

CALIFORNIA  
COAST & OCEAN

VOLUME 14, NO. 2

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Fence Trouble

Beach  
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Owns the  
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the Sea?



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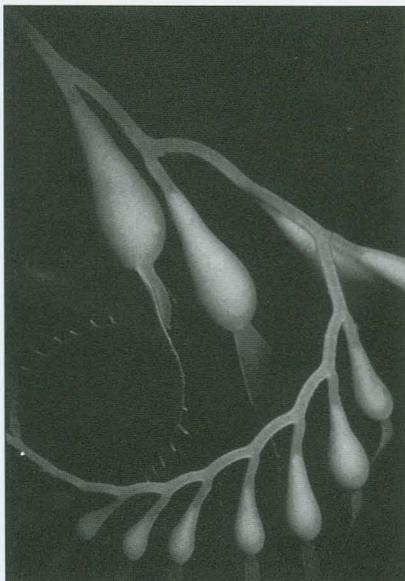
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#### Cover photos:

#### Giant kelp in Monterey Bay,

by Liza Riddle and Mark Goudy. For more than 20 years, Riddle and Goudy have traveled around the world photographing underwater and landscapes. They live in Berkeley.



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## THREAT TO TIJUANA RESERVE

# Mexico Border Fence Worries Neighbors

RASA GUSTAITIS

**“To face a threat like this is a real irony, given the taxpayers’ investment in the restoration of the borderlands and some real progress having been made.”**

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**I**F YOU HAPPEN TO BE in Imperial Beach, take a walk to the westernmost block of Imperial Beach Boulevard and gaze south. Your eyes will travel across a great green marshland of the Tijuana River Valley, coming to rest on the Border Highlands. When oceanside mist softens the rugged hillsides and etches their ridgeline against the sky, this is one of the grand vistas on the southern California coast.

The Tijuana River National Estuarine Research Reserve (TRNERR) begins at the sidewalk’s edge, right where you stand. Tidy city streets and houses cluster behind you, while directly ahead, only a few feet away, a snowy egret might be stalking its dinner in the pickleweed. Off to your right the ocean shimmers beyond the beach, interrupted at the Mexican border by a fence descending into the surf.

This is a place that calls out to the imagination, an ecological, political, and symbolic borderland long riven by conflict, abused and degraded, which nevertheless supports an abundance of life. Most of the valley’s tidal and brackish marshlands and some of the uplands are encompassed within the 2,500-acre reserve, while the riparian floodplain and the rare coastal scrub and maritime chaparral habitats of the border highlands are included as a



Core Biological Area in the City of San Diego Multiple Species Conservation Program.

For the past 16 years, the consortium of 10 agencies and organizations that constitute the TRNERR Management Agency, along with scientists, educators, and citizens from both sides of the border, have been working to restore the natural resources of this unique landscape and improve parklands and trails. Around \$15 million of public funds have been spent on these efforts thus far. In addition, a whopping \$341 million has recently been laid



out for a binational sewage treatment plant, built to help resolve one of the area's most pernicious problems, crossborder sewage contamination.

Now, however, just as the estuary's health is improving, fears have arisen that much of this patiently crafted effort might be undone by a massive road and fence project, now under way, designed to seal the 14 westernmost miles of the border against illegal crossings. The U.S. Border Patrol has begun to reinforce the fence completed in the early 1990s with a second, stronger and higher fence, and in

the corridor between these two fences it is building a near-level road flanked by lights, sensors, cameras, and other detection devices. "The goal is to secure the border 365 days a year, in all weather conditions," explains Kenneth R. Stitt, assistant chief patrol agent, San Diego Sector.

The 15-foot fence is to run from the lowtide zone east to the western slope of Otay Mesa. Two eastern segments are already up, totalling 3.5 miles. To build the 1.8-mile piece planned across Smuggler's Gulch, one of the westernmost canyons, massive earthmoving would be required.

**From Mexico, two men watch the Border Patrol in Smuggler's Gulch. Plans call for a massive cut and fill here to build an all-weather road between two parallel fences.**

## ALARMING WAIVER

**T**WO MORE FENCES and roads between them (in addition to the fence now in place) are mandated by the Illegal Immigration Reform and Immigrant Responsibility Act of 1996, PL 104-208. This law's Section 102, written by Rep. Duncan Hunter of San Diego, instructs: "The [U.S.] Attorney General shall provide for the construction along the 14 miles of the international land border of the United States, starting at the Pacific Ocean and extending eastward, of second and third fences, in addition to the existing reinforced fence, and for roads between the fences."

"We will build the fence, and a smooth all-weather road," Rep. Hunter's aide Gary Becks said in July. "But it seems that with the level of control we're getting at the border the third layer will not be necessary."

The legislation includes a waiver of the Endangered Species Act and the National Environmental Policy Act "to the extent the Attorney General determines necessary to ensure expeditious construction of the barriers and roads."

This waiver is extremely disturbing to resource managers and others. "I spend my time working with many nations, making sure they do environmental assessments on protected areas," said Mark Spalding, a consultant on international environmental policy and law. "If the U.S. does something like this without an environmental impact statement, I don't believe we'll have any credibility whatever."

In September 1997, having seen no proposals or environmental documents for the project—although an inland segment had already been constructed—the Coastal Commission notified the Border Patrol and the Army Corps of Engineers that a consistency determination would need to be submitted for proposed land acquisitions and the fence, including a finding as to whether the project is "consistent to the maximum extent practicable with the California Coastal Management Program."

Some details of what is intended emerged recently, after the TRNERR's Management Authority, concerned because nothing had been submitted to it on paper, asked the reserve's newest member, the Border Patrol, for information. The Border Patrol responded with a meeting on April 30, at which Chief Warrant Officer Carl

The gulch would be filled with millions of cubic yards of material cut from two adjacent mesas, one of which, Spooners Mesa, was acquired by San Diego County this year as an addition to Tijuana River Valley Regional Park. Both mesas harbor areas of rare and unique habitat.

