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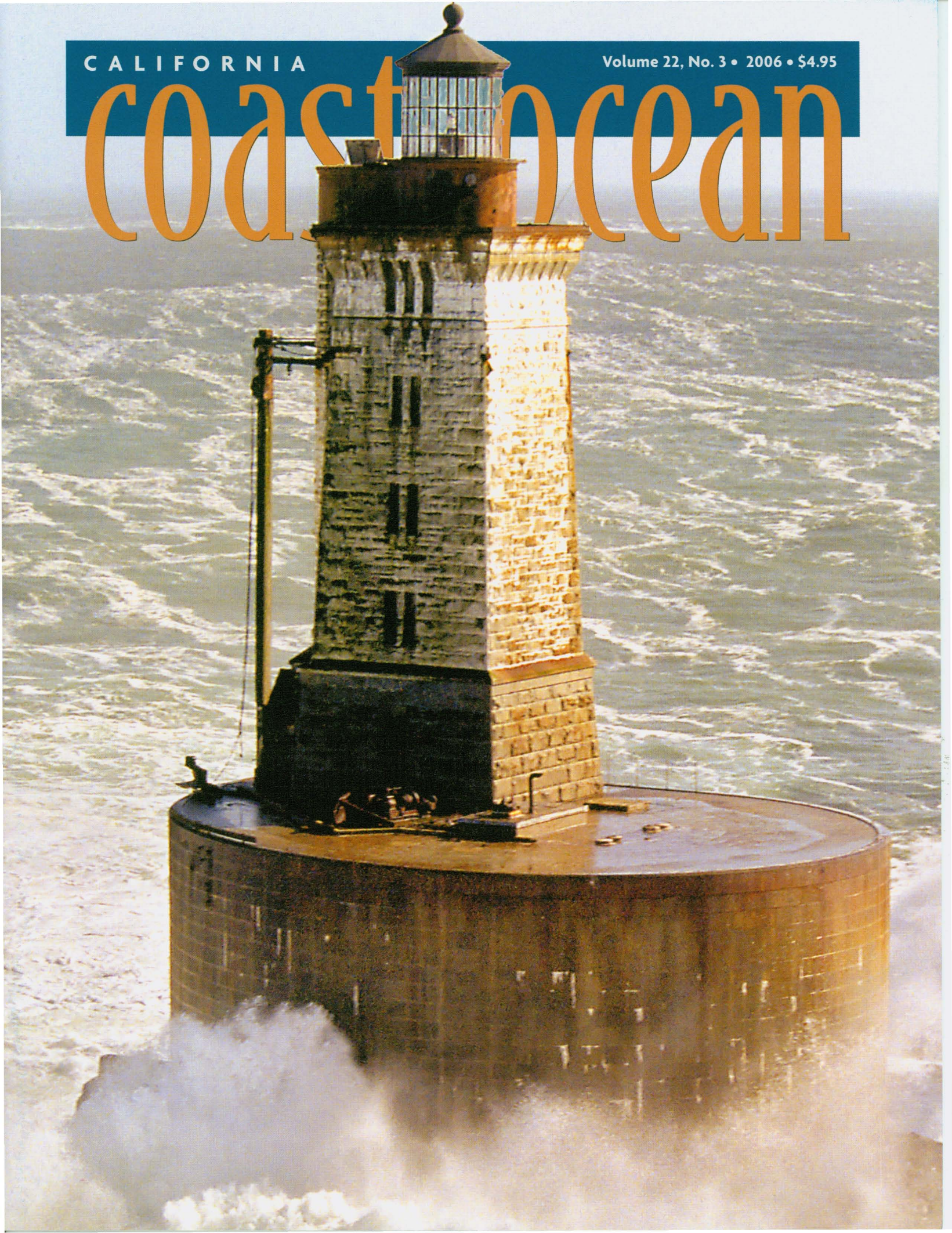

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Subscriptions: (510) 286-0515;
subs@coastandocean.org

To pay by credit card, call (510) 286-0515
or e-mail ghertz@scc.ca.gov.

Editor: (510) 286-0934;
editor@coastandocean.org

Cover photo: St. George Reef Lighthouse by Stephen Corley. In 2003, he told us, on a day when ocean swells were huge, he accepted an invitation from North Valley Helicopters, which flies tours to the lighthouse, to join them for a great photo opportunity. "The next summer I was contacted by a photo agency in Washington that had found the photo on my website and said the USPS wanted to commission a painting of it for possible use on a postage stamp. I had to keep this secret until it was officially announced in the fall of 2006, one of the hardest secrets I've ever had to keep." The stamp (back cover), with a painting by Howard Koslow based on Corley's photo, will be released in 2007. See inside back cover for more on this lighthouse. See Stephen Corley's photographs at www.nicelightimages.com

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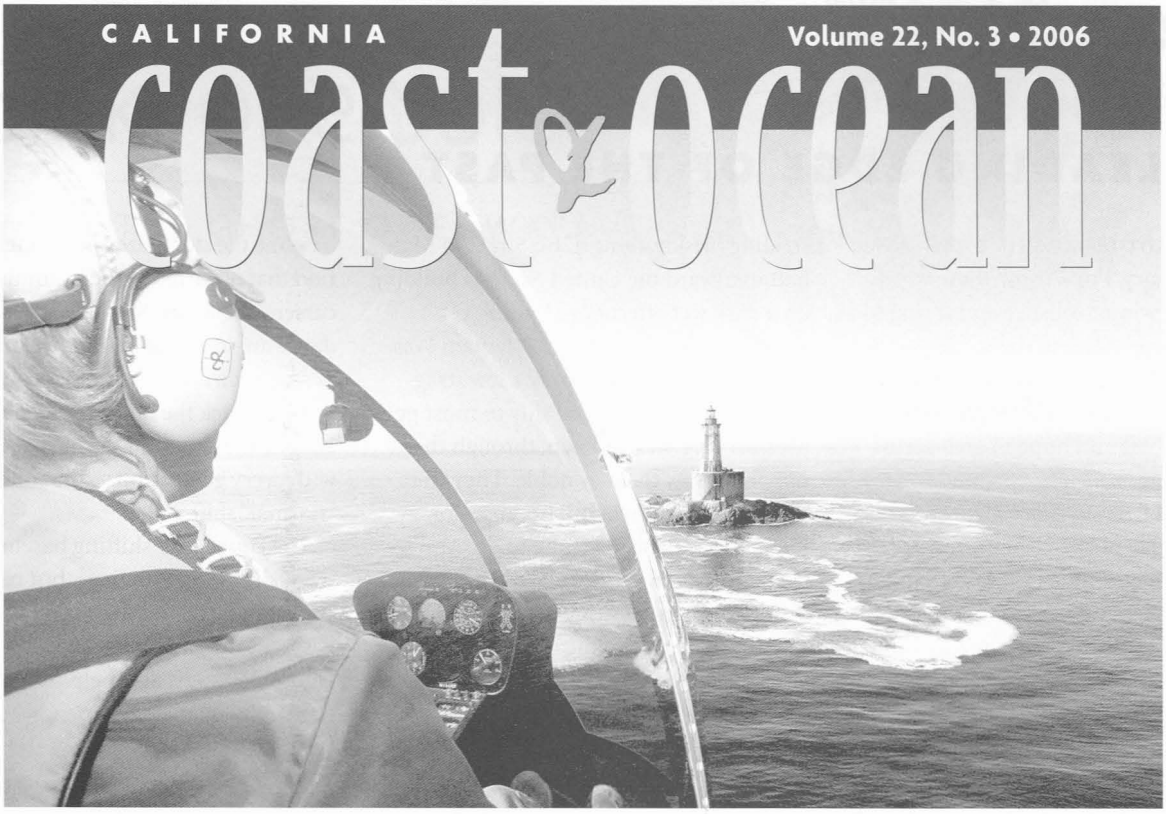

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COASTAL VIEWPOINT

THE LEADING EDGE OF THE PAST

YOU SHOULD RECEIVE THIS issue in January. I'm writing these words on the winter solistice and trying to imagine how you'll read them a few weeks from now. That's not possible. I can only perceive the present, so I'll write from my immediate view and hope to arch across time to you.

As I begin here, in this quiet room on the longest day of the year, however, uninvited images slide into my peripheral vision. Joel Hedgpeth, who died July 28 at age 94. He was one of the amazing human beings I was privileged to meet during my decades as reporter: brilliant, irreverent, funny, cantankerous, a great marine biologist who played a big role in the saving of the coast. I knew him only slightly, but he was generous with his scientific help and advice. If I called him with a question, he would send pages of information, and if he found an error, he'd let me know. But when I interviewed him for *Coast & Ocean*, he was impossible, interrupting constantly by bursting into a Welsh song with many verses. He was already in his late 80s, but his voice was beautiful (see *Coast & Ocean*, Vol. 15, No. 1). Goodbye, Joel.

Now others appear. Buckminster Fuller. I had prepared for months before the interview. When I arrived, he was scribbling numbers on a note pad, the *Los Angeles Times* on the dining room table in front of him, open to a story on the dollar cost of eliminating sulphur emissions. He had just finished calculating what the numbers broke down to and told me. I said that was a lot, surely industry wouldn't go for it, and he got furious. Only later did I appreciate why: I was thinking politically and thereby compromising a principle. We have a right to clean air and must insist on it.

Behind Bucky Fuller I see A. J. Muste and Norman Thomas, thin, tall old men striding briskly along 42nd Street in Manhattan toward the United Nations building on a dark wet afternoon, leading yet another protest against the Vietnam War. They were followed by only a few stragglers. Maybe they looked silly to most people hurrying, heads down, through the rain, but I saw them as noble. They were marching not to win but because, for them, it was the right thing to do. And so now, more than 40 years later, I am still inspired by that glimpse of Muste and Thomas, two life-loving giants encountered ever so briefly, because they helped me to understand our world and my place in it.

We can't see the present or prepare for the future without a perspective that includes the past.

What is the present? In the December 18 issue of the *New Yorker*, Hendrik Hertzberg writes that "the present is simply the past's ever-moving edge, it cannot help looking back." He tells how members of the Iraq Study Group insisted that, in writing their report, they had decided to "take the situation as it exists" and not examine the past. But that proved impossible, writes Hertzberg.

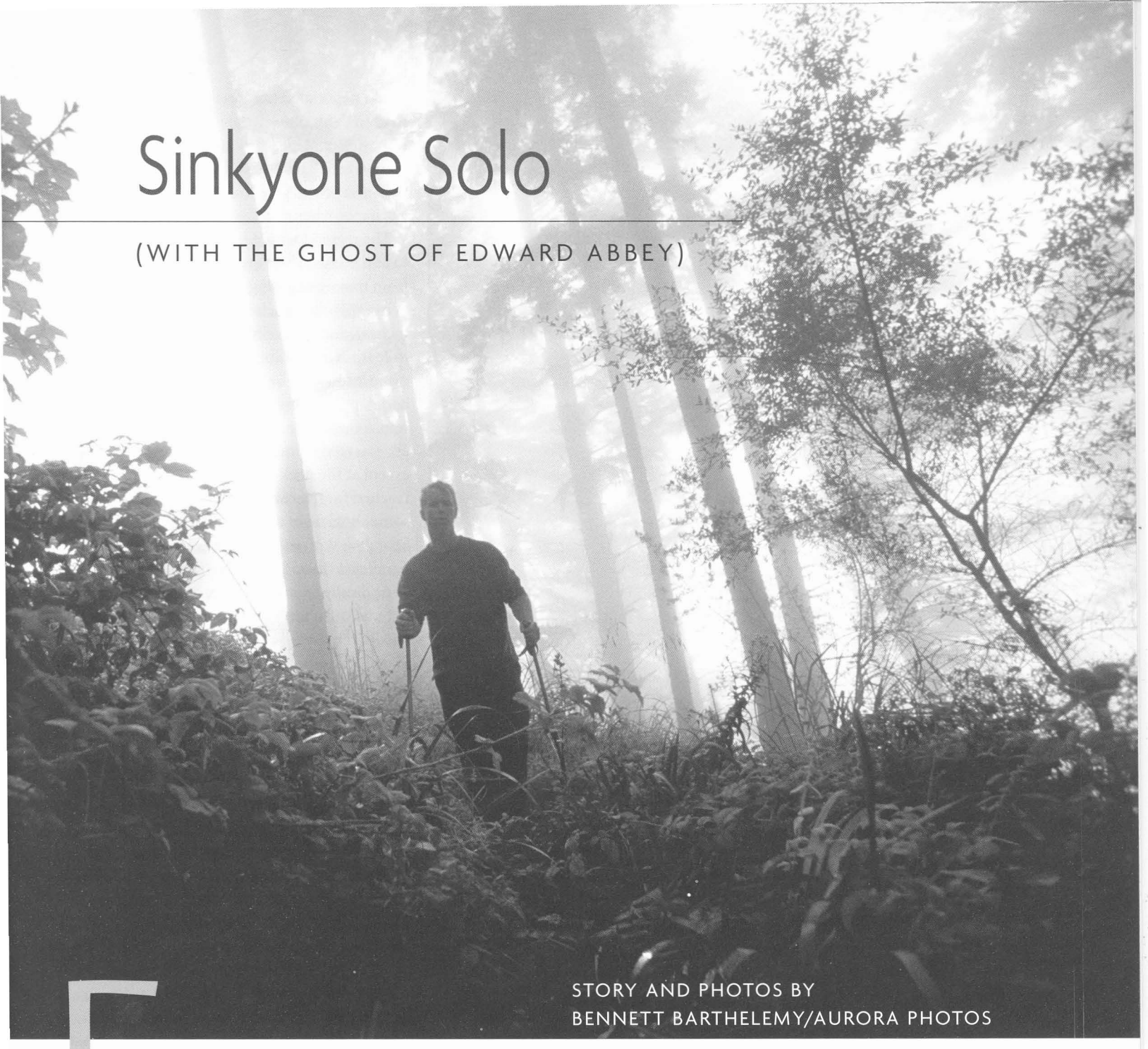
It's not only impossible; failure to include the past in the immediate view leads to tragic consequences. In this issue, you will find an article by Anne Canright on the shifting baselines syndrome, which I found highly enlightening. The term was coined by Daniel Pauly, a Canadian fisheries scientist who noticed that young biologists tend to accept as normal whatever they see before them, and therefore miss gradual changes that can mount to catastrophic consequences. "Each generation accepts as a baseline the stock size and species composition that occurred at the beginning of their careers," he wrote. Stories of past abundance are irrelevant to them. Consequently, as stocks shrink and fisheries collapse, these scientists lack the breadth of perspective to address the situation—which gets worse with every generation as the concept of "normal" shifts.

The concept of shifting baselines may seem simple and obvious, but many great concepts are. I find it exciting because it has many applications during this time of global change. It also helps me to understand why many young people take for granted what to some of their elders is unacceptable and outrageous, why the study of history is essential, and why we accept the continuing degradation of the natural world. The Coastal Act established a baseline, as did the United States Constitution. We need to know both. We can't see the present or prepare for the future without a perspective that includes the past. We must understand what people had in mind when they fought for the Coastal Act, and insist on the rights it established.

My idea of normal includes what I learned from many people I have encountered and admired. Yours will be different. Perhaps some of the people you meet in these pages will stir your imagination. What we all have in common is the need to keep recognizing the baseline shifts and keep broadening our vision. That requires loosening our grip on reality a bit and softening our gaze to see what's subtly evident on the periphery.

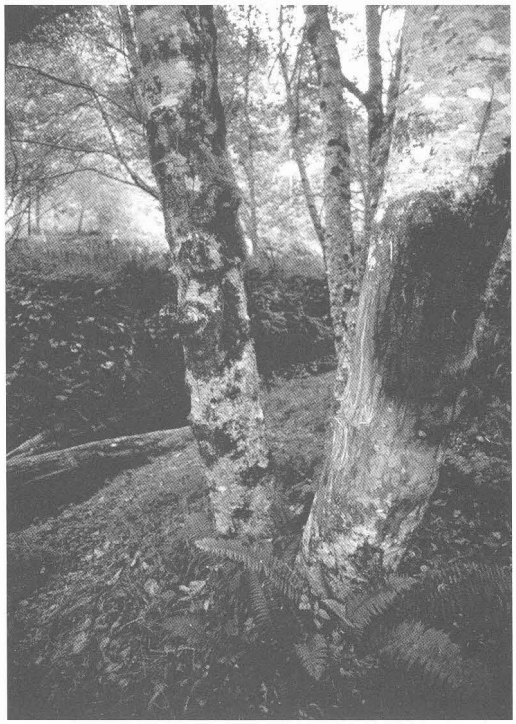
Sinkyone Solo

(WITH THE GHOST OF EDWARD ABBEY)



STORY AND PHOTOS BY
BENNETT BARTHELEMY/AURORA PHOTOS

EARLY ONE SEPTEMBER MORNING, with some trepidation, I headed for Sinkyone Wilderness State Park on the Lost Coast, within one of the longest stretches of coastal wilderness in the Lower 48. With the coming of fall, male Roosevelt elk would have increasing issues with territory, hormones, and harem size. Bears would be active too, but at least I'd had enough forethought to rent a bear cannister. Two weeks earlier I had hiked 25 miles of the northern Lost Coast with a group, and on day three a bear dragged one of our tents some 20 yards before we could scare her away. This time I would be hiking 35 miles round-trip, from Bear Harbor to Usal via Hotel Gulch, then back up along the Coastal Trail, alone.



As I negotiated the treacherous one-lane dirt road to the trailhead, the words of Edward Abbey resonated clearly in my adrenalized body. "If you feel that you are not ready to die, never fear; nature will give you complete and adequate assistance when the time comes."

The region I would be backpacking is referred to as the Lost Coast because of its remoteness from major roads. It gets up to 80 inches of rain per year (San Francisco gets only about 20 inches), and is usually shrouded in fog. Half a mile from the trailhead, a raft of wild turkeys came into view, the larger males ruffling feathers and flapping wings to tell me to stay out of their way. A dozen yards farther on, a beautiful bull elk emerged from among the alders, golden except at the neck and head, which were black. I reached for my camera, ecstatic that I could get some shots from the safety of my truck. The elk kept pace with me, trotting along the ditch that paralleled the road to the parking area, stopping periodically to strike elegant poses.

I was still a bit "elk shy" from a photographic encounter last fall at Prairie Creek Redwoods State Park (where the reintroduced Sinkyone herd hails from). A massive bull had rewarded my impertinence at getting a close-up by charging me. At the penultimate second I had bolted into a thicket with a move that would have made an NFL coach proud, and I felt the blast of wind from his massive body (and antlers) as he passed by. I rounded out that day by shooting ravens on the beach.

I parked at the trailhead and, with a 35-pound pack on my back, soon settled into the rhythm of the soft sounds of my trekking poles and footfalls on unpaved earth. Another Abbey tidbit floated to mind: "There is beauty, heartbreaking beauty, everywhere." And there was, even beneath the blanket of somber fog.

As I climbed the switchbacks out of the first gulch, I passed droopy bells of purple foxglove and explosions of poison oak in luminous crimson and fluorescent orange. A stand of bigleaf maples was slowly changing into its autumn-yellow coat. Little brown birds, possibly winter wrens, bounced among the thorny berry vines that reached out into the trail. Higher up, a Douglas fir cone dropped through the branches into the ghostly swirl of fog, and another Abbey quote rushed to the fore: "The essence of wilderness is big mammals that can eat you." It was time to shelve Abbey and seek my own epiphanies.

Originally, I had hoped my friend Sam Camp would join me on this hike. He is also a photographer, passionate about wild places, and had first hiked the area in 1981. His response to my questions about that hike had been inspiring.

"Few people had ever heard of the Sinkyone then," he told me. "There were no photos available. So I wanted to go in there and get some to show the world the beauty of the place and how the Georgia-Pacific Corporation was clearcutting the steep slopes and causing massive erosion. Very few people hiked out there then. . . . The stark contrast between devastation and natural beauty was intense. I thought that if people could see some images of the beauty as well as the destruction it might inspire them to take up the cause."

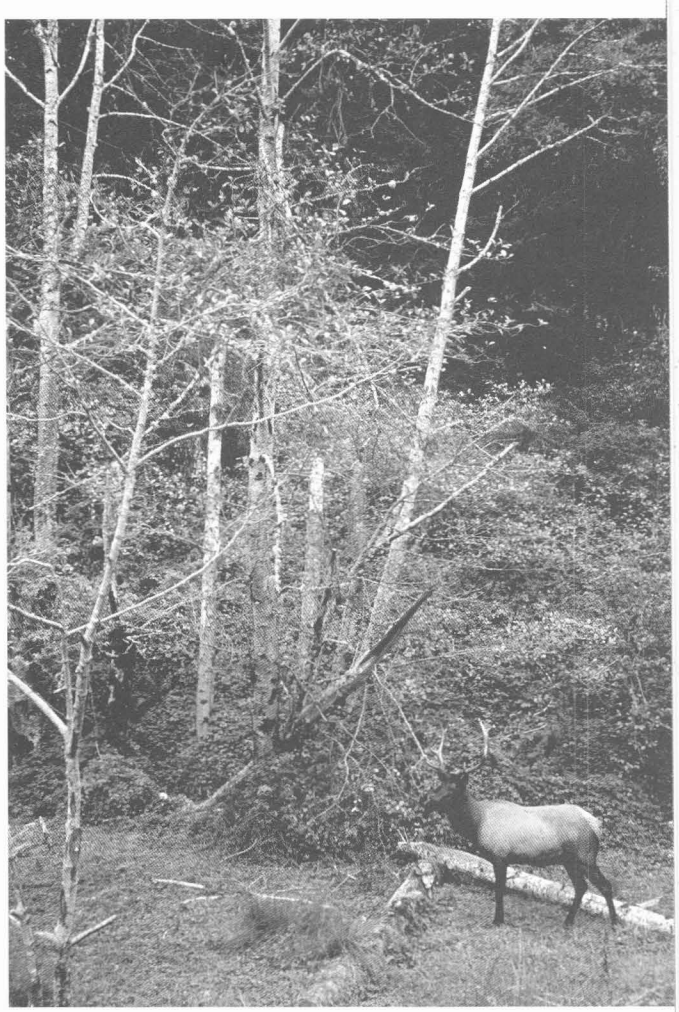
Later, Sam hiked into the Sinkyone with a group that included the tireless North Coast activist Richard Gienger and then-Assemblyman Dan Hauser, who helped push the bill to protect most of the Sinkyone through Congress.

