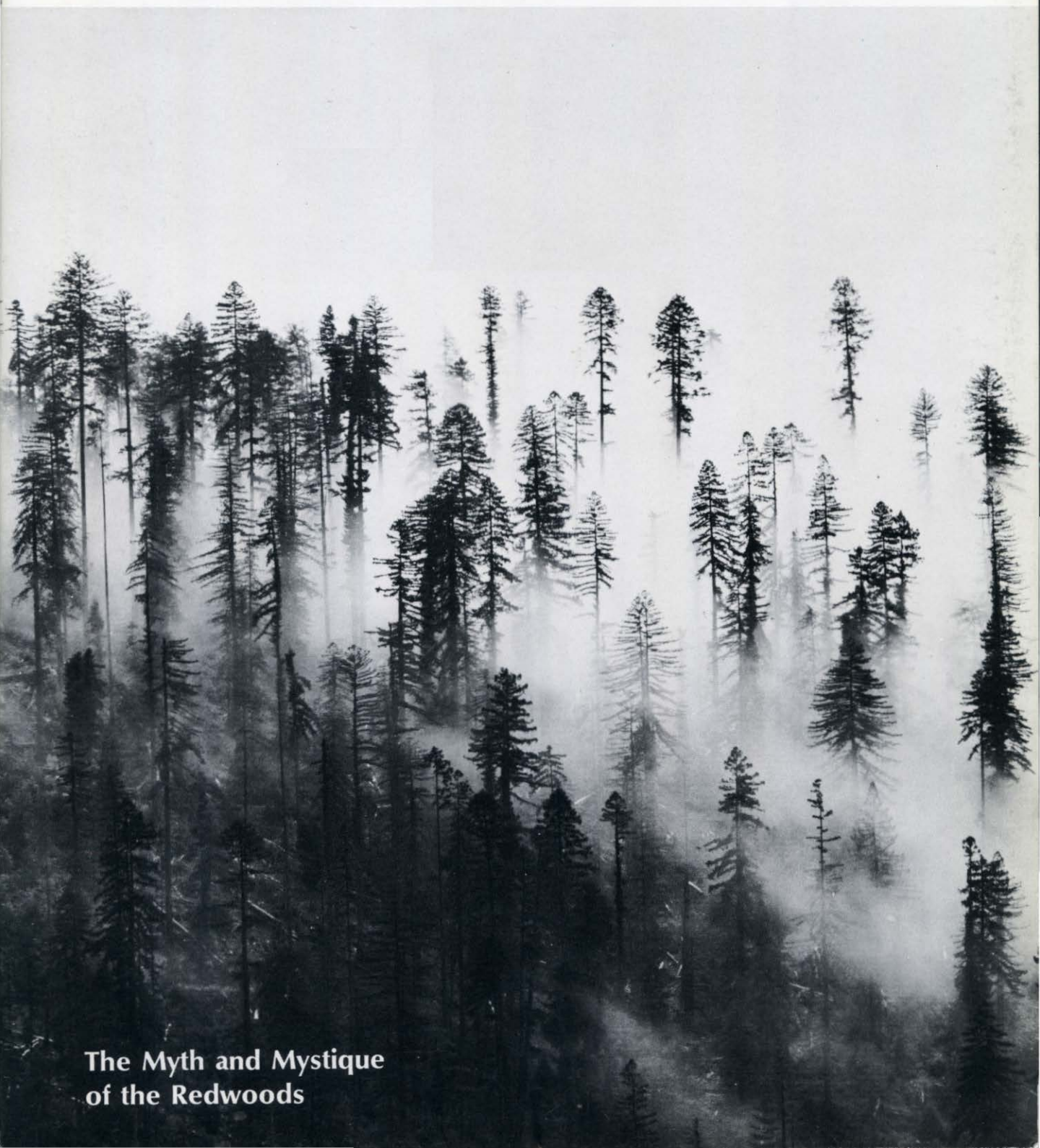


Green America

A QUARTERLY PUBLICATION OF THE AMERICAN FOREST INSTITUTE • WINTER 1973



The Myth and Mystique
of the Redwoods

GreenAmerica

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IN MY JOB, I travel a great deal around the country and have the frequent pleasure of talking to people about America's forests and what's happening to them.