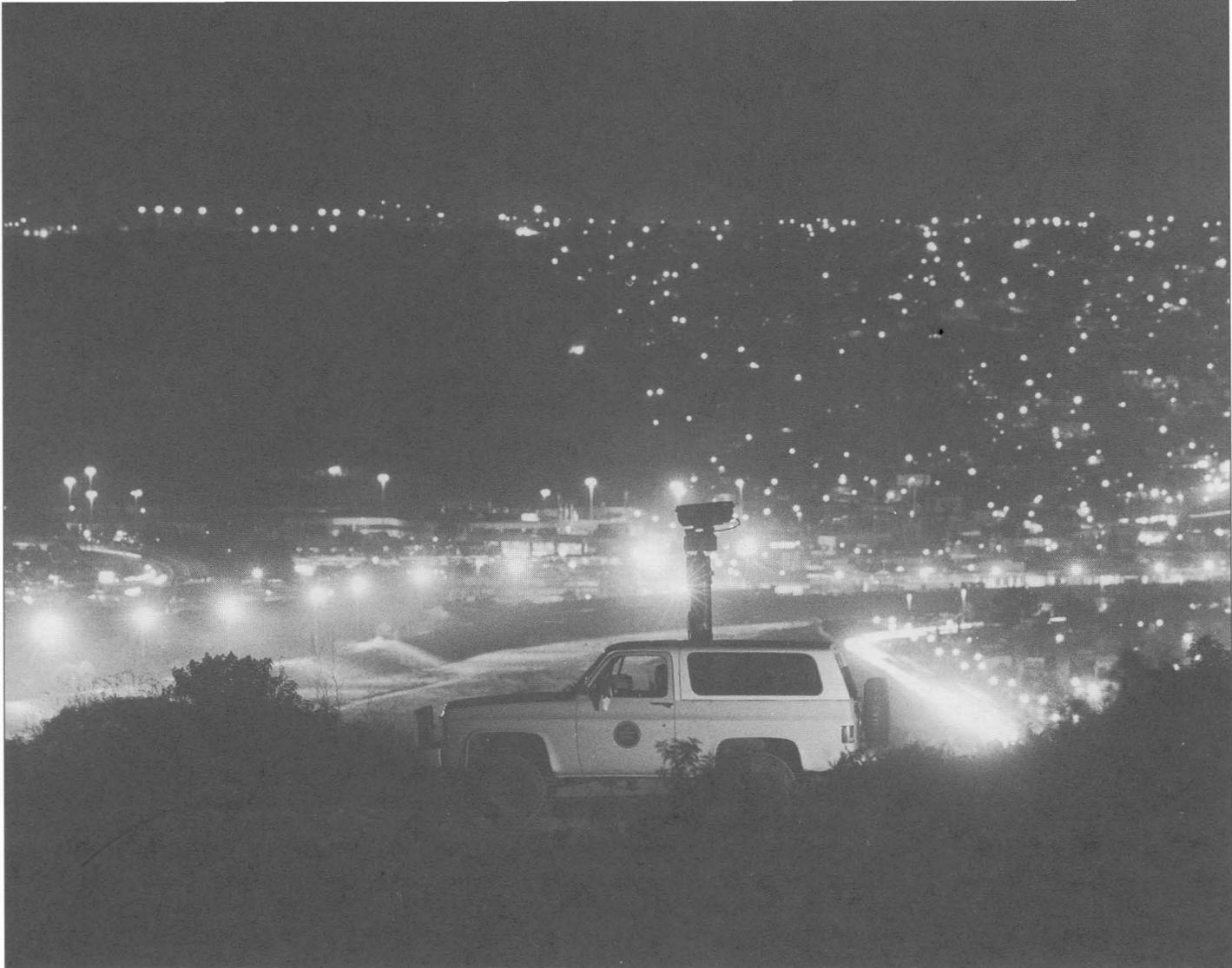
Some scientists, agency staff, and citizens working in the reserve and the valley believe that such a project would seriously damage irreplaceable natural resources, increase sedimentation and erosion, and greatly compromise public access improvements, especially those now being planned for Border Field State Park; and that it also would undermine binational projects in the Tijuana River watershed, two-thirds of which is in Mexico. Many question the need for such mammoth fortifications at a time when illegal crossings have greatly diminished in San Diego County and have largely shifted inland.

"The project's footprint would be equivalent to building an interstate road along the border," commented Paul Blackburn, the Sierra Club's conservation chair for San Diego County.

"To face a threat like this is a real irony, given the taxpayers' investment in the restoration of the borderlands and some real progress having been made," commented Jim King, who has worked in the estuary for a decade as the Coastal Conservancy's staff representative. "It's just this simple. The design mandated by Congress is out of touch with reality here and it needs to be reassessed."

**Border Patrol and California National Guard officers meet with local officials, activists, and resource managers in Smuggler's Gulch.**





Anderson of the California National Guard unrolled engineering drawings. These showed the road and fence crossing Smugler's Gulch and either cutting through Border Field State Park or wrapping around Border Field Mesa. "Driving in would feel like driving into a prison," said Lee McEachern, a planner for the Coastal Commission. "This would all but destroy any use of that park."

The Border Patrol explained that the drawings were no more than preliminary conceptual sketches that reflected what the Border Patrol knew "would work extra well for us from an enforcement perspective." It is hoping to adopt a strategy of "forward deployment" that would reduce its need for manpower. Instead of continuing to patrol two miles from the border northward, it would like to concentrate surveillance on a 500-foot-wide corridor next to the border. To do that, it needs better vehicular, visual, and surveillance access to the immediate border.

There was, as yet, no design, the Border

Patrol said. That would be produced by the Army Corps of Engineers out of Ft. Worth, Texas, which would also do the environmental assessment and build the project. In the absence of a design, the Border Patrol thought that these concerns were premature.

These explanations did not allay fears. Nan Valerio, coordinator for planning at the border for the San Diego Association of Governments (SANDAG), recalled that no environmental documents were submitted to SANDAG, the regional clearinghouse for environmental review, when the first fence was built. After being briefed about the current project, however, SANDAG's executive committee voted to write to the U.S. Attor-



**Top:** A Border Patrol vehicle with night vision scope waits on Spooners Mesa high above the Tijuana River Valley, near the San Ysidro border crossing. A Tijuana neighborhood is on the hill to the right. Bright stadium-type lights illuminate the river bottom to the left.  
**Above:** Border Patrol pursues a fleeing man in the dry Tijuana River channel.

**"We are offended. When we've been trying to cooperate on this border for three years, why not on this issue?"**

ney General requesting that endangered species and environmental protection law requirements not be waived. The committee pointed out that the entire southern part of the county is identified as sensitive habitat, and that large parts of it are accorded protection by the Multiple Species Conservation Program.

Valerio noted that the municipal government of Tijuana was also concerned that it might not be consulted. "At a time when there's a whole lot of consultation and information exchange on police, health, transportation planning, and other matters, all we can tell them is that we haven't been consulted either," she said.

Across the border, Oscar Romo, director of Ecoparque, a wastewater treatment and recycling project operated by the Colegio de la Frontera Norte, said, "No one on the Mexico side was consulted. No one knew."