Antlers in the Trees

THUS FAR I HAD SEEN ONLY HINTS of the past pillaging: leveled-out spots, bits of graying wood that had been split for some now unknown structure, an old slab of concrete. The land is slowly recovering, although invasive alien pampas grass has spread on disturbed slopes. This region had been heavily exploited from the 1860s, when non-native people moved in, until it was acquired for protection in the 1970s and '80s. Early on, bark was stripped from oaks for use in tanneries, and later, huge remote stands of timber were logged. Meanwhile, adjacent grasslands were turned to pasture or cultivated for farming. A railway had been punched through the forest, and huge wire chutes were built to send logs down to waiting ships. Only a name remains to remind of all that: Railroad Camp. I thought of Sam and how he had not been back here since his hike with Hauser and Gienger. He would be pleased that the land was recovering.

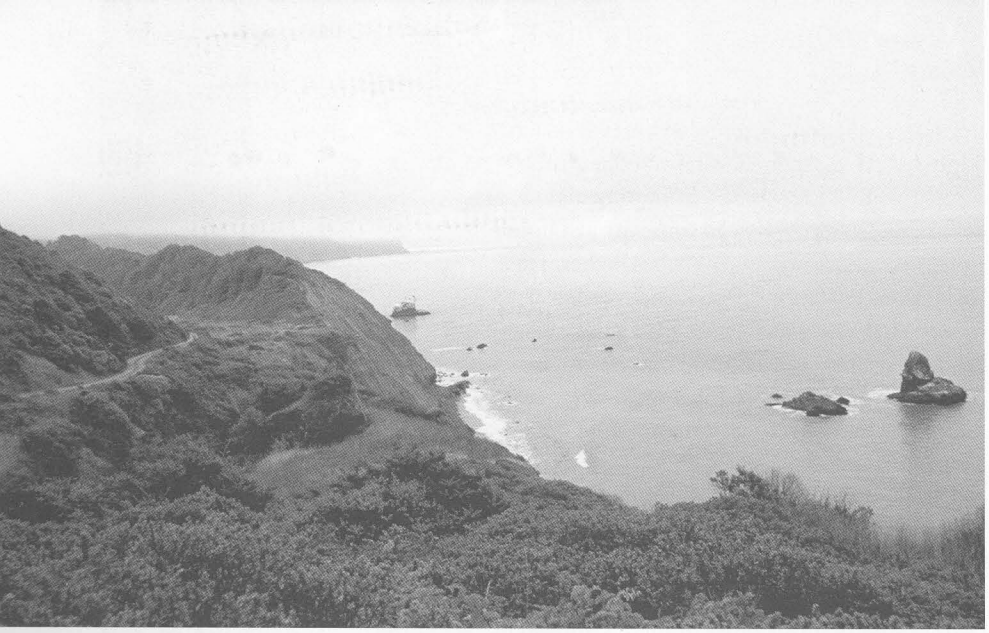
I had crested the first ridgeline and found my stride when it happened: the encounter I'd feared. Remember: When you round a corner on a narrow path and confront an elk, the elk has the right of way. I yielded and slowly backed up. The elk kept walking toward me. I dropped my pack and trekking poles and jumped up into a skinny fir. The elk decided to use his ten-point rack to smash apart some branches of a scrubby tree just up the trail. It sounded horrible—like bones breaking. After a few minutes he strode across the trail, a few leaves decorating his antlers, and angled between some firs just uphill from me. I climbed a few branches higher. The elk stopped ten feet away on a grassy patch at my eye level, and watched me with a huge black eye as he grazed. At least I had my camera. In tight places it often has calmed my nerves, refocusing my attention from imminent demise to epic images.

After about ten minutes, I summoned a little boldness and started climbing down the tree. I needed to rest my camera on my pack to take advantage of the low light and slow film. I rationalized that the wispy branches, too small to slow a charge, would at least make the elk think twice about lunging down the embankment. Suddenly, a branch snapped under my foot. I fell and was caught by my armpits, nearly wrenching my shoulders from their sockets, with my feet just grazing the ground. The elk looked up and snorted as I dropped and rolled out onto the trail. After shaking off the pain and embarrassment, I inched up to my pack and took my shots. Moments later along the trail, I met the only other backpackers I would see on the entire trip. "You've got it all to yourself," one said as they passed. My single-word response, "Great," sounded incredibly mousey.



With the sea breeze pushing tendrils of fog off the ocean and up Wolf (aka Jackass) Creek to Wheeler Camp where I stood sweating but elated with the scenery, I filled my bottle with water from a creek that flowed from the adjacent InterTribal Sinkyone Wilderness and dropped in some iodine tablets. Poppies in the nearby meadow were only half open, as though not committed to either sun or shade, hanging on to the middle ground. I could relate.

I headed down the trail, crossed the stream, and passed a sizeable alder that had been



completely girdled and was blood-red with deep gouges from an elk's antlers. "I could always car camp and do a few day hikes in," I quickly reasoned. The big challenge of hiking solo is you only have yourself to check you when you get sketched. I had been treed by a surly bull-elk just two miles back and my heart rate was racing again at the sight of the bloody scores on the tree. I later learned that elk damage trees this way while rubbing the velvet from their antlers; bruised red alder develops a bright, rusty-red color.

Restoration and Access

FROM WHEELER CAMP I COULD have headed up Wolf Creek and into the InterTribal Sinkyone Wilderness, 3,845 acres owned and managed by the InterTribal Wilderness Council—a huge blank spot on my map. I would have liked to see some of the stream restoration work being done there. Hawk Rosales, the council's executive director, had told me that since 1990 the council, working with State Parks, has hired nearly 90 Native Americans and other workers each summer and early fall to conduct assessment, planning, restoration, cultural conservation, and management activities on these lands and in the adjacent state park. "The two entities are working together holistically rather than segmented," explained Su Corbaley of the Coastal Conservancy, which funded the joint effort. "Natural resources don't know boundaries even though there are property boundaries."

The InterTribal Wilderness Council, founded in 1986, represents ten tribes and has also hosted many cultural gatherings. One of its goals is to reestablish local tribes' traditional cultural stewardship and land uses within the wilderness.

There is no public access to the InterTribal lands yet, so I took Wheeler Road, which climbs from sea level to above 1,200 feet in about a mile. I climbed above the fog and gazed eastward into the impenetrable tangle of forest on the InterTribal side.

State Parks' North Coast Redwoods District and the council also have partnered on a heavy equipment operation training program for tribal members. Their joint watershed rehabilitation project is removing some 44 miles of abandoned logging roads and numerous stream crossings from Sinkyone Wilderness State Park. The scope of this project is limited both by protections for sensitive plant and animal species and by a three-month weather window each year that closes on October 15th. For four years,

project manager Ethan Casaday and his crew have put in shifts that last from sunup to sundown to maximize their time during the brief work season.

Ultimately the council plans to remove most of the old logging roads on InterTribal property as well, which will result in the full restoration of most of the watershed between Usal Road and the ocean.

The road I was walking on was not slated for removal because it affords access to council and State Parks personnel for firefighting, restoration, and management purposes. This also may have appeased the mountain bikers (International Mountain Biking Association), who have been edged out of federally designated wilderness areas but still get to ride in this section of the state park wilderness.

Eventually, three new trails will depart from points along Usal Road, traverse InterTribal land, and connect to the Lost Coast Trail in the state park. The Coastal Conservancy is funding this public trails project.

"Eventually" seems like a long time. "Don Beers [State Parks maintenance chief in charge of roads and trails] wants things to be perfect," explained Casaday. "Our crew will finish the road removal this year, it will set during the winter, and then the trail crews will come in and work the new trail by hand. It will set again over winter to harden up and then be opened."

I finally made it into Usal campground—a hike of 16 miles from the trailhead. It was busy,which was a bit of a shock after so much wildness. Cars kicked up dust, radios blared, garbage cans overflowed, all of which thwarted my good judgment to stay put and camp there. After a snack and water fill-up from the local creek, I rationalized that since it was only 4 p.m., I had at least three hours of daylight to hike the five miles to Anderson Gulch. I pushed my tired body to the trailhead sign and took a minute to read the announcements. On a payment stub in the bottom left corner of the message board someone had written: "Warning, very large and very territorial elk 500 yards up the trail. Good luck."

Over the Top

A BIT JUMPY NOW, I HEADED up the steep switchbacks and out of the forest onto a grassy plain, from which I could actually see the beach far below for the first time on my trek. I then hiked through a very recently burned area, where I lost the trail. It took a while to find it again, but I did, and continued up through a layer of chilling fog into dripping wet forest and then into full sun. With my pack I was now deeply hunched over the trekking poles, but ever grateful for them. My tongue was dangling like a golden retriever's. An hour above Usal I passed three day-hikers. "Tired?" the guy in front asked. "Oh," deep breath, "yeah!" One of the women offered, as a kind of incentive I guess, "When you get to the top you get to go a really long way down. But you still have a long way to the top."

The trail up Timber Point tops out at over 1,000 feet and was the roughest of the journey by far. It's no surprise that the park does not allow horses on this 11.5-mile leg from Usal to Wheeler. At the trail's high point, before entering the dense woods, I stopped. The world seemed split into brilliant cobalt sky and blinding white fog. To the west, the fog hovered halfway up the cliff below me and stretched to the horizon.

The sun was dropping behind the fog, and in the fading light I hugged the edge of the ridge and began descending into a steep gully. I soon heard the surf crashing far below, then above me and to the east, and then from behind me to the south. The labyrinthine twist of the canyon was bouncing the sound around like a pinball. I had never heard of a sound giving someone vertigo, but it was happening to me, and the fog and fading light added to the effect. As I kept stumbling and tripping, I began to wonder just how tired I would have to appear before a mountain lion thought I was easy prey.

I saw plenty of old elk beds as I climbed out of the gulch and into and out of the fog again—grass neatly folded down at corners of switchbacks and on perches just off the trail. On autopilot, I managed the next huge descent, stumbled across Anderson Creek, and found Anderson Gulch Camp. Too tired to worry about becoming part of the food chain, I nestled in and

How to Get There

THE ROADS TO BOTH the north and south ends of Sinkyone Wilderness State Park are unpaved, steep, narrow, and can be treacherous. They are not recommended for large recreational vehicles, and may be impassable during wet weather. If you're planning a visit, call (707) 986-7711 for road conditions at the north end of the park and for other information; for Usal Road conditions, call (707) 463-4364. Wilderness Press (www.wildernesspress.com) publishes a good Lost Coast recreation map that covers both the King Range Conservation Area and Sinkyone Wilderness State Park.

To reach the Bear Harbor campground and trailhead, take Briceland Road west from Redway, which is a short distance off Highway 101, northwest of Garberville. The State Parks visitor center at Needle Rock is 36 miles south and west from Redway; the Bear Harbor campground and trailhead are about three miles farther. Just before the park entrance, the road changes from asphalt to hard-packed dirt.

To reach Usal Beach campground and trailhead, from Highway 101 at Leggett, take Highway 1 west for 15 miles to mile marker 90.88 (about 13 miles north of Westport on Highway 1). Turn north onto unpaved, steep, narrow Usal Road and follow it six miles to the campground.

welcomed the coming darkness. From my synthetic cocoon I watched a turkey vulture soar in the Douglas fir forest to the serenade of barking sea lions.

I awoke in fog 11 hours later, feeling about as stiff as the old-growth trees around me. I mixed my 12th Emergen-C packet of the trip into my iodized water after breakfast. Before leaving, I ventured into the roofless outhouse that had black plastic sheeting for a door. The ghost of Edward Abbey was back, in a most unlikely place. Scratched into the wall was "Hayduke Lives." Someone else had added "Frodo" just below "Hayduke." As I set out on the trail I thought, "I wouldn't be a bit surprised if I met either of them out here today."

After 2.5 miles, I entered the fold of Little Jackass Creek and, while still high up the sides of the gulch, was greeted by a massive protrusion of old-growth redwood crowns. Above me in the mist was the historic Sally Bell Grove, where in the mid-1980s activists had managed to save one of the last old-growth stands, bringing national attention to the plight of forests. I felt honored to walk in the shadow of giants and visionaries. I marveled, too, that the grove was named for a Native American who had survived a massacre of her people in the 1850s.

Where Wolf Creek meets the ocean, I sat and ate lunch in the company of a thousand seagulls and pelicans. They would fly in huge flocks to the fresh water of the creek to bathe. I thought of the torrential rains that would soon fall, and the new generations of salmon that would have a chance to spawn upstream. The fog still hovered at the edge of land and sea, and as I continued through the meadow back to Wheeler, I saw that the poppies there had opened their delicate petals, and the sun poured down. ■

Bennett Barthelemy's last article for Coast & Ocean was "River Renewal," in the Winter 2005–2006 issue.

SHIFTING BASELINES

ANNE CANRIGHT

IN 1741, THE GERMAN naturalist Georg Steller wrote of the fur seals and sea lions on Bering Island, "If I were asked to say how many I have seen . . . I can say without lying that it is impossible to make any computation. They are innumerable." Today, the sea lion named after Steller is listed as endangered in the Aleutians, its numbers down 70 percent worldwide since 1960—from roughly 300,000 animals to 85,000, according to the Seal Conservation Society. The reason? Quite likely, overfishing of a staple food source: pollock. Two other species that Steller was the first to describe, the spectacled cormorant and Steller sea cow, are extinct, hunted into oblivion for their meat.

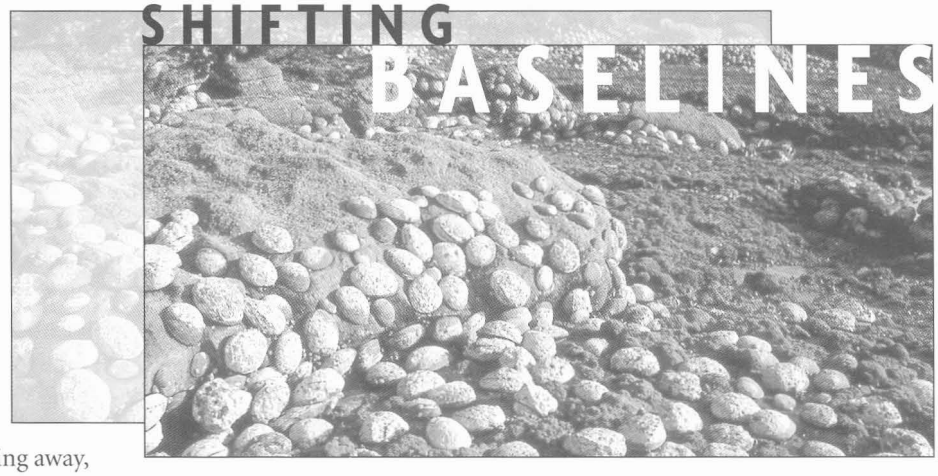
Threatened species, threatened environments. Every week, it seems, more dire news appears about the state of the oceans. Coral reefs are sliming away, turning into dead zones. Inland bays such as the Chesapeake are being drowned in sediment and excess nutrients. Hawksbill turtles struggle at the edge of extinction. Fisheries are collapsing.

And yet many people think all this is, if not normal, then perhaps inevitable. Not the way it's always been, to be sure, but absent any catastrophic changes—such as volcanic eruptions or tsunamis bring—these slow, chronic, hard-to-notice slides become part of reality as we know it.

This phenomenon of acceptance has a name: it's called the shifting baselines syndrome, and it is beginning to drive some new thinking in marine conservation.

The term was coined by Daniel Pauly, a Canadian fisheries scientist who happens also to be an outspoken critic of modern fishing practices. In a 1995 paper in *Trends in Ecology and Evolution,* Pauly charged that young biologists fail to address the collapse of once-abundant fishing stocks because anecdotes of immense past catches have little meaning for them. "Each generation," wrote Pauly, "accepts as a baseline the stock size and species composition that occurred at the beginning of their careers." The result is an ever-shrinking sense of possibility, which leads to ineffectiveness, and to continued overexploitation—or, as Pauly puts it, a continued "fishing down the food web" that eventually will leave people with a diet of "jellyfish and plankton soup."

In 2001 in an article in *Science,* Jeremy Jackson, a marine ecologist at Scripps Institution of Oceanography, and 18 co-authors presented a worldwide examination of shifting baselines, exploring the idea that "humans have been disturbing marine ecosystems since they first learned how to fish." Kelp forests, coral reefs, tropical and subtropical seagrass beds, and estuarine oyster beds are all scrutinized, and the short- and long-term effects of overfishing examined. Those effects, the scientists conclude, "are synergistic, so that the whole response is much greater than the sum of individual disturbances." And there is a time lag, typically, between the onset of fishing and a noticeable collapse in stocks or environmental health.

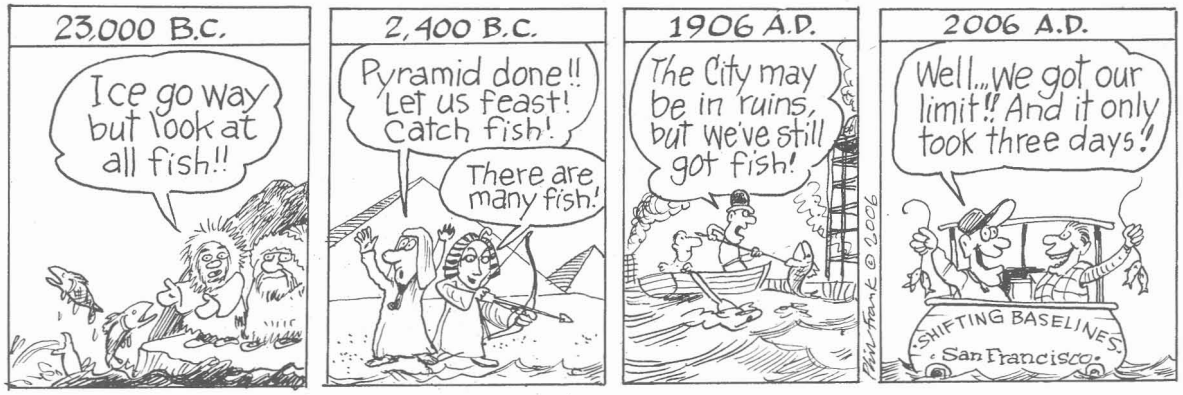


GARY E. DAVIS, NATIONAL PARK SERVICE

Appearances can be deceptive. This 1982 photo shows a seemingly healthy population of black abalone on the southwest shore of Santa Rosa Island. But several hundred years ago—before they were hunted to near-extinction—sea otters would have kept abalone populations in check. Now more than 99 percent of the abalone in the area have been wiped out by bacterial infection.

Complexity and, especially, time: these are masks that hide change from view. Baselines, reference points for measuring the health of ecosystems, shift without our noticing. That means that many ecological models, which supposedly relate to "natural" conditions, were almost certainly programmed from erroneous starting points, starting points much closer to present-day conditions than to conditions that held even 100 years ago, much less before Europeans came along with their fancy boats and fishing nets.

Jackson, who has spent over three decades exploring Caribbean coastal waters, says that "every ecosystem I've studied is unrecognizably different from when I started." And that's in only 30-odd years. The turtlegrass beds he first encountered as a young researcher, for instance, flowing meadows of foot-high, emerald-green grass, looked healthy enough from a distance. But one thing missing from the scene was turtles—as many as 40 million of them, Jackson estimates, based on colonial hunting records. "Even the smallest estimate for green turtles" in the 17th and 18th centuries, he notes, "exceeds the highest recorded wildebeest abundances in the Serengeti." And all these turtles chomped away, cropping the turtlegrass to a height of only



PHIL FRANK

a few inches. This action kept the grass healthy and the organisms that depend on it thriving.

By the 19th century, however, green turtles had been largely eliminated from the Americas, hunted to excess for food. Today, in the absence of these natural lawn mowers, the turtlegrass grows long and the tops become rotten and covered by enrusting organisms. One of these is a slime mold that, in the 1980s, caused a vast die-off of turtlegrass beds in Florida Bay and the Gulf of Mexico.

Other, similar scenarios have played out in oceans worldwide. The consequences are potentially huge, yet relatively little scientific study of historic processes has been done. "We are," observes Jackson, "more aware of the mass extinction of large vertebrates at the end of the Pleistocene than what happened in coastal seas only a century ago."

Can we bring back millions of sea turtles? No. Can we do *anything?* Of course.

Part of the answer involves understanding just how far our baselines have shifted—and ceasing, or seriously modifying, destructive practices before we find ourselves eating plankton soup. To continue to believe that wild coastal fisheries are sustainable, for example, is foolhardy, both Jackson and Pauly believe. Rather than perpetuating that myth, Jackson writes, "scientific efforts should be redirected toward evaluating options for restoration of resources. . . . It is hard to imagine how increasingly sophisticated and frequent environmental monitoring and micromanagement could do a fraction of the good of simply stopping fishing."

Stopping fishing is far from simple, though. And taking a single action, in any case, is never sufficient. In addition to overfishing, impacts on the health of ocean waters include pollution, coastal development, and global warming. The web of influences is complex, and remedies must be similarly multifaceted.