Among the public, the conversation invariably gets around to one kind of tree, which grows in a relatively small area of the country . . . the redwood.

The first question I'm usually asked is why the industry is cutting all the redwoods down. And of course I answer that they are not all being cut down, that the coastal redwood is one of America's fastest growing trees and that companies who own redwood forests are very interested in insuring an abundant future supply of the magnificent trees.

The other thing that comes out in these conversations is confusion between the coastal trees and the giant sequoias of central California such as the fabled "General Sherman."

Then it's my turn to ask a question. And what I ask is: "Have you ever been to the redwood region or seen these trees?" Most of those people across the country with whom I've discussed the situation have never been to the redwood forest. They've only seen pictures.

This issue of *GreenAmerica* will *not* take the place of a visit to the redwood region. We hope it will do the opposite: stimulate you to go there and see for yourself how much of what you thought you knew about this famous American tree is true.

You can spend several days in the rugged upper reaches of the region itself . . . or you can see an impressive stand of smaller trees in the Muir Woods preserve just a half hour's drive from downtown San Francisco over the Golden Gate Bridge.

This issue's poster produces a photographic illusion of a redwood "cathedral." We can provide an unfolded copy in a tube for \$1.

As always, we welcome your comments on *GreenAmerica* and hope that each issue helps increase your understanding of the state of America's invaluable forest resource.

George C. Cheek

*Publisher
Executive Vice President
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Redwoods:

THE PRODUCT

by Phillip T. Farnsworth

Executive Vice President

California Redwood Association

Redwood the product is as unique as *Sequoia sempervirens* the tree. Straight and beautiful, durable and strong, it may be considered among man's most useful renewable resources.

Four generations of architects, landscape architects, and designers have been inspired by redwood's versatility and durability. They have used it in homes, gardens, churches, schools, and commercial buildings across the continent. Because its quality of performance comes from inherent properties not found in other species, redwood has become indispensable in the manufacture of wine and water tanks, food processing vats, pipelines, and a wide variety of other products. There's nothing better for such varied uses as cooling towers, caskets, saunas, silos, sewage filters, insulating walls, and even atomic radiation shields.

The fine architectural applications for which redwood is best known begin with the history of its native state. Early California settlers and the

mission-building Fathers first used redwood because of its availability and beauty. Some of the missions, mills, and ranch houses they built still stand after a century or two of service. The barracks at Monterey and Sonoma, as well as Fort Ross and several of the missions along the California coast offer historic proof of redwood's durability and lasting performance.

Today's style of American architecture started evolving on the West Coast in the latter part of the 19th century. Innovative California architects—Maybeck, Mullgardt, and the Brothers Green—were making handsome use of redwood at about the same time Frank Lloyd Wright's prairie architecture was changing the face of the Midwest. The California architects were using natural materials and new space concepts which were to influence the whole nation.

Maybeck and his contemporaries used redwood in churches and public buildings, but it was the



From the Victorian to the contemporary, another house of redwood, with an oriental flair.

Lumberman William Carson built this spectacular redwood mansion in Eureka, California in 1884.

application of California's unique building material to the informal life style of the West that produced what became known as the California bungalow. This simple, indoor-outdoor structure opened the door, nationwide, to the ideas and style of West Coast design.

The succeeding generation of young architects set about improving the redwood bungalow. Their up-dated designs, which were to become known as the Bay Region style, used sizeable amounts of redwood, but in notably different applications. Massive, hand-carved mantles gave way to soaring ceilings and window walls.

California's preoccupation with outdoor living was reflected in and fostered by the exciting new architecture. Redwood decks, fences, and garden structures were an integral part of the indoor-outdoor living revolution that spread throughout the century.

High performance is the key to redwood's use in hundreds of manufactured products. Most of these fill man's needs for the necessities of life, just as redwood housing often determines his quality of life.

