CALIFORNIA

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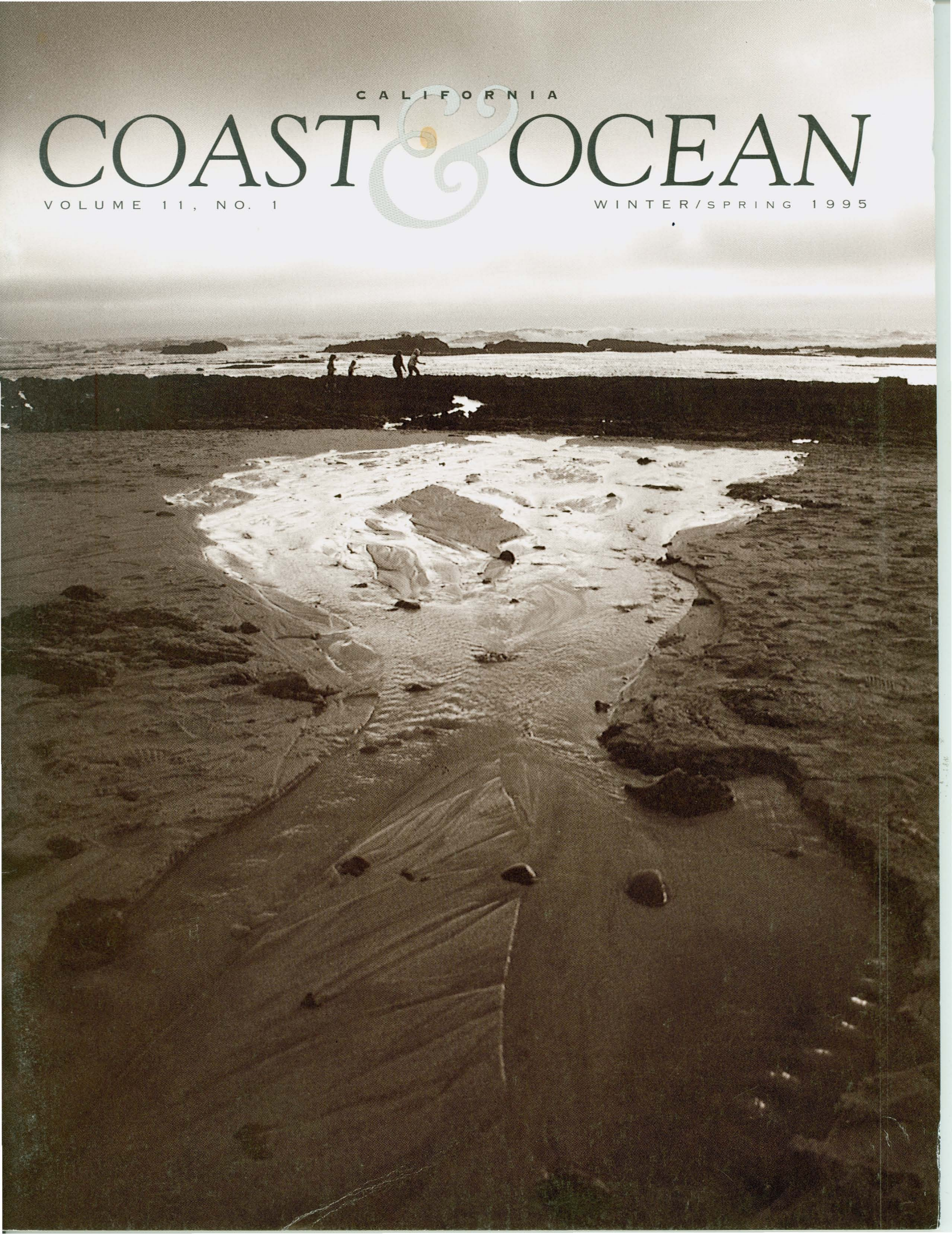
WINTER/SPRING 1995



ABOUT THE CALIFORNIA
STATE COASTAL CONSERVANCY
The Coastal Conservancy is a state agency working to preserve, improve, and restore public access and natural resources along the coast and on San Francisco Bay. It builds trails and walkways, purchases threatened coastal land from willing sellers, enhances and restores wetlands and watersheds, protects open space and farmland, supports commercial fishing, helps cities develop and improve waterfronts, and crafts innovative solutions to land use conflicts. The Conservancy undertakes projects in partnership with nonprofit organizations, landowners, local governments, and other public agencies. It is funded primarily by bonds authorized by California voters.

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About the cover:
The work of Michelle Vignes has been widely exhibited in France, Germany, and Switzerland, as well as in leading galleries in the San Francisco Bay area and elsewhere in the United States. Her most recent book, *Oakland Blues,* was published in 1993 by Pomegranate Press, Petaluma. This photograph, taken at Pebble Beach in San Mateo County, is one of many in which she celebrates configurations of the California landscape.

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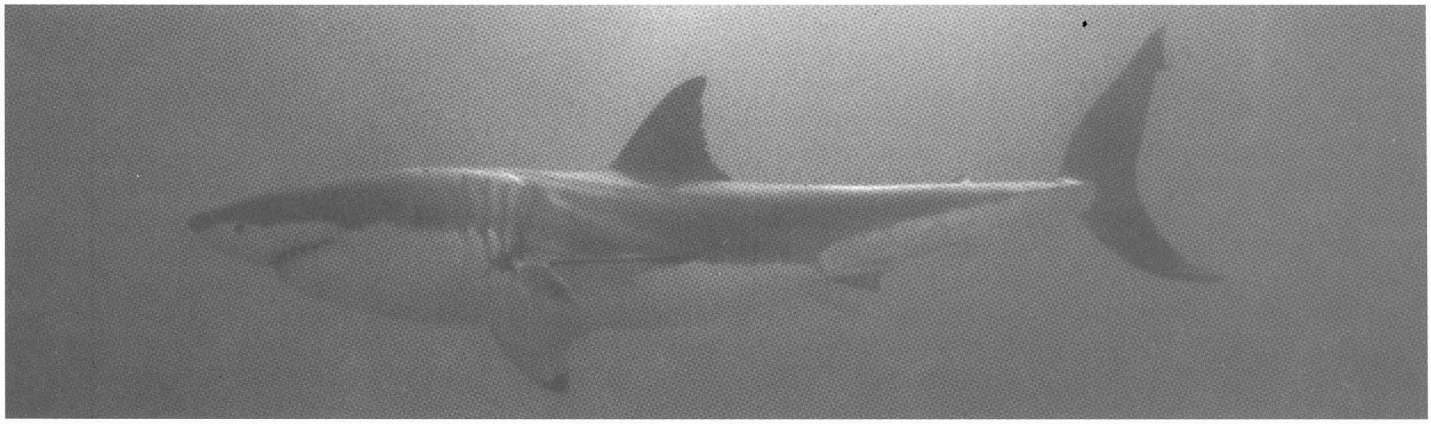

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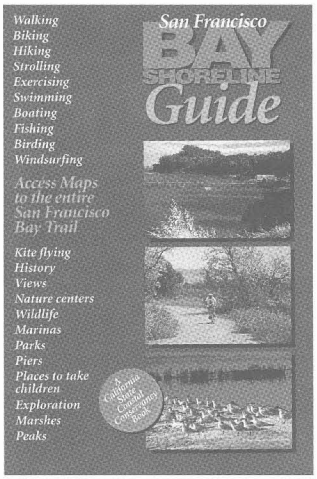


TAKING A NEW, LONG LOOK AT THE COAST

TWENTY YEARS AGO (twenty years ago!), the preparation of the landmark California Coastal Plan was in its final stages. The California Coastal Zone Conservation Commission, the predecessor to today's Coastal Commission, had been created by the passage of Proposition 20 in 1972. Its principal task was to make a plan for the protection of the coast and present it to the state legislature in 1976.

The California Coastal Plan included findings and proposed policies dealing with public access, land development, the marine environment, habitat restoration, and other major issues. The proposed policies grew out of a comprehensive analysis of the situation along the state's entire coastline and emerged from literally thousands of meetings and public hearings.

The state legislature never adopted the Plan, but it did create, as a permanent agency, the California Coastal Commission. In the following decade, cities and counties, one at a time, adopted Local Coastal Programs (LCPs) and presented these to the Commission. The sum total of these LCPs is the closest thing to a state coastal plan we now have. It's disjointed, and it's old.

Twenty years after the California Coastal Plan was prepared, it's fair to take another look at the entire coast and evaluate its health. Which stretches are doing just fine? Where are the most significant problems? Where should the agencies charged with coastal protection focus their limited resources?

The California coastline is *long:* 1,100 miles long. No Californian knows its entire stretch intimately. Think of this: were our coastline superimposed on the Atlantic coast of the United States, it would stretch from Boston to Charleston, South Carolina. That's *ten states,* with enormous geographic, economic, cultural, and political diversity. If you were to live on Delaware Bay, issues of concern on Naragansett Bay, Chesapeake Bay, or the Outer Banks simply wouldn't be a factor in your life.

California's Pacific coast likewise encompasses huge diversity, a great range of economic, political, cultural, ecosystem, and geographic characteristics. But California is one state, not ten. Therefore all Californians are responsible for what goes on in Crescent City, Pacifica, Morro Bay, Malibu, or Tijuana—and all stops in between.

In the last twenty years, much has changed. A great deal of coastal protection and sensitive development has been accomplished by local elected officials, by scores of nonprofit groups, by individual property owners, and by builders. There have also been major losses. California voters have approved the investment of hundreds of millions of dollars in the purchase of coastal parks, refuges, and sanctuaries. But lack of funding has impeded local governments' ability to open new accessways and maintain existing ones. Challenges remain and new problems have emerged. To face them in today's economic and political context, with sharply reduced funding, we need to reassess the issues and priorities on our beautiful coast.

Where should the agencies charged with coastal protection focus their limited resources?

Over the next year or so, we at the Coastal Conservancy will contribute to such a task, working closely with our colleagues at the Coastal Commission, the San Francisco Bay Conservation and Development Commission, and other organizations. As the Coastal Plan did in 1973–75, we'll look at diverse topics, one at a time, then put the whole picture together again.

This review will not attempt to masquerade as a comprehensive revision of the Coastal Plan. For one thing, that's not our job; the Coastal Commission is responsible for that. And the necessary resources would have to be provided by the legislature; they are beyond the means of either Commission or Conservancy. Further, the Conservancy is not a planning agency; we buy land, build accessways, work with developers and nonprofits to make projects happen. But with sharply reduced funding, we must make our priorities count. And we can't do that without a regular assessment of the highest-priority needs.

The first topic, the topic of my next column in *Coast and Ocean,* will be public access, recreation, and tourism. Subsequent columns will review erosion, sea level rise and other coastal hazards, urban waterfront development and decay, habitat protection and restoration, the viability of the coastal agriculture and fishing industries, and the state of our watersheds.

The health and beauty of the California coast is extremely important to the overall quality of life in California; it is a cornerstone on which the strength of our economy depends. After twenty years, it is now time to give it a new assessment. ■

—Michael L. Fischer

DURING 1994, the Coastal Conservancy completed, in partnership with others, several projects that expand the public's access to the state's coast and the San Francisco Bay shoreline. Here are some highlights.

ESCAPE TO ALCATRAZ

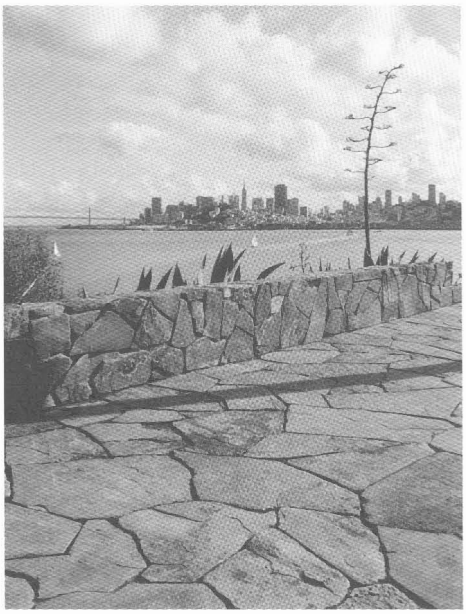
Hardly anyone, hearing the name "Alcatraz," would think of peace, nature, and breathtaking beauty. Almost every one of the million or so visitors who troop to "the Rock" each year come to see the infamous prison where Al Capone and other legendary felons were confined. Yet this steep, rocky island in the middle of San Francisco Bay is also a refuge for birds and other wildlife. To our own harried species, it offers an opportunity for escape from urban stress into a unique haven.

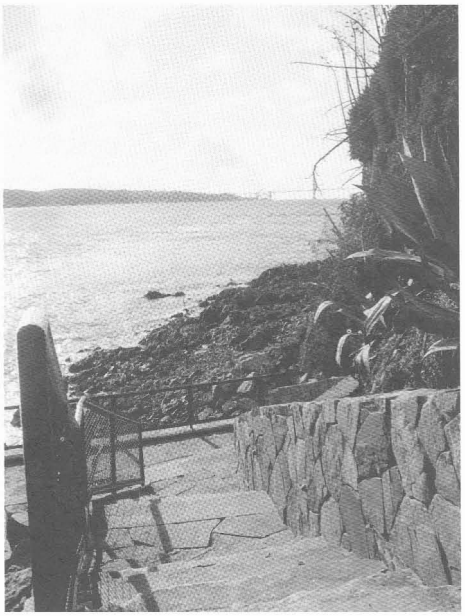
The penitentiary closed in 1963, and nine years later the island was added to the Golden Gate National Recreation Area (GGNRA). But most of it remained closed to visitors until last December 6, when the extraordinary Agave Trail was dedicated, opening the southern third of the island to the public for the first time.

The State Coastal Conservancy's funding and technical assistance helped the Golden Gate National Park Association to undertake and complete these access improvements for the GGNRA. The long-range goal is to build a trail around the entire island.

The new $2 million trail starts at the ferry dock, leads along the southern edge of the island, and rises as a 110-step stone stairway to the historic parade ground, which now is also accessible. Designed by Lawrence Halprin and built of reddish Arizona sandstone, the quarter-mile trail invites you to linger as one visual delight after another unfolds before your eyes. Try one of the seats built into the low stone wall. Below you are steep cliffs, across the glittering water lies San Francisco. Above and around you the spiked leaves of the agave plants reach into the breeze. Nothing hints at the existence of the grim prison until you reach the top of the pathway and walk onto the parade ground. From here the lighthouse and warden's house loom above you, while on either side of you stand two giant mounds of rubble that is gradually being reclaimed as habitat by diverse plants and creatures.

The mounds are all that remains of two apartment buildings that were constructed in 1940 as housing for guards. After the penitentiary was closed the buildings stood vacant for a time, while the future of Alcatraz was being debated. On the night of November 20, 1969, 90 Native Americans from more than 20





GREG MOORE/GGNPA

SHIRLEY CROCKETT

Views along the Agave Trail (top). Lighthouse and warden's house (bottom).

tribes arrived secretly in boats and claimed the island in the name of Indians of All Tribes. They moved into the abandoned guards' quarters and stayed there until June 1971, when federal marshals removed all who remained. The General Services Administration razed the buildings before the island was turned over to the National Park Service.

To barge the rubble off Alcatraz would have been enormously expensive. So the Park Service decided to keep it as part of the island's history. Halprin designed a low retaining wall to contain the mounds and discourage people from climbing them. The Coastal Conservancy provided partial funding for the wall's construction. The mounds are to be planted to provide habitat for several animal species. At the moment, the effect of the retaining wall is to create a site sculpture. Already a deermouse, western gulls, and black-crowned night herons have found the mounds acceptable for nesting, and some young trees and plants have taken hold.

"Alcatraz has been home to plants, birds, and animals and has seen waves of humans for thousands of years. It was only a penitentiary for 29 years," noted Penny Allen, chair of the Coastal Conservancy, during opening ceremonies for the Agave Trail. The trail will be closed each year from February to August so as not to disturb nesting black-crowned night herons.

Coastal Zone 95

THE NINTH BIENNIAL international Coastal Zone conference will be held in Tampa, Florida, July 16-21, providing opportunities to exchange ideas and techniques for coastal and ocean management issues. The theme, as in earlier conferences, is "Spotlight on Solutions." Three broad areas will be highlighted: Managing Ecosystems, Exploring the Human Dimension, and Building Partnerships. Three days of plenary and technical sessions are planned, and three days of other meetings and workshops. Since 1978, Coastal Zone conferences have been bringing together professionals, decision-makers, and interested persons for an exchange of information and views on promoting the protection, restoration, wise development, and understanding of coastal and marine resources.

For a preliminary program or an exhibitors prospectus, contact Matt Menashes, CZ 95 national coordinator, by voice at (301) 713-3086 ext. 105, by fax at (301) 713-4370, or by e-mail at mmenashes@coasts.nos.noaa.gov.

Organic Apples

A THREE-YEAR STUDY of apple production in Santa Cruz County has shown that yields and returns from organic production methods can compare favorably with those from conventional methods. In organic production, a particularly effective technique is the use of pheromones to confuse the codling moth and disrupt its mating. So reports *California Agriculture* in its November/December 1994 issue. This magazine, published by the Division of Agriculture and Natural Resources, University of California, focuses on research conducted at the University. For information regarding subscriptions, call (510) 987-0044.

TWO OTHER PROJECTS were completed on San Francisco Bay: a link in the Bay Trail in the city of Richmond, and a bicycle staging area on the eastern end of the San Mateo Bridge.

A RICHMOND SHORELINE TRAIL

A century of industrial use has shaped the Richmond shoreline, and some of that use continues today. But this San Francisco Bay city can also boast of extensive shoreline parks and trails that provide recreational opportunities for people of the East Bay region. These were expanded early last year with the completion of a section of the Bay Trail along Marina Bay, linking Shimada Friendship Park with the trail being built by the East Bay Regional Park District from the southern edge of Marina Bay to Point Isabel. The project, partly funded by the Coastal Conservancy, includes a mile-long section of marshland trail along the edge of the old Kaiser Shipyard site and a small loop off the main trail, leading to a blufftop overlook. Views from the entire Marina Bay shoreline trail are spectacular. Across the water you can see Brooks Island, the entire shoreline from Albany to Oakland, the Bay Bridge, Treasure Island, and San Francisco.

BICYCLE STAGING AREA AT SAN MATEO BRIDGE

The eastern end of the San Mateo– Hayward Bridge has new picnic facilities, a drinking fountain, restrooms, and a parking area constructed with Conservancy funding. These access improvements will serve people who come to fish off the San Mateo County Fishing Pier, the longest pier on the bay, as well as hikers and bicyclists who set out from here to explore the shoreline trail north to Coyote Point Regional Park and south around Foster City.

IN SAN DIEGO COUNTY, two access projects completed last year are serving a diverse population.

NEW PLAYGROUND IN SAN DIEGO

The barrier-free Tecalote Shores Playground, partly funded by the Conservancy, was designed with much enthusiastic input from members of, and advocates for, the community of people with physical impairments. Dedicated in July, it combines new barrier-free play structures, pathways, and a

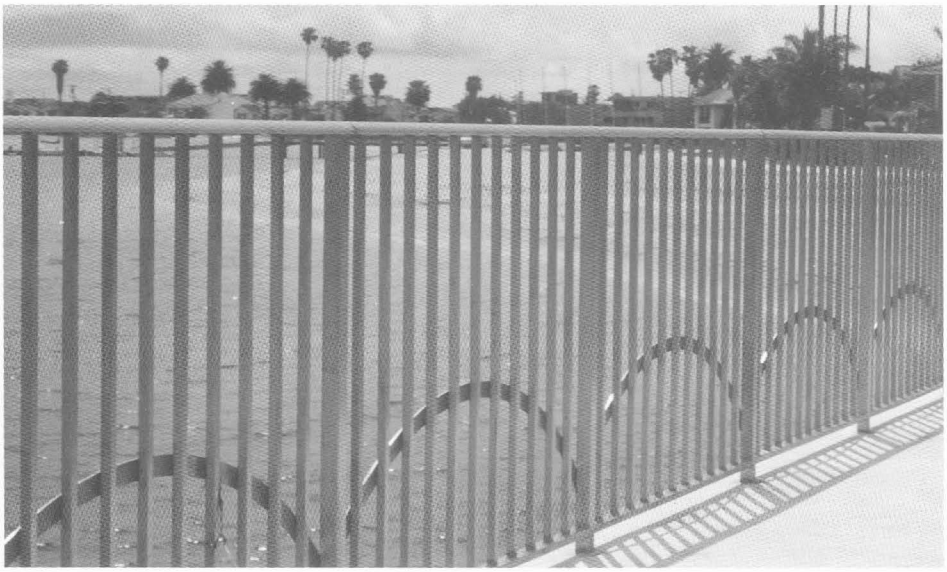
raised area overlooking Mission Bay with existing play structures and sandy areas. The recycled compressed rubber surfaces provide easier access for a whole range of people with mobility limitations. Visitors using walkers, crutches, and canes mingle with babies in strollers and wheelchair users. The new parking area has added spaces for handicapped parking, and restrooms were retrofitted for better accessibility. This playground is visible from Interstate 5, and is very near to Seaworld, one of the major visitor destinations in San Diego. The Conservancy provided almost 25 percent of the funding needed to complete this extremely popular facility.