The shifting baselines concept feeds into this complexity, giving concerned parties—scientists, conservationists, policymakers, or citizens—new hope (a new baseline, if you will) for what can be done. By understanding what once existed, we can plan better for what might again be possible.

I spoke with Jeremy Jackson by phone recently, and will let his words round out this overview.

What is your opinion about the new decision regarding marine protected areas off California, setting aside some 18 percent of coastal waters?

Jeremy Jackson: I get uncomfortable when people talk only about marine protected areas, because I think marine protected areas make more sense in some situations than they do in others. [Jackson did say earlier in our conversation, however, that anything less than 30 percent protected area, as Australia has allotted for the Great Barrier Reef Marine Park off Queensland, is probably inadequate to bring about real change.] Certainly it's the case that not killing fish is good for fish, so if you have areas that are in effect sanctuaries, that's going to do a lot of good. But for something like the California sardine, it makes a lot more sense to think about water bodies, and about adaptive management where you change the rules based on climatic trends and other variables.

So every fishery is going to have a lot more going on than just how many fish are caught.

JJ: Inevitably, because the world is a very variable place. Maximum sustainable yield, for example—it's a silly idea. If you calculate numbers ignoring the fact that environments go up and down, you're in trouble.

A former student at Scripps, David Field, published this really cool paper in *Science* this year. He studies planktonic foraminifera, those little calcareous things that float around at the surface

of the ocean. We know a lot about them because they're how we tell time in ancient rocks and they also tell us a great deal about the environment. David showed from a 1,300-year record from the Santa Barbara Basin that tropical and subtropical species are now moving into the California Bight, and temperate and north temperate species are becoming much less abundant. And all of this started big-time in the 1960s. The point of that, of course, is that environments are changing in systematic ways that are very different from anything in the previous 1,300 years. So on top of all the other uncertainties, we have this new uncertainty. Which is one of the reasons that a flexible management program that includes in its toolkit protected areas, catch restrictions, seasonal closures, and geographic flexibility to move protected areas over time makes so much sense.

But all of this requires trust. That's why I've been turned off by the situation in California [over the establishment of marine protected areas], where all these people are screaming at each other and not listening. Because if we don't have dialogue and if we don't show respect for each other and trust each other, then we're just going to keep screaming. And that's not a good way to manage anything.

We are more polarized on these environmental issues in this country than any place I've ever been. And we don't have a lot of respect for the winner. We get nasty and vindictive. It's spooky.

The baselines are changing in every way. It's not just natural populations. It's also the economic environment we live in, the social environment we live in, and the climate we live in. Under those circumstances you've got to keep your eyes open and be flexible, and above all pay attention: take things seriously. Hopefully, that's what will emerge finally in California.

In a strange way, just the way it was Nixon who went to China, in California, Schwarzenegger can do a lot of good for the environment. Because he can laugh at himself and his Hummers and then say, "But I support this," and then get a lot of attention. He doesn't make the policies, but he's a smart enough politician to listen. And we need more like that. Especially in this day and age, what the states do is all-important. What I'd like to see people who lobby and work on this stuff say to the governor on a regular basis is, be as much of a leader on this as you're being about climate change, and you'll go down in history as the most environmentally conscious governor in the history of the United States.

"This" being coastal water management?

JJ: Yes, all of it, the whole thing about how we manage our coasts. This state is really interesting in this regard, because it's hard to think of a state other than Florida or maybe Maine that makes as much of its income out of nonextractive uses of the water. Recreational use is an enormous business in this state.

You know, I've never been on a surfboard in my life, and I'm sure I never will be, at the age of 63, but I've worked quite closely with the Surfrider Foundation, because they get it. Those are potentially powerful organizations.

And what is the Surfrider Foundation doing?

JJ: What got them interested in all of this is, A, they don't like dirty-looking beaches, and B, they *really* don't like getting hepatitis. And they really don't like not being able to go in the water after it rains. And basically, from Santa Barbara south, if it's been dry awhile and it rains, they shouldn't go in the water. But in [dealing with these issues], they pick up on the other stuff.

And then there's groups like World Wildlife Fund, which is big on sustainable fisheries. What they're really good at is dealing with the corporate world quietly and effecting change that way. They're the prime movers on sustainable forestry, and they're working to do the same thing with fisheries. It's an important approach, but it's not the only approach. Sort of a mix of World Wildlife Fund and Greenpeace makes a lot of sense, I think, because it's almost a good cop, bad cop approach—and they talk to each other. They'd never admit it, but they talk to each other all the time.

And then there's the Nature Conservancy, and Environmental Defense. There was a big article in the *New York Times* business section about a deal TNC has brokered with the trawl fishers on the central California coast. [For more on this, see the earlier "Reinventing a Local Fishery on the Morro Bay Waterfront," *Coast & Ocean,* Autumn 2005.] Basically, they're buying out the licenses, and then they're going to retire them. That gets pretty close to TNC owning half of all the licenses in California—which is a huge investment, but it's a really smart strategy.

So most organizations are involved. In any movement, though, there's a lot of rhetoric, and there's a lot of striving to be the most important group, and to get the most publicity and attention. It's one of the things that offends me about

What If?

MOST OF US LEARNED, probably in school, that when the early European explorers began traversing this continent, they encountered untold riches of wildlife: vast herds of shaggy buffalo roamed the western plains; waterbirds flocked to West Coast estuaries in such numbers that they darkened the sky. The wealth of the land was unimaginable! And it had always been so—until the Europeans came.

Well, not necessarily.

In a fascinating book, *1491: New Revelations of the Americas before Columbus* (Knopf, 2005, 480 pp., $30 hard cover, $14.95 paper), Charles C. Mann, a journalist, puts such long-held, cherished assumptions to the test. He mines learned opinion and solid knowledge from ecologists, archeologists, historians, epidemiologists, and other scholars to piece together an alternate vision of what life was like in the Western Hemisphere before Europeans came along.

One of Mann's conclusions is that the "pristine wilderness"—vast, abundant, untamed—is about as mythical as the solitary frontiersman who pitted brawn and wits against all that wildness to civilize the land. That job of taming had been done long before, by the native inhabitants. At the time of Columbus's voyages of exploration, agriculture was practiced in as much as two-thirds of what is now the continental United States. Large areas of the arid Southwest were terraced and irrigated, eastern forests had been replaced by fertile farms, and salmon nets stretched across virtually every river mouth of the Pacific Northwest. Everywhere, fire was a crucial management tool, and vast herds of anything were pretty much unheard of. Indians had profoundly altered the landscape by the early 16th century, when the first European explorers arrived.

Yet by the time the second wave of explorers began their push into the hinterlands more than a century later, the situation had changed dramatically. Where in 1540 the Spanish explorer Hernando de Soto had found lands "thickly set with great towns," in 1682 the Frenchman La Salle encountered, in the same areas, "a solitude unrelieved by the faintest trace of man." La Salle did, however, encounter bison, grazing in great herds along the Mississippi River—an extraordinary beast that de Soto would surely have mentioned had he seen one. A similar abundance marked the West Coast. When Sir Francis Drake sailed into San Francisco Bay in 1579, he noted, "infinite was the company of very large and fate Deere." And scarce was humanity—though according to archeological evidence, that had not been the case just a century before.

What happened? Disease brought to the Americas by the first explorers (and their livestock) is the quick answer. Mann explains why the Indians were so susceptible to European illnesses, which some scholars believe sent human populations plummeting by as much as 95 percent. The people ceased to be able to shape the land and manage its wildlife. Without regular culling for food and to protect fields of maize from trampling, bison, elk, and other animals multiplied and spread. Without fire management, forest succession proceeded rapidly. The "forest primeval" that we romantically picture covering much of this continent was in a sense created by the Europeans.

—*AC*

environmental organizations in general. They're not much different from BP when it comes to, "Look what World Wildlife did!" or "Look what Nature Conservancy did!" instead of "Look what *we* all did, and accomplished." Greenpeace might be the exception, because they're so radical; they don't think the same way.

But they are all making good changes that are politically driven, if not in the same way states' decisions are politically driven.

JJ: Well, except California could turn around. I think, at the end of the day, if we have to depend on NGOs [nongovernmental organizations], we're in deep trouble. I think it has to be fundamental social change. Why are people smoking less? It's not because they got put in jail or fined. And why do women genuinely have more parity—not total, but more than they used to? These are fundamental social changes.

Which got pushed by policy changes.

JJ: Yes. By social activism.

And the environmental groups are the harbingers.

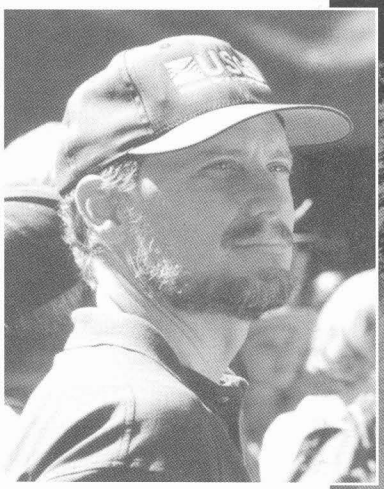
JJ: Yes, though they used to be more. There used to be a time when five to ten million people showed up for Earth Day. I believe that almost universally, the environmental organizations have become too corporate, they've turned off youth. There's not just a conflict between left and right, and blue state and red state; there's an enormous conflict between everybody over 20 and everybody under 20. And none of the environmental organizations know how to reach those people.

The generation gap has gotten even stronger because of the acceleration of mass communication, and the fact that you used to have to listen to ABC or NBC, and now you have 300 choices. The president of the United States could come on television to tell us that we're being invaded by Martians *for real,* and he would get a 15 percent viewer audience.

So the ability to focus effectively has been dramatically eroded. And it's a much more populist society. Which is why somebody like Schwarzenegger, of all people, because he's savvy about those sorts of things, *can* be effective, much more so than other people who just don't understand.

The generation gap. A more populist society. Shifting baselines extend from marine conservation into the very heart of social change. One point that should not be forgotten is that we all need to listen to each other, and respect each other. Different groups will have different perspectives—different baselines. It's an ongoing dance, one we have to keep learning new steps to. Not fancy steps. Just ones that work. ■

RESTORATION AND GLOBAL CHANGE



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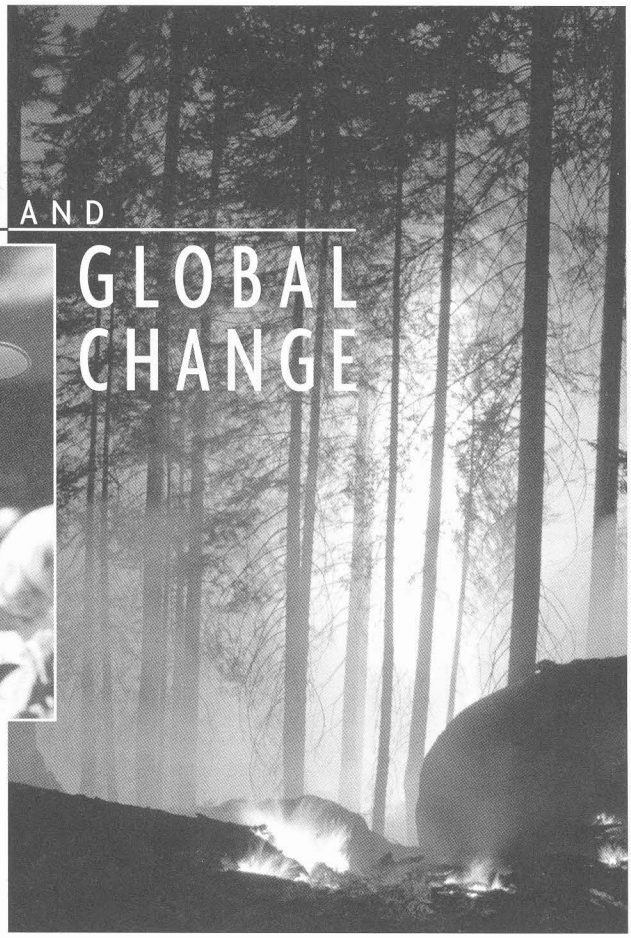


NATHAN STEPHENSON

EILEEN ECKLUND

NATHAN STEPHENSON'S career as a research ecologist spans more than 25 years. Since receiving his doctorate in plant ecology at Cornell University, where his dissertation analyzed effects of climate on distribution of vegetation types, he has been working in the southern Sierra Nevada. For years he has studied the interaction of fire with forests, especially with giant sequoias, and he helped to refine a management regime using fire. Since the early 1990s, when he helped establish (and later became director of) the U.S. Geological Survey's Sierra Nevada Global Change Research Program, he has studied issues surrounding climatic and other global environmental changes in Sierra Nevada ecosystems.

Recently Stephenson has been speaking at conferences and other professional gatherings about ecological restoration in an era of rapid global changes. He contends that, although it's useful and necessary to be able to refer back to a historical baseline to see how a particular ecosystem worked, it's often no longer possible—or useful—to attempt to restore systems to a supposedly pristine "natural" state, one assumed to have existed at a particular historical point in time. What is important, he says, is to try to maintain native biodiversity and build an ecosystem's resilience rather than dictate its structure or species composition.

Coast & Ocean spoke with Stephenson by phone at the USGS's Sequoia and Kings Canyon Field Station in Three Rivers, California.

How did you arrive at your views about ecosystem restoration in this time of rapid global change?

Nathan Stephenson: I started my career as a scientist with the National Park Service; now I work for the U.S. Geological Survey, but I work in the same location I always did and on the same topics. I had a deep belief in the mission of the National Park Service, which is to restore and maintain naturally functioning ecosystems. It seemed pretty clear that to succeed at that in the Sierra Nevada national parks, fire needed to be reintroduced. Sequoia–Kings Canyon had been nationally known for having one of the most sophisticated and successful prescribed fire programs in the national park system.

Then in the early to mid-1990s, a couple of people here started to put together the numbers and look at how close we were to restoring the pre–European settlement fire regime, and we

were falling pretty substantially short of that in spite of our best efforts. There's always something that, for good reason, gets in the way, whether it's being able to burn at the safest time of the year, or the air quality is too poor—which is a really big issue. You need permission from the Air Pollution Control District, and if you can't get that, you don't burn. Sometimes it's staffing, sometimes it's money—all these things come together to mean that we burn a lot less than used to burn before the arrival of European settlers. Safety is also a big issue.

And that created a crisis for me. I thought, it looks like no matter how hard we try, we're not going to meet the mission of the National Park Service in the strictest sense, of trying to restore the fire regime that used to be there. That little personal crisis started leading me to question everything. At the time I was studying the potential effects of climatic change, and I started putting all the pieces together and realizing that even if we could completely restore the pre-European settlement fire regime, all these other things are happening that have no precedent.

We have a lot of ozone air pollution that comes into the park, and it particularly affects a few species of pines, and who knows what else it might affect. We're getting more nitrogen deposition from the atmosphere than we did in the past, from fossil fuel combustion. We have invasive species: If I look out my window here in the foothills, probably 90 percent of the species are introduced from different parts of the world. We have a non-native fungus that was introduced a long time ago, the white-pine blister rust, and that's slowly but surely killing off the sugar pines in the park. And then you throw rapid climatic change on top of all that, which, if the models are correct, is going to become a bigger and bigger issue in the very near future. I just reached this crisis point where I said, my gosh, we can't go back to a "natural" past, it's just too late for that. And then I started to ask, well, what the heck do you do?

A point I try to bring home to people is that, for good reason, we have a tendency to look to the past, to try to find an analog to current conditions. That provides a comfort factor where, if we can figure out what our ecosystem looked like 500 years ago and restore it to look like that, we ought to be okay. But the environments we have today have no analog in the past, and so we don't have that extra comfort zone anymore of being able to look to the past and say, here's my model for what I want my ecosystem to look like.

You hear a lot of talk among restorationists these days about "building ecosystem resistance and resilience" to try to maintain native biodiversity within ecosystems. What are some of the things you can do to achieve that?

NS: In some cases there are some really obvious things you can do. I'm going to talk about what I know best, which is forests here in the Sierra Nevada. Many forests have become unusually dense due to a century of fire exclusion. By thinning those forests—whether by prescribed fire or mechanical thinning—you can increase their resistance and resilience to air pollution and . . . you name it. I can't think of a stress where an overly dense forest doesn't benefit if it's thinned. In a national park, the main way you get a forest to be thinner is by prescribed fire. It tends to kill the smallest trees and open up things a little more, and there's less competition among the trees, and those that remain tend to be healthier and grow faster. In other areas it may be more appropriate to go in with chainsaws and thin out the smaller trees—I know that's a political hot-button issue, but just about everything is these days.

So you are suggesting that instead of trying to replicate ecosystems, you have to take the lessons you've learned from the past systems and try to apply them on the ground as conditions change?

NS: Yes. I still think we need to look to the past to understand how ecosystems work; we definitely have to keep learning about how ecosystems respond to climate, to fire, to all these different things, and one of the best ways to do that is to look at the past. Maybe as we develop a better understanding of how ecosystems work, we'll be in a better position to conserve native biodiversity into the future.

Is there anything beyond thinning that you're looking at that might help the forests?

NS: No, not currently. The main reason I've been giving talks about this is to get more people to be thinking along those lines, about what we can do, because I certainly don't claim I have the answers. I'm just trying to pose the questions. ■

RESTORING LAKE MERRITT'S BIRD ISLANDS

EILEEN ECKLUND

STEVEN JENNER

HAROLD WINDER, COURTESY OAKLAND PARK DEPT.

Top and middle: The bird islands today, from air and land.

Bottom: Paul Covel (far left), the West Coast's first municipal naturalist, leads a team of Boy Scouts planting vegetation on one of the islands

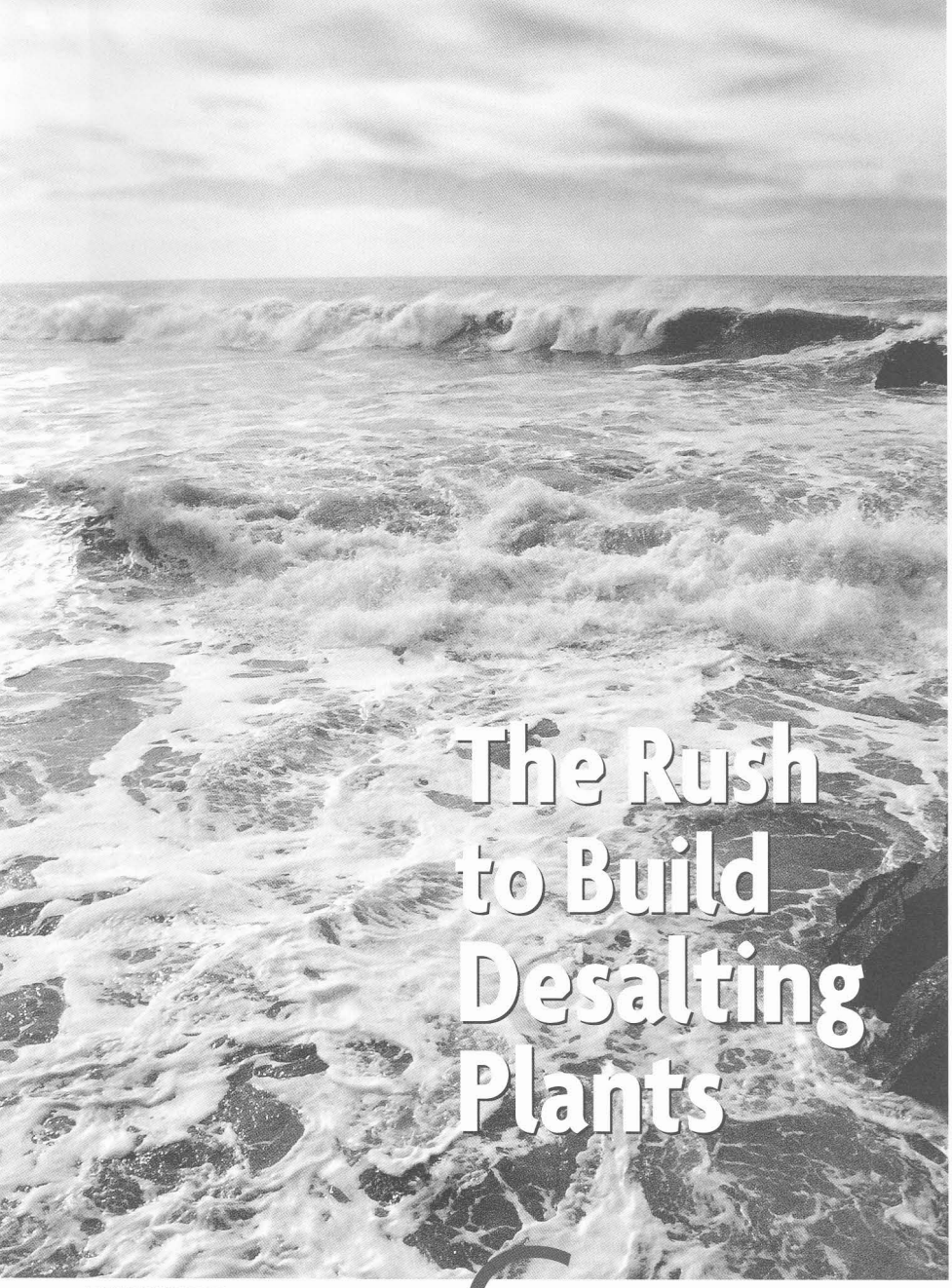
A LAKE IN THE MIDDLE of a city may seem an unlikely haven for waterfowl. Yet hundreds of herons, egrets, geese, ducks, and other birds have flocked to Oakland's Lake Merritt to feed and nest since it was created in 1869, when a dam was constructed at 12th Street to control flooding. In 1870, the lake became the first state wildlife refuge in the nation.