Perhaps the best known of redwood's unusual properties is its resistance to insects and decay. The extractives which make redwood heartwood resistant are also responsible for its familiar rich reddish-brown color. This natural durability means redwood will remain solid long after lesser woods have become dust.

Documented cases exist where redwood has lasted for centuries with negligible deterioration. Over the years redwood stock has been used in applications where other materials, including concrete, proved ineffective. Typical are industrial tanks and bins, caustic acid vats, and sewage lines. Here, redwood performs exceptionally well and often can be re-used.

Just as coast redwood is more fire-resistant than all its neighbors in the forest, so is the wood it produces. The Underwriter's Laboratory recently assessed the redwood's reputation. Following extensive tests, UL awarded redwood the highest rating, a flame-spread classification that is unique among untreated softwoods.

Redwood is indeed a wonder wood. The combination of all of its important physical characteristics—insect and decay resistance, dimensional stability, fire resistance, and strength—makes it ideal in important uses for which more conventional woods cannot compete. Wine tanks, a highly demanding application, are a good example. The tanks must impart no taste or odor to the wine, have a high insulation factor allowing even



The natural beauty of redwood is apparent in these carved animals. Robert Kingsbury was the sculptor.

temperature control, and remain unharmed by idle periods or alternate wetting and drying. Redwood can qualify on all counts and is used in processing over 90 per cent of all the nation's red wine.

Redwood has given man both shade and shelter; useful products and inspiration. To its many superlatives must be added yet another, perhaps the most incredible gift of all. That is its supreme renewability.

No American conifer grows faster than coast redwood. A single acre of young-growth can produce an average of 1,000 board feet of wood fibers a year. Up to 5,000 and 6,000 feet have been recorded on some sites. That's two or three times the ability of most other lumber-producing species.

Redwood, the eternal tree, resident of the planet for 100 million years, is proving that redwood the product is also capable of serving man's needs on a permanent basis. ♻️



The "California atmosphere" is quite often enhanced by the versatility of redwood.

Redwoods:

THE TREE

The Big Trees, Forest Giants, Cloud Sweepers, The World's Tallest or the World's Biggest are some of the names popularly lavished on the two wonders of the western forests: the Coast Redwood and the Sierra Redwood. As detailed by Kramer Adams in his authoritative book, *The Redwoods*, these trees always excited and amazed. He calls them, justly, the "noblest plants on earth."

The redwood of the coastal fog belt is *Sequoia sempervirens*; *Sequoia* from a famous Cherokee chief who certainly never laid eyes on this California-Oregon tree, and *sempervirens* meaning "evergreen."

The redwood of the Sierra was named *Sequoia gigantea* in the middle 1800's and few would quarrel with "gigantea"—which it is. *Sequoia* means that it belongs to the same family or genus as its coastal cousin. But in the late 1930's Dr. J. T. Buchholtz, an Illinois botanist, showed it was not quite so close, based on a microscopic study of the genetic chromosomes of both trees. They are second cousins, and the Sierra family is probably far more ancient than the Coastal. After this, a new family name was established and henceforth the Sierra tree became known unofficially as *Sequoiadendron gigantea*.

Meanwhile some other names had crept in for the Sierra monster. In 1852 a British botanist visited the snow-capped mountains, collected seeds and believing the tree was a new genus named it *Wellingtonia gigantea*, after the British general who won the Battle of Waterloo. An American promptly responded with the name *Americus gigantea*, and the U.S. Forest Service, ignoring everybody, called it *Sequoia Washingtonia*, after the very famous American! *Wellingtonia* it remains, in England, and *Washingtonia* it occasionally is, in the U.S. Ironically, by the strict botanical rules, the British name technically takes precedence for this most American of trees.

In the 1940's yet another long-lost cousin turned up in Central China, a surprise to rival the Giant Panda. Dubbed *Metasequoia glyptostroboides* and called "Dawn" for short, this much smaller version of the redwood has since been propagated world-wide and is doing very nicely. Unlike the true giants, Dawn barely gets to 100 feet, and



SEMPERVIRENS

GIGANTEA

DAWN

unlike its evergreen relatives Dawn loses its needles completely and has to bud afresh every spring.