NEW BRIDGE ON SAIL BAY

A shoreline link has been forged between two trail segments on Sail Bay in San Diego's Mission Bay area with the completion of Briarfield Cove Bridge. Thanks to this Conservancy project, pedestrians and bicyclists along this heavily used trail no longer have to detour to the nearest street to get around the little Briarfield Cove. ■

KAREN RUST

Tecalote Shores Playground offers access to everyone (above).



The Briarfield Cove Bridge links trail segments on Sail Bay in San Diego.

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How Close is Too Close?

IS IT OK TO ATTRACT GREAT WHITE SHARKS?

ANNE CANRIGHT

TO JON CAPPELLA, great white sharks are creatures of incredible power and grace. Over the past year and a half, through his recreational diving business, TriSharks, Inc., he has offered divers the opportunity to view these greatest of ocean predators up close in their natural habitat. For $975 per person, he takes groups out for three days in a chartered boat to a spot off Año Nuevo Island, in the newly established Monterey Bay National Marine Sanctuary, then down in a shark-proof cage. He attracts the sharks to the cage by various means, including the use of "chum," which is primarily ground-up fish.

This activity has generated alarm and anger among surfers, fishermen, divers, and scientists, and brought protests from legislators and other public officials. In January 1995, the Monterey Bay Marine Sanctuary Advisory Council, in response to the outcry, urged that "immediate steps" be taken "to stop the activity of dumping chum and/or other attractants into the Sanctuary for the purpose of attracting great white sharks for viewing." The resolution was forwarded to the National Oceanic and Atmospheric Administration (NOAA) in Washington, where further action is currently pending.

The story is an interesting one, and its implications for environmental management are far-reaching. For in this emotional situation, issues of public health and safety, federal and state jurisdictional authority, and

the protection of biologically sensitive ecosystems come actively into play, joining with commercial concerns in a complex formula.

Cappella, whose business is based in Aptos, has been involved in the scuba industry since 1978, first as an instructor and then running a dive charter vessel out of Monterey. He says that in attracting sharks he is performing a public service: he is helping people to witness and study these magnificent, misunderstood creatures. A side aim of his business, he says, is to counter the "Hollywood myths" and educate the public about white sharks in local waters. Those who want him to cease and desist, however, argue that he is creating a public hazard, interfering with the rights of others to use coastal waters safely, and violating the regulations of the Monterey Bay National Marine Sanctuary.

It's common knowledge that the coastal waters of California, from Monterey Bay north to Tomales Bay and extending offshore as far as the Farallon Islands, are shark territory. Divers refer to this area as the "white triangle" because of the relative abundance of great white sharks. The media, playing on the occasional bloody shark attacks on humans in this region, have referred to it as the "red triangle." In fact, white shark attacks on humans have been rare. Department of Fish and Game records show that in the 63 years from 1926 to mid-1989, the total number of attacks along the entire 1,100-mile California coast was 63, eight of which were fatal. However, opponents say, Cappella's activity off Año Nuevo Island, throws an added and very dangerous element into the natural equation.

The furor began after surfers learned of Cappella's first white shark dive. On New Year's weekend 1994, he took twelve people out to Año Nuevo Island, north of Santa Cruz, in a boat outfitted for overnight dive parties. Each participant paid $650 for the three-day adventure, which turned out to be a success and generated much news coverage. Four to seven sharks were viewed continuously over the three days. (The current trip price of $975, Cappella says, is still lower than the $1,000 per day fare for similar excursions in Australia.)

Año Nuevo, in addition to being prime white shark territory at certain times of the year, is also a favorite surfing and windsurfing spot. Surfers feel that Cappella's operation is entirely too close for comfort; after all, there's no guarantee that the chum used to lure the sharks won't spread into the surfing area. They also fear that the sharks will acquire dangerous habits as a result of the chumming. "He's inevitably training the sharks to do what bears do in Yosemite,"

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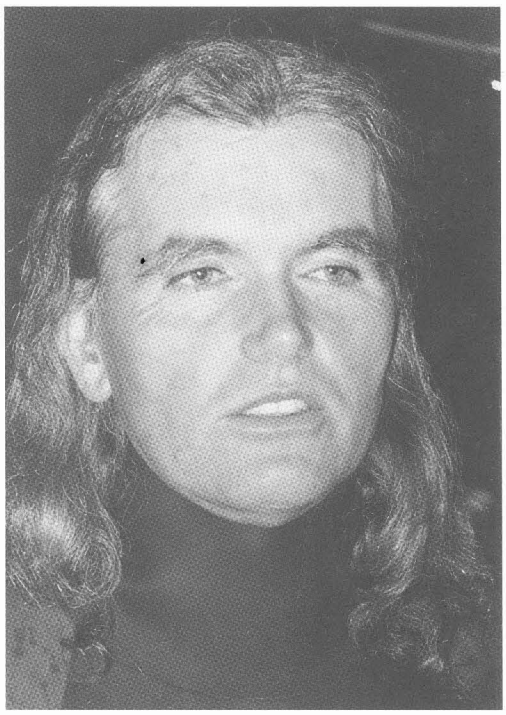
SHARKS

charges Ward Smith of the Surfers' Environmental Alliance. "Sharks will learn to follow people in boats and snoop around."

The great white shark is the largest predatory fish on earth. Despite its notoriety—a notoriety gained from its attacks on humans and from the 1970s hit movie *Jaws*—very little is known about it. Scientists still have no solid information on where it breeds, how long it lives, or even why it attacks people. As a consequence, a dark and distorted mythology has grown up around it.

What little is known for sure is the result in part of research conducted since 1970 at the Farallon Islands. The facts are these: great white sharks, which grow to a maximum length of about 20 feet, take many years to mature, and they reproduce at a low rate. They seem to spend most of their time slowly cruising open temperate waters and are most often observed traveling alone or in pairs. When they do come close to land, it's generally to feed, especially on pinnipeds—seals and sea lions. Two prime locations for such activity are the South Farallon Islands and Año Nuevo, with their thriving elephant seal colonies.

The migratory patterns of the shark are fairly clearly linked to the pinnipeds' breeding cycles. Sightings of great white sharks close to the mainland have occurred mostly



ANDREA McLAUGHLIN

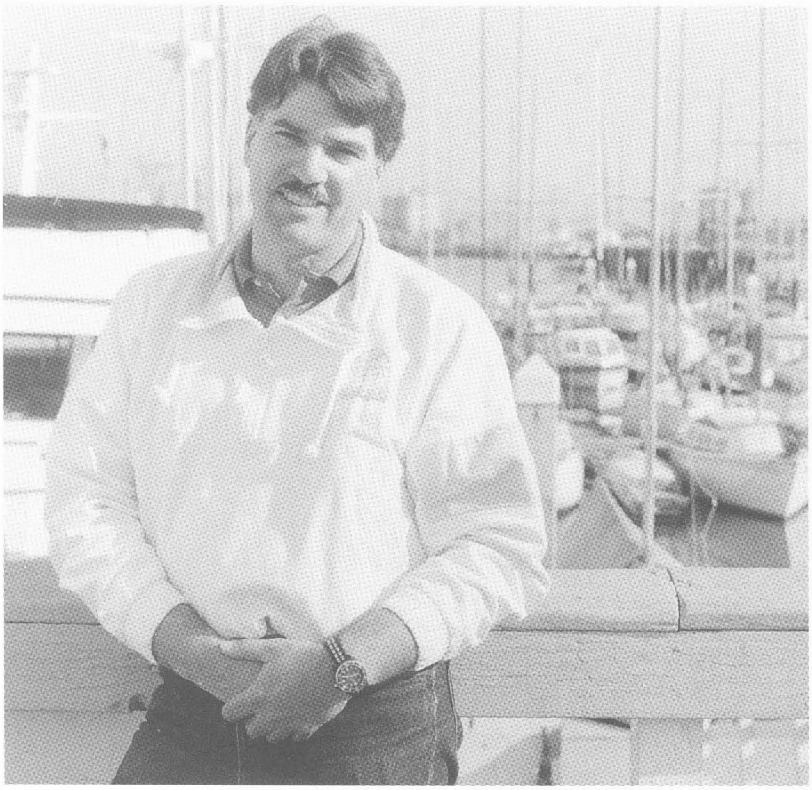
in spring and summer, when they are believed to feed mainly on young harbor seals. In fall and winter, they move to the islands, there to feed on young elephant seals and sea lions. Researchers suspect that they stay in a particular area as long as the feeding is good, then depart until the following year.

Most of what we do know about the white shark in fact centers on its feeding habits. It will eat "almost anything it can sink its teeth into, including fishes, birds, whales, seals, dolphins, and sea turtles," according to *Sharks and Rays of the Pacific Coast* by Ava Ferguson and Gregor Cailliet. White sharks have been known to attack sea otters as well, though whether they actually eat them is uncertain: the fish may mistake the otters for seals. "Unfortunately for the otters, mistakes of this kind are usually fatal, even if the shark doesn't eat its victims," the authors comment. Although it is not known how often white sharks eat, researchers believe they gorge themselves, then fast for several days, weeks, or even months.

When Cappella launched his first white shark expedition, he knew—or at least hoped ("There are no guarantees on a trip like this")—that the sharks would be there. The elephant seals had started to arrive in huge numbers the month before. He had spent several years preparing for this moment and knew the area well.

He brought along a specially developed shark-viewing cage. Unlike most cages,

Ward Smith (above right), and Jon Cappella (below).



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which must be entered underwater, this one allows the diver to enter directly from the boat. He also brought along a ton or so of chum: ground-up frozen fish parts and, since he wanted "to try everything," some pig's blood and a side of lamb attached to a float. "The National Park Service would never let you take a sheep carcass to Yellowstone to attract grizzly bears and put people into a cage so they could take pictures," commented Ward Smith. The sharks, it turned out, "weren't interested" in the lamb, said Cappella. "They were interested in the float instead."

Cappella has since refined his techniques. He uses an electronic device and "silhouettes" of sea lions to complement the perfume of the ground-up fish. He stopped using the pig's blood as a theatrical touch, he said, because "it's not effective as an attractant, but also because of the critics—they're exploitative of that."

The use of chum, however, is necessary because "once the sharks are there, you need to attract them to the cage. I use three to four (chum dispensers), pulling them toward the cage like a giant lure." The chum is dispensed in small amounts—a soda can's-worth every minute or so—continuously over the days-long shark-viewing period.

"It's pretty well established worldwide that the only way to get the great white shark to come to you is through chumming," commented Scott Tims, a master instructor in scuba diving who has crewed on some of Cappella's trips. "This is the only way the public can go out and view this shark in its natural environment."

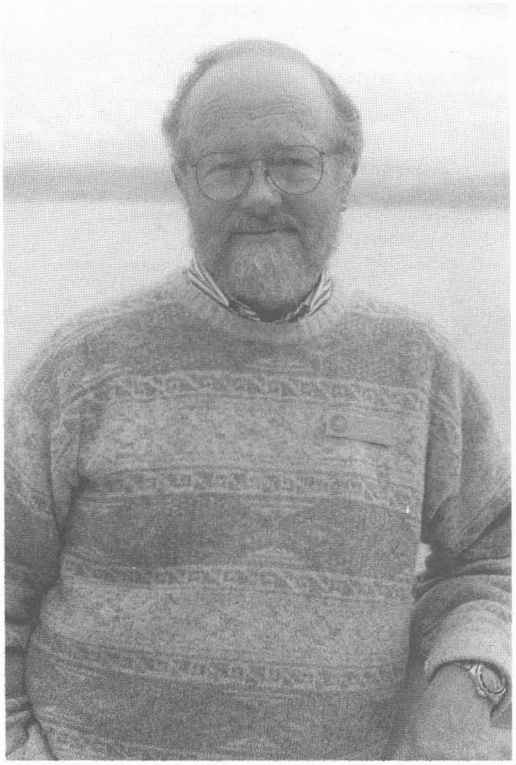
Tims has spent thousands of hours on recreational dives and says, "I just love to see a shark on a dive. . . . They're kings of the beasts underwater. You don't have to even get into a cage to get this rush of adrenaline. You get it just at the idea." Once, he said, "I had a personal experience with a 16-foot white while teaching a class in a kelp forest. I just froze. At first I thought it was a submarine. With magnification by water it looked 20 feet long, and it was coming within 10 feet of me."

WILL SHARKS CHANGE THEIR HABITS?

Several issues arise with regard to the activity of attracting sharks for viewing in the wild. Of primary concern are human health and safety, the potential disruption of scientific research, and wildlife conservation. Encompassing all these issues is the very basic question of the sanctuary's role in regulating activities in protected waters.

Recreational users, including surfers, kayakers, scuba divers, and windsurfers, as well as commercial fishermen, point to human health and safety as the key issue. The dumping of chum, they say, constitutes a dire threat to anyone in the water, especially one who might look like prey to a great white shark. Once the chum hits the water, it spreads. Although it eventually, and perhaps quickly, dissipates, there is no way to predict, given quickly changing wind patterns, tidal action, and local currents, just where that chum will go, according to Gregor Cailliet, a professor at Moss Landing Marine Laboratories. Surfers are convinced that the chum on occasion spreads into their area off Año Nuevo. Who's to say a great white shark might not be right behind?

Sharks and their relatives have a terrific sense of smell, and some shark species have indeed learned that chumming is a good source of snacks. At one spot in Fiji, says Al Huelga, owner of Aquarius Dive Shop in Monterey, small reef sharks have been fed every Wednesday and Saturday from restaurant scraps for the past decade or so. Seven years ago, Huelga saw only two sharks at one such "chum fest"; last October, some 25 were skimming the food off the reefs. John



ANDREA McLAUGHLIN

Steve Webster of the Monterey Bay Aquarium

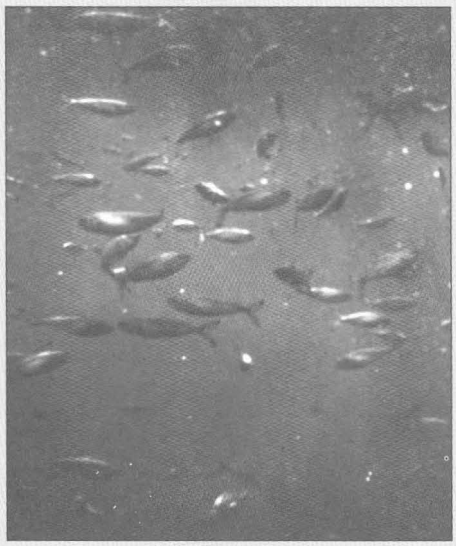
Controversies shape what the sanctuary will sanction

MONTEREY BAY NATIONAL MARINE SANCTUARY, established in September 1992, is the largest of the 12 national marine sanctuaries, encompassing some 4,000 square nautical miles of coastal and ocean waters. Its protected habitats include the nation's most extensive kelp forests, one of North America's largest underwater canyons, and the closest-to-shore deep ocean environment in the continental United States. These habitats support unique communities of marine organisms.

Management of the sanctuary attempts to balance research and habitat protection with recreational and commercial uses. Two activities—oil, gas, or mineral exploration or extraction, and designation of new dredged material disposal sites—are expressly prohibited within sanctuary bounds. Various other activities are regulated, including discharging or depositing foreign materials, altering the seabed, moving or possessing historical resources, and injuring or harassing marine mammals, turtles, or seabirds.

These guidelines are deliberately left somewhat open-ended—and occasionally problems arise as a result. In recent months, several other narrow issues in addition to shark-chumming have fired the emotions of the public and hence found their way onto Monterey Bay Sanctuary staff agendas. One of these was successfully resolved; one is in the works; the third is under negotiation.

First came the jade controversy. Before the sanctuary was designated, beachcombers and divers regularly removed jade from Jade Cove south of Big Sur. Collectors themselves estimated that up to several tons of jade were removed from the area annually, some of it for commercial purposes. When the sanctuary regulations were drawn up, jade was included in the mineral extraction prohibition, and NOAA later upheld this ban on jade. In 1994, however, a coalition of jade collectors requested that the Sanctuary Advisory Council assist them in finding a solution that would allow some degree of jade collecting at the cove. This is being done; the process, which will involve changing both federal and state regulations and may ultimately involve several tiers of permits, should be complete by the end of the year.



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A second, relatively minor tussle arose in early 1995 over the Chocolate Abalone Dive, an annual fund-raiser for the Pacific Grove Rescue Team and Divers' Alert Network (DAN). Two months before the event was to take place, NOAA alerted its organizer that he would have to pay a $520 fee for permission to drop the plastic-wrapped chocolate mollusks—a foreign material—into the water. A public hue and cry ensued, and local authorities stepped in to see that this worthy cause was exempted from the fee.

The third issue is of significant impact, both locally and globally. It concerns a proposed oceanographic research project, called ATOC (Acoustic Thermometry of Ocean Climate), that is designed to acoustically measure global warming of the deep oceans using low-frequency sound emitted from underwater sites off Point Sur and Kauai, Hawaii. The controversy stems largely from concern that the sounds will disrupt communication among whales and disturb or harm other marine mammals and other organisms. The initial proposal has already been modified in response to public opposition. "Central to the ATOC debate as it relates to the Monterey Bay National Marine Sanctuary," stated Capt. Francesca Cava, director of NOAA's National Marine Sanctuary Program, at a hearing held last year, "is whether the potential ecological risks to sanctuary resources can be adequately assessed and weighed against the project's anticipated value to the nation." According to Aaron Kind, program specialist of the Monterey Bay Sanctuary, the sanctuary has recently "expressed its desire" that a site proposed for the sanctuary be moved to one of two alternative sites.

Resolution of each of these controversies is an important step toward shaping a viable sanctuary. As sanctuary manager Terry Jackson puts it, "Managing a sanctuary means balancing the needs of the future with the needs of the present." As these cases illustrate, an informed and active public is a key ingredient in this effort. —*A.C.*

McCosker, chair of Aquatic Biology at the California Academy of Sciences, mentions similar cases of the use of chum seeming "to entrain (great white) sharks to associate boats with food" during studies in which he participated in southern Australia and California. Chum is no longer used in research projects at the Farallon Islands.

Although Cappella says that what he's putting into the water is not food, detractors give this claim little weight. Steve Webster, director of education at the Monterey Bay Aquarium, says that in "Stingray City" in Grand Cayman, where food is dropped into the water so that snorkelers can swim with these winged shark kin, rays now gather at the mere sound of a boat engine because they've learned to associate the food with boats.

This is a concern of fishermen with regard to shark chumming. Fishermen occasionally have to enter the water to defoul a propeller or to perform other maintenance tasks. If sharks were to become attracted to boats, for whatever reason, fishermen could be at risk.

Scott Tims dismisses this fear, pointing out that fishermen often filet their fish on the way home and drop fish parts into the water. McCosker, however, points out that the fishing boats are moving, whereas a dive boat tends to be stationary. Sharks could learn to associate a stationary boat with food, he says.

No one knows why great white sharks attack humans. The animals apparently are not seeking us out as prey: attacks may be purely cases of mistaken identity. From below, a surfer does bear an uncanny resemblance to a torpedo-shaped pinniped. In some cases, unmanned small boats and scientific buoys have enticed sharks in close for a bite, for no apparent reason except curiosity.

By the same token, no one knows whether the use of attractants will change white shark behavior in these waters, thereby increasing the chances of an attack. Cappella suggests that the lack of firm scientific evidence will work in his favor if the issue finds its way to the courts. Others take the opposite position, maintaining that it makes scientific common sense to doubt the wisdom of activities such as Cappella's until they can be shown to be harmless. Further, the evidence of behavioral studies of other fishes, such as the rays at Stingray City, and of bears and deer in national parks, could reasonably be generalized to predict changes in shark behavior that might threaten human health and safety.

