

A Mellifluous

ROAR

Is it enough to draw a boundary around a stand of oaks and call it protected? In the past decade, ecologists decided it wasn't. Other factors are at stake: those that enable forests to regenerate, and fish to spawn, and birds to have enough winter forage. And so, in the early 1990s, The Nature Conservancy developed a landscape-level approach to conservation at some 75 sites that it named the Last Great Places.

The Cosumnes River watershed is one of those places. A slice of central California from the Sierra Nevada to the Sacramento-San Joaquin Delta, the river today is a vital site within the Great Central Valley ecoregion, where the Conservancy aims to conserve a cross section of the valley's natural communities and native species. There is no other riparian corridor like it in the valley. As you'll read in "A Mellifluous Roar," this free-flowing river and its forests and fields have been fertile teaching ground for some of conservation's most elusive lessons—namely that the ability to adapt, or go with the flow, is essential to conservation at this scale.

—The Editors

photography by James A. Martin

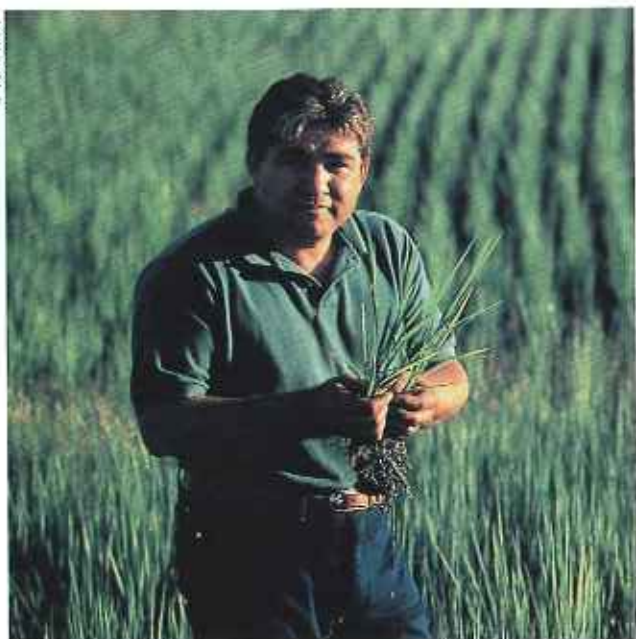


A valley oak spreads its craggy limbs beneath the snow-capped Sierra Nevada. Flooded rice fields [left] create winter wetland habitat for migratory birds.

Dawn, and I'm standing on a roadside at the foot of some tall valley oaks, staring down at a river that shatters my California illusions. In the Golden State, rivers are supposed to be meager, dusty little things. But this one—the Cosumnes—looks anything but small, or dry. It sprawls 300 yards wide. Water the color of *café latte* swirls waist deep between the oaks. What this river most closely resembles is a Louisiana bayou.

A delicate lace of birdsong weaves through the upper branches of the surrounding trees. While I savor the artistry of warblers and goldfinches, I hear another sound, too—the growl of diesel engines rumbling along Interstate 5 a few miles away. The steady drone reminds me that on this spring morning in 1998, as we Californians poke our heads up from a long, exceptionally wet winter, more than just rivers are running at full tilt.

by David Wicinas



The state's economy also is surging after a cold snap in the business climate that lasted most of the 1990s. Many communities in the Central Valley are booming. That could spell trouble for the place where I stand, The Nature Conservancy's Cosumnes River Preserve. It's sandwiched between Stockton and Sacramento, two cities experiencing heady growth spurts. Change is coming, and I wonder how these valley oaks before me will cope.

During his exploration of California in 1844, John C. Fremont traveled the *Rio de los Cosumnes*. (The name may derive from a Miwok phrase meaning "people of the salmon.") His *Geographical Memoir* describes the surrounding country as laced with sloughs, ponds, oak woods and fertile bottomlands.

Over the next few decades settlers drained those ponds, felled the oaks and planted crops on the rich forest soils, transforming the Cosumnes—and the rest of the Central Valley—into America's most productive farmland. For

The Conservancy works with farmers such as Allen Garcia [above] to help restore the Cosumnes River watershed. Mike Eaton [below, foreground] and Rich Reiner paddle over inundated farmland, with the "accidental forest" in the background.



more than a century the Central Valley has served as the nation's salad, fruit and mixed-nut bowl. But over the last two decades much of this prime agricultural land has succumbed to suburban sprawl.