These three isolated species are the relics of ancient forests whose remains are found as fossilized needles in coal deposits around the world, or as petrified stumps. In geologic times, the redwoods come somewhere in between the firs and the cypresses. They flourished in the Cretaceous period, about a hundred million years ago, but then were reduced and perhaps almost wiped out by successive Ice Ages. Finally they came to live in their present favored, and until modern times, isolated habitats.

Like all conifers, the redwoods bear inconspicuous male catkins at the ends of their branches and the seed bearing cones hang farther in. It might come as a surprise that the cones of these huge trees are quite small. *Sempervirens'* cone is only about one inch long and *gigantea's* not more than three inches—both vastly inferior to the colossal eighteen-inch cones of the California sugar pine.

Gigantea can develop only from seeds. *Sempervirens* arises from seeds, but also in another remarkable fashion: it sends up shoots from the stumps and roots of predecessor trees. When a *sempervirens* is felled, a ring of new growth appears at the stump edge and after a few years several considerable trees will be found growing in a ring. In many cases, the new trees sprout from the stump itself, occasionally in clusters of two or three. *Sempervirens* grows rapidly, taking nourishment from the parent root system and competing with each other for food, water, and light. The survivors of this competition ultimately become big trees in their own right. (Here it should be said that redwoods have no tap root, but an immense, shallow water-gathering root system.)

Sempervirens often grows to 300 feet and above. Its diameter at the base may be 15 to 20 feet. In mature trees the trunks sweep skyward as immense straight columns, bare of boughs for often a hundred feet or more. The silhouette of the tree is graceful, tapering gently in trunk and branches. Although most are in the 100-200 year age group, some sempervirens are over 500 or 600 years old. Young trees are elegantly conical in form with drooping branches, the lower ones sweeping the ground.

Gigantea displays a quite different profile, one of immense solidity. The base may be 30 feet or more in diameter (thus the famous "drive-through" Wawona tree). As it gradually tapers toward a maximum height of over 300 feet (it is still massive at 100 feet), the first branches appear. From here on up the tree silhouette is roughly cylindrical, except at the very top. The branches droop slightly and are rather sparsely clad in foliage. Enormously imposing and impressive, gigantea awes by its vast bulk; and staggers the imagination by its age, for by counting its rings, specimens have been dated to more than one thousand years B.C.

The timber of gigantea was never considered especially valuable except from curiosity. Most Sequoia giganteas are contained in national parks and forests, and it is no longer logged. Far different is sempervirens, and luckily it is estimated to be in one millionfold greater supply than gigantea. As detailed in Kramer Adams' book, its wood has just about every characteristic that makes for the ideal.

From its mode of growth it might be imagined that redwood is straight grained—and it is. It is lightweight and easy to saw, being free of knots, and it neither splinters, splits nor warps. It can really produce king-sized planks on demand—six feet or more wide! Its use in many of California's historic buildings and monuments, still standing because of their redwood fabric, proclaims its durability. It resists attack by rodents, insects (including termites), and fungi. The absence of fungi means the absence of rot. The redwood is low in pitch and resins and this makes it fire resistant—a property particularly noted in the San Francisco fire of 1906. The redwood tree itself is fire resistant for another reason: the thick bark is woolly and stringy and resists fire. Redwood bark is a valuable by-product, useful as an insulating material and as an organic insect controller. Strewn on dirt walkways, it smothers the weed population.

Redwood is water resistant and is widely used for water storage tanks and flumes for conducting water, for shingles, planters, and indeed for any

outdoor structure or article from porch furniture to stadium benches.

Conspicuous in a redwood grove are the "burls." These appear as knobby growths on trunk or base and the latter may be of monumental size. They represent growth of tree cells or budlets, and are started up by a blow from a falling tree or branch or other accidental happening.

Live or green burls, a collection of small buds waiting to be released, are the prize of tourists to the redwood region. When a small section is placed in a bowl of water, the burl is capable of sending up bright green shoots which last for several months without soil.

When dried out, the burls harden, and having the appearance of a dark birdseye maple, are milled and carved into table tops, wooden jewelry and other novelties.