Critics, including John McCosker, also say that commercial shark-chumming may jeopardize important ongoing research on sharks. Cappella views this objection as a non-issue: "Researchers have an agenda: they want an exclusive on the great white shark." The sanctuary, he points out, was developed not just for science, but also for public access.

Researchers, however, are concerned not only with the impact of chumming on sharks and on their studies, but also with its potential to disrupt the marine environment.

AL GIDDINGS/IMAGES UNLIMITED, INC.

Scientists studying pinniped populations and seabird nesting colonies, for example, suggest that changing the behavior of sharks, which are at the top of the food web, may set off a chain reaction, disturbing finely balanced ecosystems. The fact that decades of research findings could be thrown into question is but an ancillary consideration.

Some people focus their concern on the sharks themselves. Worldwide, the pattern has been that when sharks attack humans, humans demand that sharks be killed. The unnatural death of even one shark may, researchers suggest, drastically affect the local population of sharks generally, given their low numbers and low fertility rate. Hence, if we remove the chance that sharks will be

diverted from their normal focus on pinnipeds to prey, even if mistakenly, on humans, we are improving the chances that sharks will maintain healthy populations.

At stake in this controversy is more than the particular case of one operator. Cappella's detractors fear that if he prevails, other entrepreneurs will join in, adding to the use of bait—and the risk to ocean users and perhaps to the ecosystem—in certain areas.

"Minimizing encounters between white sharks and humans is generally the best policy for the protection of both populations," a statement published by the Center for Marine Conservation maintains. "Though Californians have moved beyond 'Jaws'-like hysteria over shark attacks, coastal residents have legitimate concerns about activities that can introduce additional, non-natural attack risks."

AN ADVISORY REPORT

All these concerns came together in December 1994, when the Research Activity Panel, a working group of the Monterey Bay National Marine Sanctuary Advisory Council, issued a report on scientific evidence regarding the use of chum, especially as an attractant to sharks. The report addressed eight specific questions, including the behavioral effect of chumming on shark species and the advisability of declaring areas of the sanctuary off-limits to shark-chumming. Subsequently, the Advisory Council recommended that chumming to attract sharks for viewing be stopped. It is now up to NOAA to decide whether to issue a regulation in keeping with the council's recommendation .

Any regulation that is created is likely to be very specific. Chumming "for traditional fishing activities" in the sanctuary requires no permit. To take (meaning "hunt, pursue, catch, capture, or kill, or attempt to hunt, pursue, catch, capture, or kill") white sharks is illegal in California. Any chumming to attract sharks for viewing is not, strictly speaking, part of a fishing operation; yet it is a dumping of human-introduced material into sanctuary waters, and that does require a permit. Cappella, however, contends that if it is legal to fish using chum, it is discriminatory to prohibit chumming to attract sharks for viewing.

This issue is likely to end up in the courts, with attorneys discussing semantic nuances to determine the letter and intent of the statutes. To some observers, however, the issue is simply one of common sense and courtesy. Tens of thousands of people enter the waters of Monterey Bay every year, for both recreational and commercial purposes. "It makes no sense to let a few people make a buck in sanctuary waters, in an activity that puts others at risk," observed Cailliet, principal author of the Research Activity Panel report. Even if the extent of that risk is unproven, there is no doubt that great white sharks are dangerous predators. It is not unreasonable to assume that attracting them to humans—even humans who are safely aboard a boat or in a shark-proof diving cage—may prove a threat to other humans: those not so safely out of sharks' reach.

Had Cappella restricted his operation to seeking out other sharks, such as blues and makos which stay farther out to sea and don't require extensive use of chum as an attractant, the issue might never have arisen. Sean Van Sommeran, of the Pelagic Shark Institute, suggested that his concern would diminish even if Cappella simply stopped using chum to seek out the great whites. The big problem, he said, is the potential for chum to wash into areas frequented by surfers and people who engage in other water sports.

The point of all the fuss is not necessarily to shut down TriSharks, Inc. Rather, it is to see that a solution is arrived at, one that is appropriate to a sensitive marine environment and to shared human use of coastal waters. The world is simply too small and crowded for neighbors to toy with neighbors, whether they be surfers, researchers, businessmen—or great white sharks. ■

Anne Canright is a freelance writer who lives on the Monterey Peninsula.

CHARLES NICKLIN/IMAGES UNLIMITED, INC.

Until recently, little information was available on contaminants in several fish commonly caught off recreational piers. Now it's clear that some bay fish may be hazardous to health, and that fishermen from several ethnic minorities are especially at risk.

Who fishes from bay piers? (and what's the catch?)

MARY ANN SWISSLER

THOUSANDS OF PEOPLE find relaxation and delight in fishing off public piers and shorelines on California's great bays. From over 30 piers on Santa Monica and San Francisco Bays, anglers catch striped bass, shark, halibut, mackerel, white croaker, and other species. But although the view is fine, the air blowing off the ocean is fresh, and the tranquillity on the water may feed the spirit, some bay fish may be hazardous to human health.

Three recent studies have shed new light on the potential health hazards of eating bay fish, and have confirmed what some people have long guessed: that people of color and low-income people are especially at risk.

In late December 1994, the San Francisco Bay Regional Water Quality Control Board released a study designed to measure levels of contaminants in several edible fish species caught by anglers in the bay, and to identify chemicals of concern in the bay as a whole. Fish had been collected in May of that year at 13 locations, including some that were near chemically contaminated areas and others that were physically distant from such areas.

Several of the fish species had not been included in earlier contamination studies, which focused largely on striped bass, sturgeon, and sometimes shark in this bay. Striped bass and sturgeon are a favored catch among people who fish from private and party boats. Pier fishermen, who tend to be people of lower income from many ethnic minorities, are more likely to catch white croaker, jacksmelt, shiner and walleye surfperch, and leopard and smoothhound shark.

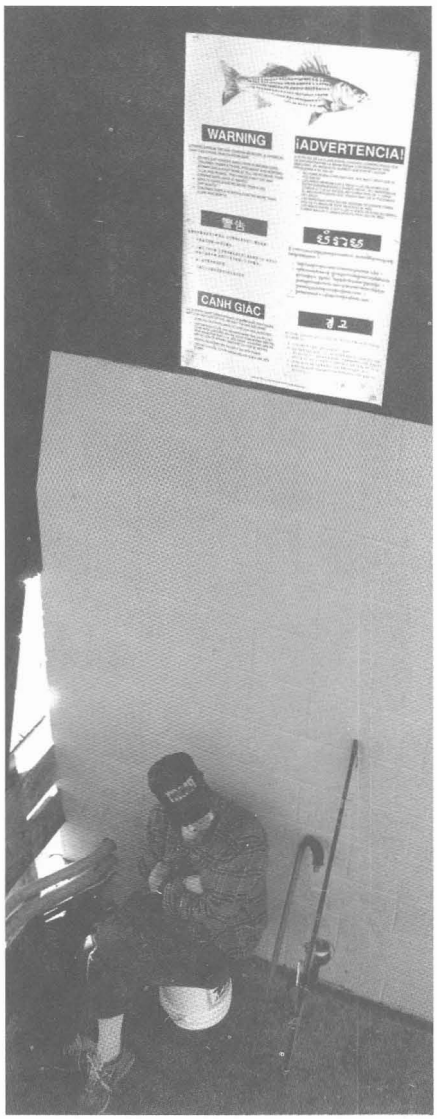
The new contamination study sampled all these fish, as well as halibut, in 13 locations. Six chemicals were found at levels of potential concern: PCBs, mercury, DDT, dieldrin, chlordane, and dioxins. Sharks had the highest concentrations of mercury, while white croaker showed the highest levels of organic contaminants. Sharks are a predator at the top of the food chain. As they feed on contaminated fish, pollutants concentrate in their tissues. White croaker feeds on the bay bottom, where certain hazardous materials settle.

State agencies, environmental groups, and anglers cooperated in designing the contaminant study, which was managed by the Water Quality Control Board, funded by the Bay Protection and Toxic Cleanup Program, and conducted by the California Department of Fish and Game. The findings will be combined with those of a demographic and consumption survey recently completed by Save San Francisco Bay Association (Save the Bay) to lay the groundwork for a more comprehensive study.

In the meantime, the California Environmental Protection Agency's (CAL EPA's) Office of Environmental Health Hazard Assessment (OEHHA) has advised that adults should eat bay-caught sport fish no more than twice a month at most, and should eat no striped bass over 35 inches

One of the seven-language signs that were posted at three locations on San Francisco Bay.

RON KUKULKA

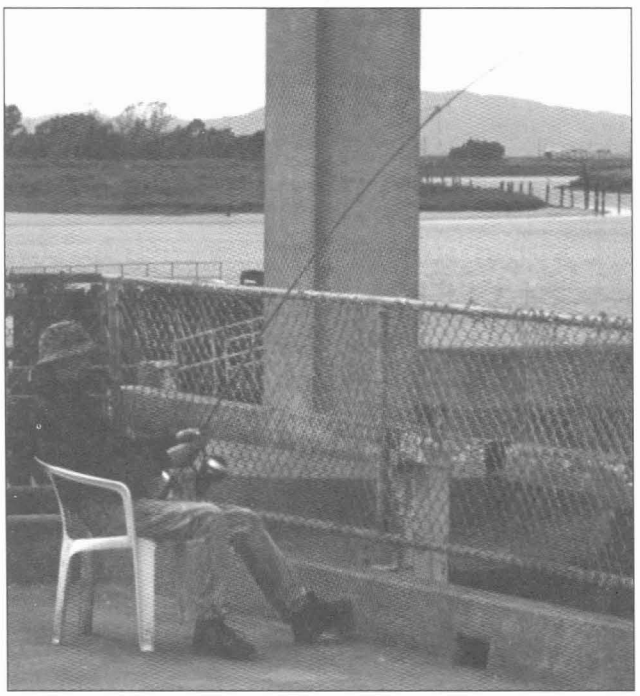


long. Children under six and women who are pregnant or may become pregnant, or who are breast-feeding, should eat no more than one meal a month of these fish, and should not eat any shark over 24 inches or striped bass over 27 inches long. This advisory does not apply to salmon, anchovies, herring, and smelt, to other ocean-caught sport fish, or to commercial fish. OEHHA will analyze the study's results to determine if more specific advisories should be issued. CAL EPA will evaluate each pollutant of concern and identify potential sources, pathways of transmittance, and control measures.

A FIRST QUICK TAKE

The pilot study provided a "snapshot" that should be augmented by more comprehensive testing of bay fish, according to Citizens for a Better Environment. Samples taken at the end of the dry season might have more contamination than samples taken in May. To determine what health hazards pier fishermen might face, more than fish fillets need to be examined, suggested Ruth Gravanis of Save the Bay. In some traditional cultures, organs including eyes, liver, and intestines are delicacies. "Organs contain greater levels of contaminants than fillets," she noted.

JAY JONES



Vallejo Pier

That ethnic minorities are disproportionately affected by contamination in bay-caught fish was shown by the Save the Bay's Seafood Consumption Information Project. This study was undertaken to find out what groups are most affected by contaminated fish and whether they are aware of existing health warnings. During five days in May and June 1994, Spanish- and Chinese-speaking interviewers surveyed 100 fishermen at several piers and on-shore sites. Of those interviewed, 50 percent were Asian (including Chinese, Filipino, Vietnamese, and Mien), 28 percent African American, 12 percent Caucasian, and the rest Hispanic, Native American, Pacific Islander, or other ethnic groups. Asians reported the highest fish consumption rates, followed by African Americans, with Caucasians eating the least. People over 55 years old reported eating more fish than younger people. The most frequently consumed fish were reported to be topsmelt and jacksmelt, white croaker, and surfperch. Gravanis said that many anglers who fish from piers do so not only for recreation but also to supplement their food budget. Of those interviewed, most were unaware of existing health warnings. Some fishermen declined to be interviewed, primarily because of a language barrier.

Commenting on the implications of both San Francisco Bay studies, Karen Taberski, an environmental specialist with CAL EPA, "Levels of PCBs and mercury found in this study make us particularly concerned about ethnic communities with high consumption rates of fish caught in the bay."

OEHHA and the water quality board "will be working with local agencies and environmental groups to spread the word in those communities where fish caught in the bay provides a significant portion of families' diet," said Regional Board Executive Officer Steve Ritchie.

THE PICTURE ON SANTA MONICA BAY

Save the Bay's consumption study was preceded by a more extensive similar study on Santa Monica Bay. The Santa Monica Bay Restoration Project successfully interviewed more than 1,200 fishermen at 29 sites during 99 days in 1991–92. The sites included piers and jetties, beaches, intertidal zones, and private and party boats. Interviewers spoke English, Spanish, Vietnamese, Chinese, and Tagalog. Of 1,740 anglers approached, 497 declined to be interviewed.

The Santa Monica Bay Seafood Consumption Study expanded upon a 1980 study of fish and shellfish consumption rates in the Los Angeles metropolitan area. That earlier study, funded by the U.S. Environmental Protection Agency and conducted by the University of Southern California, provided information on consumption of white croaker specifically. Subsequently, warning signs were posted against eating more than two meals of white croaker per month because of DDT and PCB contamination. The new survey, funded by the federal EPA and the State

JAY JONES

Some of the warning signs posted on the Berkeley Pier have vanished.

Water Resources Control Board, was conducted because species in the bay and the ethnic makeup of fishermen were changing.

Preliminary results showed that most of those fishing in Santa Monica Bay were men between the ages of 21 and 40, and that 50 percent of those fishing from private and party boats were white men. Among those fishing from piers and jetties, the largest ethnic group was Hispanic. Others included Asians (Japanese, Koreans, Chinese, Filipinos, Vietnamese, and Cambodians) and African Americans. Over 70 percent of those interviewed reported removing white croaker from their diet after seeing public warnings. Of more than 67 species of bay-caught fish that were tallied, the most frequently consumed were chub mackerel, barred sand bass, Pacific barracuda, kelp bass, combined rockfish species, Pacific bonito, and California halibut.

A health risk assessment by OEHHA is expected to be completed this year, according to Patricia V. Velez, contract manager of the Santa Monica study. While further studies and assessments proceed, state officials and environmental groups on both San Francisco and Santa Monica bays will help get the word out to communities where fishing is a way of life.

Wendall Chin of the San Francisco Bay Advocates for Environmental Rights, a coalition of local anglers that has campaigned for toxicity studies and placement of warning signs, said that little has been done so far to inform local fishermen of potential health hazards. Signs warning of mercury in striped bass in seven languages (English, Spanish, Cambodian, Laotian, Vietnamese, Korean, and Russian) were posted at only three locations about one year ago, and some have since disappeared.

John D. Nguyen, executive director of the 100-member Vietnamese Fishermen's Association of America, said that many fishermen no longer eat fish intestines. Most learned of contamination in fish they catch through Vietnamese-language leaflets, he said, and from posters that were distributed three times in 1994.

On Santa Monica Bay, more than 75 percent of the anglers interviewed were aware of health warnings about consumption of bay-caught fish, and nearly 25 percent said these warnings had convinced them to stop eating certain fish. Half of the respondents said they changed their seafood consumption habits in the light of media or other reports about health hazards. Nine percent stopped eating fish completely. This extreme reaction, said Velez, is regrettable, as many fish that do not spend much time in the bay provide excellent nourishment.

HOW TO REDUCE RISKS NOW

OEHHA has recommended that fishermen vary their fishing sites; eat smaller amounts of several species rather than making large meals out of individual species of fish that have been identified as dangerous; eat the fillet only and throw out the guts; skin and trim the fat; instead of frying, try baking, broiling, or steaming the fish on a rack; and dispose of juices from cooked fish. ■

Mary Ann Swissler is a freelance writer based in Oakland.

ADVENTURING ON THE Unknown Shores OF SAN FRANCISCO BAY

FEW PEOPLE WHO LIVE *on San Francisco Bay, and even fewer of those who visit, have any idea of how much of the shoreline is open for public use and enjoyment. California's largest and most heavily urbanized estuary is surrounded by industry, freeways, and millions of homes. Yet you can travel around it on foot or by bicycle, much of the time following shoreline trails that connect parks, open spaces, and wildlife reserves.*

What the bay shoreline offers today was won by citizens who took a stand against the seemingly inexorable forces of destruction at large a few decades ago. In the late 1950s, almost every city had plans to create more real estate by making new land where now there is water.

Then citizens revolted and launched the Save San Francisco Bay campaign. In 1965, the Legislature passed a bill establishing the San Francisco Bay Conservation and Development Commission (BCDC) and directed it to prepare a plan for the long-term use and protection of the bay. BCDC, ever under the alert eyes of concerned citizens, has proved effective in its stewardship.

Save the Bay Association then began a campaign to restore the bay. The Coastal Conservancy, in partnership with many bayside communities, landowners, and other public agencies, constructed new fishing piers and trails, and brought life back to marshes that had been diked and filled. In 1986, Senator Bill Lockyer of Hayward, now President Pro Tem of the Senate, introduced and led to passage the bill that created the grand plan for a shoreline trail around the entire bay, linking communities and public amenities. The 400-mile Bay Trail is now 40 percent complete and continues to grow as communities in all nine counties build it piece by piece. It connects with trails that lead inland and with the Ridge Trail, which is forming the second of two concentric trail systems around the bay.

Most citizens have remained unaware of all this. Therefore, five years ago, the Conservancy began to prepare the San Francisco Bay Shoreline Guide. *We are now proud and happy to announce its publication on March 30 by the University of California Press. We hope that it will help many people to enjoy the beautiful places they possess in common as citizens, and discover themselves as inhabitants of the San Francisco Bay region.*

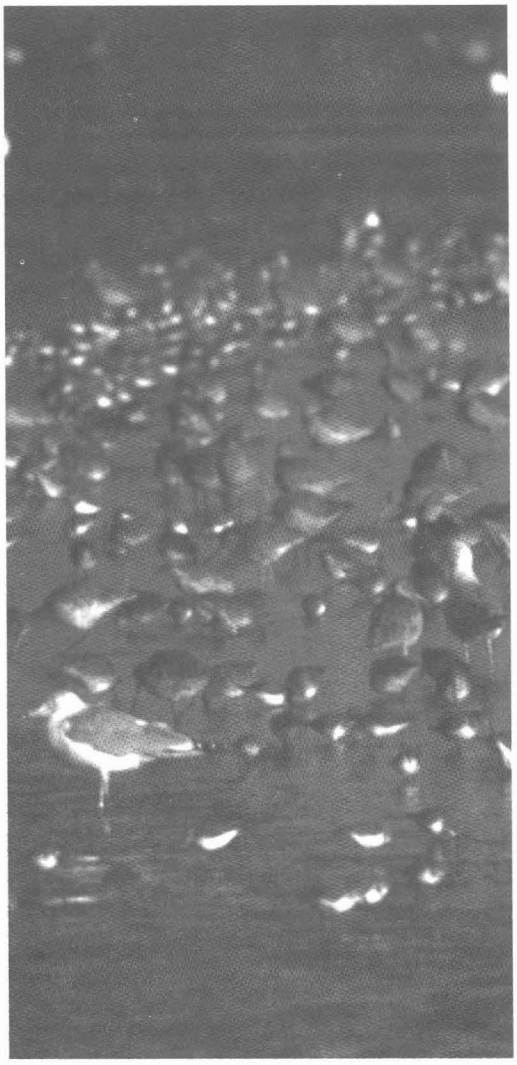
The book is easy to use, only 6x9 inches in size, yet it is the most comprehensive guide to the bay ever published. It includes 14 full-color maps, almost 500 illustrations, and a wealth of diverse information.

The following pages will give you a glimpse of what you can expect in the pages of this book and along the shores of San Francisco Bay. ■

—*Rasa Gustaitis produced and edited the* San Francisco Bay Shoreline Guide.

Ask for it at your local bookstore. The bargain list price is $14.95. It is also available by mail for $19.18 (including postage and tax) from California/Princeton Fulfillment Services, P.O. Box 10769, Newark, NJ 07193-0769. Telephone (800) 822-6657.

JOSEPH DiDONATO



Wild discoveries in familiar places

JERRY EMORY

MOST OF THE YEAR, great pockets of polar air sail down across the Pacific Ocean, spin out of the high pressure system anchored off California's shore, negotiate the coastal mountains, and bathe the San Francisco Bay Area with persistent northwesterly winds. Depending on the season, these gales usher in fog, Alaskan storms, or clear cool blasts of marine air. When they cease, temperatures climb.