Ecoparque began as a project of the Coastal Conservancy. The hope is that it can be replicated, providing inexpensive yet effective sewage treatment to other communities without sewer systems in this watershed. "I'm involved in conservation of the two canyons and the estuary," said Romo. "This has been a perfect demonstration of binational cooperation." But now, he said, "binational cooperation disappears. We are offended. The road will be environmentally aggressive. It's wrong. When we've been trying to cooperate on this border for three years, why not on this issue? I understand that the goal is to stop the immigration—but there are other solutions."

## INTENSE CONCERNS

IS A DOUBLE FENCE with a road corridor our best answer to border problems? Among those who don't think so are Michael and Patricia McCoy, founders of the Southwest Wetlands Interpretive Association (SWIA), who led the way to the estuarine reserve's creation in 1981 and were recently honored by the Environmental Law Institute's National Wetlands Award. They are now working with other groups to establish a national wildlife refuge in San Diego Bay and to have the Tijuana Estuary designated wetlands of international importance.

"We're trying to foster good will. With Mexico getting on its economic feet, I honestly believe that in a few years a project of this magnitude will be redundant," said Patricia McCoy. "I also believe that the fence-road-fence configuration is not conducive to officer safety. It escalates the danger and could well become a trap."

As word about the project spread, phone calls, faxes, and letters poured in to various elected and other officials. The Border Patrol arranged another meeting, this time in Smuggler's Gulch, to answer questions, clear up misunderstandings, and lay fears to rest.

A handful of people were expected, but 25 showed up, representing a wide array of organizations and agencies. Because not all who would have wanted to come could make it, and questions remained, a third meeting was set up, this time through the good offices of San Diego Dialogue, a community-based public policy center at the University of California, San Diego, Center for U.S.-Mexican studies. More than 35 people gathered in the offices of the San Diego Sector of the Border Patrol. Later, Stitt said: "It was a surprise to me, personally, that this came up this way"—that is, while the project was still at an early stage.

Some of those present, however, thought it was late rather than early to consider alternative concepts, perhaps something less offensive than a military-style barrier between two friendly nations. This fence threatened to wreck cross-border initiatives they had been nurturing for years, building a foundation for binational watershed stewardship.

The binational citizens group pro esteros, founded to protect coastal wetlands, is about



A southward view of Smuggler's Gulch with existing fence and Border Patrol roads. Tijuana is in the background. This canyon would be filled for a second fence and a nearly level parallel road.



to celebrate its 20th anniversary. Schoolchildren have been tracking the migration of black brant between Alaska and Mexico, reporting to each other by e-mail. Scholars and university students are collaborating on projects of mutual importance. All this is laying the foundation for ever greater international cooperation. Just this spring, with the help of the Coastal Conservancy, SWIA held a two-day workshop in Tijuana on erosion in Goat Canyon, which is known as Cañon de los Laureles on the other side of the border. This canyon is west of Spooners Mesa, and is the focus of a SWIA-Conservancy plan for habitat restoration and erosion control. Would the people from Cañon de los Laureles, who have participated so enthusiastically, want to hear further suggestions from behind that new fence?

The Border Patrol told the June 12 gathering that it had no intention of circumventing environmental review requirements and wanted to be part of the community. Its expertise, however, is in law enforcement, not in building projects. As he was unable to answer many of the questions raised, Stitt urged people to write to Eric W. Verwers, assistant director of the INS Architect-Engineer Resource Center, Corps of Engineers, at Fort Worth, Texas. Only a 1.8-mile section across Smuggler's Gulch

was now being planned, he said. No one knew what would be needed the rest of the way to the ocean's edge.

To this Jim Peugh responded that "piecemealing" violates planning principles. The 14-mile project had to be viewed as a whole. If that was not done, added the Coastal Commission's McEachern, that 1.8-section could well "set the stage for having to continue to the water."

In any case, critics argued, wasn't the border already under effective control with Operation Gatekeeper, which in 1994 more than doubled the Border Patrol's manpower and provided more technological assistance? Stitt replied that yes, indeed, Operation Gatekeeper was very effective. "Last year we had the lowest number of apprehensions in the San Diego area in 17 years, and this year there has been a decline of another 21 percent." Between October 1996 and September 30, 1997, apprehensions within the 7,000 square miles patrolled in the county numbered 283,889, less than half the 524,231 recorded in the same months of 1994-95, according to Supervising Agent Mario Villarreal. The Border Patrol's San Diego Sector now has formidable enforcement tools: 10 helicopters; the IDENT system, which identi-

*continued on page 36*

**This kind of border crossing is now rare in the Tijuana River Estuary.**

## THE MULTI-MILLION-DOLLAR DREDGING DEBACLE

# Beach Bullet Bingo

GARY TAYLOR

Moonlight Beach in Encinitas is crowded because sandy beaches are scarce in northern San Diego County.