Five islands were built at the lake's northern end between 1925 and 1956 to provide roosting and nesting sites for the birds. In recent years, however, the habitat on the bird islands has deteriorated and the number of birds using them has decreased. Now the City of Oakland will use a $1 million grant from the Coastal Conservancy, approved in October, to restore the islands and build a demonstration marsh along 100 feet of shoreline near the Rotary Nature Center, across from the islands.

The biggest problem on the islands, which lie between 25 and 300 feet offshore, is a direct result of their success as bird habitat—guano (bird droppings) that has accumulated over decades has killed many of the eucalyptus that serve as nesting trees. The city plans to remove the guano and dead vegetation, replant fast-growing trees, and place wood chips beneath the trees. The wood chips, along with newly deposited guano, will be cleared away at the end of each nesting season. A new freshwater irrigation system will be installed and invasive vegetation will be replaced with native plants.

The new demonstration marsh will enhance the educational programs and activities currently conducted year-round by the adjacent nature center, aviary, and Junior Center of Art and Science. A viewing area and interpretive signage along the marsh will allow visitors to observe and learn about the birds foraging in the marsh and nesting on the nearby islands. The city will also use some of the funds to investigate the potential for marsh habitat between the islands once the lake's channel is widened to increase the tidal action in the body of the lake—a much larger project that Oakland hopes to undertake within the next few years.

The funding for this work is available through Proposition 50, a resources bond act approved by California voters in 2002. The funds were provided to the Conservancy by the state Wildlife Conservation Board. ■



The Rush to Build Desalting Plants

LAWRENCE ROBBIN

RASA GUSTAITIS

CALIFORNIA'S CHRONIC WATER worries worries have been aggravated by rapidly accumulating signals that the climate is changing, with warmer winters, smaller snow pack in the Sierra, earlier snowmelt, and more extreme weather events. Coastal cities expecting water shortages are searching for ways to build "portfolios" that ensure a stable, reliable, and locally sustainable water supply. Water districts and state agencies are promoting conservation measures as part of the mix, but the more intense push right now is for desalination.

More than 20 proposals for producing drinking water from seawater are in various stages of active consideration along the southern and central coast and on San Francisco Bay. They are driven by dire expectations, supported by public subsidies, and encouraged by the federal and state administrations and private water purveyors. Private corporations or public/private partnerships are proposing five of the projects, including two that would be the largest on this continent, in Carlsbad, San Diego County and in Huntington Beach, Orange County.

Desalination is the most expensive way to get potable water in California. Technological refinements have lowered its cost, but energy accounts for a third to half of the cost of production, and energy prices are moving only in one direction. Peter Gleick, cofounder and president of the independent, nonpartisan Pacific Institute, which in 2006 published an analysis of benefits and costs, *Desalination with a Grain of Salt: A California Perspective,* says subsidies hide the true costs.

California voters gave desalination a boost in 2002 with Proposition 50, the water bond act, which provided $50 million in grants to help water districts develop and build desalination plants. Meanwhile, the Metropolitan Water District of Southern California, which covers six counties, has offered 25-year subsidies of $250 an acre-foot for water produced by desalination. (An acre-foot is about 326,000 gallons, or one acre one foot deep, and provides for the annual needs of four average families). At the federal level, three bills to fund development or production of desalted water, available to both public and private water services providers, were introduced in the last Congress. The U.S. Desalination Coalition, founded in 2003 by five large southern California water agencies, is working to "encourage federal support and funding." Its members now include water agencies in Florida, Texas, and Hawaii.

Everyone involved in discussions about desalination—from voters to public officials to environmental organizations and water companies—seems to accept that it will play some role in California's future. At conferences, workshops, and hearings they are debating, however, whether that future has arrived.

When and where will desalted water be needed? Who gets the water? Who should build and operate plants, at what cost and for whose benefit? How big should they be? Would they encourage excessive development? What effect would the discharge of left-over brine, with its chemical residues, have on marine ecosystems? What type of seawater intake will be permissible and how will it impact the coast? If private companies are involved, will water, a vital resource in the public trust, be turned into a commodity?

If all the plants now proposed are built, they could supply an estimated seven per cent of the state's urban water use. Their effects on the coast, however, could be major. A report by the Coastal Commission, *Seawater Desalination and the California Coastal Act* (2004), states: "The concerns about desalination are due primarily to its potential to cause adverse effects and growth that are beyond the capacity of California's coastal resources." In some coastal areas, the single largest constraint to growth has been a limited water supply.

Proponents of desalination plants maintain they are needed for a growing population, as hedges against drought and other disasters, to reduce dependence on a limited imported water supply, and as a reliable new local water source. They tout the end product as pure water that is of better quality than what now flows out of faucets in many locales.

Go-slow advocates point out that forecasts of water requirements have proved to be greatly overblown, that immense amounts of water are now wasted, that water use has been reduced greatly, and can be reduced much more, by measures that improve efficiency, encourage conservation, and provide for reuse. Such measures can yield more water at far less cost than desalination, they say, while reducing water pollution and saving energy and money. Building desalination plants now could undermine further progress.

"The largest, least expensive, and most environmentally sound source of water to meet California's future needs is the water currently being wasted in every sector of the economy," states the Pacific Institute's *Waste Not Want Not: The Potential for Urban Conservation in California* (2003). About a third of the state's urban water use alone can be saved with existing technology, the report estimates. Agriculture also offers big water conservation opportunities.

What's more, the dire expectations of water shortages may be way off. "Note that California is using less water today than ten years ago," Gleick told a conference on desalination held at the Aquarium of the Pacific in Long Beach on October 5. Although the state's economy has grown and its population has risen to more than 34 million from 21.5 million in 1975, statewide water use has decreased, he said. Los Angeles has 700,000 more residents now than it did 20 years ago, but water demand has not risen.

There are two ways to desalt seawater: by distillation, or by reverse osmosis. All the plants proposed in California would use reverse osmosis, a process in which pressure is applied to seawater to force it through membranes that allow only water molecules to pass through. The remaining brine, along with minerals and residual chemicals used in the process, is discharged in a waste stream. Two gallons of saltwater will produce one gallon of drinking water. Because desalted water comes out tasteless, minerals must be added to make it palatable.

Some of the proposed plants would be be built next to power plants with once-through cooling systems: they take in seawater to cool condensers, then discharge it through an outfall. The desalination plant would be connected to this outfall to collect some of the cooling water for desalting. The brine would be mixed with the power plant's discharge.

Nikolay Voutchkov, senior vice president of technical services for Poseidon Resources Corporation, wrote in the July/August 2005 issue of *Asian Water* that "co-location of desalination plants with large power generation stations may yield significant cost-savings and further reduce the cost of desalinated water." Tom Luster, environmental analyst for the Coastal Commission, meanwhile, says that such tie-ins could delay the transition coastal power plants must make from once-through cooling, which harms marine life. Many of these plants were built in the 1950s and '60s, when neither energy nor the environment were big public issues. In sucking in water from the ocean, they kill fish and other marine life that is trapped against the intake screen (impingement) or pulled through the system (entrainment). The California Ocean Protection Council has called for once-through cooling to be phased out, the U.S. Environmental Protection Agency has ordered a severe reduction in impingement and entrainment, and three coastal power plants have already switched to a cooling system that uses air instead of water. A co-located desalination plant could lock in a harmful and obsolete technology, Luster said.

In the past, when water districts wanted more water, they got it from northern rivers or the Sierra by building dams and pipelines, with federal and state governments paying a big share of the cost. Desalination follows that tradition: it would expand water supplies by developing a new water source that requires hard structures. Those on the go-slow side of the debate hold that the 21st century demands an approach that makes the most of the water already available.

A simple measure such as replacing old toilets that use six gallons per flush with the kind that

use 1.6 gallons per flush would save 420,000 acre-feet of high-quality water that now goes down the drain, the Pacific Institute has calculated, and householders would save on water bills. (Even more efficient toilets, which use 1.3 gallon a flush, are now standard in Europe and Japan and available here.) Even more could be saved by simple changes in irrigation; most household water use is outdoors.

Conner Everts co-chairs the Desal Response Group, a network brought together in 2004 by southern California utilities interested in ocean water desalination. "We have been meeting ever since because we have more questions than the utilities have answers," he said. This group is trying to make sure that as California moves toward desalination, citizens and decision-makers understand the key issues, and that these issues are addressed. The network includes water policy experts, local government representatives, staff of permitting agencies, utility districts, and citizen advocates concerned with food, water, the fishing industry, and ecosystems. "I've met people from organizations I never heard of before and we have shared our expertise in our areas of concern," said Joe Geever, the Surfrider Foundation's manager for the South Coast.

Privatization of water is a big concern. "If your water system is operated by a company with headquarters in Germany and that company is trying to divest itself of its water holdings in America, whom do you call when you need something?" Everts asks.

The coastal desalination plants now being considered vary in size, character, and purpose. In October, the Coastal Commission unanimously approved a pilot project to be built by the City of Santa Cruz Water Department at the University of Santa Cruz Long Marine Laboratory to help the City decide whether to build a 2.5 million-gallons-a-day (MGD) facility to provide water during droughts, earthquakes, and other crises. The city might also opt to run it year-round and sell water to nearby communities.

In December, California American Water (Cal-Am), currently owned by RWE, a corporation based in Germany, won a divided Commission's approval for a pilot facility on the site of the Moss Landing power plant, which has once-through cooling. Cal-Am, the principal water supplier for the Monterey Peninsula, intends to build a plant that would generate 11 to 12 MGD, the amount the State Water Resources Control Board has required it to stop drawing from the Carmel River watershed. Cal-Am has been taking more than its permitted amount from the river, impeding efforts to restore the river's steelhead population.

The Marin County Water District is considering a plant next to a wastewater treatment plant on the San Quentin peninsula. It would take water from offshore and discharge brine with wastewater. San Francisco, Santa Clara County, and the East Bay Municipal Utility District are considering a large regional plant.

The projects that have made the most headway are also the biggest, proposed by Poseidon, whose headquarters are in Stamford, Connecticut, as public/private partnerships, co-located with power plants in Huntington Beach and Carlsbad. Each would be twice as big as the desalination plant in Tampa, Florida, which is supposed to generate 25 MGD. Also launched by Poseidon, it has been plagued by technical and management problems. Two companies involved in the project went bankrupt before it was completed. The regional water management agency, Tampa Water, now owns it and hopes to take it into full operation in 2008, six years later than originally planned. Tampa Water is investing another $29 million to work out the problems with the help of Cal-Am and a firm from Spain. The original $100-million pricetag has jumped to $150 million, watertechnology.net, a water industry website, states.

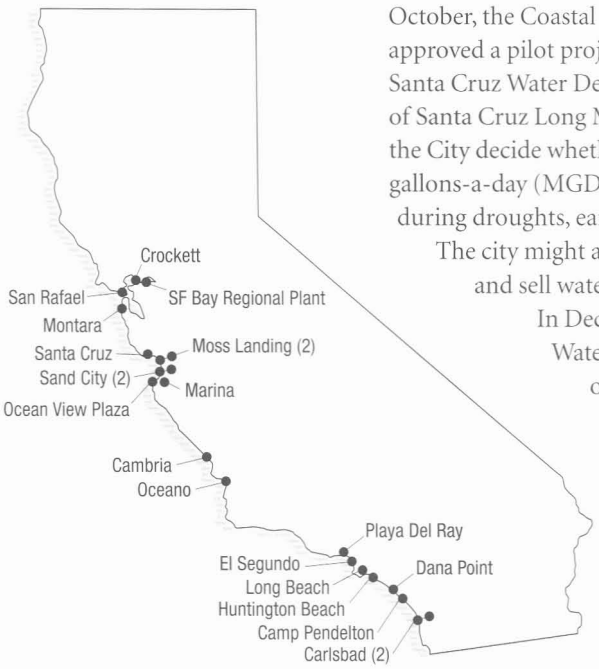
The Cities of Huntington Beach and Carlsbad have approved Poseidon's environmental impact reports. The next steps are leases from the State Lands Commission and a permit from the Coastal Commission.

"Desal proponents in the biggest hurry are the private companies," said Surfrider's Geever. "Public agencies seem to be taking a more cautious approach." The City of Long Beach, for example, has a ten-year "drought-proof" strategic plan and is bent on finding an "affordable" approach. The Municipal Water District of Orange County has finalized a successful pilot demonstration of subseafloor intakes that avoid marine life mortality.

Water management is fragmented in California and no strategic plan exists in which the whole picture of needs, requirements, and options is examined. The Coastal Commission hopes to remedy that, at least partly. "Now that

Proposed desalination plants

Based on map from: "Desalination, with a Grain of Salt: A California Perspective," Heather Cooley, Peter H. Gleick, and Gary Wolff. Pacific Institute, Oakland, June 2006



water issues are moving to the coast, the Coastal Act allows us to take a more comprehensive look at different issues," Luster said. The Commission has established criteria for proposals and guidelines to help permit applicants move smoothly through the process. The criteria are: The facility should be set back from the coastline; a subsurface water-intake system should be used where possible; brine should be discharged through an existing outfall when possible; the plant should be publicly owned; the applicant should show that the water will affect an already developed area with an approved growth plan; and the service area should have an effective conservation program.

Because it met five of these six criteria, a relatively small project in Sand City north of Monterey, proposed by the Pajaro-Mesa Utility District with Poseidon, was approved within six months. The project has a subsurface intake, is to be sited a half mile inland, and there is a plan to move it farther inland if coastal erosion occurs.

In the case of the Cal-Am pilot project to be co-located at the Moss Landing power plant, the Commission's permit approval went against its staff recommendation that it be denied. Staff found that the proposal did not conform to the Local Coastal Plan and did not adequately protect sensitive natural resources. It was proposed by a private company, although Monterey County has an ordinance requiring public ownership for desalination plants. At the Commission hearing, Cal-Am president Ken Turner said no decision had been made on what kind of intake the plant would have. The pilot project will simply provide needed information, he said. Permit opponents saw the pilot plant as the first step toward a co-located plant that, even if small at first, could be expanded once the distribution system is in place.

Drawing water from the seabottom is considered to be less environmentally harmful than taking it from the surface. However, subsurface intakes are mostly suitable for small projects and are inappropriate in some locations, said Poseidon's Voutchkov. In Huntington Beach, he said, the seafloor is too polluted, while surface waters are consistently clean, except after storms. Unanswered questions about the impact of pollution, red tides, and other ocean water quality variables on desalinated water is the subject of a study being prepared by the West Basin Municipal Water District in Los Angeles.

Tapping the seas for drinking water is hardly a new idea. Saudi Arabia has done it for decades. In a desert nation rich in energy sources, the cost/benefit ratios are different from those in California. Most of the significant seawater desalting capacity is in the Persian Gulf, on islands with little local water, (including Catalina Island), and in some other locations "where water options are limited and the public is willing to pay high prices," states the Pacific Institute's report on desalination. However, "while seawater desalination plants are already vital for economic development in many arid and water-short areas of the world, many plants are overly expensive, inaccurately promoted, poorly designed, inappropriately sited, and ultimately useless."

The debate about desalination has engaged public agencies, private interests, fishermen, farmers, utilities, planners, and many others. Zeke Grader, president of the Pacific Coast Federation of Fishermen's Associations, said he's ready to give "conditional approval" to desalination, but only if the things that trouble him can be resolved. It would be hypocritical for his organization to advocate the removal of hydroelectric dams on the Klamath River while supporting new high-energy water projects, he said. He hopes to see desalination become an energy-saving technology, one that reduces the need to pump northern river water south.

Meanwhile, the Surfrider Foundation is working with the West Basin Municipal Water District and other utilities on an Ocean Friendly Garden program for residential and large landscapes. By reducing runoff, the program should reduce water use, stream and ocean degradation, and the associated costs of controlling intractable nonpoint source pollution. San Diego County, which originally was a partner in the Poseidon project for Carlsbad, has stepped back after its water conservation efforts proved so successful that projections for water requirements were scaled down. Reuse and groundwater recharge are progressing in Orange County.

"Our vision should be absolutely no discharge into the ocean," said Geever. "We should be reclaiming every drop of water and finding a productive use for it." Small, public desalination plants can have a place in that vision. How the story evolves, however, will depend in no small part on the attention it gets from California citizens. ■

IN THE YEARS 2000 TO 2006, 20 people drowned in the Russian River in Sonoma County and 14 of them were young Hispanic men, the County Coroner's records show. "The Hispanic community comprises 20 percent of the resident population in Sonoma, but accounts for 75 percent of drowning deaths that occur in our rivers, lakes, and pools," according to the Red Cross of Sonoma County.

The Russian River

EL RIO PELIGROSO

STORY AND PHOTOGRAPHS BY DEBORAH HIRST

Maria Moto-Fincher, station manager of Univision's KDTV 28 in Santa Rosa, has been aware of these drownings for years. "Since 1965 I've lived near the river," she said. "Every summer, when I heard the helicopter really low, people went missing." She and others believe that many of the casualties are seasonal agricultural workers from Latin America, especially Mexico.

"They come from the heart of Mexico," she explained. "They don't have access to rivers and lakes. They're poor. They just come here to work for the season. They work, they go to the river with friends for a picnic, they drink, because that is what they do. Then they swim. The river is too strong for them and—" She shrugged in frustration.

In the heat of summer, many agricultural workers, as well as local families in the region, seek out the cool and deceptively inviting river, unaware of the strength of the currents and the rapid changes that can occur. As a result, all too often, bodies of young men are shipped back to places like Jalisco and Michoacán.

Moto-Fincher is passionately committed to spreading the word about river hazards through her Spanish-language television program in hopes of helping to save lives. "We did a one-minute public service announcement for the Red Cross last year," she said. "That was the first thing they had in Spanish." The announcement, promoting swimming lessons and water safety, was aired repeatedly in the early mornings to catch waves of people heading out to work. On the day we spoke in her studio, Moto-Fincher and station producer Hugo López were putting the finishing touches on a 20-minute video about Vamos a Nadar (Let's Swim), a Spanish-language swimming program for children, which also includes water-safety training for parents. It is offered by the Red Cross and the Sonoma County Regional Parks and Recreation Department.

Moto-Fincher's KDTV program, *Retrato Hispano,* airs Mondays from 2 a.m. to 5 a.m., when fieldworkers are most likely to tune in. By 4 a.m. their workday is already under way. She has watched groups of them "wearing lights, headlamps, you know, on their hats—to pick the grapes…." If they see just a few minutes of the program before leaving for work, "just one thing like grabbing a branch, that is something in the moment they can remember and maybe survive."

The video on Vamos a Nadar is a creative outgrowth of the Sonoma County Water Safety Committee's concern about the drownings. This committee was formed in the early 1990s, bringing together representatives of the Red Cross, State Parks, local public swimming pools, city governments, County Regional Parks, and the Coastal Conservancy. One of the first products was the *Russian River Access Guide,* published in Spanish and English, which highlighted ten beach access points and detailed river dangers. Bilingual warning signs were also installed at key places on the river, and press releases were distributed at the beginning of the swimming season to warn about the risks.

Rosiris Guerra and Bert Whitaker, members of the Water Safety Committee, designed the Vamos a Nadar and Vamos a Ser Salvavidas (Let's Be Lifeguards) outreach and training programs in hopes of effecting a cultural shift in the Spanish-speaking community. The goal is to

raise awareness of river hazards and build desire to learn how to swim and use water safety skills. Since 2004, the programs have been coordinated: Children take swimming lessons while parents receive rescue skills training, and teens train to become lifeguards.

"We need long-term solutions," said Guerra, who now chairs the committee. "If the parents don't think it is important, they won't do it. If the kids don't learn, they won't know."

Social Marketing

AS I LEARNED MORE ABOUT the Red Cross programs, I came to see how they fit with the concept of social marketing developed by Philip Kotler and Gerald Zaltman in the 1970s. Social marketing uses traditional marketing skills to promote behavioral change, and has been adopted internationally by nongovernmental organizations and public agencies seeking to combat disease, promote better nutrition, prevent smoking, and encourage such practices as recycling and local watershed stewardship. The purpose of marketing is to create desire for a product, without regard to the perceived cost of its acquisition. In the Sonoma effort, the "product" is a belief within the Hispanic community that it is important to know how to swim and be able to save lives.

Experience here and abroad has shown that signs and leaflets are not enough. Accidents occur even where water dangers are well marked. Knowing a risk exists is not necessarily enough to motivate a person to behave differently. The risks of many popular vices, such as speeding, overeating, or smoking, are well known, for example, but that does not keep people from continuing to indulge. One thing that can make an impression deep enough to change behavior is experience—either a frightening experience of one's own or the personal story of someone else's.

In the KDTV studio, Fincher cued up their current work-in-progress. On the video screen, a graduate of Vamos a Nadar translated into Spanish as Michelle Wilder told a group of Hispanic parents how her teenaged son drowned in the river in May 2005. (See www.apebbleinthepond.org for more on Wilder.) The parents were visibly moved. Their children were at a swimming lesson as they listened.

The video cut to a young Latina in a red sweatshirt, Jenira Chang, a graduate of Vamos a Ser Salvavidas, who now works as a lifeguard and leads classes for the Red Cross. She too had a story: her uncle drowned in the river.

"No One Knew How to Swim"

I MET CHANG EARLY one summer Sunday morning at the Finley Aquatic Center in Santa Rosa, where she was working as a lifeguard during the summer before her senior year in high school. "You have to be realistic," she said. "You go to the river and have fun. People say, 'Oh, it's hot. Let's go to the river.' People are not going to go start buying lifejackets to go in the river. But people need to understand what could happen." As she spoke, her eyes scanned the swimmers in the pool. I asked her to speak of her uncle.