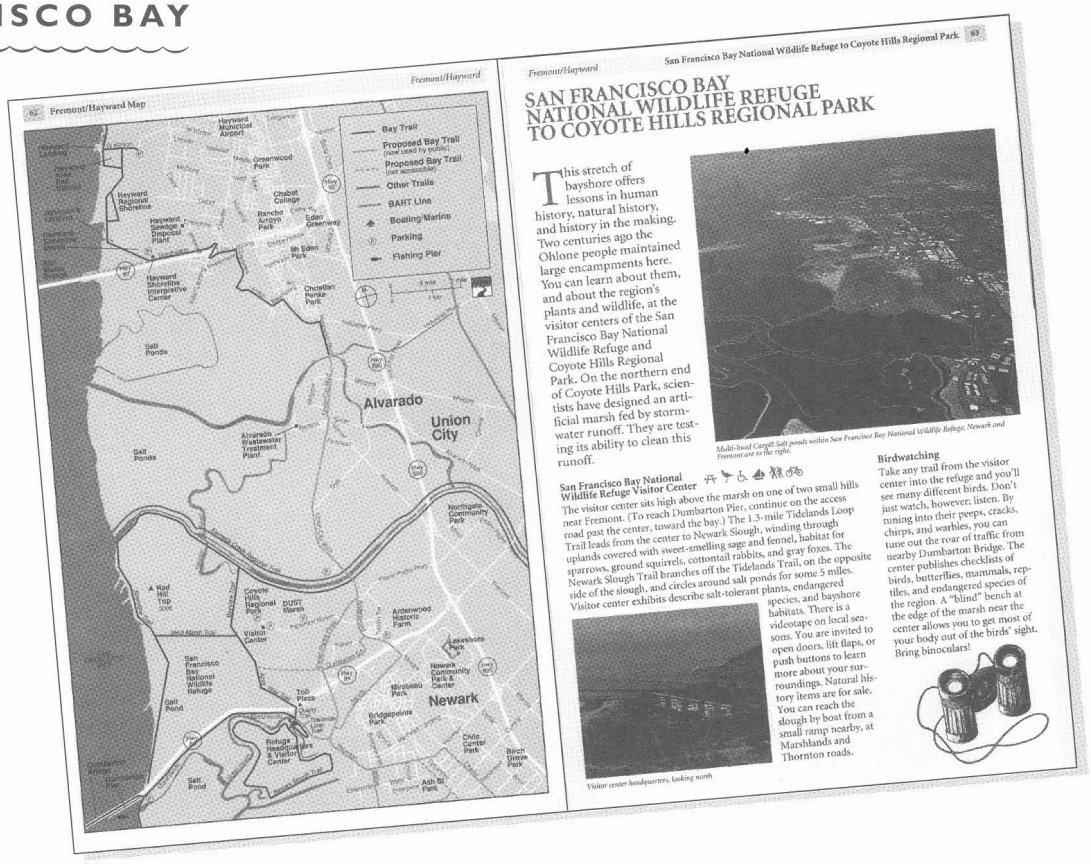
I thought about the weather, and this gift of well-traveled wind, as I followed the San Francisco Bay Trail by bicycle and on foot, doing research for the *San Francisco Bay Shoreline Guide.* Sometimes I tried to imagine where the wind had wandered before arriving here, forcing me to lean this way or that. Thanks to the winds, with each breath I inhaled powerful elements of the Pacific, the coastal mountains, and the bay. Spice molecules from Asian shores might have mixed with traces of mid-Pacific whale exhalations and pungent whiffs of sea lions from the Farallones. Essence of coastal marsh, chaparral, and redwood might be folded into a gust of air, then a dash of sourdough, pier pitch, mud flat, and salt pond would season the blend as it tucked down to leeward of the coastal mountains, eddying, then spread across bay waters.

It took me the better part of two years (and some 1,500 miles) to circle the entire shoreline and seek out the finished segments of the Bay Trail. I took my time, indulging in detours, using each field trip to learn something new and discover a new place or person or species. Amazing discoveries were my reward. Though I had lived on San Francisco Bay my entire life, and had spent much time on it, I had never known how much there was to find.

No matter where I was, whatever the season or time of day, the wind was my companion. Occasionally it was a faint breeze, barely strong enough to tickle the fresh green shoots of cordgrass along the shores of China Camp State Park. But most often it was strong, elemental, and at times primeval, as on the afternoon I hastily laid down my bike on the trail at Hayward Regional Shoreline because I could no longer ride against the salty torrent of air blasting off the water. I leaned into the wind and shouted with joy.

This is what a visit to the bay shoreline can do for people: inspire, relax, exhilarate, as well as educate, all at once. All you have to do is find your way past the elevated highways, buildings, and other obstructions to the shore.

ADVENTURING ON THE **Unknown Shores** OF SAN FRANCISCO BAY



Each of 13 regional chapters is preceded by a five-color map.

Trails have been built along every stretch of the shoreline. Many of them remain unknown, even to nearby residents. These trails lead through parks and wildlife preserves, past exercise stations, to piers, industrial and historic sites, along levees and through marshes. The Bay Trail is now linking these trails into a 400-mile system that circles the entire bay. At the initiative of local citizens and with the help of the California State Coastal Conservancy, a vision is being realized: one trail that connects the people of all nine bayfront counties.

The Bay Trail is one of two concentric trail systems being built around the San Francisco Bay and estuary. It connects with the Ridge Trail, which links the peaks in a wider ring. With the right maps and directions, today's explorer can survey the bay from high ground, then descend to the shore for a close-up view of its diverse inhabitants.

One blustery spring morning I strolled along San Francisco's Pier 7, just north of the Ferry Building, listening to snippets of English, Italian, Portuguese, Chinese, Spanish, and Vietnamese floating toward me. I stopped to ask one of the fishermen leaning over the railing whether anything was biting and learned that squid or small fish pieces were best for catching mackerel and smelt. Then I followed the wind beyond the Ferry Building, along the Embarcadero Promenade to Red's Java House for a cup of coffee.

Later, I worked my way down Third Street and Cargo Way to check out "Pier 98" on India Basin, on the northern side of Hunters Point. This is not a spot you're likely to find or seek out unless someone tells you about it. Cargo Way ends in a parking lot where large semi-trailers rest. A trail extends from it toward the PG&E Hunters Point Power Plant. Here cormorants and people gather to fish in the stream that flows toward the intake gate and in the warmer stream that flows out of the plant after serving as coolant. A path leads from the trail onto a long, narrow landfill peninsula known as "Pier 98." It was built to serve as footing for a bridge across the bay. The bridge was never built, and the landfill has become a *de facto* wildlife refuge.

Among those who appreciate the place is Pat Gray, whom I found on the path to the power plant, in front of an easel. She told me she likes to paint landscapes that show man-made structures in natural settings. "Natural" might be stretching the point, but this is one of those places where nature did take over again as soon as people gave her a chance. I stopped to glance at her canvas and tried to see the view with her eyes: Offshore, cormorants were diving and surfacing while chatty terns and graceful brown pelicans plunged into the gray-green waters. Patches of vibrant marsh edged the "pier" and the power plant. Included in her rendering were the people fishing along the shore, the view of Hunters Point Shipyard and neighborhoods to the south, the Bay Bridge to the north, and much of the East Bay. She gave me a new perspective on the word "scenic."

MARE ISLAND NAVAL SHIPYARD

Among many historical photos is this image of welders at Mare Island Naval Shipyard, 1943.

A design challenge

OUR FIRM, REINECK & REINECK, has spent 20 years practicing the design of information graphics and special purpose maps. When we agreed to design the *San Francisco Bay Shoreline Guide* we had designed other guidebooks and numerous maps/guides, and we assumed that this task would be similar, but somewhat more complex.

To our surprise, this book proved to be an enormous task—mostly because of the organizational activities required to attend to the thousands of details and select from hundreds of photographs and illustrations.

In retrospect, the book was an enjoyable and challenging project—the enjoyable part was working as part of a team with Rasa Gustaitis and Jerry Emory, and all the photo researchers and photographers. The challenging part was keeping track of the myriad details.

Our goal was to design a book which was colorful, interesting, easy-to-read, and varied throughout its length, but which was also meticulously crafted in terms of the maps, visuals, text (chapters) and cover.

All four parts of the book were designed simultaneously, using Macintosh computers with Quark XPress for the layout and Adobe Illustrator for the maps. This is the largest project we have completed entirely digitally—maps, photos, and illustrations were merged with the text—all on disk—no "camera ready" artwork was produced. All of the photos were scanned for "Automatic Photo Replacement"—we placed "low-res" versions in our Quark XPress chapters, and when the final four-color film was produced, they were replaced with the "high-res" versions.

Perhaps the most time-consuming task, one which we had not anticipated, was reviewing the color proofs for each of the hundreds of photos—comparing the color accuracy with the original slide, sending detailed notes about the photos which needed color correction or rescanning, then reviewing the additional color proofs—often several times before they could be approved.

In spite of all the hard work, this was a wonderful project—we learned things about the bay we never knew before and found new places nearby to visit and explore. By the end of the project we were fairly exhausted, but we would now happily design a similar, or even more challenging book.

—Gay & Jack Reineck

RON KULKULKA

ADVENTURING ON THE
Unknown Shores
OF SAN FRANCISCO BAY

JAY JONES

Alviso is a place suspended in time.

Wide angle lens on the bay

When I have time for myself, I like to spend it in nature. Some people go to movies regularly; I go on trails, and always I take my camera. Until I started photographing the San Francisco Bay shoreline, however, my outdoor experiences were limited to famous places, the places people drive miles and miles to see. I would go as far as my time would allow—to Yosemite, Sonora Pass, Mendocino County. It did not occur to me to look around closer to home.

Then last spring I discovered that you can find peace and solitude amid natural beauty in the many parks and preserves along San Francisco Bay, without ever leaving the metropolitan area. This discovery has opened my way to a new kind of creative exploration, with the camera and simply with my eyes, ears, and mind. I never knew many of these places existed before I started to take photographs for the Coastal Conservancy's *San Francisco Bay Shoreline Guide*. They were right in front of me, but outside my focus.

Shoreline at Mountain View is a case in point. I had been to many concerts at Shoreline Amphitheater but was totally ignorant of the huge park that lies behind the performance space. I wonder now how many other people, like me, have sat in cars waiting to get out of the parking lot, thinking, "I can't wait to get the CD"—with no idea that from this same parking lot you can go hiking in rolling hills, or rent a boat and go out on the water.

Or take the Berkeley Pier, on which you can go out, on your own power, so far onto the bay that boats have to go around you. Many people who live in the East Bay probably know the place, but I did not. Nor did I know about the San Pablo Trail, with its beautiful views of Carquinez Strait.

Some places caused me to think about history. At Brickyard Cove, in Richmond, a brick kiln stands in front of a complex of modern apartments. (I felt uneasy stopping there at first. There were so many BMWs and Mercedes parked in front I wondered if I was trespassing.) Here is a monument to a craft long since tossed aside for new technology. I admired the building, shot it from different angles, and imagined what this cove looked like when the kiln was turning out bricks to build our cities.

In the town of Alviso, which is now part of San Jose, I found artifacts that spoke not only of the past but also of our possible future. Skeleton remains of boats are marooned at the Alviso Marina, sunk in a sea of grass. The pier is still there, with a security gate around it. Where are the boat owners? The land has subsided here because enormous amounts of ground water were removed for farms and orchards. Now

On another day I explored the historic town of Alviso, then lost myself in the San Francisco Bay National Wildlife Refuge. Along the Alviso Slough Trail Loop, light was playing off shallow waters, changing exposed mudflats into glistening borders and highlighting grass blades. I walked far enough into the confusion of sloughs and marshland to forget I was surrounded by millions of people. Out on the southernmost shore of the bay it was just me and the water and the marsh.

I was circling the bay counterclockwise, so my further excursions led me into a landscape of salt ponds and levees as I moved northward on the eastern shore. This is where the bay salt industry began in the late 19th century. Many of the salt ponds have been abandoned and are being restored as wetlands. There are proposals to incorporate some of them into the wildlife refuge.

A contrast—though no less a pleasure—was my trip along the shoreline of San Leandro, 15 miles north of the refuge. There I discovered tidy and popular Marina Park. On any given day, it's enjoyed by scores of walkers, runners, windsurfers, sailors, and children.

From Marina Park, a spectacular seven-mile segment of the Bay Trail heads south and runs on levees past marshes and mudflats all the way to the Hayward Shoreline Interpretive Center (with an early break at Roberts Landing). The interpretive center has information on the history of the bay's salt industry, interactive exhibits on local wildlife and wetlands, and offers weekend programs.

Just north of Marina Park, at Oyster Point Regional Shoreline, a trail climbs the hillside through fields of fennel and mustard. In late spring, when I was there, so many swallowtails, painted ladies, and California sisters were visiting these host plants that I felt I was walking through a butterfly tunnel. The view from the summit is made possible by tons of garbage now covered with grass, wildflowers, and trees. Like Byxbee Park in Palo Alto, North Waterfront Park in Berkeley, Hayward's aptly named Mt. Trashmore, and Shoreline at Mountain View, this tranquil open space has been created atop an old those farms and orchards are gone, the South Bay is full of houses. The boats in the grass suggest what we have to look forward to if we don't change our ways.

There are beautiful parks along the bay that are public but secretly so. Shoreline Park in Alameda has fountains, trails, and an exercise area—but access is through the parking lot of a housing complex and everything around you says: "Private." Only a tiny sign tells you it's all right to be there if you don't live there. Now, however, this park is in the *Shoreline Guide*, along with many others that are similarly hidden.

No matter where I went, I met interesting people and saw interesting things. Some people spend a pot of change to go to Hawaii, but I was able to tour places of beauty and relaxation right near home. At the Benicia Fishing Pier, I talked with a black man who owned the last bait shop in that area. Along the San Pablo Trail a man walking his dog told me he used to walk the same paths with his father. I watched the sun set on many parts of the bay, and saw my home estuary in ways I had not seen it before. Knowing I can go back to all these places anytime I have a few hours free is the pot of gold at the end of the rainbow.

JAY JONES

Shoreline at Mountain View offers much more than an amphitheater.

Jay Jones' "Rumors of Rain" was the cover for the Winter/Spring 1994 issue of Coast & Ocean. *He contributed numerous photographs to the* San Francisco Bay Shoreline Guide.

garbage dump. It's a place that provides habitat for wildlife, and to us humans it offers opportunities to relax and reflect on the themes of reclamation and renewal.

On my rambles I made it a point to study wetlands that have survived against all odds along the bay's altered shore. No matter if the marsh is 100 square feet or measured in acres, I always found it worth studying. As I did so, I became more and more captivated by the mudflats that glistened at low tide. I would get as close to them as I could without actually walking on them, and try to read the story they told. Here coils of mud and sand indicated a lugworm living below, there a miniature volcano meant a ghost shrimp at work. The loose pile of feathers at the end of a long ragged furrow showed that a peregrine falcon had landed with a meal.

Everywhere I found contrasts. Along the urban strand between Alameda and Richmond the story of human occupation is told by historic buildings and a variety of museums. Towering gantry cranes and smokestacks testify to an active industrial economy, while large tracts of parkland provide open space and refuge. Just below the eastern anchorage of the Richmond Bridge, harbor seals haul out on a cluster of rocks exposed during low tides, in view of the Chevron Longwharf and gargantuan tankers. About 3,600 tankers and cargo ships enter the bay each year, and most of them pass by this spot.

When I got to Point San Pablo, due north of the Richmond Bridge, I found a remnant of another kind of history. The captain of the Point San Pablo Yacht Harbor, Dale Lampton, talked a bit about his former occupation as a whaler. "It was real hard work, you know. And we used to work on four gray whales at a time," he said. Whalers sailed into San Francisco Bay as early as the 1820s, and by the late 19th century San Francisco was the world's largest whaling port. The whaling station at Point Richmond—the last one to operate in the United States—was active until 1971. Today it's only a burned-out building west of the yacht harbor.

My explorations took me all the way up to the Petaluma River (which is actually a slough) and back down to Marin County, where I live and where I continued to find surprises.

When I began this project I thought I knew the bay's shoreline. When I was done, I realized that I had only begun to explore an unknown landscape—a landscape that is so accessible and so full of surprises that I'll be getting to know it for a lifetime.

Today you will not likely find any "pristine" bay shoreline. Almost every inch has been altered by riprap, fill, levees, dikes, and various structures. And yet, more than two centuries after European settlement began, the San Francisco Bay shoreline retains an allure, a history, a diversity of people and places—and a wildness—unequaled by other settled shores. It would be impossible to restore the bay's former character. Yet we can rejoice in getting to know what has been preserved and what is being restored. Most of the 6.5 million people who call the Bay Area home have come from elsewhere. Slowly, though, as we explore the bay's shore, we may be coming to know ourselves as people from the San Francisco Bay region. ■

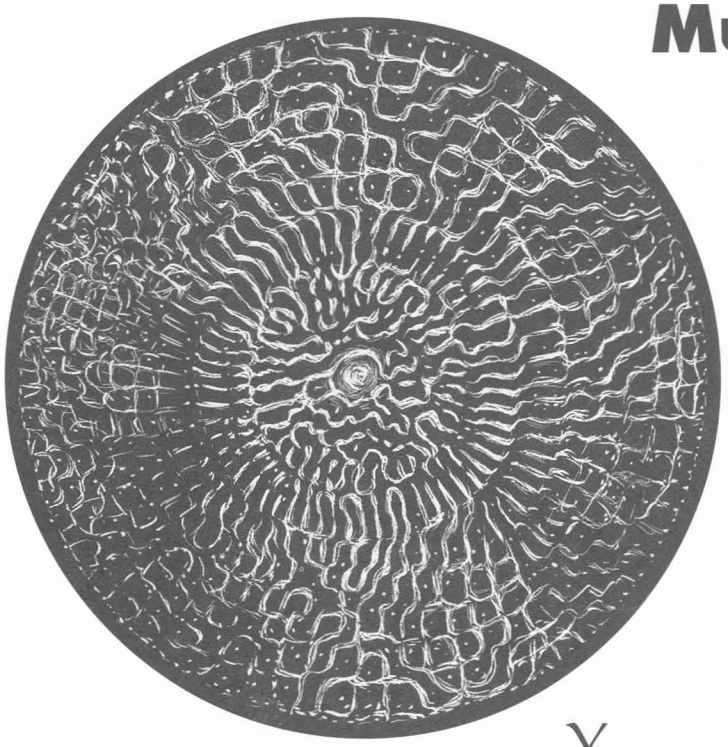
Jerry Emory researched and wrote the San Francisco Bay Shoreline Guide.

PORT OF OAKLAND

One of many tranquil spots on the Oakland Estuary.

Mud Poems

BULBUL SINGH



ARTHUR OKAMURA

And that is why I say
My body is mud.
Because it needs the rain.
It needs the sun on its face
And the mist in the hills:
Without these the mud dies
And shrinks up the earth;
Without these the soul dies.
For if the mud is gone
What else remains?

Long ago I heard a song
That said mud fell from heaven,
And disbelieved.

Once I heard a song that said
The sky came from the earth,
And disbelieved.

Time changes all.
Time has changed me.
Or have I come to know
That the mud
Comes from heaven
And heaven
From earth?

You see, when the circle ends
It returns to the same point.
Eventually, we must return
To the sea, the mud, the sky.