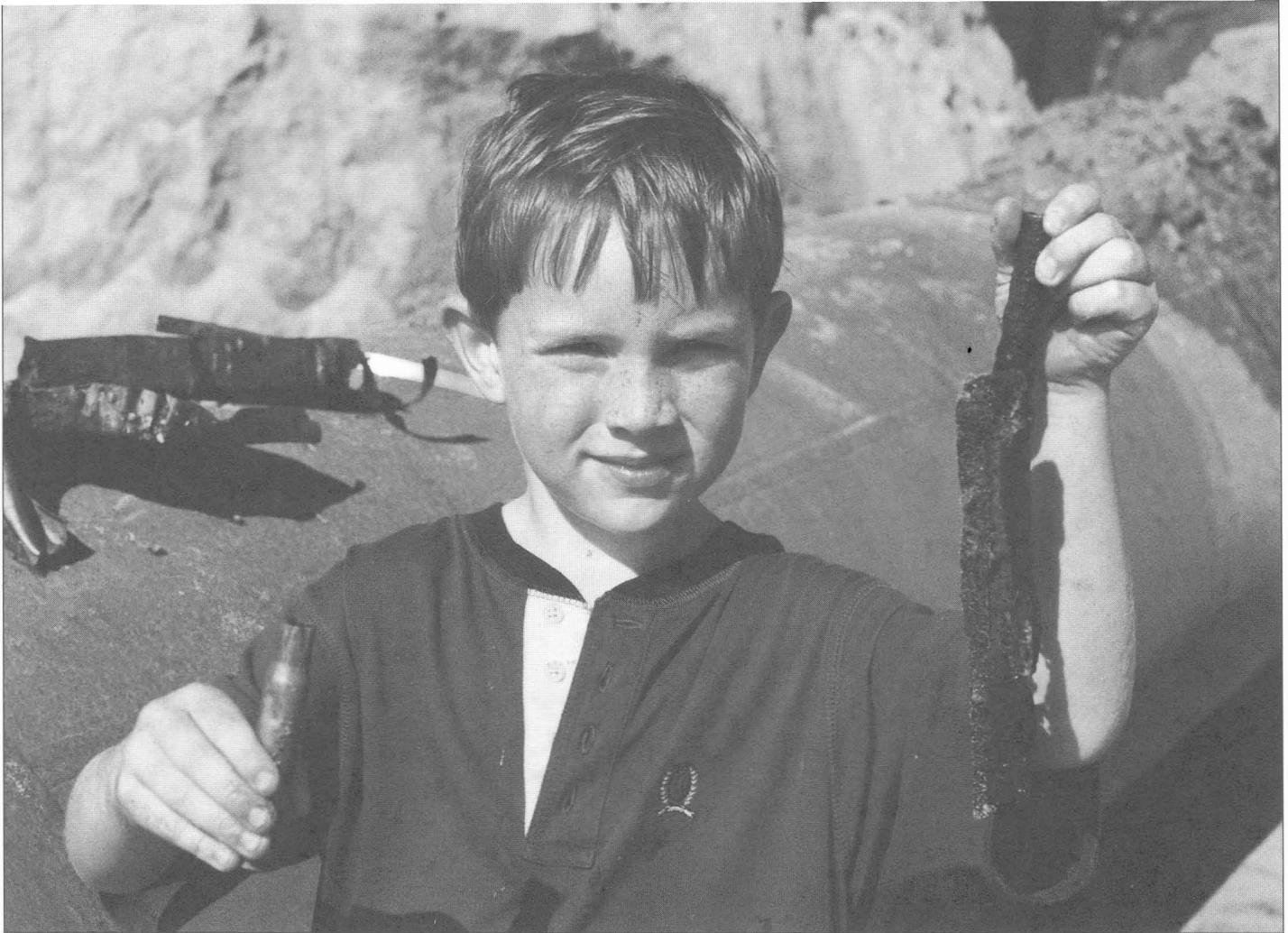
**O**N SEPTEMBER 25, 1997, Kathy Ragone was taking her usual morning walk on the beach in Oceanside to get some exercise and collect a few seashells. One shell in particular caught her eye, so she moved closer and used her foot to scrape the sand off it. She thought it might be the carcass of a lobster, but it was not. The object she discovered turned out to be a live 81-mm mortar shell.

That chance discovery—soon followed by other, similar ones—eventually shot down one of the most ambitious and expensive beach sand replenishment projects in U.S. history.

The Vietnam-era ordnance had arrived within a load of sand that was being barged up from Mission Bay, pumped ashore, and spread on the county's beaches as part of the U.S. Navy's Homeporting Project. The Navy was dredging in San Diego Bay to create a deepwater berth for the USS *John C.*



GARY TAYLOR



JOLENE THOMPSON

*Stennis*, a nuclear-powered aircraft carrier that is scheduled to arrive from the Persian Gulf in August 1998. In response to pleas from coastal communities, the Navy had agreed to place seven million yards of the dredged sand on north county beaches that were denuded by El Niño storms in 1982–83 and have not recovered.

The project pleased nearly everyone. For the Navy, using dredged sand to restore the region's beaches—sand it would otherwise have dumped five miles off Point Loma—amounted to a public relations coup. To local and regional lawmakers and beach advocates, the project seemed to offer a once-in-a-lifetime opportunity to return the region's coastline to its pre-1982 splendor. To coastal scientists it was a chance to study beach nourishment on a large scale. Kathy Ragone's discovery dashed all these expectations.

Soon other beachcombers were finding unexploded ammunition and other military debris. A news story on Ragone's find included a photograph of a tourist holding up his own Oceanside souvenirs: bullets, shells, twisted metal, and a rusty dust pan. The caption read: "Beach Bullet Bingo."

## REALLY?

**N**EARLY EVERYONE involved was surprised. "The subject of munitions or other dangerous debris never entered any discussion I was a part of pertaining to the Homeporting Project," said Encinitas City Councilman James Bond, a member of the San Diego Association of Governments (SANDAG) Shoreline Erosion Committee. "Yes, I was surprised. We were all surprised at this discovery."

"The possibility of debris never occurred to me," said oceanographer Reinhard Flick of the California Department of Boating and Waterways and Scripps Institution of Oceanography. "Someone did say later that the issue was raised during the EIS [environmental impact statement] process by 'divers,' but I don't have any knowledge of what was presented."

"It did not surprise us to find debris (mostly scrap metal), but the ordnance was not expected," said a Navy spokesman.

Yet there had been warnings. Sport and commercial divers had reported seeing beds of 20-mm shells, bomb casings, and a scattering of other munitions south of Bal-

Robert Grange picked up some souvenirs to take home to Salt Lake City: bullet shells and mangled metal.

**The beach communities were desperate for sand—an essential ingredient of the regional economy.**

**In retrospect, it does not seem at all surprising that ordnance lay buried in the San Diego Bay sediments.**

last Point, near the area where dredging would take place.

In February 1996, more than a year before dredging was to begin, Lee Olsen, then president of the San Diego Council of Divers, had sent a letter to the Navy, the State Regional Water Quality Control Board, and the U.S. Army Corps of Engineers, advising of the possibility that dumped munitions and chemical containers might exist in or adjacent to the dredge footprint. In June 1996 he wrote to the Navy and to the Coastal Commission expressing concerns about "apparent serious inadequacies" in the environmental review process. "The Navy, RWQCB, and COE [have] failed to identify and assess the possible impacts of this type of material in or adjacent to the dredging area," Olsen wrote. "The potential certainly exists that it could be detonated and place divers, reefs, and marine animals and plants at risk."

In retrospect, it does not seem at all surprising that ordnance lay buried in the San Diego Bay sediments. During World War II, shore batteries had periodically practiced on targets off Point Loma. In 1983, the Navy discovered the wreck of one of its patrol boats in the outer channel, near the area later selected for dredging, that contained some explosives, including hedgehog depth charges. Navy divers collected the munitions, planted explosives in the wreck, and blew it up. "I was on the 10th

floor of the Bank of California at the time," wrote Olsen, "and the entire building swayed back and forth for over a minute. Fortunately there were no divers in the water at the time."

Responding to Olsen's reports, the Navy stated that its divers had repeatedly searched the dredge footprint and found nothing unusual, only some old anchors and other debris. "After extensive field investigation, the Navy determined that the specific locations of these observations were outside the limits of the channel dredging project," a spokesperson said. "The Navy could not validate the presence of any ordnance within the dredging footprint."



## **GREAT EXPECTATIONS**

**I**N THE WEEKS and months following Kathy Ragoné's discovery, some people suggested that wishful thinking had blinded those involved with the beach nourishment project to any potential hazards.

