. This canyon of redwoods was never logged. Its forest of mixed-age and dead trees supports a biologically rich community of plants and animals.

Closely related, the giant sequoia (*Sequoiadendron giganteum*) grows larger in bulk but is less tall than the

coast redwood. Giant sequoias can be seen in Yosemite and Sequoia and Kings Canyon national parks. Their range is restricted to small groves on the Sierra Nevada's west slope



Redwood
Height to 370 ft.
Age to 2,000 yrs.
Diameter to 22 ft.
at breast height
Bark to 12 in.
thick

Giant Sequoia
Height to 311 ft.
Age to 3,200 yrs.
Diameter to 40 ft.
at breast height
Bark to 31 in.
thick

Coast Redwoods: Tallest Living Things

Bohemian and Cathedral groves have the biggest trees in Muir Woods—one 252 feet tall and one 14 feet wide. Some are at least 1,000 years old.

Most mature trees are 500 to 800 years old. Coast redwoods grow best in moderate temperatures and protected from the wind and salt spray. They need

substantial soil moisture from rainfall and summer fog and grow tallest on floodplains of streams that flood periodically. The world's tallest living thing is a

coast redwood in northern California. One identified by the National Geographic Society in 1963 measured 367.8 feet tall.

Roles of Fog and Fire

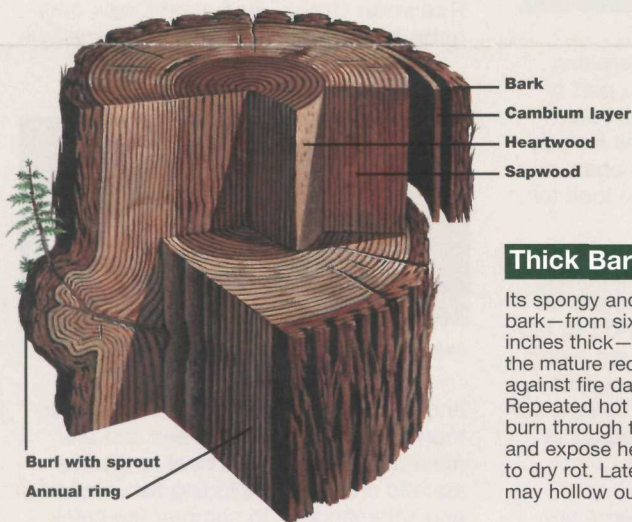
Fog Redwoods flourish only in coastal California's fog belt, where frequent summer fog supplies critical moisture in the dry season. Condensing on leaves and needles, fog drips to the forest floor, replenishing water that

trees lose to evaporation and transpiration. Winter is the wet season; rainfall averages 40 inches per year.

Fire Fire benefits long-term forest health. Fire clears the floor of duff so redwood seeds can

reach mineral soil. It destroys bacteria and fungi in the duff layer that can kill seeds before they germinate. It recycles nutrients, turns debris into ash, and can enhance wildlife forage. Until fire suppression, begun in the

19th century, upset the natural cycle, wildfire occurred every 20 to 50 years here. To restore the ecosystem's integrity the National Park Service conducts prescribed burning to re-establish fire's natural role in the forest.



Thick Bark

Its spongy and fibrous bark—from six to 12 inches thick—insulates the mature redwood against fire damage. Repeated hot fires can burn through the bark and expose heartwood to dry rot. Later fires may hollow out rotted

portions—the blackened cavities you may see along the trail. A reddish-brown, bitter chemical, tannin, gives the tree its name. Tannin also makes both bark and wood resistant to fire and attack by insects and fungi.

Cones and Seeds

Redwoods are conifers and evergreen. Mature cones are woody, reddish brown, and small, olive-sized. Cones mature in a year and drop seeds, 50 to 60 tiny flakes per cone, in late fall. Within one month, warm, moist soil may

stimulate a seed to germinate. If it is on suitable, fresh mineral soil it will root. After the first leaves appear, a seedling begins making its own food and may grow two or three inches tall in its first year of life.



Burls and Sprouting

In established forests like Muir Woods, burl sprouting accounts for most reproduction of redwoods. A burl is a mass of dormant buds

that grows at the base or on the roots or side of redwoods. When a tree is injured or tissue near a burl is affected, the burl may sprout.

Sprouting gives redwoods great competitive advantage over other trees that reproduce by seed only. Tightly grouped red-

woods, or those fused at their bases, probably began life as burl sprouts.

Shallow Roots
Roots penetrate only 10 to 13 feet deep, but they spread out 60 to 80 feet.