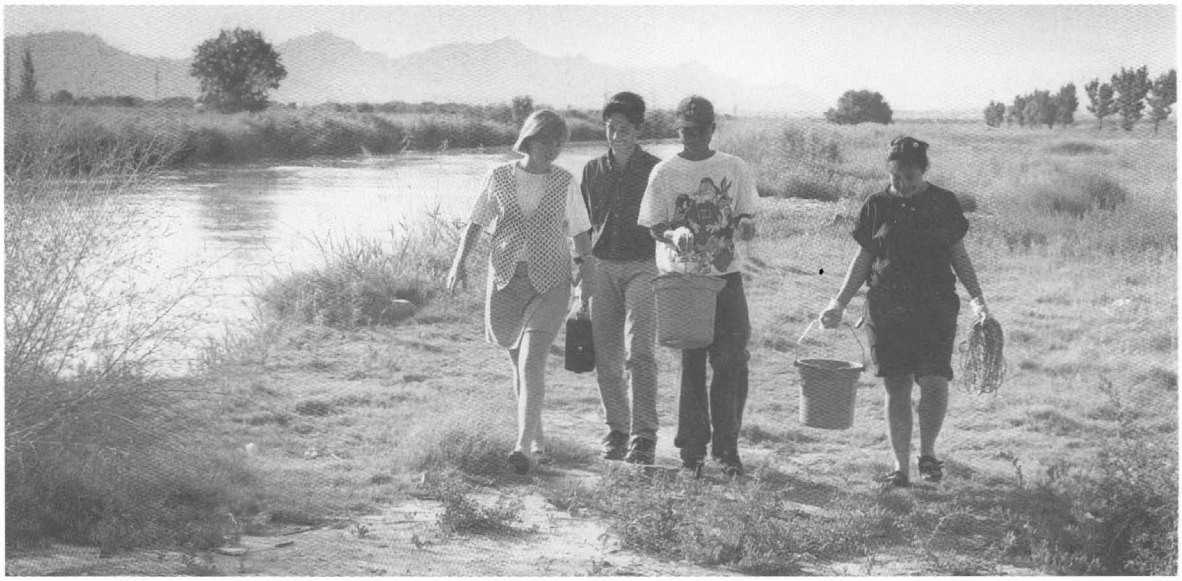
I made mud gods in spring
And then put gold and vermilion
In their hair and sandal
On their foreheads, and later
When the harvest came
To the mud gods I offered
The first grain and prayed
That the rains would be plentiful:

So the mud gods kept my thoughts
And watched the skies for rain:
And I return to the gods
Who kept my soul together

The mud gods of spring,
The mud gods of winter,
The mud gods of the hills
The trees, me, and mine.

For this is where the circle begins
And comes to rest, eventually.

Editor's note: I met Bulbul Singh two decades ago, when he passed through San Francisco en route from India to points east. He left behind a cycle of poems he had written "as my song of joy for my mother, the Mud." He had begun them in 1973, during a drought. We bring you three of them in a time of floods. Unfortunately we do not know where to find Bulbul Singh now. Please let us know if you have heard of his whereabouts. —RG



WAYNE BAKER

The El Paso Youth at Risk Program checks the Rio Grande (right and below).

Testing the waters they know personally

WAYNE BAKER

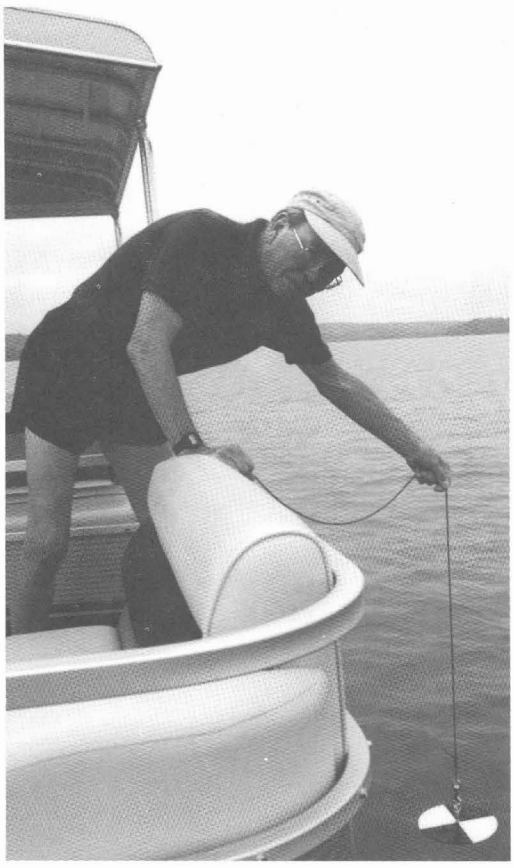
ELEANOR ELY

CITIZENS FOR BUCKEYE BASIN. Friends of Fauntleroy Creek. Elkhorn Slough Monitor. All across the nation, tens of thousands of citizens, members of groups like these, regularly trek to local streams, lakes, or estuaries where—for no pay—they perform what is generally thought of as scientists' work. They are part of a grassroots movement that was virtually unheard of just 25 years ago: "citizen volunteer environmental monitoring." Most monitor some type of water body.

The basic concept goes back to at least 1890, when the National Weather Service began training volunteers to take daily temperature and rainfall measurements (a program that continues to this day, with 11,500 volunteer weather stations nationwide). But that was a top-down effort, conceived and orchestrated by a federal agency. In contrast, the recent explosive growth in water quality monitoring is quintessentially a home-grown local action phenomenon. Ask some of those who participate what motivates them to spend their free time doing water quality

tests, and chances are you'll hear, "My kids and grandkids swim in this river," or "This lake is our drinking water supply," or "We don't want the place where we live to be ruined." These people are watching waters they know personally.

Just about anyone can get involved. "We have carpenters, doctors, farmers, teachers, students; we have a funeral parlor director and a bee keeper," says Amy Picotte, who coordinates the Vermont Lay Monitoring Program. "About half of our volunteers are retired, but we have a lot of young people, too—it's amazing how many take time out of their busy schedules to monitor." A 1993 national survey showed the typical program to be small: the median number of volunteers was 25, the median annual budget was $4,000. Even the largest programs are usually made up of small, local "partners." For example, the Texas Natural Resource Conservation Commission's statewide Texas Watch coordinates efforts of 231 groups.



ELEANOR ELY

Bill Fairhurst, a volunteer with Michigan's Tip of the Mitt Watershed Council, prepares to lower a Secchi disk into Walloon Lake.

Each group seems to have a slightly different genesis. Personal health may be an issue: in California, Surfrider Foundation, a national surfer organization, began to test ocean waters for bacteria because surfers were getting sick. Economics may play a part: in Maine coastal towns, fears that economically vital shellfish-growing areas would be tainted by sewage motivated citizens to organize. Some groups were launched by local and state agencies: Vermont's Department of Environmental Conservation started the Vermont Lay Monitoring Program because it lacked the staff to visit all the state lakes. And at least one project, an international network of high school river-monitoring programs, was inspired by a planet-wide vision. Professor William Stapp of the University of Michigan School of Natural Resources founded GREEN (Global Rivers Environmental Education Network) in 1989 because he perceived river monitoring as a path to cross-cultural understanding. Today U.S. and Mexican students are working together to monitor the Rio Grande in just one of GREEN's projects.

SPONTANEOUS COMBUSTION

The latest (1994) edition of the *National Directory of Volunteer Environmental Monitoring Programs* lists 517 programs nationwide, undoubtedly an underestimate. In 1969 there was just one—Save Our Streams (SOS), in Maryland. In 1975, the Izaak Walton League of America, a national conservation organization, took SOS nationwide with the Water Wagon. This motor home outfitted with basic water testing equipment visited all the lower 48 states in the space of two years.

Meanwhile, at the University of Minnesota, geology professor Joseph Shapiro was struggling to find a way to collect statewide data on lake water clarity. In 1973 he decided that volunteers were his only hope. Lake water clarity is easily measured with a Secchi disk, which is lowered on a calibrated rope into the water from a boat or a pier into the water. (See photo.) The point at which it disappears from sight is recorded as the Secchi depth. Shapiro had 1,000 Secchi disks made, began recruiting, and the Minnesota Citizen Lake Monitoring Program was born. It is still going strong—as is SOS.

During the 1980s new programs sprang up all over, as if by spontaneous combustion. There was no campaign or targeted effort. People would hear about the concept, get excited about it, and adapt it to local needs. However, programs in different parts of the country remained largely unaware of each other's existence.

All that changed in May 1988, when the first national volunteer monitoring conference brought representatives from some 80 groups to the University of Rhode Island campus. "We found people primarily by word of mouth," recalls Kathy Ellett, coordinator of the Chesapeake Bay Citizen Monitoring Program, who organized the conference with Virginia Lee, founder of Rhode Island's Salt Pond Watchers. "When we started calling around, we were amazed at how many groups there were."

Having found each other, the conference attendees resolved to stay in touch. They asked the Environmental Protection Agency, a co-sponsor of the conference, to help fund a national directory and newsletter, as well as future conferences. The EPA agreed. "I don't know anything else that works as well as monitoring for educating communities about water quality," explains Alice Mayio, the agency's national volunteer monitoring coordinator.

CALIFORNIA: A LATECOMER

Despite its reputation as a hotbed of environmental activism, California was slow to join this movement, though no one seems entirely sure why. No one from this state attended the first national volunteer monitoring conference. No California group was included in the first two editions of the national directory, and the third edition (published in 1990) listed just one: the San Francisco BayKeeper.

Now, however, the state is catching up. The 1994 directory includes 27 California groups. Surfrider Foundation members in Santa Cruz, Ventura, Laguna Beach, and San Diego are testing ocean water at popular surf spots for bacterial contamination. Some chapters publicize their results via hotlines (the number in Santa Cruz is 423-POOP) and local newspapers. The Gulf of the Farallones National Marine Sanctuary, headquartered in San Francisco, has trained volunteer beach monitors to tally marine debris, identify

What do volunteer monitors do?

Broadly defined, monitoring simply means making observations at regular intervals. Exactly what volunteer monitors do depends on the type of water body they are checking on and what they want to find out.

For assessing stream health, one of the most popular methods is a "bug count"—or benthic macroinvertebrate analysis. Macroinvertebrates are small spineless creatures, mainly insect larvae plus some snails and worms, that live on stream bottoms and range in size from just-visible to finger-sized. Volunteers catch them in a fine-mesh net, then sort and classify their collection using a simple identification key. If they find lots of pollution-sensitive bugs, the stream is likely to be healthy; if they get only pollution-tolerant types, it is probably in trouble.

"People really get a kick out of bugs," says Jerry Schoen, coordinator of Massachusetts Water Watch Partnership. "Tables of chemical data can cause eyes to glaze over, but if people see that living creatures can't live in their stream, they might think twice about letting their kids swim there, or about voting down an ordinance for septic system maintenance."

Bug counts give a good general indication of stream health, but they don't tell you precisely what's in the water. A group concerned about dissolved oxygen level (fish and other aquatic creatures suffocate when dissolved oxygen gets too low) might opt for a field test kit. Such kits are easy to use and relatively inexpensive (about $45 for a kit that will do 100 dissolved oxygen tests). Kits are also available for measuring pH, nitrates, phosphorus, and other chemicals. Most kits work equally well in streams, lakes, and estuaries.

Tests can be performed with a greater or lesser degree of scientific rigor, depending on a group's goals (some screen for gross problems; others need very precise measurements) and on the amount of time and money available. Connecticut River Watch Network volunteers perform analyses in a nearby high school lab. The equipment they use includes a spectrophotometer, which reads color electronically and allows volunteers to get more accurate measurements than with a field kit. Lab work takes more time, however.

"People really get a kick out of bugs"

Some groups rely primarily on observations. Armed only with data sheets, pencils, and measuring tape, volunteers walk along a stream or shoreline, recording bottom type (sand, rock, mud), presence of algae, potential pollution sources (such as pipes discharging waste into the water), and other simple yet significant facts.

PENELOPE NILAND

San Francisco BayKeeper volunteer Ralph Pericoli samples a storm drain in Oakland.

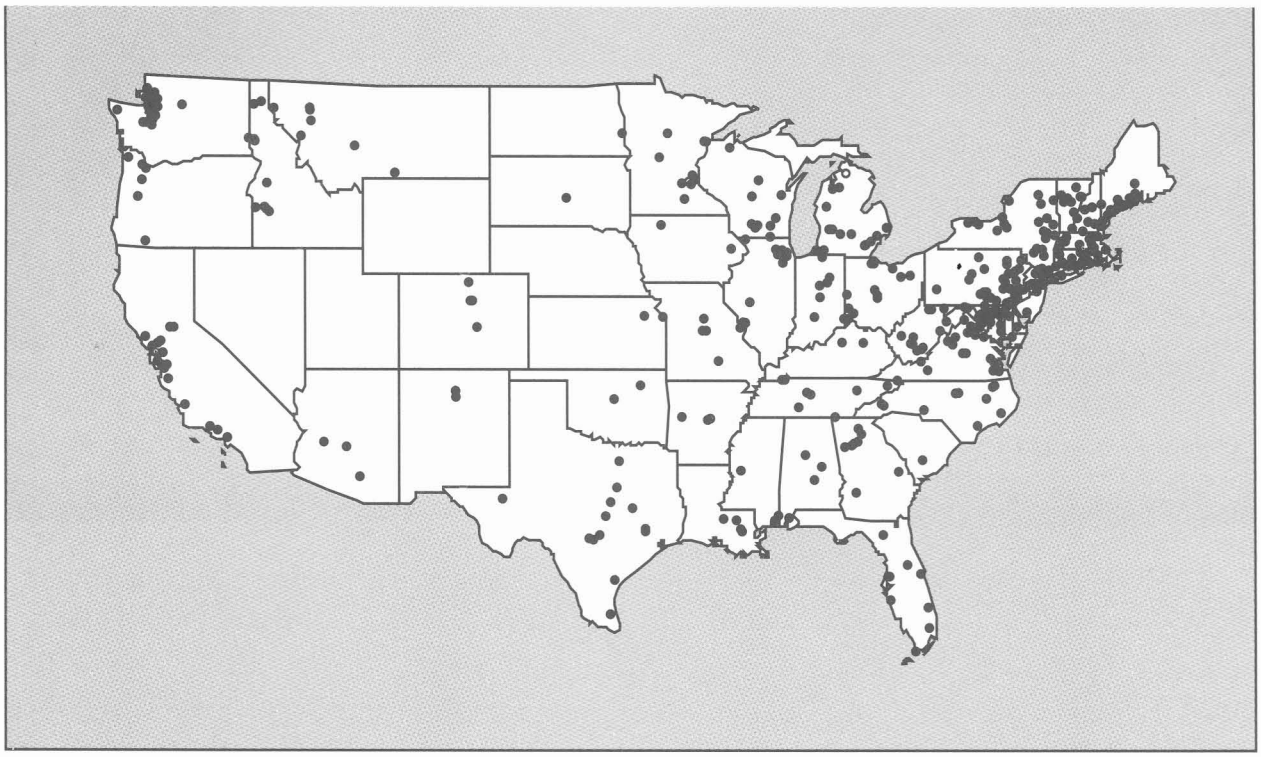
seabirds and marine mammals, and photograph beach profiles. San Francisco BayKeeper volunteers, on patrol since 1989, watch for violations of water quality and other environmental laws.

One of the most ambitious new programs is Community Creek Watch, started in Santa Clara County by Mike Rigney, a wildlife biologist and director of the Coyote Creek Riparian Station, an environmental research organization. He had been concerned for years about California's disappearing riparian corridors (the plant communities at the edge of rivers and streams, which provide essential habitat to many freshwater and land species). With an estimated 90 to 95 percent of the state's streams channelized or otherwise altered, Rigney wanted to find out exactly "what's left, what condition it's in, and how long it will last." Launched in 1992, Creek Watch had 125 volunteers within two years. Every foot of stream bank in the county is to be visited, not just once, but repeatedly, to collect data on water chemistry, fish habitat, streamside vegetation, amphibians, and birds.

The State Water Resources Control Board has formed a steering committee to improve the links between groups monitoring riparian corridors in the San Francisco Bay area, watershed awareness groups, and public agencies. The committee's first task is to identify monitoring needs of public agencies and information being collected by volunteers. For information, call Gwen Starrett at (916) 657-0518 or FAX (916) 657-2127.

FROM DATA TO ACTION

No one wants to collect information to sit in some box. "The bottom line is that volunteers want and need to make a difference," says Margie McEleney of the Bellevue Stream Team in northeastern Washington. This does not necessarily mean making headlines. Typically, volunteers do not sue



THE VOLUNTEER MONITOR

Location of the 515 programs listed in the latest *National Directory of Volunteer Monitoring Programs* in the 48 contiguous states. There are also two in Alaska.

JOHN BILDAHL

At a "quality control session," volunteers with Chesapeake Bay Citizen Monitoring Program are tested to see how accurately they can perform measurements with field test kits.

polluters or try to change federal law. They usually supply their information to local decision-makers, alerting them to local water quality problems and helping them find their way toward solutions.

- In Baltimore, Maryland, volunteers surveyed a small stream called Herring Run, documenting problems like stream bank erosion, unshaded stretches, trash-dumping areas, and exposed sections of sewer lines. After they presented their findings to the city council, the council agreed to fund tree planting, wetland regeneration, and other restoration efforts.
- The Santa Cruz chapter of Surfrider Foundation recently found very high bacteria counts in water discharging from a storm drain pipe onto the beach at a popular surfing spot. They notified the county health department, which verified the problem and traced it back to a supermarket about a mile away. It turned out that the floor drain of the store's meat department had been plumbed into the storm drain by mistake. That problem has been fixed, but high bacteria levels persist, so the county is looking for other possible sources.

- Volunteers with Adopt-a-Beach in the state of Washington collect mussels and clams and send them to county or state health departments to be tested for their potential to cause paralytic shellfish poisoning, a serious and sometimes fatal illness. The test results are used to determine whether to close beaches to shellfish harvesting. (Paralytic shellfish poisoning is actually caused by a tiny one-celled organism that is eaten by clams and mussels. The shellfish themselves suffer no harmful effects.)
- When the Vermont Water Resources Board set out in 1989 to define realistic target goals for phosphorus levels in Lake Champlain, they relied on the 10-year record of phosphorus levels collected by Vermont Lay Monitoring Program volunteers—the only long-term data that existed. (Phosphorus is a plant nutrient, and high concentrations are a primary cause of algal blooms.) Now the volunteers are helping to monitor progress toward the goals their work helped to establish.

In these instances and countless others, information gathered by citizen monitors has directly influenced public decisions on water

Resources

The Volunteer Monitor newsletter: Published twice yearly; national focus. Subscriptions are free. For a copy of the most recent issue, send request and SASE (78¢) to The Volunteer Monitor, 1318 Masonic Ave., San Francisco, CA 94117.

The publications listed below are available from Alice Mayio, U.S. Environmental Protection Agency, Office of Oceans, Wetlands, and Watersheds, 4503F, 401 M Street, Washington, DC 20460. All are free.

Volunteer Monitoring Fact Sheet. Six-page introduction to volunteer monitoring.

National Directory of Volunteer Environmental Monitoring Programs, 4th edition. 1994. Lists 517 volunteer monitoring programs, with descriptions and addresses; also includes summary results of national survey of volunteer monitoring groups.

Volunteer Water Monitoring: A Guide for State Managers. 1990. A good starting point for people interested in setting up a volunteer monitoring program.

Free offer: respond to our reader survey, page 47

ELEANOR ELY

Mary Force uses a kit to test dissolved oxygen levels in Los Alamitos Creek near San Jose

Please remember to send in the reader survey, page 46

quality issues. In other cases, such information has been weighed by local agencies in making decisions on zoning, building permits, and other matters that ultimately affect water quality.

MAINTAINING CREDIBILITY

If data is to lead to action, however, it must be widely accepted as credible. Volunteer monitors often face a high level of skepticism. Sometimes their findings are dismissed as products of "alarmists" or "knee-jerk environmentalists." Even more often, they run up against the you-can't-do-this-without-a-Ph.D. mindset. Barbara Taylor, now director of Maryland Save Our Streams, recalls an incident in the 1970s, when she confronted county construction site inspectors with evidence that mud from construction sites was polluting local streams: "Their response was basically, 'You're just a housewife. Let me explain this to you.'"

To counter such attitudes, volunteer organizations bend over backwards to ensure the accuracy and reliability of their data. The first step is training: "nonprofessional" does not mean "untrained." To be certified, volunteers may be required to attend several training sessions, then pass a test. Many programs also require them to attend follow-up training and testing sessions.

The accuracy of actual measurements can be double-checked in several ways. Duplicate water samples can be sent to a professional lab. Water quality professionals can be enlisted for parallel testing—making measurements side-by-side with some of the volunteers. Florida Lakewatch used a slightly sneaky approach: volunteers were told that professional biologists would be going out with them to collect lake samples for an unrelated study. Only later did they learn that the biologists also checked on the effectiveness of their monitoring efforts. The volunteers passed with flying colors, says program coordinator Sandy Fisher, and "they understood. They know that the burden of proof is on us to establish the credibility of our data."