The beach communities were desperate for sand—an essential ingredient of the regional economy. According to a 1997 press release by San Diego Hotel Reservations, Inc., the county is "best known for its near perfect climate and incomparable sandy beaches that stretch for 70 miles along the Pacific Ocean." Yet for more than 15 years, many of those "incomparable sandy beaches" had been little more than denuded strips of bedrock reef and cobblestone.

These beaches' ability to recover from storms was impaired decades ago when dams were erected inland, holding back the flow of sediment. When Oceanside Harbor was built in 1963, the north jetty at Camp Pendleton was extended, obstructing what



PHOTOS BY JOLENE THOMPSON

sediment was still coming down the once-mighty Santa Margarita and San Luis Rey Rivers, and the fate of the beaches was sealed. Huge storm waves in 1982-83 scoured away what little sand had made its way to the shore, mostly from lagoon dredging projects, and by 1997 much of San Diego's coastline looked more like a war zone than like Waikiki.

In the mid-1990s, an unlikely combination of scientists, business leaders, and politicians began to look at the problem. SANDAG, a consortium of cities and county agencies, put forth a strategy for replenishing and maintaining beaches and began to search for "opportunistic sand": beach-appropriate material that was made available by new housing developments, landfill expansion, and other projects. The Homeporting Project arrived as the answer to SANDAG's prayers.

Of some 10 million cubic yards the Navy expected to dredge from the bottom of San Diego Bay, 260,000 cubic yards were to be

used as backfill (to shore up dock facilities for the carrier), while another 932,000 cubic yards would be dropped at an ocean disposal site. The rest, seven million cubic yards, was deemed by the Navy's EIS to be suitable for beaches.

This was stunning news. Oceanographer Flick said that seven million cubic yards, built to a width of 300 feet and a wedge up to nine feet high, would create a 26-mile beach. The Navy intended to transport the beach-suitable material by barge and deposit it at four nearshore sites off Oceanside, Del Mar, Mission Bay, and Imperial Beach, allowing summer waves to wash it to shore. In spring 1995, however, SANDAG and the local Congressional delegation requested that the project be expanded to six sites, and that the sand be deposited directly onshore, via portable pipelines, at Oceanside, Carlsbad, Encinitas and Solana Beach, Del Mar, and San Diego.

Millions of dollars more would be needed. While the Navy's original plan was included

**Sand piped in from barge (top left) is spread on the beach.**



GARY TAYLOR

**The Navy instigated a worldwide search for an efficient, legal, and cost-effective way to deliver several million cubic yards of munitions-free sand to the beaches.**

---

in its Homeporting Project, SANDAG estimated that \$14.33 million would be required to pump sand to the six additional sites. To secure the funds from state and federal sources, a massive lobbying campaign was launched, aimed at regional legislators and the governor. The state agreed to contribute \$4.7 million. Legislators added \$9.63 million to the Navy's 1996 budget, with the stipulation that it be matched one-to-one with other funds. So a total of \$9.4 million was secured, with the promise of \$4.93 million more if a full match was found.

Confidence over the project grew and its war cry was "The opportunity of a lifetime." To be sure, some beach erosion experts cautioned that it was impossible to predict exactly what would happen to sand once it was deposited on beaches or near shore, but they welcomed the opportunity the project presented to study the dynamics of natural sand transport.

Yet Olsen's was not the only voice that had warned of trouble. In May 1996 the San Diego Environmental Health Coalition had sued the Navy, contending that the impacts of the Homeporting Project, including the sand disposal plans, had not been adequately researched, and that sediment testing was not adequate to determine toxicity levels in the dredged materials. U.S. District Judge Barry Moskowitz ruled in favor of the Navy.

The possibility of bullets and bombs turning up on beaches apparently was never seriously discussed on an official level. Everyone was in a hurry to fulfill an agenda. The Navy wanted to finish the dredging; beach advocates were dazzled by the prospect of so much sand for the shore.

## AND THEN . . .

**B**Y SUMMER 1997, with all legal, financial, and logistical roadblocks out of the way, a barge was filled with sand dredged from San Diego Bay, a pipeline transportation system was set up in Oceanside, and the project was underway. Only days after the sand arrived at the foot of Wisconsin Street, Ragone found that live mortar shell.

Damage control was swift. The project was immediately "demobilized . . . above all to ensure the safety of the public," according to a Navy statement. The dredging was stopped and the Navy found itself trying to navigate a legal and bureaucratic obstacle course.

While the dredge stood idle, those involved in the project applied themselves to a search for better sand screening techniques. Meanwhile, thousands of military personnel across the country had begun making plans to move to San Diego, and the *Stennis* was still scheduled to arrive in August.

Determined to keep the Homeporting Project on its tight schedule, the Navy began to dump beach-grade sand at the off-shore deposit site established for material that was unsuitable for beaches. The Navy did not, at this point, completely abandon its beach nourishment plan. Some sand was still being pumped to the beaches, after being screened by two types of grates. But this screening slowed the process, so the Navy decided to dispose of over 4.7 million cubic yards at the offshore site (more than five times more than the 932,000 cubic

yards originally projected).

With this shift in course, the Navy landed in a new bind. The Coastal Commission approved an emergency permit for dumping only 435,000 cubic yards of beach-grade sand offshore and told the Navy to search for ways to save more of this valuable natural resource.

"The Navy should not be allowed to continue with this project without first cleaning the sand," Rep. Ron Packard (R-Oceanside), a senior member of the House Appropriations Committee and chairman of one of its military subcommittees, remarked. "If the Navy would come up with a solution to clean the sand in the Bay, then we will have solved the problem."

## MORE TROUBLE

**T**HEN, ON NOVEMBER 18 and 19, 1997, the Navy found four unfired 20-mm rounds on the beach in Oceanside and attempted to bypass the Commission. The Navy informed the Commission that it would engage in no mediation on other alternatives and asked the Corps of Engineers for approval to dump all the remaining dredged material offshore. The Commission responded by suing the Navy to stop the dumping.

Growing desperate, the Navy instigated a worldwide search for an efficient, legal, and cost-effective way to deliver several million cubic yards of munitions-free sand to the beaches. On December 15, Assistant Secretary of the Navy Robert B. Pirie Jr. flew to San Diego to meet with congressional representatives and local officials. "We don't have any assurance that the sand is free from hazardous substances," Pirie acknowledged. "In the absence of complete technology to remove the debris, we remain in a quandary." He added that the Navy would "stand firm" on its commitment to provide a berth for the USS *Stennis* by August 1998.

On January 29, 1998, the Navy's plight worsened when U.S. District Court Judge Jeffrey T. Miller issued a preliminary injunction ordering that it stop dredging and negotiate. An editorial in the *San Diego Union-Tribune* expressed a sentiment widely shared along the north county's coast: "With the world's finest technology in its hands, the Navy can find a way to put its dredged sand back on the beaches."