Besides utility, the pioneers recognized and named the redwood for the overall hue of its heartwood which gives to anything made of redwood a peculiar and intrinsic beauty. Wonder and utility are indeed part of the conflicting mystique of the redwoods: the gap between a national treasure of surpassing beauty and a natural resource to be put to use. 🌲

Big Trees / Big Issues

Controversy has been a frequent companion of the big trees. Over the years, charges and countercharges, litigation, and media coverage have underscored the emotionalism that has always been connected with the redwood. The issues are abundant. How do you balance preservation of beauty with the need for those same resources as useful products? Do you decide to save scenery at the expense of many peoples' jobs? Can you sustain commercial productivity in the face of increasing conversion of forestlands to non-commercial government and private ownership?

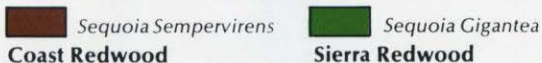
Some issues grow from a lack of knowledge. *Fiction:* the forest industry is involved in a massive harvesting of the bigger and older trees. *Fact:* logging is almost totally confined to the less spectacular but vigorously growing younger trees. *Fiction:* the industry employs haphazard, cut-and-run logging methods that upset the natural balance of the forest. *Fact:* all area companies employ specialists who respect the land and work for a balance of harvest and new growth and to improve the quality of the tree stock.

Redwoods: THE REGION



RANGE OF THE TWO CALIFORNIA REDWOODS

Source: U. S. Forest Service



The coastal redwoods (*Sequoia sempervirens*) form a patchwork quilt of tall timber along California's rugged, 500-mile, 15-county Pacific Coast rim from Morro Bay northward into Oregon. The country is as brawny as its redwoods. Rough-cast cliffs absorb the battering of an angry Pacific. Hemlock, pine, spruce, firs, and cypress face the first violent impact of wind and salt spray that the redwoods choose to avoid. Shifting soil and high erosion rates underscore the adolescence of the land. The earthquake is an infrequent but not unexpected visitor.

Fog and moisture abound, prompting the myth that the redwoods draw life-giving water to themselves through some magnetic miracle. The north coast produces 20 per cent of California's water on only 10 per cent of its land area. This is a rain forest, and turbulent floods are not uncommon.

Ironically, the threat of fire looms large from August to October. Low humidity begets dry timber and forest managers pray for the usual pervasive dampness. And well they might, for the huge cost of putting out a north coast forest

fire is \$50,000—not including timber and watershed losses.

Some of the north coast forest just inland from the ocean is tall, dark, and silent. Shade from the flora skyscrapers inhibits the growth of browse that would support wildlife, which abounds in warmer, drier upland regions and in other areas where men and nature have opened the forest floor to plant life and game animals.

Redwood country can be a gentle lady, particularly in the spring. A color kaleidoscope of mini-growths—rhododendron, mountain iris, fairy bells, dogwood blossoms, lady slippers, tiger lilies, star flowers—bursts from the earth in a fierce competition for sunlight and moisture.

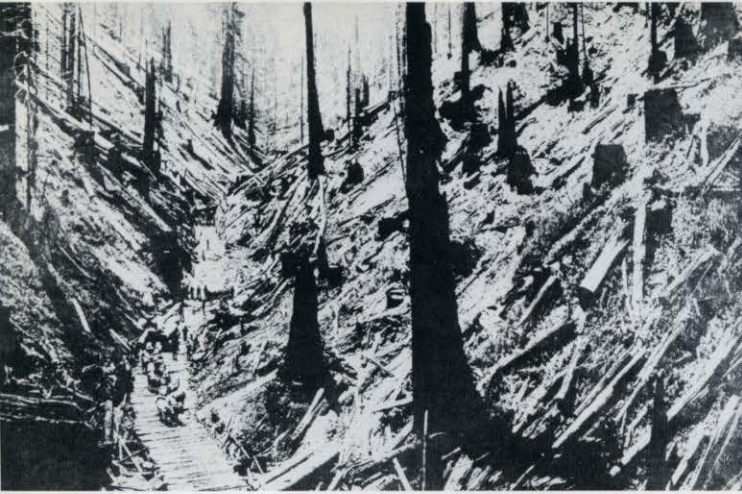
Still, spring's floral delicacies only serve to accentuate their massive big brothers. The premier redwood stretches to 367 feet (a football field and then some) and weighs more than a million pounds. The average coast redwood lives for two centuries, supported by a trunk up to 20 feet in diameter.