"I was nine or ten years old. My mom, my aunt, a couple other relatives and my uncle went to the river. We had carne asada," Chang said, glancing at me to see if I knew the dish. "It was around 4 p.m. We always go around noon and stay until about 6 or 6:30 p.m. I had just been pulled out by my brother, because I didn't know how to swim and I was going down the river.

"The tree had a little thing in it you could hang off." "A rope swing?" I asked. "Yeah. And there was a little current. Once you got out of it you were okay. But then when my uncle went off the thing in the tree—I guess he just got caught in that current and that was it. No one knew how to swim, we couldn't do anything."

"Could anything have changed what happened the day with your uncle?" I asked. "Maybe if there was a sign in Spanish or with pictures?"

"Pictures help, but not very much," Chang said. "But if we had known there were underwater currents, if we had known that was dangerous, the adults would have said, 'No, you can't go in there anymore.'"

Jenira Chang's family had gone to one of many spots on the river that is not a lifeguarded

Top left: Jenira Chang at her job as a lifeguard.

Top right: Young men hop a fence near the river.

Hugo López and Maria Moto-Fincher.

park. It is a common thing to do along the Russian River, some stretches of which are managed by local government, while others are private property. Where there is a rope swing on a bend in the river, you can figure that someone put it up with the intention of swimming and playing there, regardless of whether it is signed private property or not signed at all. What isn't so apparent is that conditions change rapidly, banks are slippery, and the bottom is unpredictable. A place that is safe to swim on one day may be treacherous on another, even with little rain.

Alcohol and Water Don't Mix

IN SEARCH OF LOCAL THOUGHTS about safety on the river, I visited Sonoma County's Veterans' Memorial Beach and met lifeguard Kevin Dowdey. Were everyone to go to this beach, which Dowdey supervises with up to seven others during peak periods, drowning statistics would change dramatically. The United States Lifesaving Association (www.usla.org) estimates the chances of drowning on a beach with lifeguards on duty to be less than 1 in 18 million.

Dowdey pointed to a boundary rope that is staked out in the water parallel to the bank all along the beach, showing where the depth reaches four feet. Non-swimmers must not cross this line into deeper water. A summer dam constructed by the county slows the current and provides a safe, well-monitored recreational beach for people of all ages to enjoy.

"If we see anyone we're concerned about, we check it out," Dowdey said. "Parents must keep their children within arms' reach. We've been called in to help rescue people. Things happen, often outside the area of our beach." He gave me a copy of the *Russian River Access Guide* and encouraged me to tell people about the U.S. Lifesaving Association.

The ten river access points highlighted in the *Guide* provide a kind of security that many of those most at risk of drowning may want to avoid, including a prohibition on alcohol and dawn-to-dusk hours of operation under close watch of lifeguards. The unguarded banks of the river will continue to draw those who want to drink or avoid having to pay fees ($5 per vehicle at some sites).

Further along the river in Healdsburg, I met two young men from Oaxaca. In Spanish they told me they had been living and working in Petaluma, doing construction, for the past eight years. They believe most people from Mexico know how to swim, as they do, and said it is the people who can't swim who have problems. According to the coroner's statistics, at least a quarter of the Hispanics who drowned in the river over the past six years were known to be poor swimmers or nonswimmers.

As we talked, three young men beyond the park's fence were swinging from a rope tied under a bridge and jumping into the water. I caught up with them as they were about to leave. Through the fence they'd scaled to reach the swing, they told me they had learned to swim in the river with their families and only went into the water when conditions were good. They were community college students who grew up nearby, and they never knew anyone who had drowned in the river. When I asked why there were drownings every year, they looked at one another and said, as if stating the obvious, "Accidents happen when people are drinking. People do something stupid." Coroner's statistics confirm that regardless of ethnicity or language, in roughly half of all the drownings in Sonoma County in 2000–2006, alcohol was involved.

I winced when, on the way down Route 116, in Rio Nido, I saw a "Beach" sign with an arrow pointing toward the river sharing a post with another sign that reads "Liquor Store." The post is in a liquor store parking lot. Alcoholic drinks are even sold at the refreshment stand at this private beach.

Getting the Message Out

THE COUNTY WATER SAFETY Committee issues bilingual press releases about the dangers of drinking while swimming. The swimming outreach, however, focuses on building survival skills. In terms of the "4 P's" of marketing, "product, price, places, and promote," the task on the Russian River may be seen as marketing the *product* of swimming and water-survival skills, while minimizing the *price* of learning to swim or avoiding risks in the river. The Vamos a Nadar programs are inviting members of the

Spanish-speaking community to take advantage of swimming lessons for children at reduced cost, offering water-safety training for their parents, and free lifeguard job training for teens to *promote* the desire to use newly acquired skills in the community. Program partners are working with Spanish-speaking swimming and lifeguard program graduates to promote these skills through Spanish-language media, such as KBBF radio and KDTV 28, and by reaching out to people in *places* where they live, study, and work.

"It was Rosiris who told me," said Jenira Cheng. "She was at a table at school during a health fair. She told me there were scholarships and that I could get paid. I wanted to learn to swim after my uncle [drowned] but I didn't know. It was never even in my mind to become a lifeguard, but I talked with Rosi. We spoke in Spanish and then English; she told me about the program. They taught me how to swim. The teacher was really patient, and now I have been working as a lifeguard." Rosiris's outreach and encouragement led Jenira to believe she could make an impact in the community by sharing her experience, doing public speaking and trainings, working as a lifeguard, and serving as a role model.

Could Jenira's uncle have been saved if someone who didn't swim, or who swam poorly, had jumped into the water? Rosiris Guerra is emphatic: Without the necessary skills, trying to save others from drowning can get you killed. "There are reports of Good Samaritans dying after jumping in to try to save someone," she said. An article in the August 15, 2006, issue of the *New York Sun* reported that a Marine just home from Iraq, a mother, and another family member all died while attempting to rescue a four-year-old child who was caught in an undertow in a river outside Chicago. The child was rescued farther down the river.

"We're trying to get the message out to people—there are things you can do to help save someone without going into the river yourself," Guerra said. For example, an empty Styrofoam cooler can be thrown into the water as a lifesaver, or a beach umbrella or branch can be held out over the water for the swimmer to grab. Rosiris Guerra, Jenira Chang, and Maria Moto-Fincher all have similar parting messages: Even if people can just learn this, it could save them: "Throw—Don't Go!"

The Russian River safety program is not free of charge, by design. "If it is free, people may not even come," Guerra explained. Incentives include an additional two-week session of swimming lessons for $15 (a 75 percent discount) for graduates. Between 2004 and 2005, 200 children and 300 Hispanic parents have completed Vamos a Nadar. The pilot program for Vamos a Ser Salvavidas had a first class of five prospective lifeguards in 2005 and anticipates reaching the program capacity of 15 students. The 57-hour lifeguard training is provided on a scholarship that covers the full $250 cost and prepares graduates to complete the Red Cross lifeguard certification. Swimming lessons in Spanish for adults are being planned, and additional languages may also be possible.

Although spring is months away, planners in Sonoma County are getting ready. Moto-Fincher intends to air a longer piece on bilingual outreach and promoting the desire to learn survival skills, and the programs will soon begin recruiting. With their hard work, perhaps 2007 will bring fewer tragedies along the Russian River. ■

Deborah Hirst, a Coastal Conservancy project manager, has been driving her brother's beat-up old pickup truck along the Russian River and up the Sonoma Coast since joining the Conservancy in February 2006.

Coast Guard Video Warning

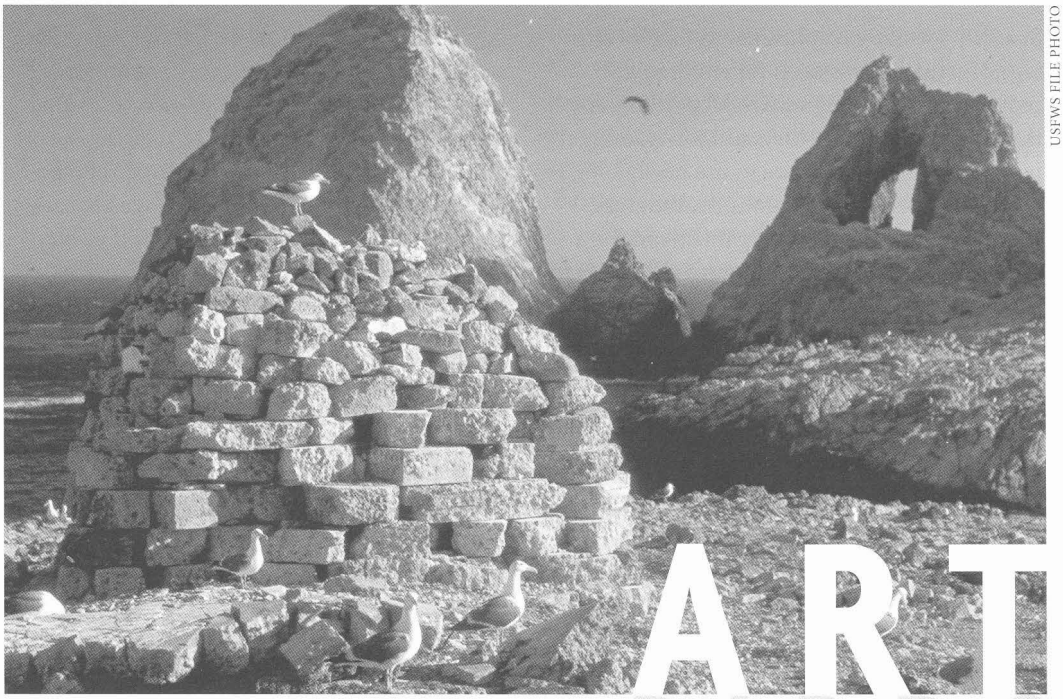
THE U.S. COAST GUARD determined there was a need for a public water-safety campaign after a large number of accidents occurred along the Pacific Northwest coast in 2005. "Even if there are signs warning people it is dangerous, they're going to go in," Petty Officer Jeffery Polinger said. "Rip currents are the biggest threat." To promote water-safety skills, the public affairs office of Coast Guard District 13 developed a video on dangers at beaches and began distributing it across the country.

Now more than 500 copies have been distributed to other Coast Guard offices and to inland and coastal emergency response agencies. "We've received requests from places as far away as North Carolina and Trinidad and Tobago," Polinger said. "We've used a lot of different marketing strategies to get it out there. It has worked remarkably well through smaller organizations and word of mouth, those with the desire to really help people."

The Coast Guard aims to reach children, tourists, and inland visitors to the coast. "We are counting on local governments to reach out to different language groups. We would like to expand on this project, maybe even [make a video] that is bilingual, with the help of another group."

After watching the 10-minute video, I was alarmed myself. It includes archive footage from the National Oceanic and Atmospheric Administration showing unsuspecting beach-goers being picked up by sleeper waves and thrown into rock jetties. Images speak powerfully without translation. (To view the video, visit www.uscg.mil/d13/ipa/video/default.htm.)

—DH



USFWS FILE PHOTO

"For the Birds": A site-specific artwork on Southeastern Farallon Island. It is also a bird-nesting habitat and an observational blind for scientists.

ART for the BIRDS

EILEEN ECKLUND

MEADOWSWEET DAIRY is an artist collaborative founded in 1991 and still located in an old dairy shed in Corte Madera, California. Current members Henry Corning, Glenda Griffith, and Dan Ustin work together to create both sculptures and, increasingly, site-specific artworks that draw attention to the beauty and inherent value of the natural world. In their site-specific work they have gravitated toward creating practical structures that fill a variety of needs, for humans and for wildlife.

In 1998, Meadowsweet Dairy was awarded a grant from the Creative Work Fund to collaborate with Point Reyes Bird Observatory (PRBO) Conservation Science and the Farallon National Wildlife Refuge on a project on Southeast Farallon Island. The result was "For the Birds," a structure that serves as nesting habitat for Cassin's auklets and pigeon guillemots and also as an observational bird blind for PRBO scientists. The artists broke up old concrete foundations left on the island by previous residents and used the rubble to conceal the blind's stainless-steel frame and nesting boxes. From the outside, the igloo-shaped structure blends into the island's rocky outcrops.

The project has been a big success with both birds and scientists, as well as with the U.S. Fish & Wildlife Service, which manages the refuge. "The very first year it was built, birds were nesting there," said refuge manager Joelle Buffa. "We were pretty surprised at how quickly they took to it." In 2004, the best year so far, the structure's nesting boxes were two-thirds full—a very good occupancy rate, Buffa said. By removing the old concrete pads, the artists also opened up new ground-nesting areas for the birds.

Buffa and other Fish & Wildlife staff were so pleased with the results that they are now working with the Meadowsweet artists on two other projects: a second Southeast Farallon project to create habitat for common murres, and one at Mayhew's Landing in the Don Edwards San Francisco Bay National Wildlife Refuge, transforming an old agricultural silo into habitat for bats, white-throated swifts, and swallows. Of the latter project, Don Edwards manager Clyde Morris said, "This is a way of preserving history as well as creating something useful for the refuge."

Presenting site-specific environmental art such as the Dairy's to the public can be challenging, particularly when the sites—such as Southeast Farallon and Mayhew's Landing—are inaccessible. To provide a showcase for this type of work and offer resources and connections for environmental artists worldwide, Dairy members created the nonprofit greenmuseum.org (see page 27), launched in 2001. *Coast & Ocean* talked to Meadowsweet artists Henry Corning and Glenda Griffith at the Dairy in Corte Madera.

I'm interested in how you made the transition from art as object to art as something useful.

Henry Corning: It's almost a service, as opposed to a product.

Glenda Griffith: Henry has been painting for many years, and then began to do more sculpture. Then we began collecting a lot of natural things and really enjoyed putting them together. We wanted to raise people's awareness so that when they saw a beautiful natural form they would appreciate the innate beauty of it and of nature. But over time we began to realize that just creating objects couldn't transmit fully the message that we wanted to transmit, and we began to do more habitat work. I'm really not a trained artist. I was in the healing arts for many years; I've rehabbed birds, I'm a gardener. And we began to make sculptures that sort of blended our passions.

HC: We were asked to go to the Cedarhurst Museum in Mount Vernon, Illinois, to propose a site-specific piece. We walked around this outdoor sculpture garden and they had a beautiful pond with an island in it and terrible, shabby bridges, and we said, "You need new bridges." So that's what we built, and they came out beautifully. We used a local logger to cut down mature white oaks from their woodlot, and we milled and used those.

GG: We cleared areas, opened up areas in their heavy forest so that the bird population could benefit from the diversity of habitat, and all of the birders there were very happy. We did a job that answered the needs of several different communities of people involved with the museum.

HC: For another one of those early pieces we built a big stone disc in the bottom of an irrigation lake in Utah, and the rise of the water would submerge it under 15, 18 feet of water. Then the water would get pumped out by the alfalfa farmers, and toward the middle of the summer the disc would start to re-emerge, and then be all by itself in the bottom of the dry lakebed toward the end of the summer. It was built by the community with our leadership, and it drew attention to water consumption in a kind of instinctive way, not didactic in any way.

We were involved in another project with a famous stream ecologist, Charley Dewberry, who had never been on a team that included artists before. In a week we put together a plan that won the approval of a very skeptical neighborhood organization, and Charley Dewberry said he would never work on another project where artists weren't involved. I think he touched the input that comes from the creative side, the right-brain side.

GG: That's what artists give to these projects. Biologists and scientists are trained in a certain hierarchical, linear way of thinking, but artists come at things from different perspectives and can provide some unexpected input, which adds a little spice to the mix.

And it's not just biologists. We did a project in New Hampshire where the administration of this school had torn down an old boathouse because kids would break into it to smoke and do all the things that adults don't want teenagers doing. It was the kids' gathering place. There was a floating dock beside it, and it was in the woods, and they would go there to get away, because it was a very stressful academic environment. The kids were really bereft that the boathouse was gone; they were very angry.

We were invited to work with a group of students and do a project. We ended up creating a grand plaza with standing stones that we harvested from an old barnyard on the campus, and used a grist millstone in the center. We made a gathering place for the kids that was open—so the administration felt comfortable about it—and that honored the fact that the kids needed a place to go and unwind.

We also worked with the groundspeople, who had felt in the last few years that their input, which had once really been respected, had sort of been pushed to the side. They made our project possible. It was wonderful to see everyone somehow gaining something from the project. I think their perspectives were enhanced by their participation, and that's what we try to do. Artists can see where people are bumping into the walls and try to create a doorway where there was just a limitation before.

How did the Farallones project come about?

HC: Sam [Bower, a former Meadowsweet Dairy artist who now runs greenmuseum.org] discovered that a couple of the

Below: The Meadowsweet Dairy artists: Glenda Griffith, Dan Ustin, and Henry Corning (left to right)

Bottom: The old farm silo at Mayhew's Landing will provide habitat for swifts, swallows, and bats.

DAIRY ARCHIVES

EILEEN ECKLUND

JANA BROWN

The student plaza at St. Paul's School under construction

Haas family foundations had a program called the Creative Work Fund that granted money up to $35,000 for a collaborative work between artists and a nonprofit. The work had to be done in either San Francisco or Alameda County. The Farallones are the westernmost point in the city of San Francisco.

So it was a natural progression to working with a federal agency when we saw that we could attract funding that came not from a trickle-down budgeting process, but from restricted grants that we could bring in, right at the level that was needed. That was the secret of working with a federal agency: you could make a local manager successful at a local level by funding things off-budget. [It allows them to] accomplish something creatively within the very strict limitations they have to contend with.

And the nonprofit you were working with was the Point Reyes Bird Observatory?

HC: Right. And that came to mind because I've been a water taxi driver for them since 1978. I knew the island and the biologists, and had been talking about a few projects like this with them for years. So we proposed a collaboration and they said, "Cool, let's do it." It was easy. The Fish & Wildlife administrator there, Joelle Buffa, was very supportive, and she's now doing a second project with us.

So you asked them what they needed?

GG: We did. They needed more habitat for the birds and they wanted a way to access the nesting areas. They were using little infrared cameras that they would put down the holes, and they'd have to put a bag over their head—it was just very laborious. We created basically a rubble pile that has nesting boxes embedded in it, and the scientists can crawl inside and stand up and access all the boxes.

Kind of like an ant farm?

HC: Yes, similar.

GG: It looks like an igloo. We helicoptered out a stainless steel blind shape and then we stacked big chunks of rubble—they had these buildings that they'd collapsed because they were dangerous, so we broke them into big pieces and stacked them around the stainless steel blind. It just looks like part of the landscape; it's very hard to see from far away. But the birds recognize it as a place to live.

What birds nest there now?

HC: Cassin's auklets—none of whom are nesting in it this year, because the Cassins have had zero reproductivity—and pigeon guillemots—there are a few of them this year—with the potential for rhinoceros auklets and ashy storm petrels.

After this first Farallon project was finished and they realized that we had performed, there were a number of different proposals—take your pick.

GG: They invited us to a meeting, and it was wonderful—all these refuge managers were sitting there, and they had brought their biggest problems to the table. They presented them and said, "OK, what do you want to do? Anything sound good?" So now we're doing a bat project at Mayhew's Landing in an old farm silo. It was a dangerous liability for U.S. Fish & Wildlife because people were breaking into it and it was unsafe. They were going to tear it down; they wanted to know if we could effectively tear it down. We said, how about if we repair it and make it into a habitat structure, and they were thrilled. It hadn't crossed their mind to try something like that.

We've already cleaned it up and secured it. Now we have to put a structural insulated panel on it and a roof, and we'll build habitat for white-throated swifts and swallows on the underside of the roof. Then we're going to install habitat for bats on the inside of the silo. We'll be bending plywood and attaching it to the walls. Bats are having a hard time with habitat loss, and there are lots of areas in the vicinity that harbor bats. So even though we're not seeing bats [at this particular site], we think that if we build a habitat, they'll discover it and use it. We're working with a wonderful bat biologist, Dave Johnston.

And you're also working on a second Farallones bird project?

GG: Yes, the problem there arose because the boats come in at a different landing spot than they used to. Now everyone walks down this trail

A model of the refurbished Mayhew's Landing silo

EILEEN ECKLUND

to get to the houses that the biologists live in, and they pass by a point where human travel disrupts a colony of cormorants and murres. They asked us if there was something we could do to obstruct this spot, and we've decided to construct a blind that will enable biologists to watch the cormorant colony. Then we're going to create a series of narrow ledges that go from the base of the blind down the hillside, and that will create an area for murres to nest. It's funded partially by the *Command* oil spill mitigation money, and murres were tremendously affected by that oil spill. It will be covered with copper, and we'll use rubble from the surrounding area to build a stone wall that will flank the building and obscure traffic.

Do you have any other projects coming up?

HC: I think we're going to get involved with a project in Silverton, Colorado, which is a large restoration of acid mine drainage damage. We're really excited about taking a definable ecosystem that's been just clobbered by mining and restoring it. The guy who's going to lead us there is Allan Comp. You can see a similar project he did in Vintondale, Pennsylvania [see www.amdandart.org]. His group is called AMD&ART, Acid Mine Drainage & Art. He restored a devastated Appalachian coal town—its industry was gone and what was left behind was a devastated ecosystem. He restored the stream in the town and in the process restored the town. It was just a miracle. I think we can do that again at Silverton, on a much larger scale. And you only have to do this two or three times, and then everybody wants to do it, and that's the idea.

I'm curious about the fact that these recent projects of yours, both the Farallones and the one you're doing in the San Francisco Bay National Wildlife Refuge, are ones that people can't really see.

HC: Good point. Which is true of almost all art, anyway.

I guess that's true, unless it's in a museum.