The impasse was finally resolved, 11 days later, with a compromise that allowed the Homeporting Project to go forward, while the Navy took steps that promised to benefit beaches—even if not as directly as originally envisaged. All material from San Diego Bay would be dumped at sea, and the Navy would seek out natural deposits of beach-suitable sand about a mile offshore. Through the efforts of Rep. Packard, Congress reallocated \$9.63 million to find new sand and place it on beaches.

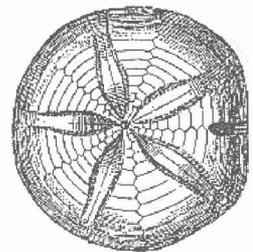
Those involved in the beach project tried to make the best of the situation. "To me and the people on the Shoreline Erosion Committee, it was an extreme disappointment, because much effort and time was taken and we still have no sand on our beaches," said Steve Sachs of SANDAG.

"On the other hand, I recognize the value of going through the process because the environmental analysis had to be done in any event." Much of this work will be useful in improving the process of moving offshore deposits onshore, he believes. "We've made tremendous progress working with the Navy. We will try to replicate the benefits expected from the Homeporting Project as much as we can."

Has anything been learned from this gigantic debacle? Perhaps it's only the old lesson, once again: Look before you leap. In its zeal to provide a port for nuclear-powered carriers on a tight deadline, the Navy neglected warnings that the dredged material might contain ordnance that could endanger unsuspecting beachgoers. Meanwhile, beach replenishment advocates, blinded by the prospect of wide sandy beaches and the economic boost, failed to do the necessary homework.

The search for sand continues. Sachs believes off-shore sources will turn out to be most cost-effective. At this writing, a new source is also being touted: Hundreds of miles inland, the Bureau of Land Management has stockpiled mountains of beach-quality sand dredged from the Colorado River as part of its maintenance program for the All-American Canal, which flows into the Salton Sea. It is reasonable to assume that this river sand contains no military ordnance. ■

*Gary Taylor was editor of the Coast News, a north San Diego County weekly, till June. He now writes freelance.*





# So Cold, So Rich With Life

ANNE CANRIGHT

**Y**OU'VE NO DOUBT heard that droll line attributed to Mark Twain: "The coldest winter I ever spent was a summer in San Francisco." Though some doubt that he actually said this, there's

no question that he knew that San Francisco—and indeed much of the central coast—gets foggy in summer, and that fog doesn't so much tiptoe in on little cat's feet as roll in and envelop, sucking the warmth out of a body. Mark Twain may even have been enough of a natural scientist to know what, at least in part, causes this fog: upwelling.

In a nutshell, upwelling is a process by which cold water is brought up from the depths of the ocean. Along California and Oregon, wind from the northwest pulls warmer surface waters away from shore, and cold water moves up to take its place. The reason the wind doesn't just push that water on down south has to do with physics—friction, to be specific, and the Coriolis effect, which combine in a process known as Ekman transport. But more on that in a bit: the point is, cold water appears off our shore from about April to September.

When that cold water comes in contact with the moist warm air flowing off the land, fog results. And a beautiful sight it is—especially from a distance.

But fog is only one aspect of the upwelling phenomenon. That cold water also brings nutrients, which nourish the

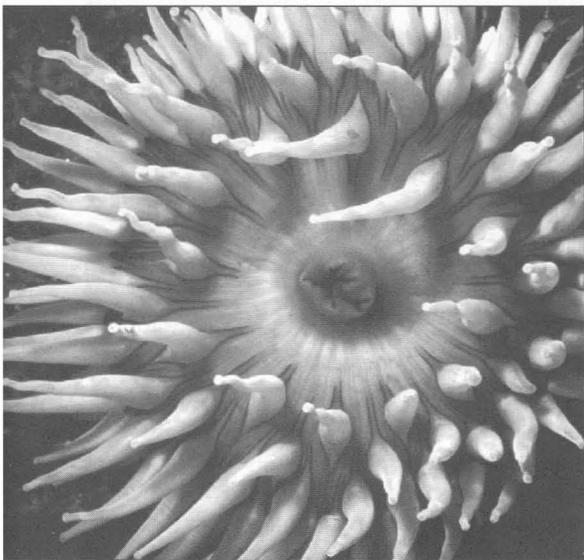
very bottom of the food web: phytoplankton and zooplankton. And plankton, in turn, supports some very large animals indeed.

I once went whale watching during the summer on Monterey Bay. Or rather, it turned out to be a "whale-listening" trip, since we were quickly shrouded in fog, and the only way we could tell if whales were around was to shut off the boat engines and . . . listen. Every so often we'd hear the huffing sound of a blow, and we'd fire the engines up and chase off in that direction. Occasionally we got close enough to see the long, long back of a blue whale break the surface and go under. That time, the fog made for a special experience.





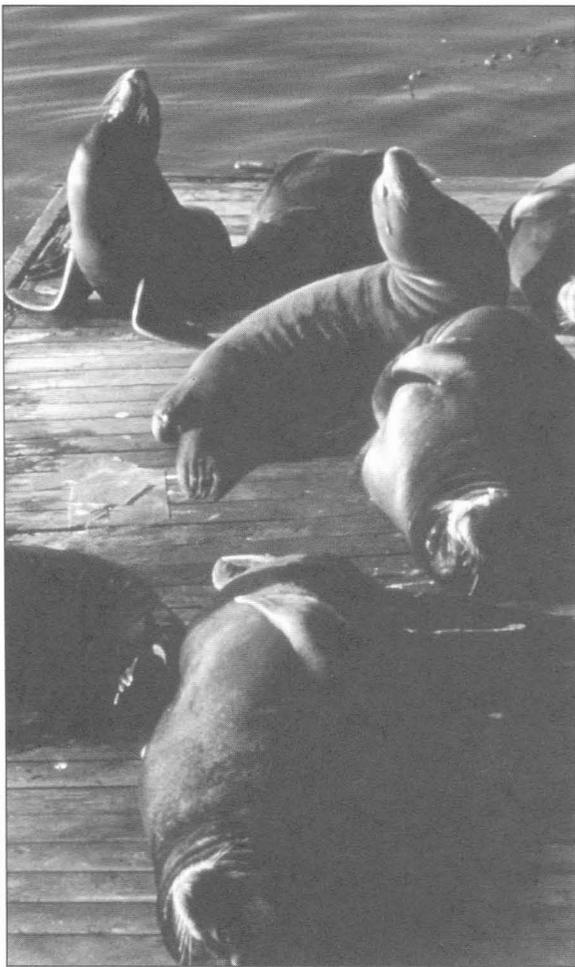
LIZA RIDDLE



LIZA RIDDLE



KIP EVANS



You might be thinking, Blue whales? In June? Isn't it just grays that ply our coast, and then during the winter months?