It is true that sempervirens is billed as the tallest tree in the world, but it is neither the oldest nor largest in girth. Sempervirens rates fourth in age among trees native to California, and individual specimens of several trees outrank the coast redwood in circumference.

The inland Sierra redwoods (*Sequoiadendron gigantea*) are earth's biggest form of life. Though they lose the race for the sky to their coastal relatives by as much as 100 feet, they can weigh in at 2.5 million pounds with a diameter of more than 32 feet.

The gigantea stands high on the western slope of the Sierra at altitudes from 3,000 to 8,000 feet. This, too, is tough mountain country, subject to sudden climatic change, earthquakes, and erosion. But nature gave the gigantea the character to withstand its mutable environment. Its great mat of roots can cover three or four acres—an anchor against disaster. The entire 250-mile strip of Sierra redwoods is preserved in government parks and forests.

On the coast, however, the redwood is a significant part of the economy. Nearly a million acres of commercial forestlands (most of them privately owned) comprise a sizeable chunk of real estate.



Three photos show redwoods' renewability. Above, Bear Gulch, California after logging, 1888.



Bear Gulch 40 years later. Redwoods, all a result of natural reproduction, line both sides of the gulch.

A third of this acreage is in mature redwoods. The balance is in thriving young stands—the harvest of the future.

The California boom—and its accompanying need for more schools, homes, buildings, and myriad other products—has made it incumbent upon the forest industry to conserve intelligently and use nearly all of every tree. As important as maximum use is sustained yield—the key to perpetuating the species. Thoughtful attention to regeneration research, management, and land use promise a productive future for the industry.

Paradoxically, the commercial forest is a haven for the big tree. Logging, road building, and slash burning create violent conditions that, according to ecological studies, promote reproduction and survival of the redwood. Sunlight, rich soil, and lessened competition for nutrients—the results of this commercial upheaval—are all nourishers of the redwoods.

And the region's economy is nourished by more than 20,000 jobs the redwoods provide—

for people like loggers, engineers, foresters, salesmen, mill hands, and railroad engineers. And some forty redwood product companies try to make those jobs easier by investing an average \$10 million annually in new plants and equipment. This also expedites the timber flow. But the tall order of felling the trees and getting them to mills belongs to the rugged individuals who are as much a part of the region as the redwoods themselves. Equal measures of brute strength, razor-sharp reflexes, and ingenuity get the job done.

These are honest, friendly, individualistic people. They're proud of their unique regional character and their verbal excursions into the folklore of the forest can be unabashedly embellished and exaggerated. They'll tell you about the innocent fun of times past in Eureka, California, when Saturday night fishermen-logger fistfights endured until the last man was standing. Then they'll move on to the still controversial tale of the elusive "Big Foot," the Pacific northwest's version of the abominable snowman. And they're sure to dust off the one about the woodsman who chopped for a week on one side of a redwood before discovering another chopper who had been working for eight days on the other side of the same tree.

The local storytellers don't all earn a living from the trees. Commercial ocean fishing is a thriving business, with a smorgasbord of species that includes abalone, crab, clam, cod, salmon, and rockfish. Old stone wineries (using redwood casks) and their neighboring vineyards provide another shot-in-the-arm for the economy. Farms and ranches are scattered in the soil-rich lowlands. And, of course, the region is a beacon for tourists and recreationists.