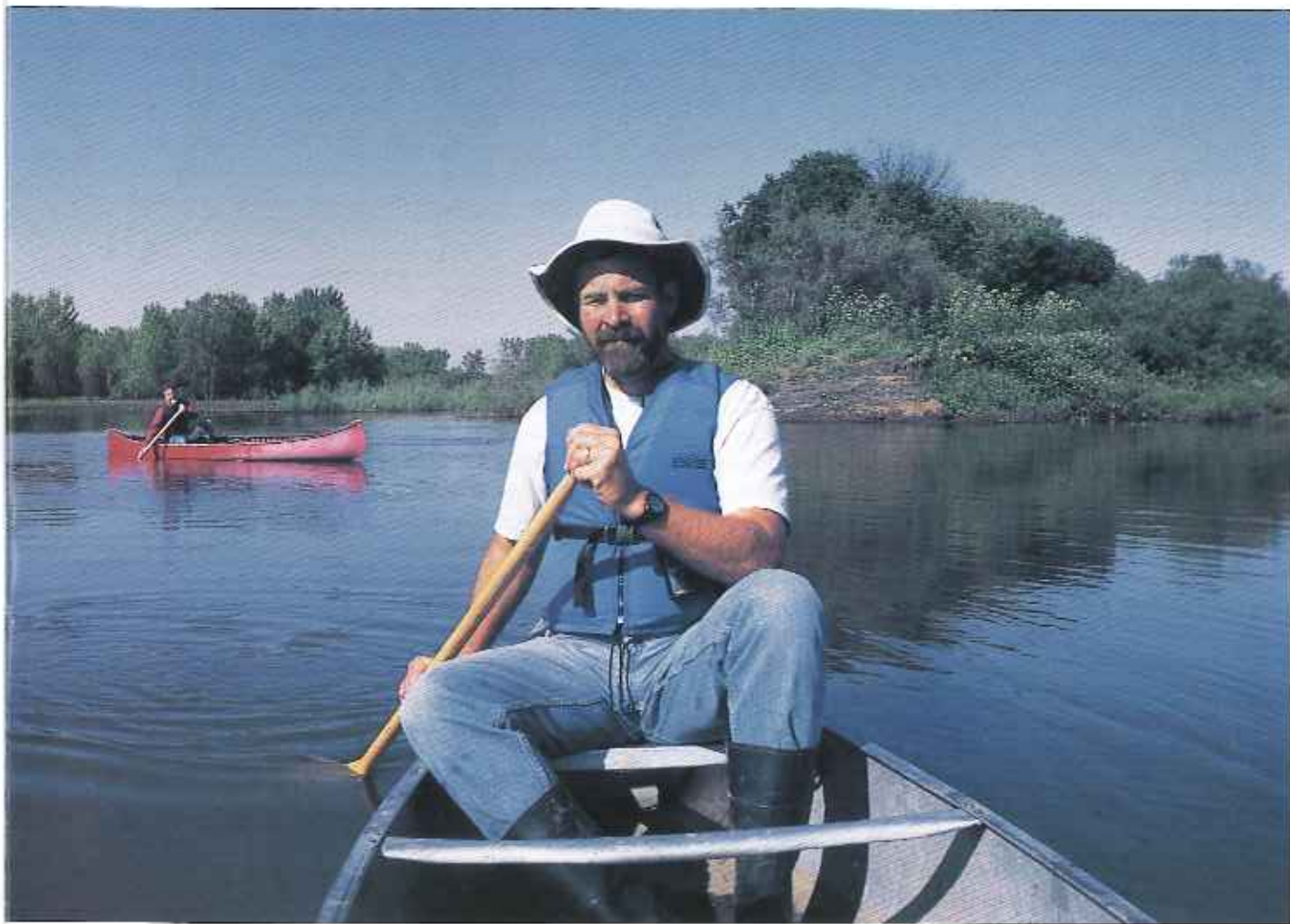
By the 1980s, the Conservancy was responding to California's galloping urbanization by attempting to preserve rare natural communities, such as forests of *Quercus lobata*, the valley oak. Although advertisers love to use images of this craggy tree to symbolize California's natural heritage, the oak itself was disappearing throughout the state at an alarming rate.