HC: Van Gogh, in his lifetime, produced all this stuff, and how many—like three?—were sold, and then they worked their way into private collections. Now, way over 100 years later, you can go to museums [and see them], but most people experience van Gogh on a calendar. The availability of art has always been limited to the real community, the live community that it serves. Sometimes that community is not human.

GG: At one point someone wanted to write an article about us and decided that our work wasn't art because not enough people can see it. We pointed out that you can't really see cave art, either, but it's still art.

HC: We're trying to put [our work] in as large a context as possible. The people who ornamented painted caves 50,000 years ago, it's not really clear to us now what the function of those drawings were, but it's clear that they were very important to the culture in some way. And the ornamentation of, say, fresco-decorated churches or Greek temples, it's really clear what those images were intended to do. At this point we're putting all of our ability to make sculpture, our ambition to make art, into drawing attention to what is truly sacred, just like our predecessors. We think this is an important change in the role of art, moving from the creation of tradable commodities, from a focus on lifestyle decoration, to actually serving what the culture at its deepest level considers sacred.

To the extent that the art world begins to embrace this value system, you're going to see a flow of money into what people like us are doing. It's not going to come from the conservation world, because they're already strapped. The art world, on the other hand, has people of enormous net worth paying extraordinary prices for, materially speaking, the most rarified objects. And they might wake up one day and say, "What am I doing?" Because it's a completely artificial market, like diamonds—it's all a manipulation of supply.

So to the extent that the case can be made to art collectors that this is something of value, there's going to be a revolution in art. That's not an overstatement. And it's long past time for that to happen, because right now our conventional art world is all about consumption. What drives art collecting is people who want to get something that increases in value. At a time when conservation is absolutely the key to our survival as a species, to have the art world still focused on consumption—it's absurd. ■

Virtual "Museum" of Environmental Art

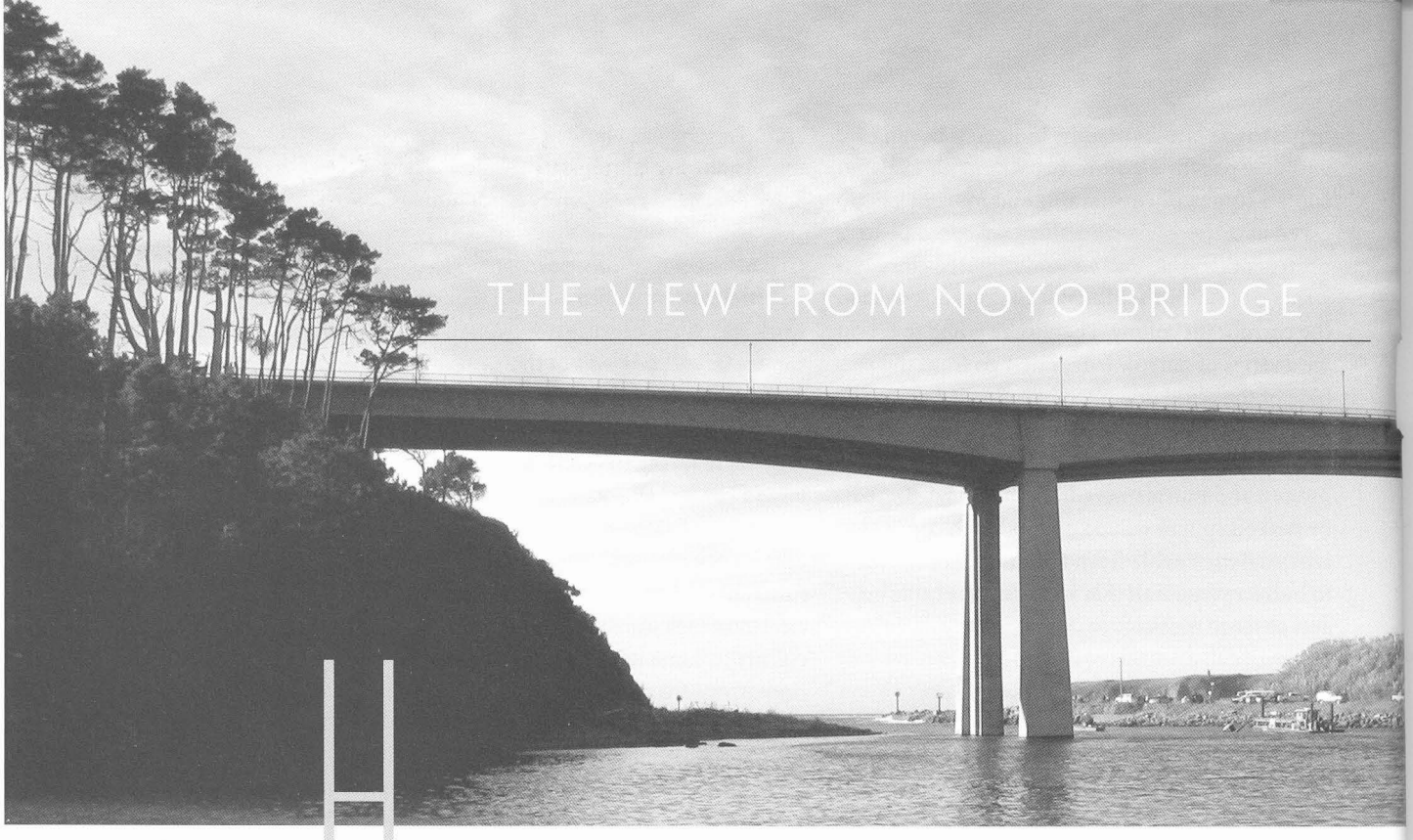
In the late 1990s, Meadowsweet Dairy collaborators Sam Bower, Henry Corning, and Glenda Griffith realized that a growing number of artists were creating works in natural settings, works that, like their own, were difficult or impossible to show in traditional ways. Some exist for only a moment in time (like Andy Goldsworthy's ephemeral creations); some, though installed solidly in the landscape, are in remote locations (Robert Smithson's "Spiral Jetty" at Utah's Great Salt Lake, for example); and still others, like Meadowsweet's "For the Birds," in the Farallon National Wildlife Refuge, are inaccessible to the general public. Yet in many of these works an important component is the interplay between natural forces and human creativity, inviting an awakening of our sensibilities to nature's dynamics.

The Meadowsweet threesome began kicking around the idea of creating an online "museum" where environmental artists of all kinds could show what they were doing, list their events, find resources, and collaborate with others. After spending a year or two talking with educators, engineers, designers, and philanthropists, as well as other artists, they spent another year designing, coding, and working out the administrative details of what is now a nonprofit organization and website: greenmuseum.org, with Bower as the executive director.

The website displays images and descriptions of work by some 100 artists from around the world. It includes an international calendar of events, essays and interviews, and opportunities and other resources for artists; "toolboxes" for educators, resource managers, and others who collaborate with artists; and a forum where people with common interests can connect.

"Instead of creating a big box with treasures in it, we're directing people out into the world," said Bower. "A big part of the site is to show people what is possible."

—*EE*



SHEILA SEMANS

THE VIEW FROM NOYO BRIDGE

VINCE TAYLOR

HAD YOU NOTICED THAT SOLID concrete barriers, rather than railings, have become the norm for new bridges in California? Installed by the California Department of Transportation (Caltrans) in the name of motorist safety as older bridges are replaced, these ugly barriers have been taking away our views of streams, rivers, bays, and the ocean.

You won't see such a barrier on the new bridge across the Noyo River in Fort Bragg, Mendocino County, however. Local citizens wouldn't have it. After a lengthy battle, Caltrans approved a new railing that meets current safety standards, is aesthetically pleasing, and provides excellent visibility.

Getting Caltrans to change course was extremely difficult. Nonetheless, in the end the public won and set a precedent that can help prevent further blocking of scenic views in the name of highway safety.

I hope my story of the struggle over the Highway 1 Noyo River Bridge will encourage more people to defend coastal community values against attempts to build large projects that disregard those values. It shows that even a single citizen is not powerless.

What Caltrans Proposed

IN THE SUMMER OF 1998, Caltrans released plans to replace the two-lane steel girder bridge that crossed the Noyo River from the tops of the 110-foot-high bluffs above the Noyo Harbor entrance, at the southern end of Fort Bragg. This bridge, built in 1948 on Highway 1, had been identified as unsafe during a seismic safety review of highway bridges after the 1989 Loma Prieta earthquake. It was also a bottleneck for traffic. The agency proposed a concrete box-girder bridge, which is a typical freeway bridge. Although described as a "four-lane bridge," it was 87 feet wide—wider than the Golden Gate Bridge. It would almost completely fill its right of way and come within 10 feet of a restaurant and motel on its seaward side.

The narrow old bridge, with its open railings, had provided spectacular views of Noyo Harbor, the harbor entrance, and adjacent coastal bluffs. The proposed new bridge was to have a solid concrete barrier that would cut off most of these views.

The bridge design outraged local citizens, many of whom were already irate that a large and controversial hotel under construction near the north end of the bridge was blocking some of the same views. The citizens who objected wanted Caltrans to come up with an architecturally more distinctive design, a narrower bridge, and railings that preserved the view. Others in the community, however, wanted a new four-lane bridge and the economic benefits of the $20 million project, never mind the views and aesthetics.

The ensuing battle over the bridge and railing design went on for two and a half years. It involved Caltrans, the Fort Bragg Planning Commission and City Council, the Coastal Commis-

sion, the California Transportation Commission, and numerous citizens of Mendocino County. (An extensive chronology with linked documentation is at www.bridgerailings.org.)

Education of a Novice

WHEN THE BRIDGE PROJECT came to public attention, I was living in Caspar, a small village just south of Fort Bragg. I had recently retired from running a software business and wanted to help out in my community. When I learned about the scale and design of the proposed bridge, I studied the plans and then wrote a letter to Caltrans suggesting how to build a better bridge. I also sent a letter to the editor of the local newspaper. I never imagined that these small actions would lead me into an extended battle with the largest public agency in California.

I had some useful background and experience, having studied science and economics, and had spent many years analyzing the economics of public issues. But I was naïve about the ways of government bureaucracies and agencies. The Noyo Bridge taught me a lot.

A big early lesson had to do with the receptiveness of Caltrans to public suggestions. When I wrote to the project manager, Karen Tatman, suggesting changes that would narrow the bridge and improve the views, I actually believed that Caltrans would welcome and incorporate my suggestions. Now I understand that when Caltrans puts a project out to obtain the necessary permits from other agencies, internal approval has already been given at all levels. Changing anything is a major bureaucratic headache, and Caltrans is unlikely to change plans except in response to massive public opposition or the threat of rejection by one of the permitting bodies. Not knowing this, I was surprised and dismayed when Ms. Tatman ignored my suggestions and, in her response to me and to my letter to the editor, defended the Caltrans design.

Caltrans needed permits from both the City of Fort Bragg and the Coastal Commission. The proposal was brought before the Fort Bragg Planning Commission at a hearing on December 30, 1998. By this time Caltrans had responded to public outcry by making some cosmetic changes to the understructure and proposing a new, supposedly "see-through" railing (see photo p. 32). This I called a "see-little" railing because to me it looked more like a tank trap.

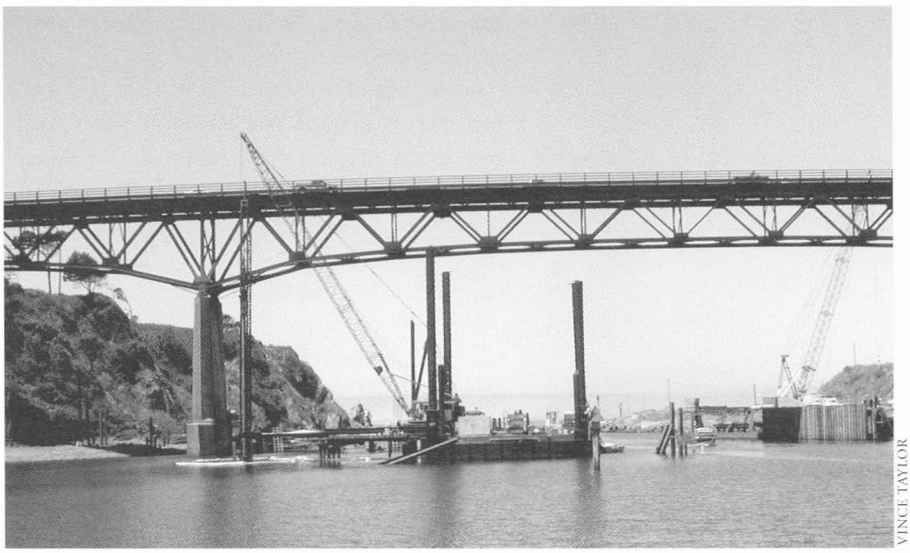
I did a thorough analysis, with simulated photos showing the loss of views, and took this to the Fort Bragg Planning Commission. When it rejected the permit application by a vote of four to one, I was elated, thinking that now Caltrans would need to go back to the drawing board. Alas, I was still a babe in the woods.

I soon learned that the City Council could overrule the Planning Commission. Two weeks prior to the Council meeting, Caltrans District Director Rick Knapp wrote to Fort Bragg's mayor, saying that if the city didn't approve the project, Caltrans might have to retrofit the existing bridge and then "you cannot expect the bridge to be replaced or improved for the next 20 years." A well-coordinated campaign, including a petition drive for acceptance of the design, was mounted.

On January 26, 1999, at a City Council meeting packed with Caltrans supporters, Director Knapp stressed that any delays could cause loss of funding for the bridge. The petition, bearing 1,000 signatures, was presented. Some former protesters recanted. I was one of only a few people willing to stand up and object. I argued that there was essentially no risk of cancellation because this was a seismic safety project, and that denying the permit would force Caltrans to negotiate a better bridge. The antagonism toward me was palpable. The City Council unanimously approved the permit.

All was not yet lost. Caltrans still needed permit approvals from several state and federal agencies, including the California Coastal Commission, which is mandated by the California Coastal Act of 1976 to protect coastal resources,

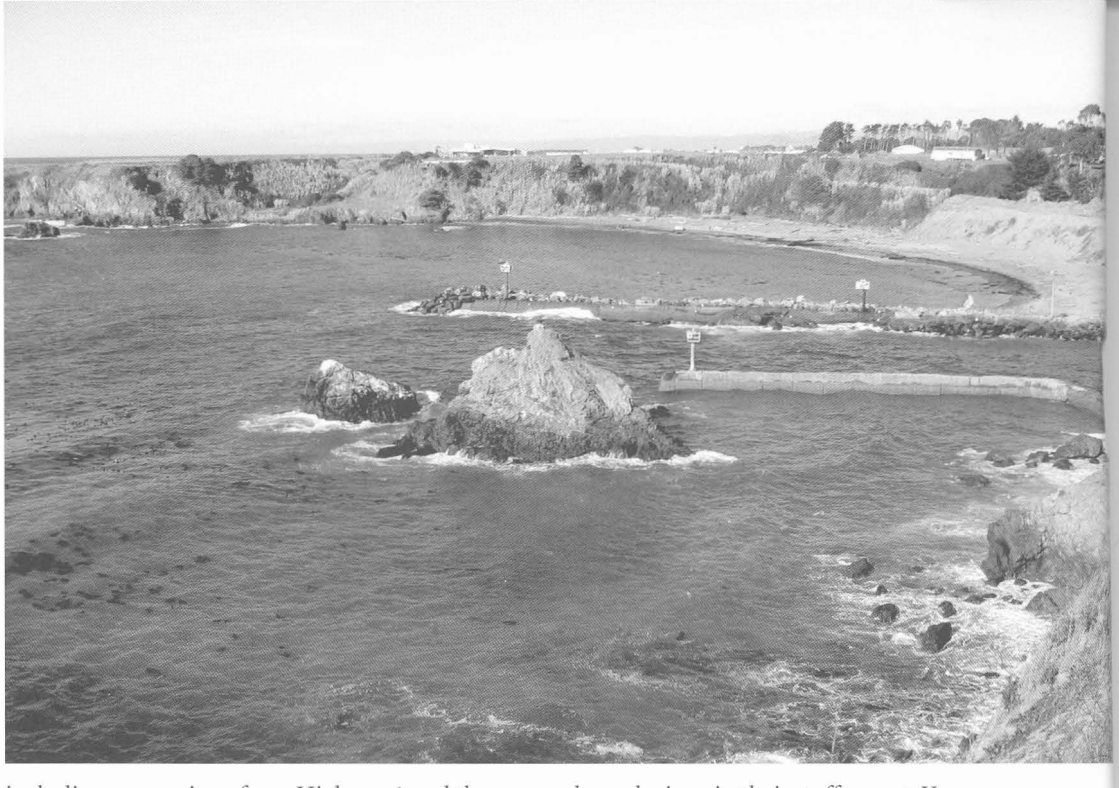
Old Noyo Bridge. In the background, the new bridge is under construction.



VINCE TAYLOR

Top and opposite: Views from the new Noyo Bridge

Below: Vince Taylor victorious



SHEILA SEMANS

including ocean views from Highway 1 and the special character of coastal communities. With my encouragement, Roanne Withers, a veteran community activist, appealed to the Commission on behalf of the Fort Bragg chapter of the Sierra Club.

Lessons at the Coastal Commission

THE COASTAL COMMISSION heard the appeal on March 12, 1999, in Monterey. Only a few people from the Fort Bragg area, other than city officials, made the five-hour drive.

I went to the meeting uninformed about procedures and learned, to my dismay, that only Caltrans and the Sierra Club would be allowed more than three minutes to speak. In a permit appeal, you have to be one of the appellants to get more time.

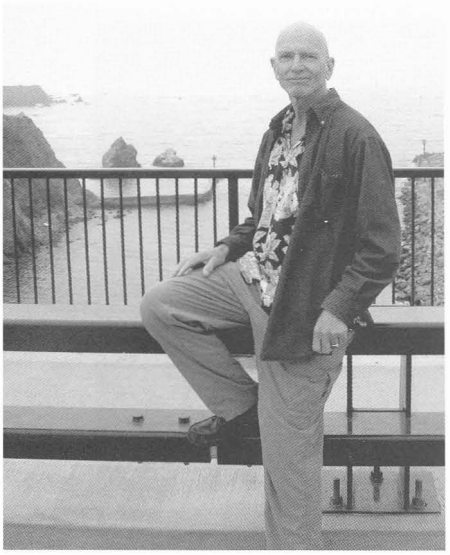
Later I would come to understand that if you want to be heard, it is crucially important to provide documentation to the commissioners before the meeting. Make sure it is clear and has a good and concise summary, because commissioners are literally inundated with thousands of pages of information before each monthly meeting.

I was also to learn the importance of working with Commission staff ahead of time. Because of their overwhelming workload, commissioners rely heavily on their staff's analyses and recommendations. Staff are often receptive, friendly, and helpful. You may be able to educate them, and they may be able to draw on your materials and conclusions in their staff report. You can also learn from them about rules and procedures that will help you be more effective as a citizen advocate. Fortunately for me, at the meeting in Monterey Mark Massara, director of the Sierra Club's coastal programs, gave me 10 of his 15 minutes, giving me a chance to show my slides and make my points about the loss of views and better alternatives in some detail.

Speaking for Caltrans, District Director Knapp emphasized that the Noyo Bridge "is a critically important seismic safety project." It is a vital section of Highway 1, and if the commissioners failed to approve the project, Knapp argued, they would be putting everyone from Fort Bragg north in danger of being cut off in the event of an earthquake. He maintained that the only available railing that met mandatory federal crash-test standards was the one Caltrans was proposing, that qualifying any new railing would take years, and that if the Commission failed to grant a permit that day, without changes, the bridge could not be started that year.

As the state's key authority on highway safety, Caltrans has almost unquestionable power when it speaks on this issue. So as a citizen advocate arguing for an alternative, you need to be prepared to demonstrate convincingly that your alternative is equally safe. I was not prepared for that.

Based on Caltrans' assertion that no design modifications or delays were acceptable, the Commission staff recommended a $2 million mitigation fee to compensate at least in part for the proposed design's destruction of coastal



BRUCE MOORE

assets. During the hearing, this was reduced to $1 million and included as a condition of the permit.

The Commission approved the permit 5 to 4. It also requested that Caltrans begin showing the Commission alternative designs for future bridges—a request that was to prove highly important in the story of the Noyo Bridge.

Don't Give Up

ALTHOUGH IT SEEMED THAT the Noyo Bridge was a lost cause, I could not accept that better, equally safe railing designs were not available. I started searching, made many phone calls, and eventually found my way within the Federal Highway Administration (FHA) in Washington, D.C., to the person who keeps track of all federally approved bridge railings. Lo and behold, a number of more visually transparent railings had passed federal crash tests. One in particular, a railing designed and used for many years in Wyoming, seemed especially suitable for the Noyo Bridge. I now knew that Caltrans was wrong when it asserted no scenic railings other than the "see-little" rail had passed federal crash tests.

The lesson here is that many people are willing to help if you ask them—I even found people in Caltrans who were forthright and helpful—and that many sources of useful information exist. Today the Internet is the place to begin looking, not just for information but also to locate and contact knowledgeable people. Don't be afraid to call people and ask them for information and leads.

I tried to get Caltrans to consider the Wyoming rail for the Noyo Bridge, without success. The existence of other federally approved railings directly contradicted emphatic statements made by Caltrans before the Coastal Commission. I looked at the Coastal Act and decided that these and other erroneous statements were grounds for revoking the permit.

On May 31, 1999, I submitted my findings to Coastal Commission staff and requested that the Noyo Bridge permit be revoked. On June 4, Peter Douglas, the Commission's executive director, accepted my request for a revocation hearing. His action would have suspended construction activities on the bridge until the Commission heard the revocation request. The suspension of construction was, however, irrelevant because—after insisting on the absolute necessity of starting the project that year, on April 16—Caltrans had announced that construction would not begin until 2000.