STILL A GRASSROOTS MOVEMENT

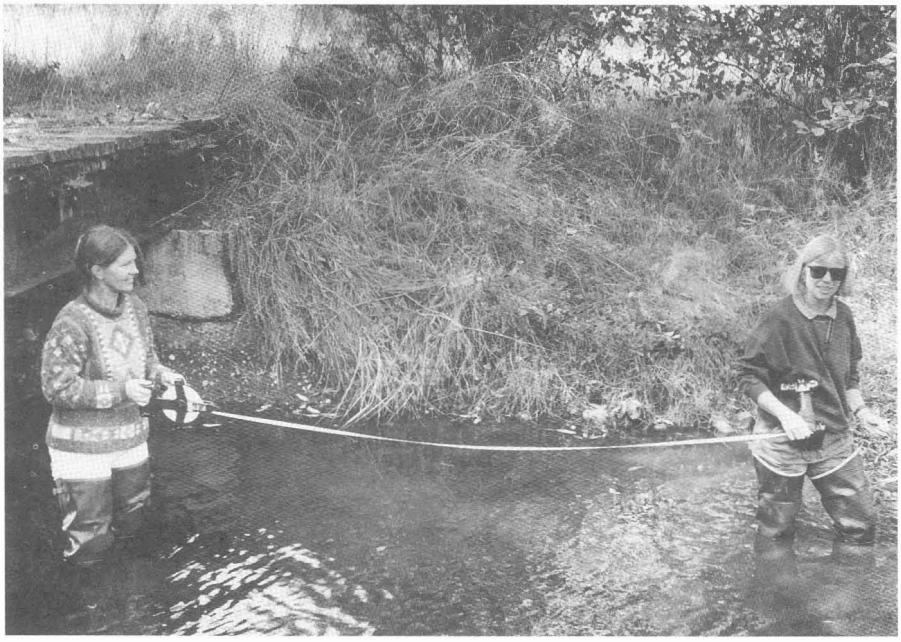
To this day, volunteer monitoring remains fundamentally decentralized and local. No national organization or clearinghouse exists; no nationally standardized methods have been agreed upon. In a few places, including the Merrimack River watershed in New England, groups monitoring in the same watershed are talking about how to coordinate their efforts. But they are careful to leave plenty of room for individual groups' autonomy.

New groups are popping up faster than ever. Each approaches its own local situation in its own way. The heart of the movement is still the sense of personal ownership citizens feel toward the waters they test.

The key to the popularity of monitoring may be its broad appeal. It brings together people of different ages, ethnic and socioeconomic groups, and political orientation, and it offers everyone a chance to connect directly with the natural world. To dip a net into a creek or slough and then examine the creatures you bring up is an entirely different experience from sending a check or writing a letter to save some distant part of the world. These citizen sentinels work in their own neighborhoods; they are learning to know their own backyards; and they get the satisfaction of making changes they can see with their own eyes. ■

Eleanor Ely is a free-lance writer based in San Francisco and the editor of The Volunteer Monitor *newsletter.*

ELEANOR ELY



Streamwalk volunteers take a measurement in a stream near Seattle. Observational monitoring like this requires very little equipment.

IF YOU TRAVEL THE LENGTH OR BREADTH OF THE STATE, you experience its diversity as a progression of distinct environments, each with characteristic plant species and climatic conditions. The cool, damp forests of the north coast are as different from the sandy washes of the Colorado Desert as any two places on the Earth. To highlight such contrasts, scientists have divided the state into large bioregions, each of which encompasses environments with broadly similar characteristics.

The Great California Mosaic

"BIOREGION" was a term familiar mostly to scientists and poet/activists just a few years ago. The same could be said about "biodiversity."

Now both represent key concepts in conservation and in endangered species education and protection efforts, which are expanding their focus beyond individual species to larger life systems.

Although state and federal endangered species laws have rescued many plants and animals at the brink of extinction, these laws—essential though they are—will not suffice to prevent the disappearance of the rich variety of life on the planet. Few species have recovered, and "plans for recovery lag far behind," according to Kent A. Smith and Noah T. Maffitt, authors of "Wildlife Conservation Law in California: From Bag Limits to Biodiversity," in *Life on the Edge.* "There simply will never be enough human or dollar resources available to recover the species currently on lists, let alone the several thousand waiting to be listed."

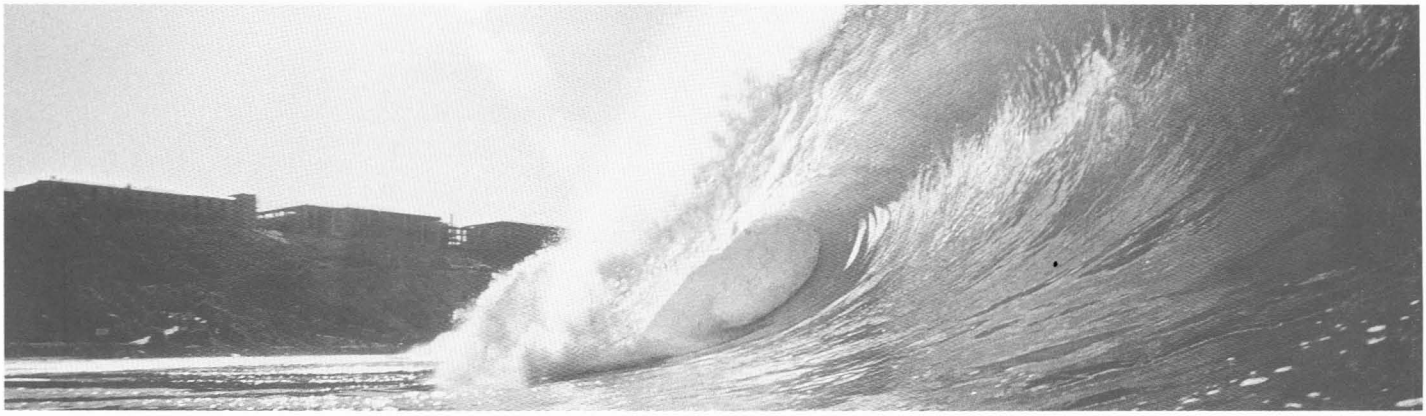
In response to these disturbing facts, California and several other states are now looking toward a more comprehensive approach, one that includes plant and wildlife communities and considers whole landscapes as well as individual species. In managing ecosystems, rather than individual species, there is hope that numerous species can be kept from being depleted to the point where they must be listed as threatened or endangered, and that biodiversity might be sustained.

... A BIOREGION IS ITSELF A MOSAIC of unique aquatic and terrestrial environments—marshes, grasslands, woodlands, forests.

—*Elna Bakker, in "California: The Great Mosaic,"* Life on the Edge: A Guide to California's Endangered Resources: Wildlife, *published by BioSystems Books, Santa Cruz, 1994. $75 cloth, $45 paper. 549 pages. Available in bookstores and by mail from Heyday Books, P.O. Box 9145, Berkeley, CA 94709, (510) 549-3564.*

Bioregions, biodiversity, and ecosystem management are concepts that come to life in *Life on the Edge,* a new, beautiful and comprehensive book that portrays the state's endangered wildlife species in the context of landscape and history. It includes essays by leading scientists, legends by Native Americans, and is richly illustrated. "This is the publication we have been looking for for years," said Beth Huning, director of the Richardson Bay Audubon Sanctuary and coordinator of the state's Endangered Species Education Program. The book's distant ancestor was a manual on endangered species prepared in 1989 for Southern California Edison Company power line workers by biologist Daniel C. Pearson. So many requests for it flooded in from resource agencies, developers, teachers, and others that Pearson and Carl G. Thelander, editor in chief at BioSystems Analysis, Inc., decided to do a book. They planned a modest volume, but "it just evolved over a four-year period," into a major collaborative effort, said Thelander. A second volume, on endangered plants, is planned.

During this year and next, the Audubon Society expects about 5,000 elementary school teachers to take part in its endangered species workshops, which are designed to encourage schools to adopt an endangered species and to prepare teachers to lead students in projects in these species' behalf. (In the next issue, *Coast & Ocean* will report on some highly successful projects.) Each teacher will come away with a copy of *Life on the Edge,* to use in learning, and helping students to learn, about wildlife, and to understand what natural wealth Californians have inherited. ■



COURTESY SURFER MAGAZINE

SECURING A BEACHHEAD *for* COASTAL ACCESS *in* ORANGE COUNTY

WILLIAM M. WILCOXEN

Behind the California Coastal Initiative of 1972, which led to the California Coastal Act of 1976, lies a history of citizen struggle against threats to close off access to the shore. Among those who played a leading role in that struggle in southern Orange County was William M. Wilcoxen, who grew up enjoying the wide open beaches around Laguna Beach and in 1962 established a law practice in his home town. In 1968 he took on the first of five battles that helped to shape public and legal thinking about coastal access. Here he tells of his fight for a favorite coastal park, and for a beach. These stories show what was required to overcome a major obstacle: the belief that it was "impossible" for citizens to keep what was rightfully theirs.

PINES PARK

IN THE LATE 1960S there were still wide open spaces to the north and south of Laguna Beach. All the beaches were open, though one might occasionally encounter a cowboy or two on one of the ranch beaches. But great pressure for development had begun.

In 1967, some local residents were alarmed to discover that their community park had been put up for auction. It sold, and the buyers announced their intention to build apartment houses on the property.

The park was on private land, but it had always been open to all to enjoy. It was developed by Mrs. Estelle Doheny, the wife of Edward Doheny, owner of Petroleum Securities Company, which in 1927 had subdivided beach-front lots as Capistrano Beach. Along the bluffs overlooking the beach Mrs. Doheny had created a park, which she called Descanso Gardens. She filled it with native and exotic plants, cupolas and amphitheaters, walkways, and picnic tables. The Dohenys' staff maintained the park, but all others were welcome to enjoy its pleasures.

In 1948, after the Dohenys died, their remaining property was sold to Consolidated Pacific, which continued to sell lots, advertising the park as a benefit of lot ownership. The level of maintenance of Descanso Gardens greatly decreased, however, and throughout the 1950s and 60s the park deteriorated. There were fires and vandalism. Nobody was in charge, and the developer had no incentive to keep up the park. Neighbors occasionally organized cleanup efforts, but by 1967 most of the landscaping Mrs. Doheny had installed was long gone. About all that was left were the pine trees, and so what had been Descanso Gardens became known as Pines Park.

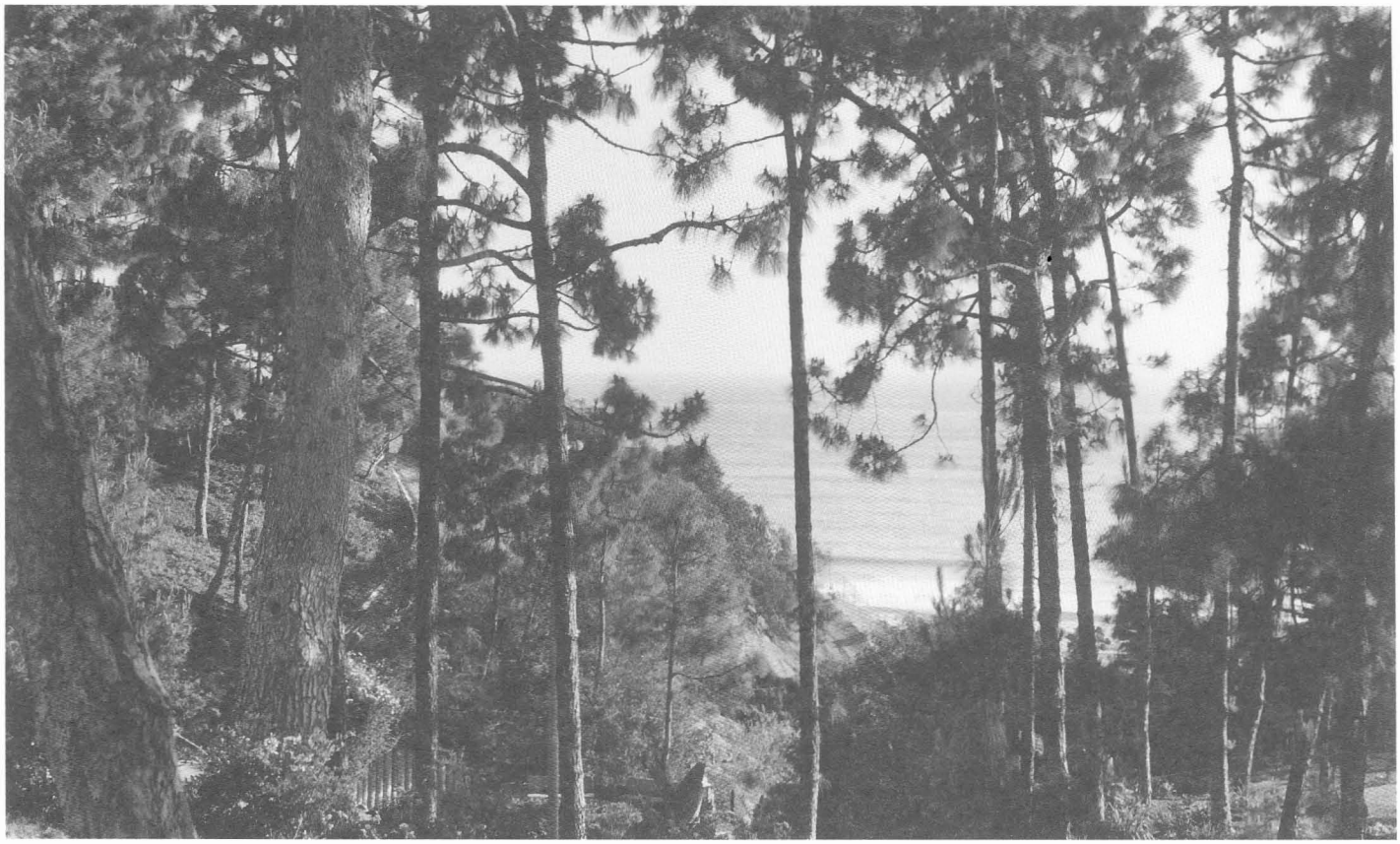
Residents indignant at the loss of their community asset formed a park and recreation district and hired me to try to preserve their park. I associated with Dick Newell, a law school classmate with public law experience, and we filed suit.

The law books revealed a legal doctrine known as "implied dedication." Even if an owner had legal title to property, the public could prevail if it could be proven both that the owner had shown an intention to dedicate property to public use and that the public had made use of the property continuously for more than five years .

With the help of a local surveyor, Alan Clark, we found old Petroleum Securities maps and old water district maps that referred to the park. Then we located some of the employees Edward Doheny had brought from Mexico after his business there had been nationalized. Not only had they helped build the park, but their families had used it for three generations. By searching through old corporate records, we discovered adver-

RICK LANG

Pines Park



RICK LANG

tising material from the Consolidated Pacific era. Many of those who had bought land at that time were still around and would testify that the company's representation of the park as a benefit of purchase had indeed influenced their decision to buy.

We had a good case. We were able to call over 50 witnesses: people who had married in the park, who had had family gatherings there, who had taken children there who were now grown and had taken *their* children there. We proved public use of Pines Park during every year since 1929. We were also lucky that the judge hearing the case, William Lee, had a great interest in horticulture; he had taken a walk in the park and was still able to see evidence of Mrs. Doheny's landscaping.

The defendants in the case were the buyers and United California Bank, which had loaned money and taken a first trust deed on the park. The buyers claimed that they were the owners of record, that they had title going back to a Mexican land grant, and that to take their property without compensation would be unconstitutional. This argument carried weight with some conservative park board members, and we had to reassure them that our case was solid.

Next the defendants argued that Mrs. Doheny had only been satisfying her own desires and had never intended to make a public gift of the land. In fact, they said, the Dohenys had made other such gifts—a state beach park quite close to Pines Park, for example, as well as significant land gifts in Los Angeles—and clearly knew how to do so. The defendants also maintained that they should not be bound by the advertising of Consolidated Pacific. Finally, the bank's appraiser testified that he had appraised the property as vacant land, having seen nothing there to indicate that the area was a park.

Judge Lee was not impressed by these arguments. He awarded the park to the public. An appeal resulted in an opinion of some length upholding Judge Lee's ruling, and the California Supreme Court declined to hear the case.

I enjoyed the experience of tracing 40 years of community history, getting to know hundreds of people who cared about Pines Park, and winning this unusual lawsuit for them. Although this park may never again attain the horticultural splendor that Mrs. Doheny created, it continues to provide inspiration and recreation for people throughout the region.

SALT CREEK

SALT CREEK BEACH lies about six miles south of Laguna, next to the Coast Highway. Until recently, rolling dunes cascaded down the hillside toward two miles of white sand beach. The structure of the offshore reefs causes an excellent surf break and makes this beach a favorite with surfers. There was open access from the highway via Salt Creek Road. To continue driving down the dirt road that ran along the bluff, one had to pay a dollar, so most people parked along Salt Creek Road. In 1968, the Salt Creek property came up for probate sale and was bought at a low price by the Laguna Niguel Corporation, funded by the Prudential Insurance Company of America, which had recently purchased an adjoining ranch without ocean frontage. The State Department of Parks and Recreation did not put in a bid, even though Salt Creek Beach had been on its short list of proposed acquisitions and purchase funds were available. We heard that political pressure was brought to bear by the Laguna Niguel Corporation.

One October day I was driving south en route to interview some witnesses in the Pines Park case. As I passed Salt Creek Road I saw a chain across it. I backed up for a closer look and read the sign: "Private Property —Laguna Niguel Corporation." I got out and stood for a while thinking of all the good times I'd had surfing, diving, and growing up at Salt Creek. Then I ripped off the sign and put it in my trunk.

The next day I made some inquiries with the county government, which had jurisdiction over Salt Creek Road. I found that the right-of-way, consisting of about three acres of oceanfront, had been summarily abandoned without even a public hearing, and for no money. The effect was to give the property to the Laguna Niguel Corporation. I also discovered that the county had adopted a very specific policy in favor of private beaches. The idea was that if all the open beaches in southern Orange County were developed into private, gate-guarded enclaves, there would be no need for county maintenance or lifeguards and the county would save money. This seemed unreal to me, although I was to find out later that the same thing was happening in many places along the coasts of the United States.

I decided I needed a lawyer and contacted one with experience in public law. We met with our county supervisor Alton Allen, a retired banker, and some county staff and objected to the road abandonment. They contended that the road was without value because it did not go to the mean high tide line, even though it did go to the beach. (Before the Coastal Act, only the Public Trust Doctrine protected public access to the coast, and that only to the mean high tide line.) Therefore, their argument went, the road was completely surrounded by Laguna Niguel property and was a proper subject

The idea was that if all the open beaches in southern Orange County were developed into private, gate-guarded enclaves, there would be no need for county maintenance or lifeguards and the county would save money.

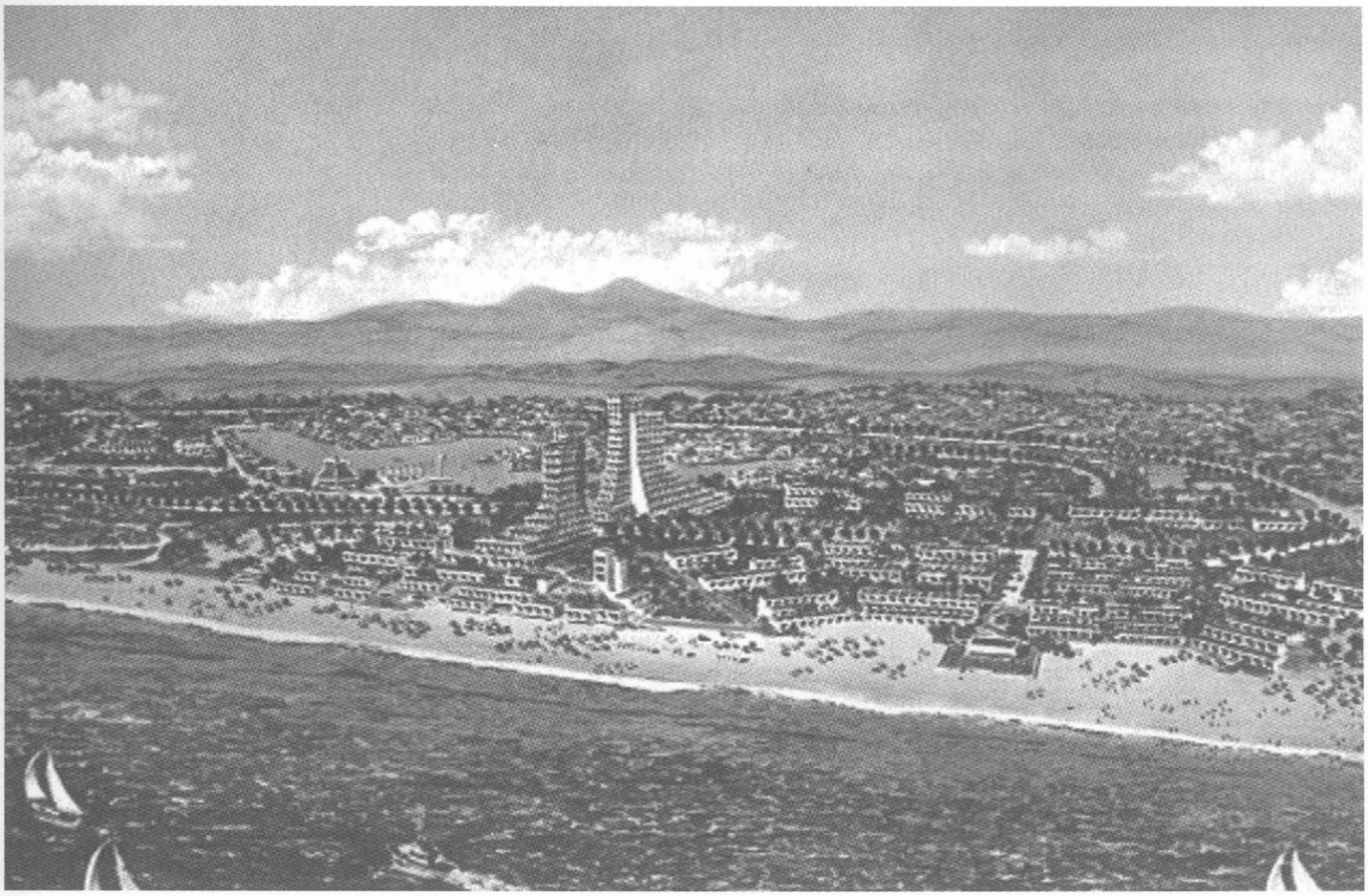
At Salt Creek

COURTESY SURFER MAGAZINE

CHARLES D. EVERTS

Salt Creek, circa 1969

"Your corporation plans advantageous use of this rare natural resource."—The Laguna Niguel Corporation, 1968



LAGUNA NIGUEL CORPORATION ANNUAL REPORT 1968

for summary abandonment. They did hold out some hope that public access might be included in the land planning process.