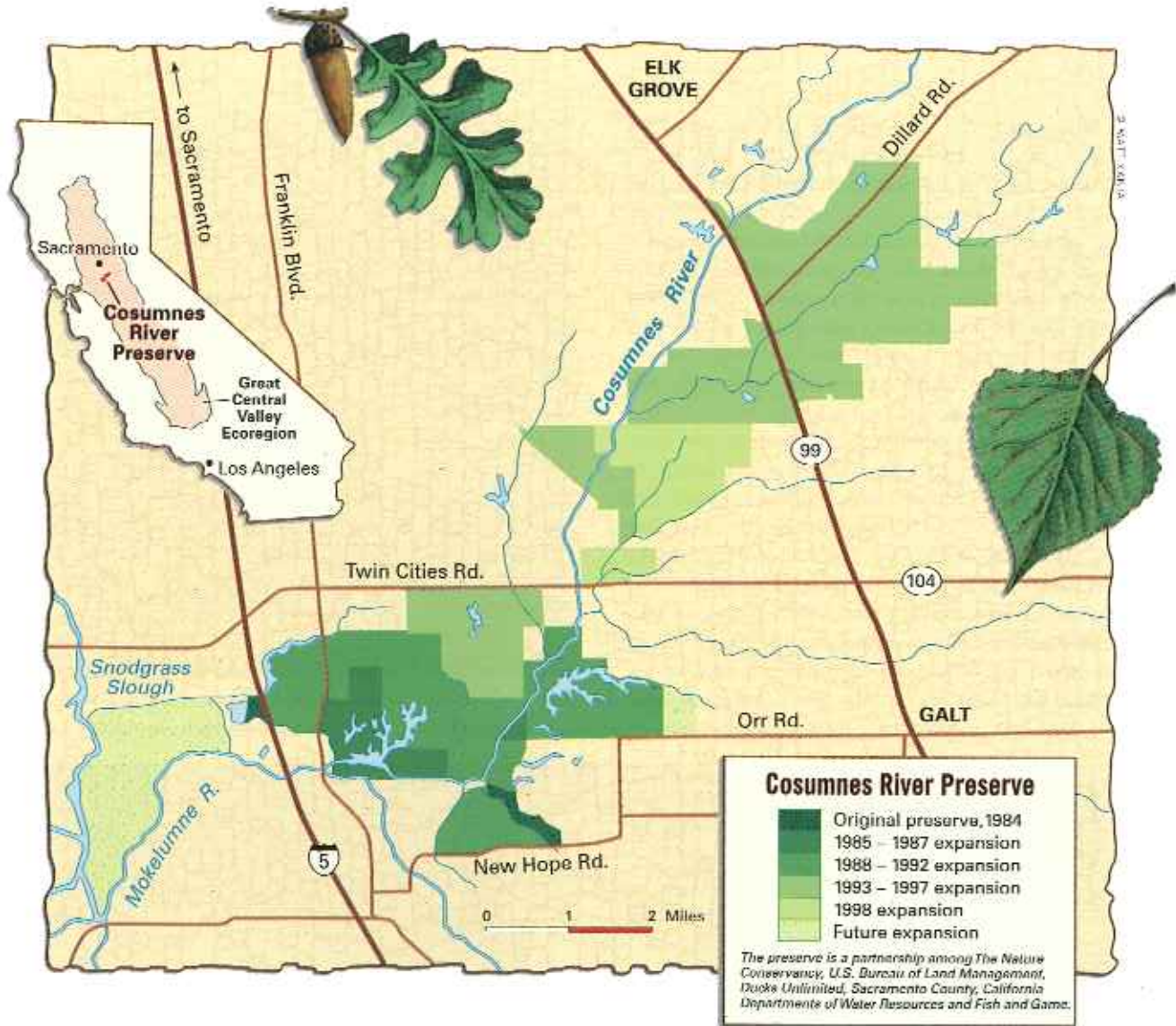
Looking for remnant populations of *Q. lobata*, the Conservancy surveyed the entire Central Valley and found the best stands along the lower Cosumnes River. But only after the dedication of the then 800-acre Cosumnes River Preserve in 1987 did scientists begin to understand the true value of the river and its interwoven natural systems. Valley oak forests thrive here and almost nowhere else because the Cosumnes is the last undammed river in the Central Valley. The landscape is still subject to a rhythm of repeated winter floods. Swamp oaks, as valley oaks are sometimes called, reproduce well in the deep alluvial soils, and the river's fre-