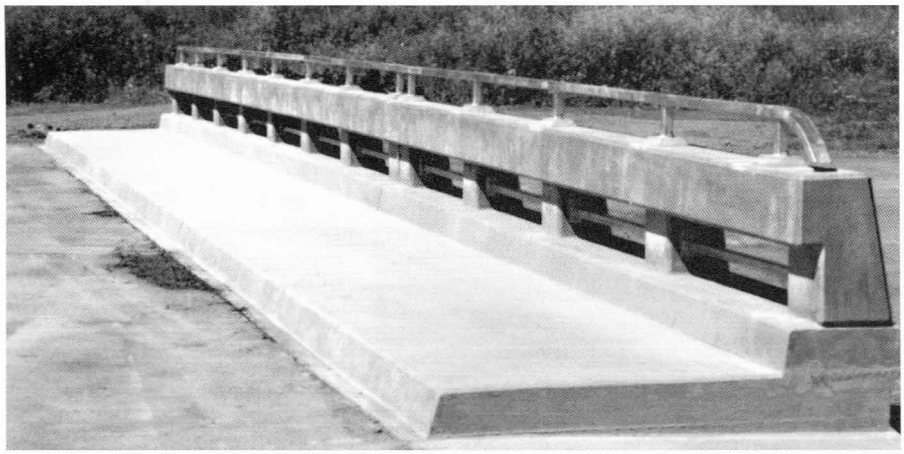
To revoke the permit, the Coastal Commission would need to find that Caltrans had deliberately deceived or withheld information. This was a tall hurdle, and my evidence wasn't sufficient to surmount it. At the revocation hearing held July 15, Caltrans acknowledged that it knew of the existence of the Wyoming rail at the time of the earlier permit hearing, but said that it had not considered it for the Noyo Bridge because it "was not consistent with the Department's policy regarding the use [of only] concrete barrier rails." So now the determining factor was not safety, but Department policy. Yet only one commissioner voted for revocation.

At this hearing Caltrans introduced an entirely new condition for an acceptable railing: it must

Other Bridges, Other Views

VINCE TAYLOR'S SUCCESSFUL battle for a "see-through" railing on the Noyo Bridge called public attention to bridge railing design throughout the coast. "Certainly since Noyo we have carefully looked at every bridge," said Tami Grove, statewide development and transportation liaison for the Coastal Commission. A working group known as the Road's Edge subcommittee now brings together representatives of Caltrans, the Commission, and some other agencies to consider a variety of potential design concepts for railings and barriers on bridges, roadsides, and median strips. What works on an urban freeway may not be appropriate for a rural stretch of Highway 1, and what looks good on a road running past sand dunes may not be the same as what fits along a road through a redwood forest. Right now, for instance, steel-backed timber is being tested as a possibility for Big Sur, Grove said. "Early next year we should have a pretty expansive palette. We will also look to insure that the Coastal Trail is incorporated into the design."

VINCE TAYLOR



CALTRANS

A Few Words from Caltrans

"A SOLID CONCRETE BARRIER is the safest barrier to date," said Sheila Mone, supervising environmental planner in the Division of Environmental Analysis. It is also "easy to construct, economical, and has good maintenance characteristics," added Roberto Lacalle, office chief, Office of Design and Technical Services. Such barriers were indeed the norm for over 30 years, he said. On some scenic and historic bridges, such as the Bixby Bridge in Big Sur, according to Mone, "we spent a lot of time and money to retrofit rather than replace."

The use of concrete on the Noyo Bridge had probably been a "department preference" rather than "department policy," according to Lacalle, because "we were considering steel rails in that time period." Among railings reviewed was the Wyoming rail, but the federal crash test results fell short of California's standards, which are not the same as the federal ones. Regarding the delays, Caltrans staff pointed out that construction projects proceed on a seasonal schedule, so if a setback occurs, a project may have to be postponed for a whole year.

As to Vince Taylor, Lacalle said: "He's been passionate about the rails and it's had us look at more options." Mone added: "The Department of Transportation went back to the drawing boards, looked at other designs used in other places, considered crash tests, and adopted some new designs into our palette."

—*RG*

Above: Caltrans' first response to citizen complaints was this "see-through" railing.

be made of concrete. Meeting federal safety standards, which Caltrans had previously emphatically asserted was the requirement, no longer sufficed. This was not the last time Caltrans changed its requirements after I showed that its previous requirements could be met by the Wyoming rail.

The Next Blow

AT THIS POINT, WHILE I HAD made some connections with Coastal Commission staff, I had not developed relations with any commissioners. I understand now that if you are involved in an ongoing Commission matter, you must try to find one or more commissioners who are favorably disposed toward your view and cultivate a relationship. That way you can often get their e-mail addresses and send them copies of material directly (but always include copies to the Commission staff). Some commissioners will also talk with you on the phone. If you go to a Commission meeting, you will hear, before an item is discussed, a request that commissioners report any "ex parte" communications about that item. You will find that developers and other powerful interests routinely talk with individual commissioners ahead of time.

It was, I believe, because I lacked good connections with commissioners that Caltrans was subsequently able to give a workshop for the commissioners on alternative railings without my being invited. In October, when I learned that the workshop, to be held in December, would be closed to the public, I wrote to the Commission to protest and offer to make a supplemental presentation—to no avail. My error may have been in writing to the Commission in general, rather than contacting individual commissioners or staff. I learned later in talking to a staff person that letters addressed just to the Commission and not related to a permit application almost never rise to the level of commissioner awareness. If you want some action, be sure that your requests get to the people who can fulfill them.

One outcome of the Caltrans workshop was the creation of a bridge railing subcommittee, consisting of commissioners Chris Desser and Shirley Detloff. Specific commissioners now had a responsibility in this area, and Chris Desser had been a critic of Caltrans's Noyo design from the beginning.

I asked the Commission staff for a copy of Caltrans's presentation. When I received it, my worst fears were realized: Caltrans had taken the federally approved railing designs of other states and modified them. All were ugly and visually opaque. In all, a traffic barrier, 42" pedestrian railing, and 54" bicycle railing had been combined into one. Caltrans had ignored the possibility of a two-rail system (which I had recommended from the outset) that places the traffic barrier on the inside of the sidewalk and a pedestrian railing on the outside. It had introduced a new set of engineering "safety requirements" that caused all of the federally approved railings to be modified to have much thicker rails. The "modified Wyoming rail" bore no resemblance to the original. Once again Caltrans had shifted the ground for design. First, it said the railings needed to meet federal crash tests.

Then it said the railings needed to be concrete to meet department policy. Now it was willing to show the Coastal Commission steel railings, but asserted that these needed to meet a different set of safety standards, and that these different standards required the modifications presented.

By now I was very skeptical of Caltrans's claim that there were legitimate safety reasons for the ugly railings. I called my contact at the Federal Highway Administration and asked him about these "AASHTO LRFD [load factor resistance design] Standards." He told me that they were from an old document and sent me a copy of the relevant pages. When I looked at the document, I found that: first, it had been superseded; second, it was only a guide for designing railings that will pass crash tests; and third, it showed that the unmodified Wyoming rail met the standards contained therein. The lesson here is to get the original source documents cited by Caltrans. You don't need to be an engineer to review them. You will be surprised at how often the source documents don't support Caltrans's claims.

I realized that my nonprofessional word would carry no weight with Caltrans. I needed to enlist someone they would listen to. On April 6, 2000, I contacted the Wyoming Department of Transportation, and Greg Frederick of their engineering department verbally confirmed that the Wyoming rail was designed to meet the standards cited by Caltrans. I requested that he send a written confirmation of this to the Coastal Commission. The same day, I wrote to Steve Scholl, a deputy director of the Coastal Commission, and to Caltrans, reporting my conversation with Mr. Frederick.

Unfortunately, it would take five months and a request from the chair of the Coastal Commission to get written confirmation from Wyoming.

A Public Servant Says: Listen to the Public

THE MORAL FOR THE PUBLIC in Vince Taylor's tale of the Noyo Bridge railing is clear: Don't give up. The moral for public servants is equally clear: Open up and listen—your colleagues, consultants, and other public officials don't necessarily have all the answers. We often get the best results when we are creative and "think outside of the box." Listening and giving real consideration to ideas from the public can be a powerful ticket out of that box.

I was the Coastal Commission staff member assigned to the original appeal of Caltrans' Noyo Bridge design, and it initially appeared to me that the project's momentum might be unstoppable. But the questions being asked by Vince Taylor, City Council Member Dan Gjerde, and other local citizens made sense. Was a bridge deck as wide as the Golden Gate's really necessary for the traffic load? How would such a massive structure affect the precarious economy of Noyo Harbor, just below it? Why were more elegant and view-preserving railings, similar to the ones I passed while crossing the Richardson Bay Bridge every day, not possible? (One of the more delightful aspects of the old bridge was its use as a "chicken view," where fishermen and boaters driving over could see the waves at the mouth of the harbor before deciding whether to go out.)

While the Commission's staff recommendation and subsequent action did not require a new bridge railing, it did require Caltrans to pay $1 million to mitigate the loss of bridge views. Eventually these funds were used to help the city of Fort Bragg purchase 20 acres at the Noyo Headlands and create Pomo Bluffs Park.

The Commission ruling also prompted Caltrans to develop more appropriate railing designs for future bridges. And, in the best tribute to the tenacity of a caring public, Caltrans was finally brought around: the new Noyo Bridge has railings that still show off the beauty of the river, the harbor, and the sea.

We're a long way from the direct democracy of a small town-meeting in New England, but it's still up to individuals to "form a more perfect union." In more than 30 years of public service in planning and environmental agencies, time and again I've found that some of the best ideas and insights come to us—free of charge—from people who are committed to their ideals, do their homework, and speak their minds. Every public servant should keep this close to heart.

—Jack Liebster

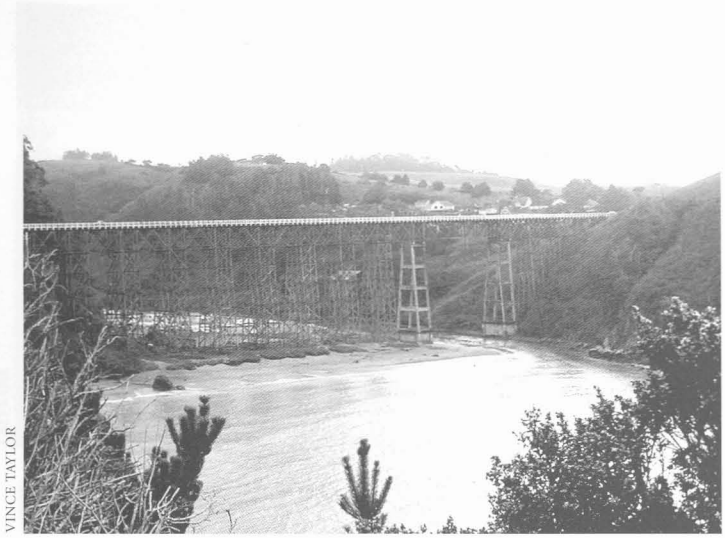
The Turning Point

THROUGH THE FIRST HALF OF 2000, I seemed to be making no progress. Then came the break. In July 2000, Caltrans announced the second delay in construction of the Noyo Bridge. It would not start before June 2001. This was two years later than the start date that Caltrans had told the Coastal Commission was essential for public safety, thereby persuading a reluctant Commission to approve the permit.

This announcement came just before the Commission's July 2000 meeting. With the help of the Sierra Club's Roanne Withers, who had filed the initial appeal, we briefed Commission staff on the delay so that they would be prepared to inform the commissioners. I prepared a one-page list of actions the Commission might take to pressure Caltrans to provide a visually transparent railing and, before the meeting, presented it to Commission chair Sara Wan and railing subcommittee members.

At the meeting commissioners expressed dismay at the delay, after Caltrans had used the urgency argument to shut off Commission consideration of alternatives that could better preserve the scenic values of the Noyo River and harbor.

After the staff briefing on the delay, I gave the Commission a necessarily brief update on my findings with respect to the Wyoming Rail and explained the list of possible Commission actions. Among these were a request that the Commission write to the Wyoming Depart-

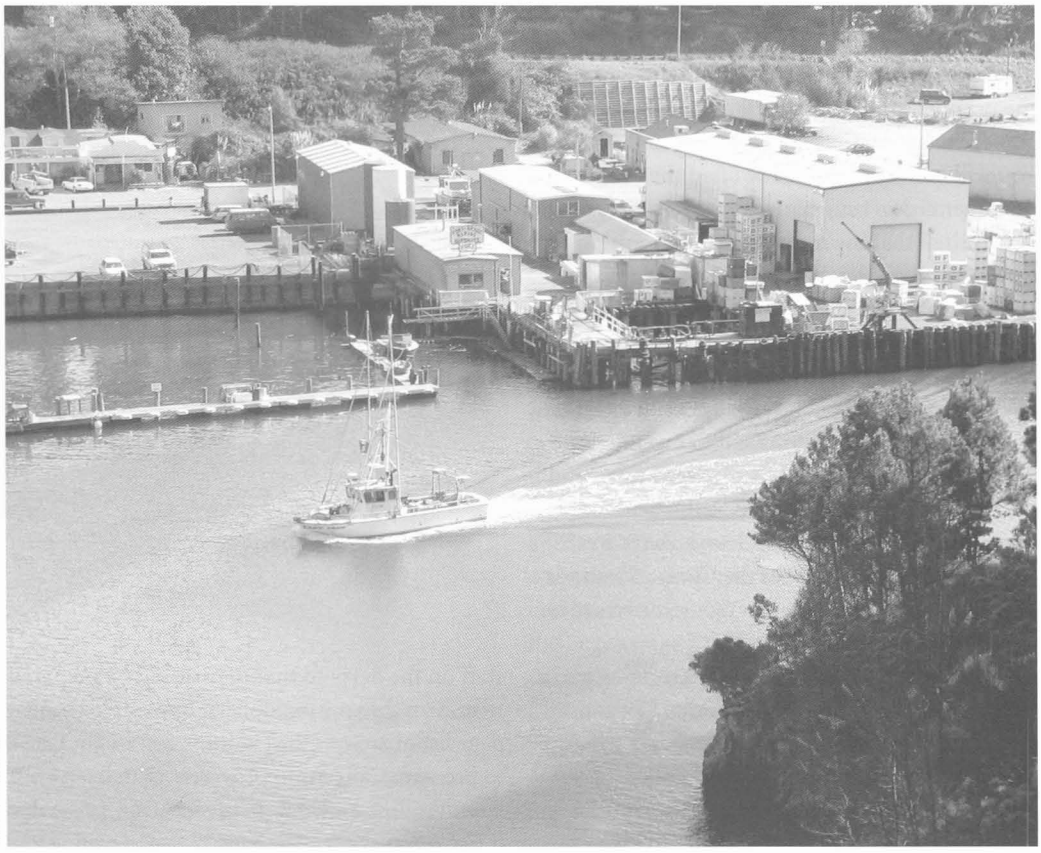


VINCE TAYLOR

VINCE TAYLOR

Above and above right: The Albion River Bridge is the oldest working timber-frame bridge in California. Constructed of old-growth redwood, it is still sound.

Right: View of Noyo Harbor from the new bridge.



SHEILA SEMANS

ment of Transportation and ask it to confirm that its railing met engineering standards and to Caltrans asking it to use one of the newly approved, metal scenic railings on the Noyo Bridge if it could be fit into the bridge's construction schedule.

The Commission was extremely receptive to my requests and directed staff to follow through on these and the others. This meeting was the turning point in the struggle for an acceptable railing, and I went from being considered an outsider to being treated as a respected, desirable source of independent information. The Commission was now taking my input seriously.

I spent another nine months of frustrating, sometimes enraging, confrontations with Caltrans engineers. Finally, on March 6, 2001, I wrote to Caltrans Director Jeff Morales, asking him to conduct a review of his engineering department's continuing refusal to accept the Wyoming rail.

A Happy Ending

WHETHER OR NOT MY LETTER had any effect I will never know for certain, because Caltrans's response on April 10, 2001, rebutted some contentions in my letter and did not directly address acceptance of the Wyoming rail. Coincidentally or not, however, on exactly this same date, Rick Land, Caltrans's bridge design supervisor, wrote to inform the Commission that the agency was approving a newly designed steel rail, the ST-10. The ST-10 was a sufficiently close cousin to the Wyoming rail to provide the Commission with a fully acceptable scenic railing. It took yet another construction delay to ensure that this railing was used on the new Noyo Bridge in the two-rail system I'd been proposing since 1998, but the wheels that led to this outcome were set in motion at the July 2000 Commission meeting.

The positive outcome grew out of a confluence of events, ongoing efforts, and preparation. The key factor was the major delay in construction of the Noyo Bridge, which provided an opening to gather information and present it to the Commission. Also, by this time I was familiar to the Commission and staff, and known at least by some to be a serious and reliable witness. Perseverance and patience, and being ready to exploit the right opportunity, seem to be keys to success in moving public policy. Of course, without the Coastal Commission, none of this would have been possible.

The new bridge spanning the Noyo River was completed in August 2005. Everyone was delighted with the sweeping vistas from the bridge and with the elegance of the railings. Caltrans held a big, self-congratulatory private ceremony, with a guest list of community leaders and politicians. I was not invited, but I heard that several local speakers lauded my contribution. At the public opening ceremony, the mayor of Fort Bragg gave me the major credit for the scenic qualities of the bridge.

Later, in a complete reversal of its earlier attitude toward me, the Fort Bragg City Council issued a proclamation commending me for protecting the scenic views from new bridges along California's coast.

There is a final lesson here: Persevering until success is achieved will garner approval and respect from many of those who opposed you at the height of the conflict. Don't give up.

Postscript: The struggle to preserve coastal scenic views and values continues. Caltrans is presently working on two new bridges on Highway 1 in highly scenic rural areas. Major issues of contention are the width of shoulders and the height of railings for bicyclists—both of which come down to arguments over the appropriate balance of safety concerns, coastal values, and public desires.

For more information on the ST-10 scenic railing and its origins, and to join the ongoing effort to preserve bridge views, see www.bridgerailings.org. ■

Vince Taylor, who has a degree in physics from the California Institute of Technology and a Ph.D. in economics from MIT, lives in the village of Mendocino. He spent 20 years doing policy analysis on a variety of projects for the Rand Corporation and other organizations, and for ten years headed a software business he had founded. Since the mid-1990s he has worked on local public service projects, including the Noyo Bridge and Jackson State Forest (see www.jacksonforest.org).

Views from Fort Bragg

IN 1998, WHEN VINCE TAYLOR stood up to protect views from the bridge, there was very little coastal access in Fort Bragg. Now much of the shoreline is open and soon almost the entire five miles of waterfront will be in City ownership, according to City Manager Linda Ruffing. While Taylor led citizens opposed to the concrete bridge railing, City Councilman Dan Gjerde became locally famous as "the million-dollar man" because he won that much for the City from Caltrans. His appeal to the Coastal Commission for $2 million to mitigate damage to coastal resources was settled for $1 million.

These funds enabled the city to buy 20 acres for Pomo Bluffs Park. Opened in April, 2006, it provides opportunities to stroll along the bluffs watching boats coming in and out of the harbor. The park also provides an important link in the California Coastal Trail.

Somewhat earlier, Glass Beach had been purchased through efforts by the Coastal Conservancy with other agencies. Blufftop property on the closed Georgia-Pacific mill site is in the process of being acquired by the City.

The value of these parks and trails is growing as the local economy continues to change. "We're on the cusp of a major demographic transition here," said Diana Stuart, who chaired the City's planning commission during the bridge battle. "The day after the mill closed, real estate values started to go up." Many of the people now moving into the community are "equity refugees," she said. "You can sell a home in Los Angeles or San Francisco and get something nice here. We have a fairly large contingent of affluent retirees. They bring capital and use services." If you have to earn a living on the North Coast, however, "you either have to be creative, start your own business, be a professional—a doctor or attorney—or be willing to work very hard," Stuart said. "We also have telecommuters, people who go to San Francisco or L.A. once a month or so."

In the future, "we'll be somewhat tourism-based," she predicted. "I hope it will be green tourism. We have a long stretch of accessible coast."

—*RG*

The race to fish depletes stocks early in the season, depresses prices, and benefits only the processors

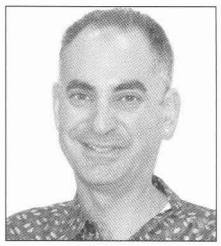
Paying to Share Could End the Race to Fish

THE INTERNET HAS MADE possible all sorts of wondrous new things, including my ability to reserve and pay for a parking spot at BART, the Bay Area's commuter rail system, the night before I have to go in to San Francisco ridiculously early in the morning. I guess I am showing my age a bit to think this is cool, but in fact until very recently parking at BART was free and could not be reserved. The BART system was built in the 1970s, long before I moved to California, and the question of paying for parking was a hot-button issue for BART's board of directors. Even though it cost money to build and maintain the parking lots around all but the most urban BART stations, the riding public generally felt entitled to free parking.

Because parking at BART was free, it was heavily used. When I started commuting to San Francisco in 1992, the parking lot at my local BART station was completely full by 8 a.m. Later it would fill up by 7:50 . . . then 7:45 . . . then 7:30. At some parking lots farther out in the suburbs the parking lots filled even earlier. BART is used all day long, but this meant that only very early morning commuters could park their cars at stations.

This situation changed several years ago when BART was confronted with deficits and an aging system that needed to be refurbished. After long debate and contentious hearings, BART finally decided to charge for parking at its lots. In the current system, you can reserve a space the night before, reserve a space for a month at a time, or even park at BART for several days if you are flying out of San Francisco Airport. Commuters don't have to get to the station ridiculously early, there are spaces available later in the day, and the system get some revenue from parking.