Well, no. In fact, blue whales, along with humpbacks, come during summer, and they come specifically to feed. (The grays, by contrast, probably *don't* feed as they pass by—but that's another story.) They hover above the edge of the continental shelf, where masses of small shrimplike creatures known as krill converge, and they strain these animals through their hairy plates of baleen by the ton.

So why is the krill here? Let's get back to upwelling to tackle that question.

Krill is a zooplankton—a tiny drifting animal. And a zooplankton eats, well, other zooplankton to an extent,

but also, and significantly, phytoplankton: microscopic plants.

Phytoplankton, like any plant, whether a baobab or a daisy, needs a few things to survive. It needs sunlight and carbon dioxide, for photosynthesis. But it also needs certain nutrients, for growth—the same 10-5-5 minerals that we buy in bags to strew over our flowerbeds.

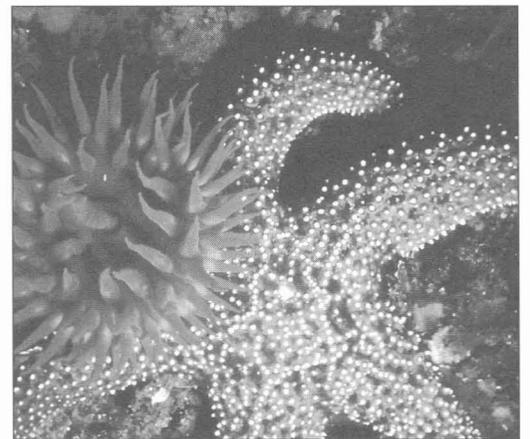
In the ocean, when organic matter dies, it sinks and decomposes. When that happens, the carbon and other minerals in its cells dissolve—but in lower regions of the water, not up at the surface where microscopic plants are busy photosynthesizing. So nutrients such as nitrate and phosphate (dissolved forms of the elements nitrogen and phosphorus—the first two numbers on our fertilizer bags) are relatively inaccessible to the plants that need them.

Enter upwelling: when the winds come and push the warm water away from shore, the cold water rising from the depths brings those nutrients to the surface. The plant life thrives—plankton and all the other seaweeds. As they convert light and nutrients

into food and oxygen, they manufacture most of the organic compounds required by marine animals: zooplankton first, which are eaten by fish, which are eaten by larger fish and birds and marine mammals. And of course, the oxygen given off by the marine plants benefits us land animals as well.

**T**HE WEST COAST of North America, especially from central California to Oregon, is one of the major upwelling areas in the world. Others are the west coasts of South America, southern Africa, and northern Africa. Although upwelling occurs widely throughout the oceans, these might be called the “big-picture” sites of the process, easily mappable from space. They are generally associated with strong cold currents—the California, the Peru, the Benguela, the Canary.

The reason upwelling occurs has to do, as I mentioned above, with Ekman transport. The flow of most surface currents in the oceans is driven by wind. When wind blows over water, the surface of that water is not pushed directly in front of the wind, but moves at about 45 degrees to the right of the wind's motion in the Northern Hemisphere, or to the left in the Southern, thanks to the Coriolis force, an effect of the rotation of the earth. As one descends in the water, the direction of flow continues to be deflected rightward (or leftward), until ultimately



a three-dimensional spiral is formed vertically in the water. The *net* transport of water, as explained by Ekman transport, is at an angle of roughly 90 degrees to the direction of the wind. In short, water, to a depth of a few hundred meters, is pulled directly off the coast—leaving room for

**About one percent of the ocean surface accounts for 50 percent of the fisheries catch worldwide.**

deep water to rise and replace the displaced water. (Want to know the nitty-gritty of Ekman transport? Check this web site: [ekman.sr.unh.edu/course/intropo/IPO20.dir/IPO20.html](http://ekman.sr.unh.edu/course/intropo/IPO20.dir/IPO20.html), which is replete with diagrams and messy formulas.)

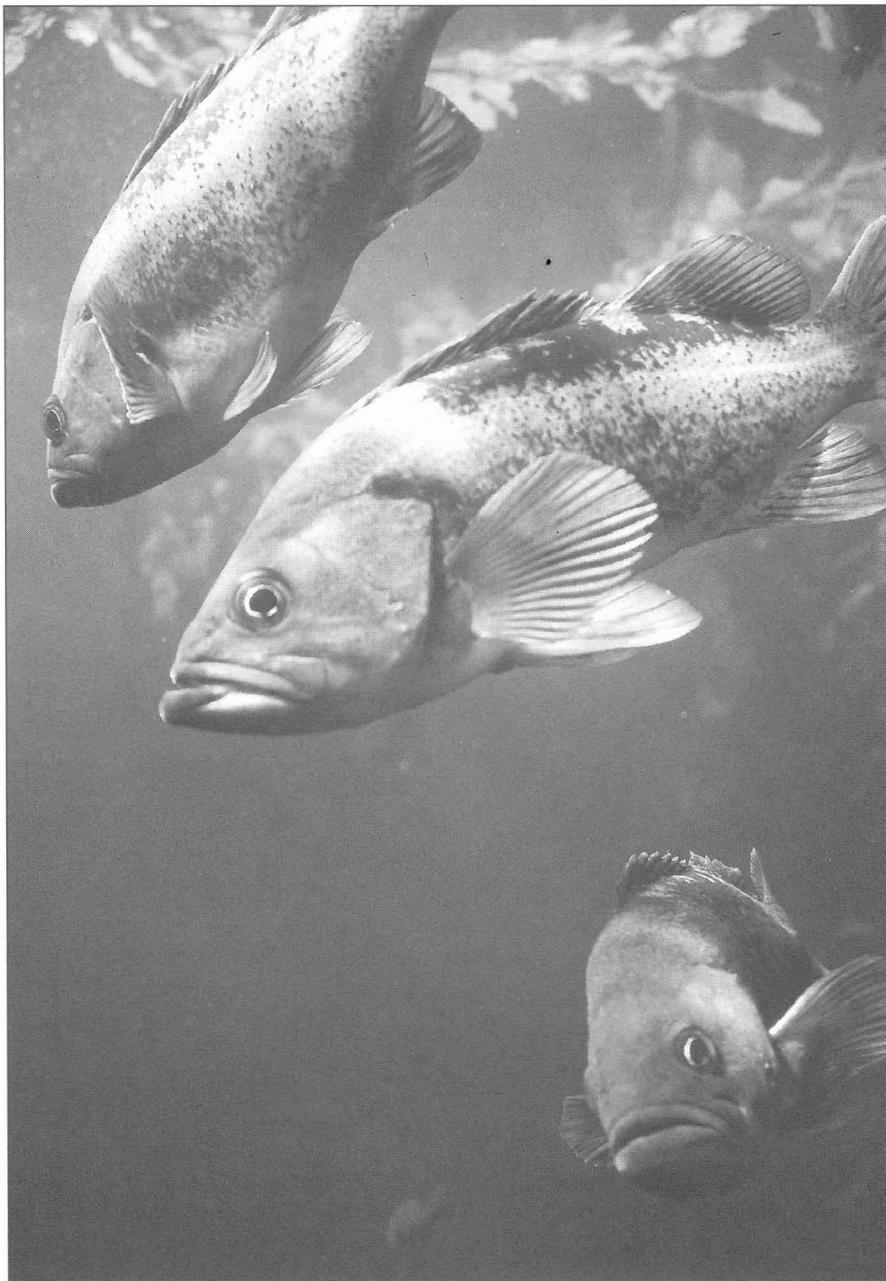
If you look at a map of the major cold ocean currents along coasts, you'll see that the California Current, for example, is sweeping past North America from north to south; water that is pulled to the right of this current is swept out to sea, leaving room for deep water to rise and take the warmer surface water's place. The same occurs off South America, where the Peru Current flows from south to north and the water is pushed leftward. High pressure zones off the areas of major upwelling appear to be determining factors in the upwelling process as well.