Shortly after this meeting, my attorney told me he could no longer be involved in the case because of pressure from Laguna Niguel Corporation. At that time, there were few attorneys who dealt with the county, and almost all of them represented developers. There was no market for any other kind of lawyer. So I had little choice but to sit back and wait to see what the land planners would do with Salt Creek.

A few months later I received an anonymous telephone call from someone in the county planning department: the subdivision maps were to be recorded the following week, without any public access provisions. The beach would be closed forever.

One thing you don't do if you want to maintain your standing in the legal community is file a case in your own name. If you do so, it is said, you have a fool for a client. You can't exercise good judgment because you are too directly and emotionally involved.

I went against this maxim and filed suit against the County of Orange, the Laguna Niguel Corporation, and the Prudential Insurance Company of America. Before doing so I convinced another lawyer, who was also a surfer, to sign on to the complaint. Mike Sager was all for it. I also got a temporary court order stopping the developer from taking any action that would affect the Salt Creek Road right-of-way.

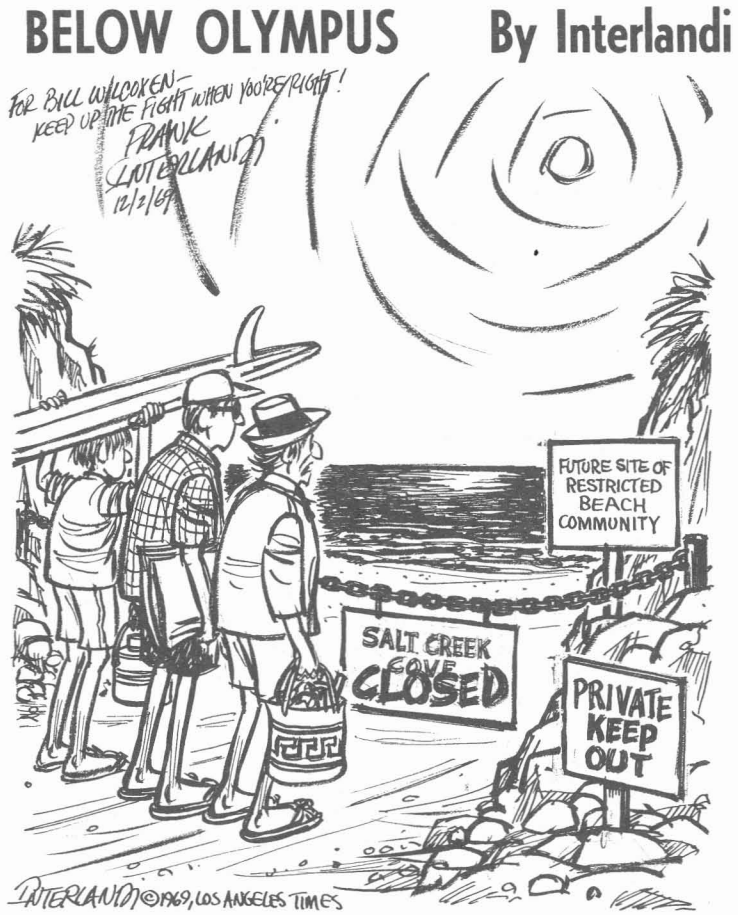
The press loved the Salt Creek case, and in time every major paper in the region editorialized against the road abandonment. Some focused on the access issue, while the very conservative *Santa Ana Register* liked the story because it once again showed how stupid government could be to give away valuable property for nothing.

But we had problems in court. First the judge lifted the stay. The very next day the developer bulldozed out all traces of Salt Creek Road. The judge also accepted the developer's argument that I had no legal grounds to file the suit, unless we alleged fraud on the part of the county. We had 20 days to amend.

I got the board of the park district I represented, the Capistrano Bay Park and Recreation District, to join the suit, on the theory that it would have standing to support the recreational values of beach access. The fraud question was more difficult. I knew our county supervisor to be an honest and upright man who simply believed that all private development was by definition good. We proceeded by alleging constructive fraud—that is, that the road abandonment in effect constituted a fraud against the public. At a second hearing our pleas were deemed sufficient to warrant a trial, so in the

Surfers had a stake in Salt Creek Beach.

COURTESY SURFER MAGAZINE



COURTESY WILLIAM M. WILCOXEN

**That's why I'm for the space program—
we're running out of public recreational areas down here!**

summer of 1969 we prepared our case. By that time, the whole issue of access to Salt Creek had become a political as well as a legal one.

We formed the Save Salt Creek Committee and met frequently. This committee was composed of Breenen "Big Hevs" McClelland, a legendary surfer and founder of the Western Surfing Association; Helen Kelley, a former city councilwoman and former member of the Orange County Grand Jury; Joe O'Sullivan, a former councilman who had defended surfers' rights in Laguna; and myself, who knew nothing at all about politics and was getting very nervous about all the publicity of a pending legal case.

I was still trying to practice law, but it wasn't easy. This case was consuming more and more of my time and energy—in part because it was so interesting. One day, for example, a man named Peanuts Larson came into my office without an appointment. He put a large piece of driftwood on the desk, saluted, and said: "Ten-four on the coconut wireless, sir. The word is that if we can put a man on the moon and a black on the bus, we should be able to get to the beach." Although Peanuts didn't have any money and could be described as a beach bum, he was an old-time surfer and knew many people. Peanuts told me that a high point in his life had been surfing Salt Creek during the 1938 hurricane. He threw himself wholeheartedly into the campaign to rescue the beach. He talked a printer into making some "Save Salt Creek" bumper stickers on spec, with payment to follow from the sales. At a dollar a sticker, he did a brisk business. He also put on an old-time abalone feed, to which he invited several influential former surfers. He talked someone into going to Catalina Island to get the abs, and talked someone else into having the party at an oceanfront home in Laguna.

The party was a great success. Among those in attendance was Justice Robert Gardner, easily the best-known judge in Orange County. He had started out in Newport Beach, where he wore a swimsuit under his

black robe so that he could get to the water quickly. Later he spent more than 20 years as a superior court judge, and in 1969 he became a judge on the California Fourth District court of appeal. His written opinions were humorous, brief, and famous. He had also written the only book in print on how to body surf. I am sure that his support, and that of Peanuts Larson's other influential beach friends, was very important.

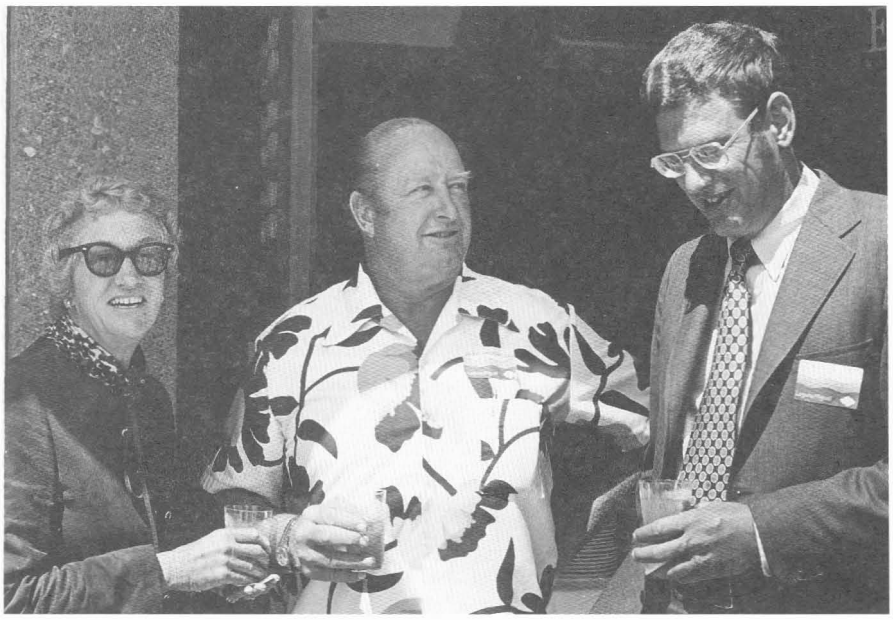
Petitions were circulated, resolutions were published. The Orange County Grand Jury condemned the road abandonment. The Orange County Board of Supervisors agreed to hold a hearing about beach access at Salt Creek. I asked Frank Interlandi to do an editorial cartoon for the *Los Angeles Times*, and it appeared on the morning of the hearing. The speakers were inspired, anchored by Big Hevs, who told the supervisors that the beach access battle had its roots in the American Revolution. When it was all over the board thanked everyone but did not commit itself to any action.

In August 1969, however, our case became very solid. In Mendocino County there is a place called Navarro Beach. A public road leads from the highway to the sand and then stops. There is an area of dry sand beach before one reaches the public beach and tidelands area. The owner of this dry sand area had blocked off access, and a citizen beachgoer had filed suit, alleging that the dry sand area had been the subject of an implied dedication to the public because the public had used it for decades without interference or objection from the property owner. The district court of appeal had ruled in favor of restoring public access to the beach.

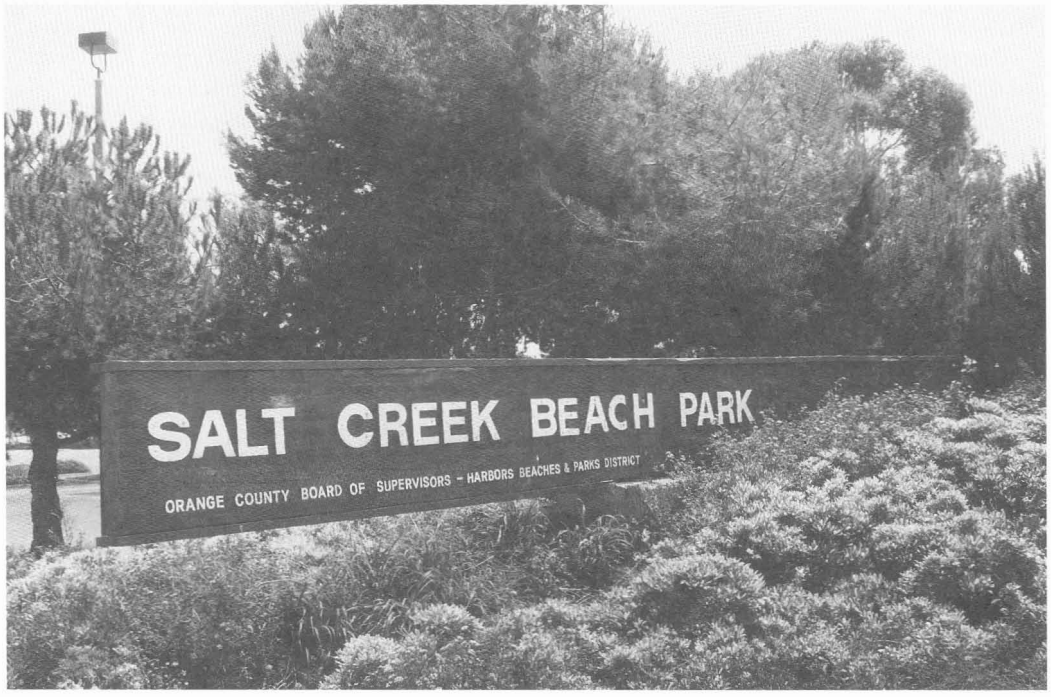
The Mendocino case was filed by a single individual, and so it was sure to help us on the question of legal grounds that had been raised by the corporation. Also, it held that public use of the dry sand area between the road and the beach could create public rights, thus making Salt Creek Road very valuable. There would be ample evidence of public use.

I waited awhile to amend our complaint. Before I had a chance to do so, the county

Helen Kelly, Brennan "Big Hevs" McClellan and Bill Wilcoxen celebrate the Salt Creek settlement, 1971.



CHARLES D. EVERTS



RICK LANG

reversed its position and came out in favor of public access to Salt Creek Beach.

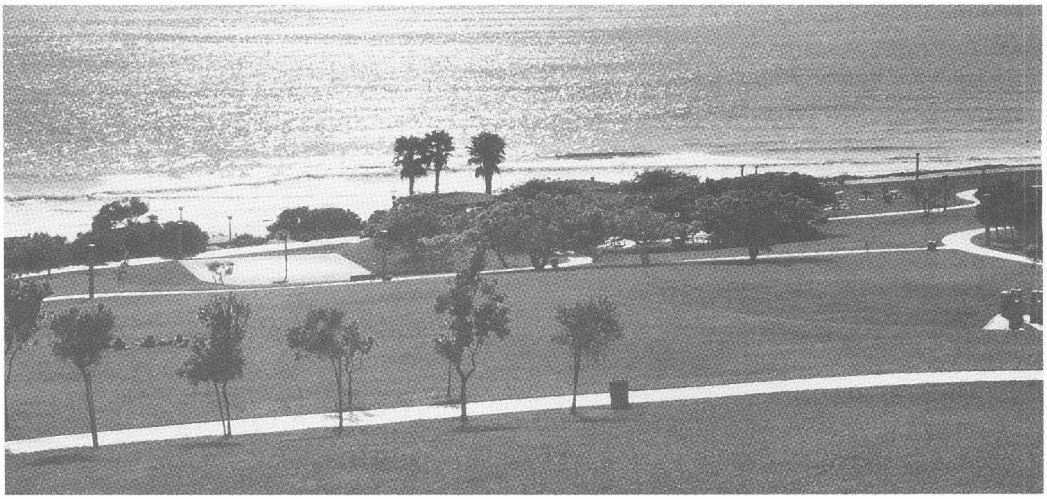
The developers, however, did not. They first erected a fence by the highway, then hired armed guards, then put up concertina wire. The public kept coming in. We were at war. Big Hevs even had letters from men in Vietnam who were looking forward to coming home so that they could go surfing at Salt Creek. Still the Laguna Niguel Corporation and Prudential Insurance Company of America did not get it. When the concertina wire didn't work, someone buried cactus in the sand so surfers would step on it. Meanwhile the county was attacking the problem with bureaucratic zeal. It had aerial photographs of the area taken and mapped every pathway to the beach. By the time all the information was in, there were good grounds for arguing that most of the area—not just the road—was the subject of an implied dedication, based on the Mendocino County precedent.

Finally the developers agreed to a settlement. They gave land equivalent to the road back to the county and sold other land to the county for a beach park. Our committee accepted the deal and dropped our lawsuit. We probably should not have, though. Given the tremendous support for beach preservation, the entire property could well have been acquired as a state park. Our political clout with the governor might easily have exceeded that which the developers had brought to bear earlier. Be that as it may, none of us ever really thought about a state park. All we thought about was beach access.

Beach access, in fact, had become a major issue generally. I got calls from the East Coast, the South, and Hawaii, and there were the beginnings of a legislative effort to guarantee coastal access in California. While the Salt Creek matter was pending, I was asked to testify in Sacramento on Assemblyman Pete Wilson's coastal bill. I paid my way up there and met Wilson and other witnesses in the hallway outside the hearing room. At that moment the senator from San Diego, Jack Schrade, canceled the hearing. That was my first exposure to the legislative process in Sacramento.

But it was not my last. Coastal legislation came up again in 1970 and 1971 but each time failed. Finally in 1972 voters approved Proposition 20, the Coastal Initiative, which led to the creation of the California Coastal Commission. In 1976 the state legislature passed the California Coastal Act and established the Commission as a permanent agency with a mission to protect and enhance the coastal environment and maintain public access. Salt Creek was open by then, but in many places along the coast public access was still denied, though it was guaranteed by the state constitution. The public access battle was not over.

It continues today. The Coastal Commission has done an impressive job. During the past 23 years, the coast itself, and beach access, have often been protected. At the same time, we have come to see that our scope of concern must be broadened. Tidelands and beaches can not be saved without awareness and action on water quality, sand replenishment, erosion, and many other environmental and technical issues. And yet there are places in California where the basic issue of beach access is still being debated. Every generation will have to act upon its dedication to the beaches. I remain optimistic. This is an easy issue to understand. ■



RICK LANG

Citizens vs. Dam Builders: A Worldwide Fight to Protect Rivers

IN THE UNITED STATES, the era of giant dam construction is over. Nothing resembling the Grand Coulee, Shasta, or New Melones Dams would be built today—not only because few major free-flowing rivers remain and federal money is scarce, but because much has been learned about the social, economic, and environmental costs of such large-scale river barriers.

The notion that rivers should be tamed and disciplined in concrete is also losing favor in Europe and Australia, where public opposition recently killed dam proposals and achieved a shift toward the kind of water resource management that is increasingly gaining acceptance in this country.

In Asia, Africa, and South America, however, dams as tall as modern office buildings, up to 800 feet high, are under way or proposed. If completed, they will reshape entire river systems, displace millions of people, destroy natural resources that are vital to human and other lives, and—if extensive experience worldwide is to be a guide—fail to deliver the economic benefits promised by their promoters to the people who will bear much of their cost.

Daniel P. Beard, commissioner of the U.S. Bureau of Reclamation, has been urging international water management agencies to consider nonstructural river management alternatives. Last spring, in an interview published by the Bangkok English-language daily *The Nation*, he warned that "it is a serious mistake for any region in the world to use what we did on the Colorado and the Columbia Rivers as examples to be duplicated."

In a speech to the International Commission on Irrigation and Drainage last May, Beard said that the Bureau's current emphasis is on demand management and conservation; open, inclusive decision-making that would help avoid costly mistakes; and "multi-objective water resource management that fully integrates environmental planning in helping us to understand the true, long-term costs and benefits of each alternative."

Experience has shown, Beard told the international gathering of water management professionals, that actual costs of large structural river management systems exceeded projected costs by at least 50 percent and that many projected benefits were seldom realized; that byproducts of such projects included soil salinization, decline or elimination of fisheries and wetland habitat, destruction of native cultures, river sedimentation, and agricultural pollution; and that these projects "largely served the needs of a few agricultural interests."

