

Redwood

Official Map and Guide



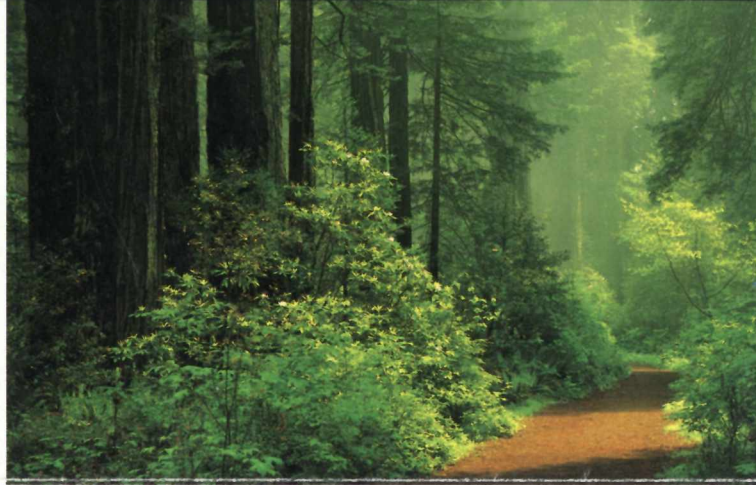
Redwoods and rhododendrons



Split Rock along the Coastal Trail



Rough-skinned newt



Lady Bird Johnson Grove trail

World's tallest living thing, king of its race, living link to the Age of Dinosaurs; it grows from a seed the size of a tomato seed and may weigh 500 tons and stand taller than the Statue of Liberty. Acquiring its thick biological armor of umber bark, this tree

seems impenetrable to the ravages of fire and insects. In 1769, the well-traveled Fray Juan Crespi named it *palo colorado*, red tree. Botanical credit for the coast redwood's discovery is generally ceded to Archibald Menzies, who noted it in 1794.

In 1847 it was given its scientific name, *Sequoia sempervirens*, probably honoring Cherokee leader Sequoyah; *sempervirens* means evergreen. Redwood National Park was established in 1968 and expanded in 1978 to protect superlative ancient red-

wood forests growing along the north-west California coast. The park is now a World Heritage Site and International Biosphere Reserve. The millions of travelers who come from around the world to see them reap other benefits from these lofty

trees' affinity for the coastlines. For, in protecting the trees, Congress and the State of California also protect for public use and enjoyment miles and miles of beaches, sea stacks, and biotically opulent tidepools.

From Exploration to Preservation

When Fray Crespi saw the redwood forests in 1769, they probably covered 2 million or more acres. By 1965, they were reduced to 300,000 acres and under intense logging pressure. When gold fever subsided here redwood never replaced it. The forests at first seemed endless, but most of these ancient forests fell to private ownership. Modern logging methods raised the specter that *all* the trees might be cut. The State of California had preserved several groves before 1968, when Congress created Redwood National Park. The park was expanded in 1978 to protect the world's tallest living things.



Early logging centered on small trees. Later, redwoods could be logged. Gold mining (below) began after 1848 strikes on the Trinity River.

Mining and Logging
The northern or redwood coast of California was largely ignored by Spaniards and Anglos until the Gold Rush. In 1850, gold was discovered on Gold Bluffs Beach. Mining proved marginally profitable. Revived during the Civil War, mines closed again at its end. Various methods were tried in the 1870s, 80s, and 90s, but operations ceased by 1920. Remains of mining operations still exist on Gold Bluffs.

Logging began in redwood country in 1851. At first small logs were floated to small mills or dragged by oxen on skid roads. Railroads came into use in the 1870s, followed by the steam donkey in 1882, and the bull donkey ten years later. Caterpillars were used by the 1920s and trucks by the 1940s. Redwood lumber was used to build some of San Francisco's great Victorian homes.

The Coast Redwood
Coast redwoods tower over all other trees in the world. At 367.8 feet, a coast redwood discovered on the banks of Redwood Creek in 1963 is known as the world's tallest tree. Redwood forests develop the world's greatest reported volume of living matter per unit of land surface. Giant sequoias, their cousins, grow larger in

diameter and bulk but not in height. Coast redwoods survive to be about 2,000 years old, averaging 500 to 700 years old. They have no known killing diseases and suffer no significant insect damage. Merely to stand within a redwood grove inspires many visitors to champion the trees' preservation.



Visitors stand dwarfed on a downed redwood trunk.



