

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 similar to those now 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. Noting that Redwood Creek contained one of the Bay Area's last uncut stands of old-growth redwood, Congressman William Kent and his wife, Elizabeth Thatcher Kent, bought 295 acres here for \$45,000

in 1905. To protect the redwoods the Kents donated the land to the Federal Government and, in 1908, President Theodore Roosevelt declared it a national monument. Roosevelt 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 had 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." On his lengthy wanderings Muir contemplated man's relationship to nature, concluding that all life forms have inherent significance and the right to exist. Humans, Muir decided, are no greater or lesser than other forms of life. Muir eventually won public acceptance of conservation as an environmental ethic and inspired generations of wilderness advocates.

Life of the Redwood Forest

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

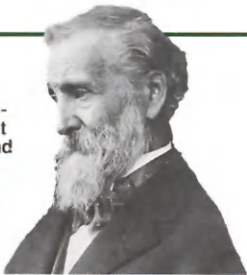


Blacktail deer

Animals. You may notice the relative silence in these woods. Animal life in a redwood forest is limited because the shaded conditions provide scarce food. Many animals that do live here feed at night, as owls and bats do, or in early morning and around dusk, as deer do. Mammals most often seen are the Sonoma chipmunk and blacktail deer.

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

— Muir to William Kent



You may hear the scolding of Steller's jays or the raucous cawing of ravens. Warblers, kinglets, and thrushes migrate, living here for part of the year. Wrens live here year round. Reptiles and amphibians are represented by western garter snakes, rubber boas, several species of lizards, salamanders, and newts.

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

Plants of the Forest Floor. Ferns are common forest associates of the redwood. Most common here are the sword fern, ladyfern, California polypody, and bracken fern. Moss and lichen grow on rocks and trees but are not parasitic. Redwood sorrel carpets much of the

canyon floor. Abundant mushrooms and fungi appear after rains. Magnificent shelf fungi can be seen year-round on both live and dead trees. Others, such as the vermilion hygrophorous and oyster mushrooms, appear only seasonally. Fields of primitive horsetail grow near the creek's banks.



Steller's jay

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

Location. Muir Woods National Monument, 12 miles north of the Golden Gate Bridge, is reached by U.S. 101 and Calif. 1. Roads to the park are steep and winding; vehicles over 35' long prohibited. No public transportation serves the park; commercial tours are available from San Francisco.

Information and Hours. The park is open year round from 8 a.m. to sunset. For information, write or call the Site Manager, Muir Woods National Monument, Mill Valley, CA 94941, (415) 388-2595; TTD 556-2766.

Weather. The park is cool, shaded, and moist

all year. Daytime temperatures average between 40 and 70°F. Jackets are advised.

Services. A visitor center and self-guiding nature trail are provided. A gift shop near the entrance offers snacks and souvenirs. The nearest gasoline and service stations are in Mill Valley 5 miles away.

Help Protect Your Park. Muir Woods National Monument is a natural area. Please help us preserve and protect it. • Stay on trails and do not climb fences. Trampling kills plants and compacts the soil; it takes years before new plants can grow. • Do not mar or remove flowers, trees, and other nat-

ural features. • Do not feed or disturb animals and do not fish. • Pets are not permitted except for seeing-eye dogs. • No smoking on trails. • Do not throw coins in the creek; they are unsightly and toxic to aquatic life • Picnicking and camping are not allowed in Muir Woods, but facilities are provided nearby. • No bicycles or horses, except on fire roads. • Portable radios are prohibited. • **Danger: Poison oak and stinging nettle are common here.**



Redwood Canyon Loop Walks
Muir Woods' Redwood Canyon is a place to walk and enjoy the forest. The park's 560 acres include 6 miles of walking trails. The main, mostly level trails along the canyon floor are paved. Bridges (1 to 4 on the map) along Redwood Creek make short loop walks possible. Unpaved trails lead up out of the canyon and connect with trails in Mt. Tamalpais State Park.

All paved trails are accessible to disabled visitors

- Paved trail
- Half-hour Loop Walk
- One-hour Loop Walk
- Extended trails (unpaved)



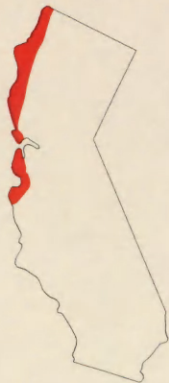
Coast Redwood

Redwood trees covered much of the Northern Hemisphere 140 million years ago. The coast redwood is a remnant of that time. As climate changed over the ages, redwood range retreated. Today there are three noted species of redwood, each with a limited range. The coast redwood (*Sequoia sempervirens*) grows along the Pacific coast. The giant sequoia (*Sequoiadendron giganteum*) is restricted to the Sierra Nevada's western slopes. The dawn redwood (*Metasequoia glyptostroboides*) is found in a remote area of China.