Economists reading this article are probably smiling by now because this is, of course, an example of a market-based system for allocating parking spaces. Market solutions for environmental problems have been around for some time, and have been more or less popular depending on the prevailing political winds. They are currently in vogue, with debt-for-nature efforts to save rainforests, water marketing, and discussion of a "cap-and-trade" system for managing carbon dioxide emissions in California and among a number of states. Here at the Coastal Conservancy we are increasingly interested in using some market approaches to help conserve California's fisheries.



It's no secret that our oceans and the fish that live in them are in deep trouble. The newspapers are filled with gloomy predictions, and this issue of *Coast & Ocean* features an article on shifting baselines, the notion that our basic ideas about plenty and scarcity are warped by our lack of historical knowledge. As an industry, commercial fishing is a classic example of the "tragedy of the commons." Individual fishermen have every incentive—including, until recently, some created by government action—to catch as many fish as they can as fast as they can, and beat the other guy to market. This is often called the "race to fish," which depletes stocks early in the season, depresses prices, and benefits nobody but the processors.

Market solutions to overfishing usually include some kind of dedication of fishing privileges. That is, each individual fisherman gets a "share" in the fishery, a proportion of the total amount of fish that can be caught in a year. The total amount is calculated to meet a goal of biological sustainability. In this scenario there is no race. Fishermen can wait for a good market price to fish and, in one of the world's most dangerous professions, they can stay in port during storms. This also gives an incentive to practice conservation, since if the fishery grows as a whole, each share of it becomes more valuable.

It sounds simple, but of course it is complicated to set up. Like the BART converting to paid parking, changing a fishery from open access to shares is difficult and requires many tedious and contentious meetings. Nevertheless, at the Coastal Conservancy we are quite interested in this transition. As many of our readers know, we are the staff to the Ocean Protection Council (http://resources.ca.gov/copc/), a new multiagency, cabinet-level part of state government charged with coordinating state policy for oceans and finding innovative solutions to ocean problems. The Council is interested in new thinking to reform California's fisheries, and is considering establishing a sustainable-fishery fund to help capitalize change.

I served on the California Fish and Game Commission for five years, and became very familiar with the good, the bad, and the ugly of how we currently regulate our fisheries. Most of that time we were coping with decline, and had to deliver a lot of bad news to our hardworking fishermen and women. I hope that the injection of some market mechanisms into the current situation will help reverse the downward spiral of fewer fish, tighter regulations, and less fishing. We certainly need to try something new, and if it helps get me a space at the BART parking lot tomorrow morning, how bad can the market be?

Sam Schuchat is the executive officer of the Coastal Conservancy.

COASTAL CONSERVANCY NEWS

ACCESS, WETLAND RESTORATION ON YOSEMITE SLOUGH

SAN FRANCISCO'S SOUTHEASTERN waterfront, long dominated by industrial and military uses and used as a dumping ground for toxic wastes, is slowly being cleaned up, restored, and opened to the public. In October, the Conservancy helped speed up that work by granting $3.3 million to the California State Parks Foundation to begin constructing some of the extensive improvements planned for Yosemite Slough in the Candlestick Point State Recreation Area. The funds are available through Proposition 50, a resources bond act approved by the state's voters in 2002, and were provided to the Conservancy by the Wildlife Conservation Board.

Yosemite Slough is a small tidal inlet between Hunters Point and Candlestick Point that was once part of a biologically diverse wetlands ecosystem. The slough was gradually filled for industrial and residential uses, and is now only a remnant channel surrounded by tidal mudflats, salt marsh, weedy vacant lots, and a parking lot, with broken rubble along much of the shoreline. The area's soil and water have been contaminated by several sources, including toxic materials used as landfill and decades of dumping by local industries. In addition, three combined stormwater/sewage outfalls discharge overflows, including partially treated sewage, into the slough during heavy rains.

There is currently no public access to the slough, but despite its degraded condition, thousands of birds can be seen there on any given day. A wildlife survey conducted from January 2003 through April 2004 counted 118 species of birds at the site.

The funds approved by the Conservancy, to be matched by more than $8 million from other sources, will enable the parks foundation to excavate and remove contaminated fill from 11.5 acres of degraded wetlands on the northern and western shores of the slough, restore these wetlands, and build an isolated nesting island for birds. A visitor center and public parking will be constructed near the slough, and an open, grassy public recreation area will be created.

Using additional, previously approved Conservancy funding, the San Francisco Bay Trail Project will build almost a quarter-mile of trail along the shoreline, connecting Candlestick Point SRA to the Hunters Point neighborhood.

The Yosemite Slough project site covers a total of 34 acres. The northern 24 acres will be improved during this first phase of the project—seven will be restored to tidal wetlands and 17 to transitional and upland areas. Plans for future phases include almost a mile of new trails, a second bird island, and 2.5 acres of new parkland along the slough with lighting, fencing, benches, and other visitor amenities. Twenty acres of wetlands will provide nursery habitat for fish.

The first phase of improvements, which includes the work partly funded by the Conservancy, is expected to cost almost $12 million, about half of the estimated cost for the entire project.

TRINIDAD PIER TO BE REBUILT

A $375,000 GRANT APPROVED by the Conservancy in October will allow the Cher-Ae Heights Indian Community of the Trinidad Rancheria to move ahead with the reconstruction of the deteriorating Trinidad Pier, the northernmost oceanfront pier in California. The pier, in Trinidad Harbor, is one of the primary commercial and sport-fishing launch facilities along the North Coast, as well as a scenic destination for tourists. Its loss could significantly harm the region's economy.

Built in 1946, the wooden pier is no longer safe for heavy use, and runoff into the bay from washing down the pier—and from the fish-cleaning and boat haul-out facilities associated with it—is contaminating nearby kelp beds. The Rancheria owns the pier and plans to replace it with a new structure built of non-contaminating materials. The new pier will have current plumbing and wash-down systems to eliminate existing water-quality problems. The Rancheria will use its Conservancy funds to develop engineering designs, complete the environmental documentation, and prepare permit applications for the reconstruction. This work must be completed before the Rancheria can compete for construction grants from the California Department of Boating and Waterways and other sources.

Trinidad Pier

SU CORBALEY

ALAMEDA STOCK PONDS TO BE RESTORED FOR WILDLIFE

MANY OF THE PONDS created for livestock in California have become important habitat for wildlife, but over time the ponds tend to fill with silt and their spillways erode. Because maintaining them is expensive and time-consuming, many ranchers have turned to tanks and troughs and have let their ponds deteriorate. The Alameda County Resource Conservation District (RCD), Natural Resources Conservation Service (NRCS), U.S. Fish & Wildlife Service, and Environmental Defense have formed a partnership to offer ranchers incentives to restore some of the 650 manmade ponds in Alameda County for wildlife to use. In October, the Conservancy approved $50,000 toward the first five of these projects, all in the eastern part of the county and all on private land.

Landowners who participate will be required to restore and manage the ponds and the 300 acres of rangeland surrounding each of them to accommodate the habitat needs of the threatened California red-legged frog and California tiger salamander. Other animals, including western pond turtles, San Joaquin kit foxes and Alameda whipsnakes, will benefit from the habitat restoration as well.

Excess sediment will be removed from the ponds, eroded spillways and gullies will be repaired, and willows and other riparian vegetation will be planted. Some areas of the ponds will be used by livestock because grazing creates good habitat for the threatened species: short bank vegetation is good for both tiger salamanders and red-legged frogs, and areas with little or no vegetation and muddied waters are beneficial to tiger salamander larvae. Livestock will be kept out of some areas.

The NRCS will provide technical and financial assistance to participating ranchers, while the RCD will offer environmental permitting assistance. Fish & Wildlife will provide assurances that the restoration projects will not subject the ranchers to additional regulatory restrictions. All five ranch owners intend to seek conservation easements for their lands, and the pond restoration projects will make them more competitive for funding.

STEVE HACKETT

Valley View Ranch

ANOTHER HUMBOLDT COUNTY RANCH GAINS PROTECTION

THE 1,532-ACRE Valley View Ranch on the North Fork of the Mattole River, near Petrolia, is the latest property to be protected through a conservation easement as part of the Six Rivers to the Sea program. A cooperative effort between ranchers and land stewardship organizations in Humboldt County, this program seeks to preserve nearly 10,000 acres of working ranchland and forestland between Six Rivers National Forest and the ocean (see *Coast & Ocean,* Vol. 21, No. 4). Ranch owners in this region have been under heavy pressure to sell their land for development as they struggle to survive on diminishing incomes. The California Department of Forestry will acquire the Valley View Ranch easement with the help of $1 million approved by the Conservancy in November.

Valley View Ranch is key to protecting the lower reaches of the North Fork of the Mattole, which runs through the property in two places along its western boundary. The ranch has been in the Sweet family since 1898 and will remain working timber and ranch land, with forestry restrictions in place to make the timber harvest sustainable. The easement controls the number and placement of new structures and roads, limits the development of water resources, and rules out residential and most commercial development. Some new commercial activities, such as a small-scale furniture factory, will be allowed.

Conservation easements have already been acquired for two of the other five properties included in the first phase of Six Rivers to the Sea; the Price Creek Ranch easement, completed in August 2006, was funded in part by $1 million approved by the Conservancy in December 2005.

NEW PUBLIC ACCESSWAY FOR VENICE BEACH

VENICE BEACH, JUST SOUTH of Santa Monica, draws more than a million visitors each year to stroll the waterfront and enjoy the street performers, roller skaters, body builders, and other colorful folk populating its Ocean Front Walk. Soon, two vacant lots will be transformed into a safe and attractive accessway from the beach to Venice's scenic canal area, with the help of a $100,000 grant approved by the Conservancy in October.

The City of Los Angeles owns easements on the lots, which residents and visitors already use to walk between the beach and the canals. Those who take this route, however, must negotiate rusty fencing, holes in the ground, and debris. The nonprofit Venice Canals Foundation, formed in part to support improvements to the accessway, will use the Conservancy funds to remove hazards and invasive plants, build a new paved pathway, and plant drought-tolerant vegetation. Other improvements include curb cuts, signs, trash bins, and fencing.

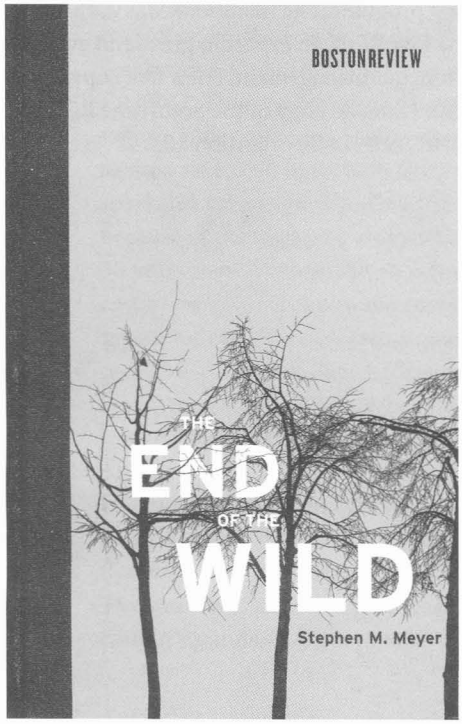
The project design also includes swales to control stormwater onsite and allow infiltration of runoff that currently flows directly into the canals and out to the ocean. This part of the project will be funded by a grant from the City of Los Angeles Watershed Protection Division.

EXTINCTION WINS

The End of the Wild, *by Stephen M. Meyer. Boston Review/MIT Press, Cambridge, 2006. 96 pp., $14.95 (hard cover).*

IN THIS POCKET-SIZED volume, Stephen Meyer, professor of political science at the Massachusetts Institute of Technology, concisely outlines the current relationship between humanity and the wild, drawing on the latest scientific evidence. He concludes that even if the current rate of species extinctions, around 3,000 per year, does not increase, the battle to preserve biodiversity has been lost. Every ecosystem on Earth is now affected by humans, from the icy poles to the ocean depths to the most remote jungles. This means that, increasingly, the species of plants and animals able to survive will be the "weedy" ones—those best suited to adapting to disturbed habitats and to living in proximity to humans.

Human efforts to preserve species—from environmental regulations to refuges and preserves to genetic engineering—cannot reverse the current trends, Meyer contends. Nonetheless, he insists that we must do everything we can to keep remaining biosystems functioning as well as possible. It is essential that we recognize that the end of wild nature is our doing. Actions we take might still stave off the collapse of entire ecosystems. He prescribes research, protecting the landscape, and intensive management as the means most likely to avert the extinction not just of wild things, but of our own species.



The terseness of Meyer's text at times gives it a hard edge, but it becomes clear that this is the kind of thought and action required in this global crisis. Substantial notes and references are provided in support of his brief but potent summation.

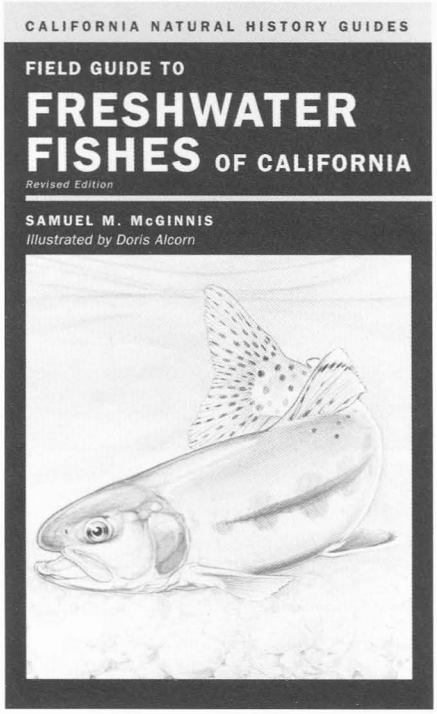
—*HMH*

A REFRESHING GUIDE TO FISH

Field Guide to Freshwater Fishes of California, *by Samuel M. McGinnis, illustrated by Doris Alcorn. University of California Press, Berkeley, 2006. 550 pp., 106 color photos, 33 illustrated color plates, 165 line illustrations, $24.95 (paper).*

ONE DOESN'T generally look to field guides for history lessons, broad ecological statements, or culinary advice, but Samuel McGinnis has blessed the universe of fish-lovers with a revised edition of his notable *Field Guide to Freshwater Fishes of California,* and it contains all this, and much more. While maintaining the highest standards for imparting detailed information, he conveys the richness of California's freshwater world in an artful, entertaining, and strikingly down-to-earth fashion.

Sam McGinnis is refreshingly old-school, and his enthusiasm is contagious. Some may be fooled into not taking seriously a field guide with a chapter dedicated to dining on California's rich aquatic taxa, but they would be wrong to doubt



the academic and artistic vision that renders this the finest and most practical guidebook of its kind. McGinnis's longtime affiliation with Robert Behnke and Robert Stebbins places him in the Pantheon of legendary ichthyologists and herpetologists. His passion for the subject translates directly to teaching skills. Those who enjoyed his classes and field sessions revere him (legends of splattered carp brain and repasts of road-kill raccoon notwithstanding), and those who didn't can enjoy a field guide that reads more like a novel than a dry, encyclopedic rendering of California's rich biological diversity.

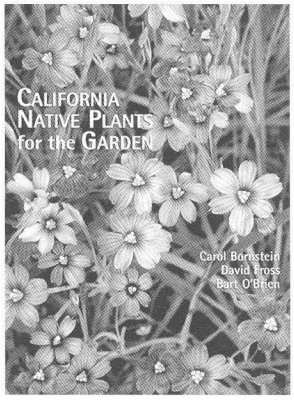
The illustrations by Doris Alcorn are superb, and reminiscent of much earlier work by Hashime Murayama. She captures the vibrantly colorful and unusual but ephemeral quality of life beneath the surface of the water.

If you love the freshwater environment, buy this book. If you don't yet love the freshwater environment, buy this book and you are sure to fall in love.

—*Michael Bowen*

ENHANCE YOUR GARDEN WITH NATIVES

California Native Plants for the Garden, *by Carol Bornstein, David Fross, and Bart O'Brien. Cachuma Press, Los Olivos, California, 2005. 271 pp., 450 color photos, $27.95 (paper).*



WITH AN OVERVIEW of the principles of native plant gardening, striking color photos of gardens across the state, and detailed descriptions and photos of over 500 individual plants, *California Native Plants for the Garden* is an essential reference for both novice and experienced native-plant gardeners.

Written by three native-plant horticulturists, this book is similar in structure to the *Sunset Western Garden Book* but, because of its singular focus, is far richer in detail. The photos of backyard gardens inspire as they educate, and the individual plant photos, many of them shot in gardens, can help readers develop a vision for their own plots.

Some readers may be tempted to head straight to the plant profiles to look for their favorite plants, and with few exceptions, they'll find them. But be sure to return to the introductory chapters on native plant care and garden design. They'll guide you through the critical first step of site analysis—examining your soil, sunlight, aspect, and prevailing winds—which will help you design and plant a garden that has a much greater chance of success.

The authors describe how to find the healthiest plants at the nursery by checking root structure and crown health. They discuss the potential pitfalls of fertilizing, recommend ways to reduce fire dangers, and lay to rest the myth that native plants don't need occasional watering.

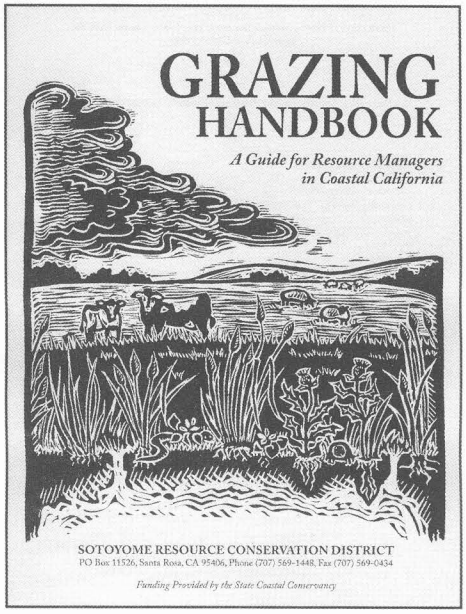
The plant profiles include detailed information about hundreds of species and varieties, from trees and shrubs to wildflowers and bunchgrasses. More than just a list of botanical names, soil preferences, and sunlight needs, the profiles provide plant descriptions, site suggestions, and pruning advice. You'll find recommendations for the difficult-to-plant locations in your garden, whether a shady bed under an oak tree or an exposed south-facing slope. The authors also recommend plants that grow well together and complement each other's colors and textures. The detailed advice on when to prune and how to address pests and diseases will help ensure that your garden looks its best even in the dry summer months. Unlike many garden books, these profiles also include the plant family name, a great help if you're trying to identify native plants in the wild, since so many plant keys are organized by family name.

Aside from a very brief overview of habitat gardening and a list of hummingbird-friendly species in an appendix, information on the habitat value of native plants is restricted to the plant profiles.

For those of us used to seeing native plants featured in black-and-white pamphlets and newsletters, such a glossy color production is truly welcome. As this book and the many gardens it features gain wider exposure, native plant gardening could very well go mainstream—which would be good news for wildlife and humans alike.

—Tom Annese

MANAGING GRASSLANDS



THE SANTA ROSA-BASED Sotoyome Resource Conservation District, through a grant from the Coastal Conservancy, has published the *Grazing Handbook,* a guide for resource managers in coastal California. The 68-page handbook should be useful to both agency personnel and landowners. Its purpose is to assist rangeland and resource managers in planning and implementing grazing, including evaluating their grassland resource and establishing a monitoring program. The handbook was authored by Lisa Bush, an expert in grassland evaluation and management. For a free copy, contact Danielle Gray of the Sotoyome RCD at (707) 569-1448, extension 105.

STEPHEN CORLEY

TALES OF THE ST. GEORGE REEF LIGHTHOUSE

In 1862 the *Brother Jonathan,* a steamer out of San Francisco Bay, crashed on St. George Reef, just south of the Oregon border. Only 19 of 166 or more passengers and crew survived. This reef is part of an underwater volcanic mountain six miles offshore. Heavy spray from waves crashing against rocks can hide them from view. This disaster sparked a campaign to build a lighthouse on the reef, but because of the high cost and perilous working conditions, 30 years passed before the St. George Reef Lighthouse could cast a warning beacon to mariners. It was constructed of massive granite blocks from a quarry on the Mad River, north of Humboldt Bay. A three-ton first-order Fresnel lens, brought from France, beamed from the lantern room atop its 134-foot light tower.

Isolation and extreme weather took a heavy toll on the lighthouse keepers. In 1937, a particularly harsh winter kept the five-man crew cut off from shore for almost two months. The strain was such that they reached a point at which they couldn't stand to look at or talk to each other. It's said that at meals they sat facing away from the table, and even asking someone to pass the salt was perceived as a personal attack. When the weather cleared and supplies were delivered, their relations returned to normal. In winter 1952, the harshest on record at the reef, 160-foot waves washed over the lighthouse, shattering a window in the lantern room.

In 1975, a large navigational buoy was anchored near the reef and the lighthouse was decommissioned. The Fresnel lens is now in the Del Norte County Historical Society museum in Crescent City. The St. George Reef Lighthouse Preservation Society, which now owns the lighthouse, offers occasional helicopter rides and tours of what may be the most dangerous lighthouse in the country. You can see it from the shore just north of Crescent City. For more information contact the St. George Reef Lighthouse Preservation Society, headed by Guy Towers, at (707) 464-8299 or http://stgeorgereeflighthouse.us/

—HMH

Coastal Conservancy

CALIFORNIA COASTAL CONSERVANCY
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