Redwoods grow in a narrow strip along the Pacific Coast of California and southwestern Oregon. Giant sequoias grow only on the Sierra Nevada's west slope.

The world's first, second, third, and sixth tallest trees grow within a mile of each other on Redwood Creek along the California coast.

Giant Sequoia Facts

Height: To 311 ft.
Age: To 3,200 years
Bark: To 31 in. thick
Base: To 40 ft. diam.
Reproduce: By seed only
Seed size: Like oat flakes
Cone size: Like chickens' eggs

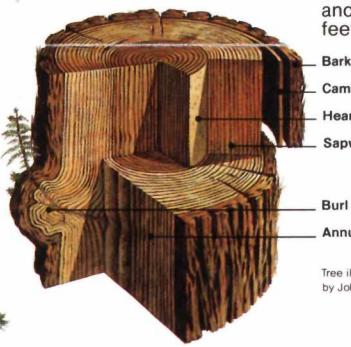
Coast Redwood Facts

Height: To 367.8 ft.
Age: To 2,000 years
Bark: To 12 in. thick
Base: To 22 ft. diam.
Reproduce: By seed or sprout
Seed size: Like tomato seeds
Cone size: Like a large olive



From Seed and Sprout
In the Age of Dinosaurs redwood species dominated much of the Northern Hemisphere, including today's Arctic. Climate change over millennia reduced redwood habitat to this narrow, fog-bound coastal corridor. (See Role of Fog at lower

right.) Coast redwoods reproduce by seeds and by stump sprouting. Seeds slightly larger than a pinhead are released from mature cones that ripen in August and September. If a redwood is felled or badly burned, a ring of new trees sprouts from burls around the trunk's base. Circular stands of these family groups are common. These saplings use the parent tree's root system. Redwoods have no taproot; their roots penetrate only 10-13 feet deep and spread out just 60-80 feet.



Tree illustrations by John Dawson



Treasures of Nature and Culture

From sea level to 3,100 feet in elevation in the Coast Range, a mild, moist climate assures the park an abundant diversity of wildlife. Elusive to visitors, many species of mammals, birds, amphibians, and insects inhabit the mature redwood forest, depending on it for food and shelter. Prairies, called bald hills, form natural islands of grasslands where wildlife abounds.

Prairies and Waterways
Prairies and rivers evoke the changing seasons far better than redwood groves do. *Prairies*: In springtime, prairie wildflowers burst with color that gives way in the dry summer to the grasslands' amber glow. Prairies are the realm of raptors, the predatory red-tailed hawk, kestrel, and great horned owl, and their prey of gophers and meadow mice. Mountain lions, bobcats, coyotes, foxes, elk, and blacktail deer also frequent prairies, which were historically kept free of trees by wildfire and elk. Acorn-bearing Oregon white oaks edge prairies at higher elevations. They provided protein-rich food for Indians who cleared their understorey with fire. Prairies make good birding spots where you may see the goldfinch, junco, quail, or raven.

Roosevelt elk favor prairie and other open lands but seek forests for cover and shade. The park's largest mammals, these elk may weigh more than 1,000 pounds. Their much larger antlers distinguish them from blacktail deer. One of the best places to see Roosevelt elk is at Prairie Creek Campground. At Gold Bluffs Beach elk are usually found along the beach and along trails. Sometimes you can see them from Bald Hills Road and along Highway 101 south of the park on the west side of Big Lagoon.



Park streams offer swimming and floating opportunities and harbor steelhead and cutthroat trout (left) and Chinook salmon (below).



Black Bears
Seldom seen, black bears number several hundred in the park. They favor the recently logged Redwood Creek area whose revegetation fosters abundant food. Fond of acorns, bears travel far to harvest them. Redwood's bears generally have not lost their fear of humans. The best way to prevent wild bears from becoming



problem bears is to keep human food away from them. Use sound food storage practices. Backpackers: hang all food, scented items—soap, toothpaste, suntan oil—and garbage in a tree 200 feet from camp; 12 feet up and 10 feet out from trunk; and 5 feet down from the branch. Check with a park ranger for proper techniques.

Restoring Forest Lands
Congress expanded the park in 1978 and directed the National Park Service to rehabilitate logged-over lands. Native trees are planted, and exotics removed, to restore natural systems. Congress



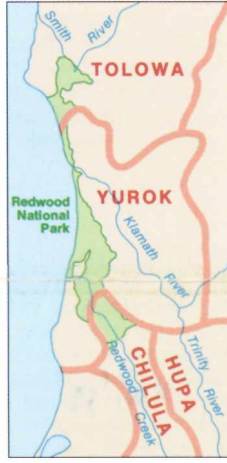
Coast redwood, Douglas-fir, and other native trees are planted to redevelop forests similar to those cut. Reshap-

ing logging roads prevents erosion that clogs Redwood Creek and endangers stream-side trees.