Though most visitors are camera-carrying scenery watchers, there's plenty of diversion for the rustic activist. In hundreds of miles of coastal streams, the fisherman finds trout, salmon, bass, steelhead . . . with a smattering of sturgeon. The hunter can pursue deer, elk, bear, squirrel, quail,

VITAL STATISTICS

	Coastal	Sierra
Oldest	2,200 years	3,200 years
Tallest	H. A. Libbey Tree	California Tree
Height	367 feet	310 feet
Location	Redwood National Park	Kings Canyon National Park
Largest	Stout Tree	General Sherman
Diameter	20 feet	32.2 feet
Location	Jedediah Smith State Park	Sequoia National Park
Average		
Cone Size	1 inch	2½ inches
Average Number of Seeds	30 to 60	100 to 250
Area Elevation	0-3,000 feet	3,000-8,000 feet



Bear Gulch in 1966, 78 years after logging, shows the great regenerative aspects of the redwood.

grouse. Sportsmanship is more than a tradition—with all such activities under the tight rein of the California Department of Fish and Game. Camping, hiking, swimming, biking, and boating are popular pursuits.

Visitors can take a train ride into the past which also gives them a modern view of harvesting, reforestation, and milling operations. In several "demonstration forests" the motoring tourist can find further enlightenment about the management of the remarkable redwood resource.

The setting for these adventures comes from a commitment to intelligent multiple-use land management from both government and industry. The U.S. and California governments have a commendable history of balancing recreation and resources in their forestlands. Industry has been a willing partner.

One of the region's premier attractions is the 30,000-acre Redwood National Park, established in 1968 (augmented by 28,000 acres of contiguous state park ownership). The present park consists primarily of lands formerly owned by the forest industry and now being purchased by the federal government. Two large blocks of existing California state parkland are being considered for inclusion in the National Park.

Nine forest industry companies have opened up more than 350,000 acres of land to public use under the Redwood Industry Recreation Areas program. Recently, a \$6 million grove was given by a forest industry company for public administration and use.

Government and industry agree that an enlightened approach to managing this colorful region can create a natural balance of forest products, clean air and water, fish and wildlife, recreation and scenery.

But the big tree itself is a manager, dominating everything around it—the people and their life style, commerce, the forces of nature. The redwood, in its majesty, has the ultimate power: creating its own environment. 🐿

Things to See and Do in Redwood Country

Ride a Redwood Train

Roaring Camp and Big Trees Narrow-Gauge Railroad: Six miles up Highway 9 from Santa Cruz, near Felton. Winds into the big trees, past Henry Cowell Redwoods State Park, up Bear Mountain and back.

The Skunk (California Western Railroad): From Willits on the Redwood Highway across the range and through young growth redwood wilderness to Ft. Bragg on Highway 1—or vice versa. Two hours each way. Rest and refreshment stop midway, alongside a Boise-Cascade Tree Farm.

Klamath and Hoopow Railroad: Former steam logging train at Old Klamath. Terwer Valley off-ramp just north of the Bear Bridge across the Klamath River. Loops back into timber company lands above the river.

Or Visit

Church From One Redwood: Santa Rosa. Built in 1875 from a single tree. In Juillard Park across from Luther Burbank's home.

Petrified Forest: Five miles west of Calistoga on the Calistoga-Santa Rosa Highway. A graveyard of big trees. Massive stone redwoods created when eruptions from Mt. St. Helena hurled them down and buried them thousands of centuries ago. Admission fee.

On the Famous Redwood Highway

Chandelier Tree: Leggett Valley, a drive-thru tree. Entrance fee.

Tree House: Piercy. The Tallest One-Room House in the World, according to Believe-It-Or-Not Ripley. Once housed twenty-nine convicts building the Redwood Highway. Now a gift shop.

Shrine Tree: Myers Flat. A drive-thru tree. Admission fee.

The Squirrel: Garberville. An open-air bus for tours through the tall trees of the Old Redwood Highway to Myers Flat and return. Seasonal (in summer).

Logging Museum: Scotia. Made of whole redwood logs. Contains many relics and displays showing the history of redwood logging in the north woods. The entire town of Scotia is built of redwood.

Sequoia Park: Eureka. A small but beautiful grove of second growth. Fort Hill above the city. Free.

Trees of Mystery: Three miles north of Klamath. A private park of unusual trees and huge wood carvings. Mighty figures of Paul Bunyan and Babe, the blue ox, greet visitors at the entrance. Admission fee.

Poster photography by George Milazzo