quent inundations help prevent non-native species from invading the forest's understory. Eventually the Conservancy realized that to preserve and possibly expand the Cosumnes's oak forests, it had to maintain the river's natural flood regime. In other words, it needed a broader vision.

In 1993, as part of its Last Great Places initiative, the Conservancy proposed a plan to protect the ecological processes of the entire Cosumnes watershed, an area 1,000 times larger than the original preserve. The proposal called for the Conservancy to incorporate working farmland into the preserve; establish cooperative agreements with neighboring landowners and water and flood-control authorities; and share ownership and management responsibility with the U.S. Bureau of Land Management, Ducks Unlimited, Sacramento County and the California departments of Water Resources and Fish and Game. Only by moving beyond its hallmark approach of buying land could the Conservancy hope to protect a 1,200-square-mile watershed.

Mike Eaton, director of the Cosumnes River project, is a big man with a baby face, a ready laugh and a seemingly unflappable manner, even as he jockeys our





four-wheel-drive truck down a rutted levee road. With tires spinning in the muck, he laughingly describes his approach to conserving a complex ecosystem that includes both river otters and real estate arbitrageurs. "Theoreticians would call what we practice here 'adaptive management.' That's a polite way of saying we don't know exactly what will happen, but we try to move in the right direction and adapt."

Black mustard and wild oats brush against the side-view mirrors as we jolt down a path separating two submerged fields, both part of the preserve. Recognizing that flooded rice fields can serve as surrogates for marshland—waterfowl habitat that is being lost to development in the Central Valley—the Conservancy has formed an unusual partnership with organic rice farmer Allen Garcia. Most rice growers in the Central Valley break down rice stubble by burning their fields, but Garcia floods his, creating wetland habitat and forage for pintail, widgeon, avocet, red-legs, mudra swan and greater sandhill crane.

From the levee, I see that more than just rice fields lie submerged. The Cosumnes, a modest river in midsummer,

has flooded at least 3,000 acres of the now 14,000-acre preserve. The best way to get around is by boat—or backstroke. Eaton and I launch a canoe from a low levee and angle across a large square lake, last year a cornfield.

As we paddle east under a glorious blue sky, Eaton verbally hopscotches from talk of levee maintenance to his boyhood years spent in the neighboring town of Galt. Emerging into the next flooded field, we startle a huge flock of coots. They take wing, and their feet skittering over the surface sound like the rush of a distant waterfall.

We glide past some 40-foot-tall cottonwoods, and I feel what must be a typical human response. These trees are father figures, and I am a child at their knees. But emotions can be misleading. "The cottonwoods are barely 12 years old," says Eaton.

The Cosumnes staff call this grove the "accidental forest." Rich Reiner, area ecologist for the Conservancy, explains why later at the visitors center. On first impression I think Reiner presents a detached, professorial air—perhaps a combination of his white beard and bemused expression. But when he describes his activities, his arms

swing in big, expansive gestures, his voice lifts, and I see a man in love with his work.

"Forests once covered tens of thousands of acres along the Cosumnes," says Reiner. Initially, he and his colleagues hoped to restore several thousand acres. They marshaled volunteers, including many local schoolchildren, to hand-plant oak seedlings. But after five years their painstaking labors yielded only a few hundred acres of new trees—a valuable gain, yet far short of Reiner's expectations. Clearly, to restore the riparian forest, the Conservancy needed to paint the landscape with a bigger brush.

Aerial photographs are strewn across the table in front of Reiner. He taps a tiny green wedge formed by two intersecting levees and says, "That's the accidental forest." Then he shows me another photo. "I noticed in this picture—the forest wasn't there."