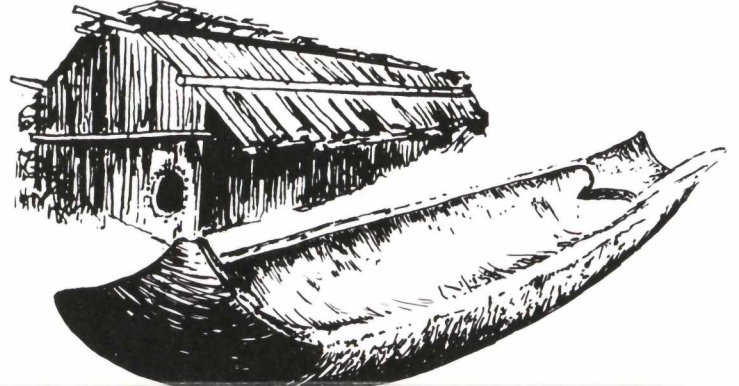
Indians of the Redwood Coast
Tolowa, Yurok, and Chilula Indians lived in this area when it was explored by non-Indians in the 18th century. Abundant and diverse resources enabled them to achieve the highest population density and most complex cultures known among any food-gathering peoples.



spoons below. Their world centered around water. Settlements were generally located near lagoons, rivers, and major creeks. They knew no cardinal directions but used only water flow—up, down, and across the stream, etc.—for directions. Yurok means "downstream" in the nearby Karok language.



Yurok Indians arrived in this area about 1300. The Tolowa and Chilula came about 200 years later. Yurok and Tolowa groups still exist; the Chilula were assimilated into the inland Hupa culture.



Life Along the Seacoast

Even apart from the Coast Range and its lofty forests, Redwood's coastline—to which the big tree is intimately related—would justify national park status. Rugged, with stretches of steep, rocky cliffs broken by rolling slopes, it is largely unaltered by humans. Generally rocky, its tidal zone can be difficult to traverse, with exceptions such as Gold Bluffs Beach, a 7-mile stretch of dunes and sandy beach. Visitors to the north coast may discover a rich mix of life forms that occupy distinct habitats shown below.

Many of the park's marine bird species are migratory. Brown pelicans are summer visitors, cormorants take to lagoon or river and shore waters, and willets and sanderlings work the beach. Offshore may be California gray whales in migration, seals, sea lions, dolphins, porpoises, and orca (killer) whales. In the intertidal areas the vagaries of periodic wetting and drying have produced tightly zoned layers of life. Lagoons—where freshwater and saltwater mix—are extremely productive of sea life. The national park boundary extends one-fourth mile beyond mean high tide.

Offshore
Between shore and the deep ocean an average surface acre is as productive as a similar acre of fertilized agricultural land. Basic wealth lies in phytoplankton, single-celled plants. Sea lions feed beyond the surf and haul out on shore or on sea stacks. Harbor seals swim in the surf; they haul out in sheltered coves. Several kinds of sea birds nest on offshore rocks. Flowing south, the California Current works with offshore winds to draw nutrients up from deep waters, feeding coastal creatures. Moisture-laden air off this current condenses as low clouds over cold water near shore.

Intertidal Zone
Twice daily on a 25-hour lunar cycle, tides rise and fall. In the zone between high and low tide, life forms arrange themselves vertically. Just where depends on their tolerance for exposure to air and/or water; heat; and wave shock, as well as the usual biological limits of predation and competition for food and living space. A **splash zone** just above high tide is home for periwinkle snails and beach hoppers that can withstand the powerful shock of



Periwinkle snail

pounding waves and episodic wetting. Splash zone inhabitants are transitional creatures, but they are more attuned to life on land than in the sea. Mussels cling to rocks in the **high-tide zone** covered by water only at high tide. They must tolerate being exposed to air and direct sunlight temporarily, for which their shells are supremely adapted. Various algae, often called seaweeds and possessing chlorophyll, frequent the **mid- and low-tide zones**. They cannot long endure being deprived of water. Seaweeds provide oxygen, food, and shelter for creatures of the intertidal zone. Larger kelp, with built-in floats and anchored in deeper water, may rival redwoods in height. **Tidepools** form in rocky beach outcroppings to shelter life forms found only



Sea star

in these environments. You can see more animal species here than in a single visit anywhere. Tidepool dwellers must cope with myriad changes—in water temperature, salinity, and oxygen content. Here are barnacles, limpets, nudibranchs, sea urchins, sea stars, and sea palms. The latter, well-anchored by root-like mechanisms called hold-fasts, are erect seaweeds whose flexible stem-like structure can withstand the full force of breaking waves.