The approach to river development now seen as obsolete in the U.S., however, is being embraced in some other countries. In China, construction has begun on the Three Gorges Dam, the world's largest hydroelectric project. It is expected to control the famous floods of the Yangtze River Valley and have the capacity to produce 18,200 megawatts (MW) of electricity. (The

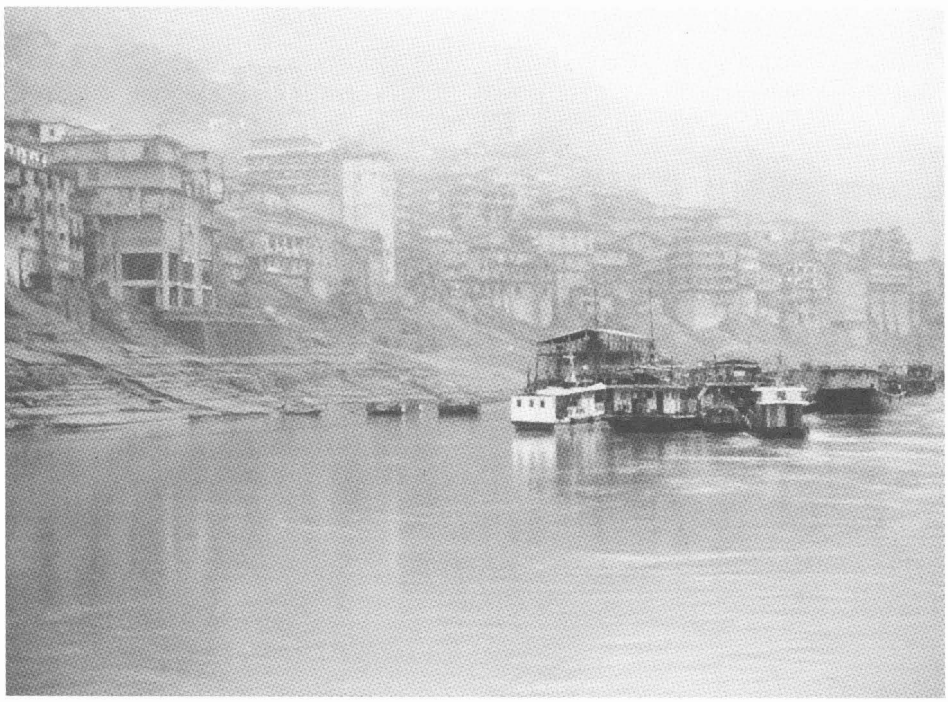
JULIETTE MAJOT, INTERNATIONAL RIVERS NETWORK

Protesters on the Nagara River

DAVID DAWDY, COURTESY OF INTERNATIONAL RIVERS NETWORK

The famous Three Gorges section of the Yangtze River, China

DAVID DAWDY, COURTESY OF INTERNATIONAL RIVERS NETWORK



Homes along the Yangtze River

rated output of the Grand Coulee is 10,830 MW.)

But because the Yangtze River water is laden with silt, its capacity could soon be diminished, critics say. The Sanmenxia Dam on the Yellow River, planned as a 1,200 MW facility, quickly lost so much storage capacity to silt that in 1973 it began to generate power at a maximum of 250 MW, according to Patrick McCully, campaign director of the International Rivers Network, a nonprofit organization based in Berkeley, which supports grassroots groups trying to protect their rivers from destructive projects.

If built, the Three Gorges Dam will inundate one of the most beautiful river gorges in the country, displace 1.2 million people, and may cause sewage backup problems in upstream cities with millions of inhabitants. The megastructure would also endanger the lives of millions of people living in areas that would be devastated were the dam to break. A series of dam bursts in Henan Province in 1975 led to the deaths of an estimated 230,000 people.

Meanwhile, in India, a dam being built on the Narmada River threatens to submerge over 90,000 acres of forest and farmland and displace 200,000 villagers, mostly from tribal communities. Thailand and Burma have planned a series of dams on the Salween; Thailand, Laos, Vietnam, and Cambodia are discussing plans for a cascade of dams on the Mekong. In Japan, an estuary barrier on the Nagara River is nearing completion, and another is planned on the Yoshino River.

Each of these projects faces opposition—from farmers, fishermen, and others who depend on free-flowing rivers for their livelihood, as well as from those who would lose their homes, land, villages, and towns, from trade unions, and from people concerned about the economic and environmental costs. Dam proponents are governments, large corporations, and lending institutions, while the opposition tends to be rooted in local communities.

Opponents have focused their efforts on public education and on trying to dissuade the World Bank and other international lending institutions from backing large dam projects. They have met with considerable success.

These enormous projects can not be built without enormous expenditures of public funds. At a conference entitled "Financing Hydro Power Projects '94," held in Frankfurt last September, it was made clear that "big dams are expensive, high risk, low return investments and that without huge public subsidies, they would not be built," reported Patrick McCully in the IRN's *World Rivers Review*. A far better investment option is combined cycle plants, which have "relatively low and predictable initial capital costs, short construction times, an excellent operating performance record and a reliable supply of fuel, and minimal resettlement and land acquisition problems."

Opponents have persuaded the World Bank to back away from lending for the Narmada project. ("Dam the World Bank, not the Narmada," was a slogan.) They have also succeeded in getting the Bank to withhold support (so far) from China's Three Gorges project. Now they are trying to dissuade the United States from guaranteeing the investments of U.S. construction companies that are eager to win contracts for the dam.

If the Export-Import Bank decides to back U.S. firms, loans will flow in from many sources, said Dai Quing, a journalist who has been outspoken in her opposition to the dam and continues to speak against it, despite a ten-month imprisonment for her activities in China. Dai, a recipient of the Goldman Environmental Prize, was in Berkeley last October to meet with other recipients of this award, given to grassroots activists from around the world. Several others who had led campaigns against large dam projects told how public opposition grew as facts about impacts and costs were brought to light.

"Most of these projects are possible only because the groups most affected are excluded from the decision-making process," said Janos Vargha of Hungary, a biologist who campaigned successfully against completion of the Nagymaros Dam on the Danube River. Hungary canceled the project in 1989, but neighboring Slovakia completed the massive Gabcikovo Dam just upstream, causing great damage to wetlands, farmlands, and water quality in Hungary. Hungary has taken Slovakia before the World Court.

Good news, and hope for the future, was brought to the group by Robert Brown of Australia and Christine Jean of France. Dr. Brown gave up his medical practice to fight against a plan to dam the Franklin River, which winds through virgin forest on the island state of Tasmania and is the last free-flowing river in Australia. The Supreme Court stopped construction in 1983. Jean won a campaign against a series of dams planned on the Loire. Alternatives are now being considered, and a $10 million restoration program is under way on the river. Two dams will be destroyed, Jean said, to reopen the migration route for salmon. ■

—*Rasa Gustaitis*

PATRICK MCCULLY, INTERNATIONAL RIVERS NETWORK

Sardar Sarovar Project in Narmada Valley, India

PATRICK MCCULLY, INTERNATIONAL RIVERS NETWORK

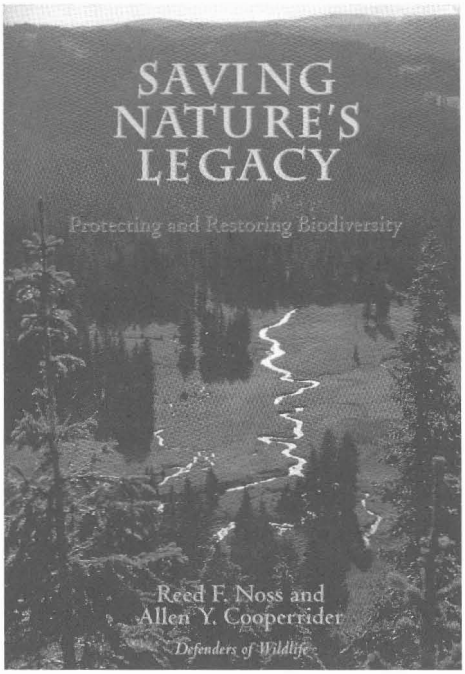
Villagers affected by Sardar Sarovar Project Main Canal in the Narmada Valley

Saving Nature's Legacy, *by Reed F. Noss and Allen Y. Cooperrider. Island Press, Washington, DC and Covelo, CA: 1994, $48 (cloth) $27.50 (paper) 380 pp.*

IN *SAVING NATURE'S LEGACY*, the authors pose a fundamental question: "How can the variety of life be maintained in perpetuity?" They advocate biodiversity conservation, and provide principles, techniques and scientific findings applicable to all who seek to achieve that goal.

The authors, Reed F. Noss and Allen Y. Cooperrider, both veteran resource managers, make a passionate and persuasive argument for aggressively managing the Greater Yellowstone Ecosystem and other lands in the United States to conserve *biodiversity*, rather than single "flagship" species such as the grizzly bear, and to manage and conserve *ecosystems*, unimpeded by political boundaries or the incompatible mandates of multiple agencies.

In an aerial view of the 2.2 million acre Yellowstone National Park, a razor-line boundary separates the park from Targhee National Forest. The park is lush with wooded slopes. The clearcut forest is nearly barren, only a skimpy paisley pattern of remnant forest patches remains. An even higher vantage reveals a watershed bounding over 14 million acres—the "Greater Yellowstone Ecosystem" —in which Yellowstone National Park is just one piece in a patchwork quilt of private lands and parks, forests, and wildlife refuges, managed by 28 different state and federal entities. Grizzly bears roam freely throughout this huge area, ignoring boundaries but often suffering the consequences of disparate management objectives. In this vast, biologically rich ecosystem, land managers, policy makers, landowners, and conservationists are grappling with extraordinarily difficult and important decisions. They must set priorities for land acquisition and preservation, achieve often-conflicting agency goals (such as preserving single species, providing recreational opportunities, or allowing resource extraction), and es-



tablish monitoring programs, all while striving for a network of responsibly and coherently managed lands.

Saving Nature's Legacy provides clear guidelines for making these decisions, using the Greater Yellowstone Ecosystem as one of many examples. The book clearly defines scientific terms, ecological principles and the concepts of biodiversity. It offers practical, comprehensive, and often blunt advice on reserve design, inventory methods, management guidelines, and monitoring programs. In the final chapter the authors decry our nation's "biotic impoverishment," and make an impassioned plea for us all to work aggressively towards reversing what they see as a national biodiversity crisis. With *Saving Nature's Legacy* in hand, we will be better prepared to do so.

Reviewed by Elizabeth Riddle, assistant director, University of California Natural Reserve System.

The Oceans and Environmental Security, *edited by James M. Broadus and Raphael V. Vartanov. Island Press, Washington, DC and Covelo, CA 1994, 328 pp.*

ONE OF THE MOST PROFOUND new understandings to arise from the ashes of the Cold War may prove to be that traditional concepts of security must be broadened beyond military dimensions to include environmental and economic issues. Yet discussions of "environmental security", particularly, have suffered from a lack of rigorous definition that has largely prevented this otherwise useful concept from realizing its practical potential.

Five years ago, a group of marine scientists from the Woods Hole Oceanographic Institute in Massachusetts visited their counterparts at the Department of Oceans and Environment at Moscow's Institute for World Economy and International Relations. That first meeting led to a four-year, multi-disciplinary research project aimed at arriving at a precise and practical definition of environmental security in the context of the world's oceans—the environment that perhaps best exemplifies the seamless continuity and interdependence of environmental processes on a regional and even global scale. The present collection of nine, largely free-standing essays by 29 American and Russian scholars is the fascinating and insightful outcome of that research.

Defining "environmental security" for working purposes as "the reasonable assurance of protection against threats to national well-being or the common interests of the international community associated with environmental damage," the writers explore through extensive case studies seven key, post-Cold War problems of ocean environmental security of mutual relevance to the United States and Russia. They include land-based marine pollution, hazardous materials transport, radioactivity in the oceans, protection of the Arctic, the Southern Ocean, and finally the 1982 United Nations Law of the Sea Convention, which is the closest thing to a global constitution on the ocean environment (although neither Moscow nor Washington has yet ratified it).

The editors set out to treat the subject in a manner that would be comprehensive enough for ocean policy professionals and yet accessible enough for students and nonprofessional activists. That goal is admirably achieved in a jargon-free narrative that mercifully blends the 29 separate voices (and two languages) into a consistent, highly

readable style. The book is an important conceptual achievement with a relevance well beyond the oceans.

Reviewed by Jon Stewart, editor of the newsletter Coastlines *and deputy editor of the editorial pages of the* San Francisco Chronicle.

ALSO OF INTEREST

Clearcut: The Tragedy of Industrial Forestry, *edited by Bill Devall. Sierra Club Books and Earth Island Press, San Francisco: 1994, $50 (cloth), $30 (paper), 290 pp*

THIS MASSIVE (12" x 13.5") volume, produced by the Foundation for Deep Ecology, documents the effects of destructive forestry practices in Canada and the U.S. with over 90 large-scale color photographs taken by an impressive array of artists. Essays by the editors and others indict the forestry industry and outline a detailed alternative program for "ecoforestry."

An Introduction to Coastal Zone Management, *by Timothy Beatley, David J. Brower, and Anna K. Schwab. Island Press, Washington, DC and Covelo, CA: 1994, $49 (cloth) $29.95 (paper), 200 pp.*

THIS IS A BASIC INTRODUCTION to the subject of coastal zone management. The authors offer an overview of management approaches and strategies in use around the country, focusing on those that have proven most effective.

Priorities for Coastal Ecosystem Science, *a report by the National Research Council. National Academy Press, Washington, DC: 1994, $29 plus shipping, 116 pp.*

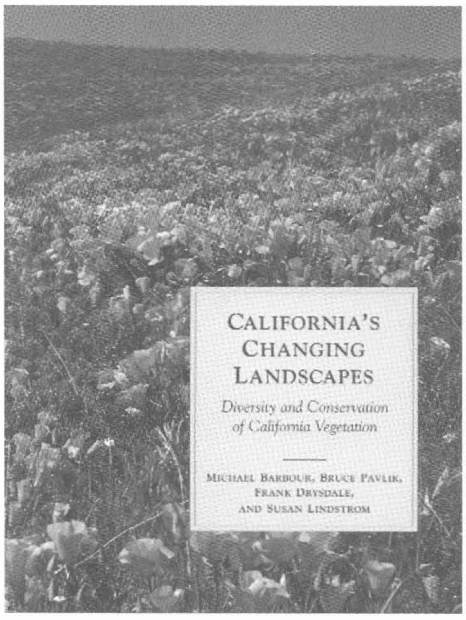
A REPORT PRESENTING the conclusions and recommendations of three National Research Council groups: the Committee to Identify High-Priority Science to Meet National Coastal Needs, the Ocean Studies Board, and the Commission on Geosciences, Environment, and Resources.

The Glove Box Guide: *Mendocino Coast, by Bob Lorentzen. Bored Feet Publications, Mendocino, CA: 1994, $11, 224 pp.*

A GUIDE FOR MOTORISTS by the author of the "hip pocket" hikers' guides to California's north coast; includes information on lodging, restaurants, activities as well as historical text and local lore.With 60 photographs, 8 original maps, and 16 illustrations.

California's Changing Landscapes: Diversity and Conservation of California Vegetation, *by Michael Barbour, Bruce Pavlik, Frank Drysdale, and Susan Lindstrom. California Native Plant Society, Sacramento: 1993, $24.95 (cloth), 294 pp.*

THE AUTHORS INVITE THE READER to join a "journey through space and time as we look at California's cover from coast to desert, from past to future, from pristine to managed, from beautiful to degraded, from known to imagined." Along the way one learns about the state's vegetation, the processes that create, maintain, and change landscapes, and the need for conservation. People who want to become inhabitants, rather than merely residents, of this state will value and enjoy this book. —*R. G.*



HOW THE DUCK HUNTERS LOVED CHINA CAMP MARSH

Editor:

Congratulations on your excellent Autumn 1994 issue, with a cover photograph of the China Camp marsh. It brought to mind a small piece of history, which might be of interest.

The photographs of the marsh on p. 21 show a duck blind at the mouth of the small slough. That is one of a group of blinds built and maintained by an informal group known as the San Pablo Bay Duck Hunters. It replaces two blinds, one of which I helped to build in the 1950s. At that time, someone we knew owned the pickleweed and the hill south of Jake's Island (lower middle of the aerial photo). That hill—it is now called Turtle Back and has a State Parks trail around it—was leased to a group of archers. At the mouth of the small straight slough east of Jake's Island sat an old blind. Two duck hunting friends and I fixed it up and—inspired by a duck hunting group on nearby Jake's Island—built a walkway to it from the marsh.

We cut eucalyptus saplings on Mount Tamalpais, limbed them, and stuck them small-end-down in the mud. This was a hilarious warm summer day activity. To drive the piles we nailed 2x4s to the upper end, then had the two heaviest workers hang from them and jump up and down. Eventually we had a blind with a padlocked box under the seat for decoys and a boat hide in back. For camouflage, we covered the sides with eucalyptus and pine branches. I would guess there were close to a dozen similar blinds, most along the Hamilton Field shore and in open water where you could hunt at low tide. Maybe half still exist.

Our greatest pride was the walkway because it allowed us to walk from Turtle Back road (now the interpretive trail) across the marsh and into the blind. When things were slow, most of the time, we explored the marsh and slowly came to appreciate what a remarkable living system it is.

The Jake's Island hunters had a large clubhouse, with a trail and a substantial walkway out to a blind that held at least four shooters. When the ducks started to fly, especially canvasbacks, they would hustle out of the clubhouse bar, down the hill, and to their blind. Their cannonade sounded like a battleship in action. All that remains of these old structures now are a few poles in the mud and marsh.

The hunting was spotty at best. The archers were quiet, and resented our shooting, but the motorcycle hill climbers were not. They raced up Bullet Knob, just east of Jake's Hill, and their ruts are clearly visible today. They in turn were outdone by jets landing and taking off from Hamilton Field.

We survived the 1955 once-in-a-hundred-years flood, which swept away our log and boat, but the storms continued to weaken the structure. The hunting slowed considerably. Finally the canvasback population was so low that Fish and Game banned shooting them. We gave up and San Pablo Bay soon reclaimed and washed away our blind and walkway.

Sadly, both my old marsh partners are now dead. A few years ago a group of Dave Lennihan's friends arranged to have The Nature Conservancy buy 15 acres of pickleweed in his memory and put it into public ownership. It sits at the northern shore of Gallinas Creek, opposite Jake's Island.

The area is even more wonderful now that Hamilton Field is closed and the State Park established. The San Pablo Bay Hunters still go there and work hard to strengthen the remaining blinds against storms. My guess is that they come back not because the hunting is great, since it is marginal at best. They come largely because it is a beautiful place, and a public place where you see almost none of the six million people surrounding you in the Bay Area. And because, in a storm with the wind whipping, you get some feel for what it was like when the Ohlones hunted here.

Lewis H. Butler
San Francisco

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China Camp Marsh with duck blind at mouth of small slough (arrow).

A GOOSE, OR A CRANE?

Editor:

The snow goose described in the photograph on p. 30 of the Autumn 1994 issue would probably have had to swim between Wrangel Island and California. A wingspan of 15 to 18 inches would not get it airborne. The actual wingspan would be closer to 40 inches.

The "snow goose" illustrated on the satellite telemetry sidebar on p. 32 appears to be a crane, with an even larger wingspan.

Sad to see hunters lost the opportunity to hunt geese in Japan, because that eliminates some of the support which might be mustered to prevent habitat loss.

Earle W. Cummings
Sacramento

Editor's Note: Our error. We apologize to the authors who meticulously reviewed their article as it moved through the production process but were not given the opportunity to see the illustration and caption Mr. Cummings here corrects. As to the observation on hunting, *ducks* are still hunted in Japan, but this does not seem to result in support for habitat at levels seen in the United States.

Be sure to respond to our survey, page 47.

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SHORELINE MYSTERY: THE ANSWER

IN OUR LAST ISSUE, we asked readers to identify the "noisome creatures" who in January 1990 invaded a charming coastal city, claimed territory, caused some property damage, and eventually—despite their strong body odor—became a major tourist attraction. Quite a few of you wrote us with the correct answer: the sea lions at Pier 39 in San Francisco! Congratulations to Donna Barrett of Morro Bay, Greg Meyer of Santa Cruz, Nancy Gorman of San Luis Obispo, Suzanne Sawyer of Monterey, Kalliann Hulsebus of Irvine, Don Makie, Jr., of San Diego, Merilyn Georgevich of Seaside, Casper J. Greif of Sacramento, and the others. Many of you who live in the San Francisco Bay Area knew, of course, but thanks for writing, anyway. You all win a subscription to *Coast & Ocean*.

Those who guessed that the invasion took place in Monterey were not too far off: seasonally, about 1,000 sea lions sometimes hang out at the breakwater, and occasionally they make a nuisance of themselves by settling on floating docks and boats. Marine mammal ecologist Jim Harvey at Moss Landing Marine Laboratory says they generally leave if people shoo at them long enough to keep them from napping. Statewide, the sea lion population is growing by 6 to 8 percent a year, he said, thanks largely to the Marine Mammal Protection Act. The sea lions are expanding their range, moving north and into Puget Sound. State of Washington officials occasionally deport some to Oregon (by horse trailer). California has refused to take any back.

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