Range of Today's Redwoods. Coast redwoods grow in a narrow, 500-mile-long discontinuous strip of Pacific coast from southern Oregon to south of Monterey, Calif. They grow best in areas with moderate temperatures and protection from wind and salt spray.

They also need substantial soil moisture from rainfall and summer fog. Redwoods grow tallest on floodplains of streams and rivers subject to periodic flooding and silting. Although many coast redwoods have been cut, some are protected in Muir Woods, Redwood National Park, and many California and Oregon state parks.

Coast redwoods grow only along a narrow strip of Pacific coast. Muir Woods protects old-growth redwoods that were never logged. Its forest of mixed-age and dead trees supports a rich mix of plant and animal species.



The Tallest Living Thing

Cathedral and Bohemian Groves contain Muir Woods' largest redwoods. The tallest is 252 feet; the thickest is nearly 14 feet across.

The oldest redwood here is at least 1,000 years old. Most of the mature trees are between 500 and 800 years old. The world's

tallest living thing is a coast redwood in Redwood National Park. Discovered by the National Geographic Society in 1963, it now

measures 367.8 feet tall. The closely related giant sequoia grows larger in bulk but not nearly as tall.

Redwood Cones

Redwoods are conifers and evergreens. Mature cones are reddish-brown, woody, and very small. Seeds are tiny flakes—it takes 125,000 seeds to weigh one pound. Cones mature in one year and drop their seeds in late fall. Within a month, warm, moist

soils may stimulate a seed to germinate. If a seed is on suitable, fresh mineral soil it will root. After the first leaves appear, the seedling will begin to manufacture its own food and may grow to 2 or 3 inches tall the first year.



The Roles of Fog and Fire

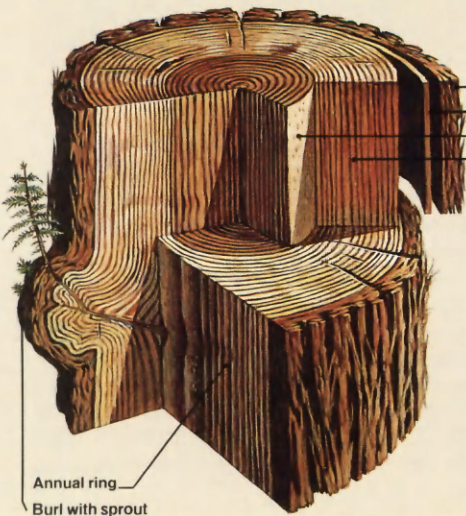
Redwoods flourish only in coastal California's fog belt. Frequent fog supplies critical moisture during the dry season. Condensing on needles and leaves, it drips to the forest floor. It also decreases water loss

from trees by evaporation and transpiration. Winter is the wet season, averaging 40 inches of rainfall.

Fire. Fire benefits the forest's long-term ecological well-being. Fire

clears the floor of duff so that redwood seeds can reach mineral soil. It recycles nutrients, turning debris into ash, and it can enhance foraging for wildlife. Fire-scar dating research shows that before Europeans arrived wildfires occurred every 20 to 50

years. Fire suppression by humans over the last 150 years interrupted these cycles, with negative effects on the ecosystem. In 1985, the National Park Service began a program of controlled burning to re-establish fire's natural role in plant and animal communities.



Thick Bark

Redwood bark has a fibrous, spongy composition. Colored by tannins, bitter chemicals found in both bark and wood, its color ranges from reddish-brown to gray. Its tannin content makes the bark resistant to fire and to attacks by insects and fungi. Bark on mature trees runs 6 to 12

inches thick, insulating the tree against fire damage. Repeated hot fires can burn through the bark, however, eventually exposing heartwood to dry rot. Subsequent fires may hollow out rotted portions, creating the blackened cavities seen along park trails.

Seeds and Sprouting

Sprouting gives coast redwoods a competitive advantage over species reproducing only by seeds. In an established forest such as Muir Woods, burl sprouting

accounts for most redwood reproduction. Tightly grouped trees or those fused at their roots probably began life as burl sprouts. Bacteria and fungi in the forest

floor's deep duff layer generally prevent germinated seedlings from reaching the mineral soil. Seeds mainly establish redwoods only on ground that has be-

come cleared through flood, fire, or windthrow. Of cone-bearing trees, only the coast redwood can reproduce by sprouting.



Mature seed



Moist seed sprouts



Sprout sheds seed coating



Seed leaves, or cotyledons, appear

Shallow Roots
Roots penetrate only 10 to 13 feet deep and spread out only 60 to 80 feet.