The second picture was taken in 1985. Earlier that year a levee had broken, and floodwaters spread a plume of sand across a wedge of neighboring farmland. The farmer who worked that parcel repaired the levee but decided against releveling his field because it cost too much. Instead, he planted corn around the sandbar. Willows and cottonwoods immediately reclaimed the bare sand. Organic matter accumulated. The cottonwoods grew tall enough to attract scrub jays, and they buried acorns in the deepening soil. After five years valley oaks began to sprout—without any human assistance. Soon a dense grove was sheltering beaver and birds.

As our canoe coasts away from the accidental forest, Eaton says, "Over the next 50 years we believe those cottonwoods will die or fall victim to beavers. Valley oaks will fill in the forest canopy."

Inspired by the accidental forest, the Conservancy staff decided to invoke an "intentional forest." The result—a quarter mile and a quick paddle away—is a long stand of half-submerged cottonwood saplings, all grown using what Rich Reiner calls natural process restoration. That's a fancy term for punching a hole in the levee and letting nature do the grunt work.

In the winter of 1995-96, they used what has become one of their principal restoration tools: a Caterpillar D-9 tractor. They bulldozed 50 feet of levee on the preserve and waited for the winter floods.

"Some of the best ecologists in the world stood out there and predicted what would happen," says Reiner.

"They said a sandbar would form, the water would drop, cottonwood seeds would land and seedlings would grow." All that proved true.

The experts did not predict what happened next. A late-season flood stripped the sandbar of its new seedlings. "We thought we'd have bare sand for a year," continues Reiner, "but to everyone's surprise more cottonwoods grew." Mixed in with the sand were cottonwood sticks, many the result of beaver cuttings. Soon a thousand trees established themselves, all from vegetative reproduction.

An unexpected bonus of the intentional forest was the discovery that juvenile salmon frequented the flooded field. "Fishery biologists," says Mike Eaton, "think this may be one of the critical missing links between the salmon's spawning grounds and the ocean. They need nutrient-rich places like this to bulk up before they make the transition to salt water."

The salmon's gain could have been the sandhill crane's loss. In previous winters these threatened birds had been using this field for overnight roosting. "If we were taking

the traditional single-species approach to managing habitat, that would be a no-no," admits Eaton, "but as our thinking evolved with Last Great Places, we started looking at the entire landscape. We feel this is a reasonable trade-off because we've been adding crane habitat with our rice-farming program."

Of course, it's easy to fire up your D-9, bulldoze a levee and kick off some "natural process restoration." It's another matter to do so with the community's blessing.

Most people think California is a dry place, but in 1862, to navigate the streets of Stockton or Sacramento, you needed a boat. Recent winter rains have threatened to revive urban yachting in the Central Valley.

Consequently, farmers along the Cosumnes get prickly about the subject of flood management. They have watched many neighbors plunge into bankruptcy, due in large part to the cost of levee repairs. None of their competitors in the Central Valley must incur the annual expense of restraining a wild river.

To alleviate anxieties about the proposed levee breaching, the Conservancy hired a hydrologist. His detailed analysis showed that removing or setting back levees on the preserve would lower flood levels for the surrounding farmland. After inviting neighboring landowners to tour the site of the proposed levee breach and conducting pub-



Trumpeter swans flock to flooded fields along the Cosumnes, where an experiment in adaptive management has been a watershed for conservation.

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lic meetings, the Conservancy succeeded in convincing the community that breaks might benefit everyone.

"Then the really hard work started," says Rich Reiner. No one in the federal, state or local government knew how to issue permits to break a levee. Each agency pointed to the next as the ultimate authority. Laughing, Reiner says, "Finally we had to get them all together and sign at the same time."

This past year the Conservancy bulldozed levees upstream along the cornfield where Eaton and I first launched our canoe. The Army Corps of Engineers, an agency renowned for its love of concrete, contributed half of the funding. It's experimenting with "nonstructural flood management solutions." Eventually, the Conservancy hopes to work with the local community and flood-control authorities to remove or set back levees along 20 miles of the lower Cosumnes. Already one neighboring farmer has supported the concept of floodplain expansion as preferable to annual levee repair.