Giant green anemone

Beaches
Life on sandy beaches also observes wet and dry zones based on tides and waves. The lower beach is often wetted while upper beaches resemble narrow deserts between sea and lush inland forests. Gulls and mole crabs burrow into wet lower beaches. Sanderlings follow retreating wave lines to forage washed-up organisms.



Brown pelican

Sea Cliffs
Northern park beaches tend to be rocky and backed by sea cliffs. Southern beaches tend to be backed by bluffs. More than half of the park's birds are marine species, some of which nest—often in great crowds—in sea cliffs: murrelets, cormorants, puffins, auklets, gulls, and pigeon guillemots.



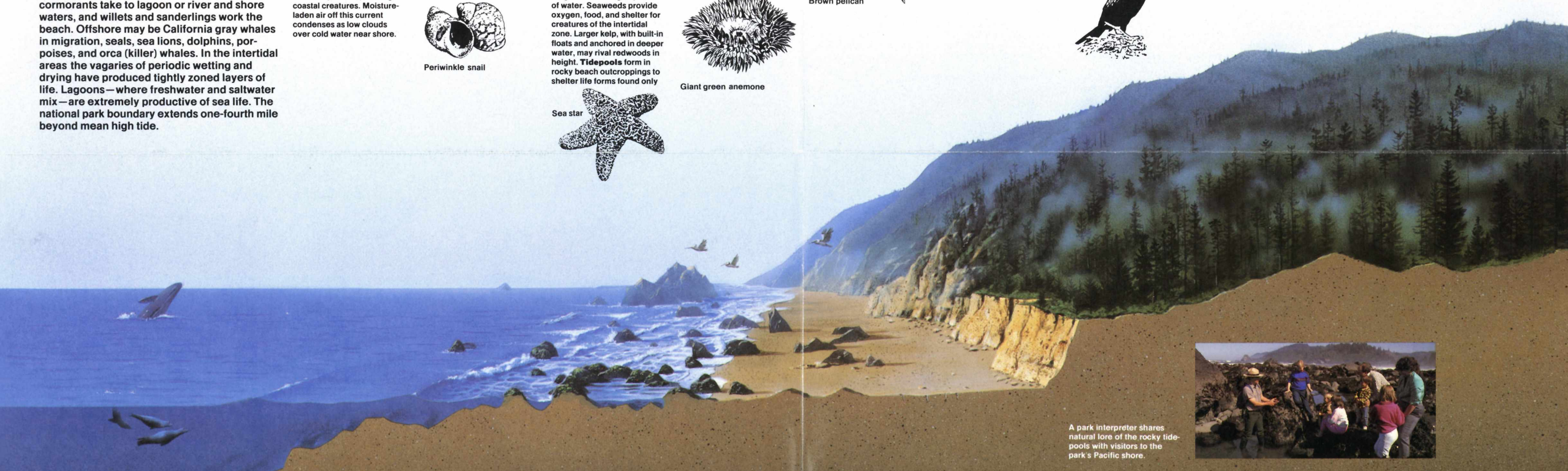
Double-crested cormorant

The Role of Fog
The passage of air warmed by inland heat over cold, near-shore waters creates fog here almost daily in summer. Fog plays a two-fold role that helps approximate the mild, moist climate that prevailed in the Age of Dinosaurs when redwood species grew over much of North America. Bathing redwood forests, the frequent summer fogs bring

relief from dry summers and decrease the amount of water lost through leaf surfaces. Also, fog collects on trees and its dripping contributes additional precipitation. Fog is not essential to redwoods, but its absence would reduce their range.

Woodlands
Forests of the Coast Range's west slope benefit from proximity to the sea in terms of fog, rainfall, and moderate climate. Redwoods favor moist, north-facing slopes where sunlight's effects are less drying. Rivers near sea level also provide hospitable flats.

Seacoast illustrations by Rob Wood



A park interpreter shares natural lore of the rocky tidepools with visitors to the park's Pacific shore.