To date no one has fully assessed the value of this program, though anecdotal reports suggest that the inten-



The muddy waters of the unfettered Cosumnes blend with the green Mokelumne, a river bent to human will.

tional levee breaks did indeed lower upstream river levels during the past winter. Jeffrey Mount, professor of geology at the University of California-Davis and author of *California's Rivers and Streams: The Conflict Between Fluvial Process and Land Use*, suggests that, ultimately, the most significant impact of the levee breaks will be as a learning tool for the nation and the world. "We are finally going to get a chance to evaluate the ecological and economic benefits of promoting floods on the floodplain."

Eaton and I portage over a berm and slide our canoe into a slough. Before we shove off, I pause for one last look back over the watery field. In my mind's eye, I see the future.

In 10 years thousands of cottonwoods will be looking patriarchal. Thickets of willow will surround them. Valley oaks will have elbowed into the mix. Floods will have eroded the existing levees, scouring channels through the fields, depositing new sandbars, triggering new cycles of growth. From the remains of an old cornfield, a rich mosaic of forest, field and marshland will have arisen.

Change is indeed coming to the Cosumnes, and on this April day the transformations have already begun. As Jeffrey Mount observes, the natural world here is exploding "in response to water on the land, rather than water handcuffed to the channel. . . . There is a mellifluous roar of springtime life."

Late in the day I stand on a low bridge overlooking the confluence of the Cosumnes and the neighboring Mokelumne River. Rosy light fills the sky. From the top-most branches of a cottonwood, a yellow-billed magpie calls *queeg, queeg*.

I consider something Rich Reiner said earlier that day. "The Cosumnes River Preserve embodies The Nature Conservancy and the changes it's going through, starting with the vision of preserving a single community—an individual stand of oak trees—to today, when we're working with entire landscapes and ecoregions, cooperating with local communities, experimenting with new techniques. This is the future of conservation."

The Mokelumne, an engineered river, the drinking fountain for half the Bay Area, flows calm and green until it joins the bustling, muddy flow of the Cosumnes. Before me, brown water mixes with green in plumes and eddies like cream poured into coffee. Here two worlds meld. On the Mokelumne we humans are bending nature to our will, while on the Cosumnes it is we who are learning to yield to the ancient rhythms of a changing landscape.

Crossing the bridge, I look downstream, and the two rivers are one. ♣

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ABOUT THE NATURE CONSERVANCY

The Nature Conservancy is an international non-profit membership organization whose mission is to preserve the plants, animals, and natural communities that represent the diversity of life on Earth by protecting the lands and waters they need to survive.

Founded in 1951, The Nature Conservancy and its 900,000 members have safeguarded more than 10 million acres in all 50 states and Canada. The Conservancy has also worked with like-minded partner organizations to preserve more than 57 million acres in Latin America, the Caribbean, the Pacific, and Asia. The California Regional Office is the Conservancy's largest state program and a leader in program development. Headquartered in San Francisco, The Nature Conservancy of California has more than 110,000 members and has protected nearly 900,000 acres in the state.

The Nature Conservancy bases its activities on sound science and uses non-confrontational, market-based economic solutions to protect critical habitat — a “win-win” approach to conservation. Working only with willing sellers and donors, the Conservancy protects land through gifts, exchanges, conservation easements, management agreements, purchases from the Conservancy's revolving Land Preservation Fund, debt-for-nature swaps, and management partnerships. Believing that the protection and enhancement of wildlife habitat can be compatible with rational economic growth, the Conservancy encourages and participates in environmentally friendly farming, ranching, land development, and other productive land use activities with private partners.

So that the endangered native plants and animals that live in the protected areas can flourish, The Nature Conservancy manages its preserves with the most sophisticated ecological techniques available, including reforestation, prescribed burns, and the removal of non-native species. Most Conservancy preserves are open to the public for educational uses and recreation such as hiking, nature study, bird watching, and photography.

As a nonprofit, tax-exempt organization, The Nature Conservancy depends on individual and corporate contributions, foundation grants, and membership dues to continue its mission of protecting biological diversity.

For more information about the Cosumnes River Project, please contact Mike Eaton, Project Director, at 916/683-1699 or <meaton@nmc.org>. For gifts or contributions, please contact Carolyn Roth, Associate Director of Development, at 916/449-2854 or <croth@nmc.org>. Visit the project's web page at www.cosumnes.org. For more information about The Nature Conservancy of California, please call 415/777-0487.