These areas of strong upwelling are, not surprisingly, associated with active fisheries. In fact, although they constitute only about one percent of the surface of the ocean, they account for some 50 percent of the catch worldwide. Let me repeat that, since it's taken me a while to get here: *About one percent of the ocean surface accounts for 50 percent of the fisheries catch worldwide.* For such a small area to be the haven for such productivity is, I think, mind-boggling. It also bespeaks the need to treat those areas with respect.

For one thing, the fact that fish exist in such concentrations may suggest a greater need for fisheries management and water quality monitoring in those areas, especially when reproduction occurs there—as in many species it does, because the larval animals are presented with such a bounty of tiny food morsels.

These areas are also often sites of dense human population: that's certainly true on the California coast. And with people come potential pollutants—fertilizers, sewage spills—that can disrupt nutrient balances in the water, stimulating the growth of aquatic plants, which in turn deplete dissolved oxygen. This isn't a problem in the open ocean so much as in estuarine wetlands, which often function as nurseries for many marine animals. The protection of these shallow wet areas is of the utmost importance.

Fortunately, humans are a weak match against such strong earth processes as Ekman transport and upwelling. We're unlikely, though hubris might tempt us to



KIP EVANS

try, to stop the flow of the winds or the currents, and so keep the cold water from rising and enriching the plant and animal life off our shores. The ENSO (El Niño–Southern Oscillation) phenomenon is much more able to disrupt upwelling, in South America particularly, by changing the depth of the uppermost layers of water—often with disastrous consequences for birds and fish.

But then there's global warming. . . . Could it be that our hubris will get the better of us yet? Let's just hope we're smart—or should I say wise—enough not to allow that. ■

*Anne Canright, a geographer, writer, and photographer, is a contributing editor of Coast & Ocean.*



ANTHONY SCOGGINS

# The Beauty and Danger of Sunset Cliffs

RICHARD RETECKI

**A** LONG SUNSET CLIFFS in the Point Loma section of San Diego you can stand 90 feet above the ocean watching a sunset as waves crash into cliffs and surfers bob in the water below. You can also descend to tidepools, pocket beaches, or into the water—if you have the stamina and are willing to take the risk.

The mudstone and sandstone cliffs are near-vertical in places, and are moving inland despite all efforts to stall geologic forces with seawalls and other armaments. Here and there, ropes have been anchored in the cliff face (who knows by whom) to help those brave enough to descend.

Surfers, carrying their boards, use the ropes to gain quick access to the water, for “when breaks are unfavorable at other surfing spots they are often good here,” says long-time local surfer Mick Gammon. Some other people descend in this manner as well—not always wisely.

Within three months last winter, three people died along Sunset Cliffs. Two fell (one may have been a suicide), and a third “we suspect was swept from the rocks in large surf conditions,” says lifeguard Lt. Nick Lerma. “Relative to Ocean Beach, the number of rescues at Sunset Cliffs is not great, but we do probably 40 or so a year.”

Sunset Cliffs Natural Park extends along

the bluffs for a mile and a half. It is very narrow for the first mile north to south, winding along the bluff edge by Sunset Cliffs Boulevard from Adair Street to Ladera Street, where it widens to take in some 50 acres inland and upslope. The cliffs beyond Ladera Street are deeply eroded. They descend in a series of ledges, dropping abruptly to the water from as high as 50 feet.

An article in the winter 1997 issue of *Surfer's Journal* names Lizard's Wall at Sunset Cliffs as a challenging practice area for climbers. "Surfing and climbing just sort of seem to go together," writes Chris Hubbard. "It's the same adventurous spirit to face raw nature and deal with it."

For more timid and less agile souls, there's another way down: a narrow path that traverses the cliff face. This writer, who does much better crawling through narrow, enclosed spaces than traversing dizzying heights, did manage that path—with much assistance. As we reached the small beach, a surfer who had led us down told us that the tide was on the rise and the sand we stood on would soon be under water. Then he paddled away, beyond Luscomb's Point, to the break. I looked up at the steep path and the clifftop 30 or 40 feet above us (and no railing!) and for a moment considered whether my will was up-to-date. With a lot of help, I made it to the top with the others—though I could have used a clean dry shirt when I got there.

There is also a stairway at the foot of the parking lot at Sunset Cliffs Natural Park, but "people have to have some kind of goat in their background to use it," says Mick Gammon, a surfer and San Diego County employee who would like to see access improved. At high tide, the rocks at the bottom of these stairs are under water.

Strolling along Sunset Cliffs Boulevard, one can enjoy fantastic ocean and sunset views at little peril to life or limb. But for an entire mile there is not one improved accessway downward. Rough trails lead to the water in several places, but they require attention and coordination. If an emergency occurs, rescue may arrive too late: there are no well-defined street entries and exits to the Sunset Cliffs area, a neighborhood of spacious and well-kept homes, so it is difficult for public safety personnel to respond as quickly as they can elsewhere.

Lt. Lerma says some people get stranded on cliffs, others in the water, and some on

boats that lose power in the surf line along this isolated stretch of the coast. "When there's large surf, as in the past winter months, surfers get caught, particularly at Osprey Point, a popular surfbreak that attracts experienced surfers, as well as some who are not as experienced as they think. They get caught in Clairborne's Cove, where there is no safe exit point."

The rewards of reaching the shore are many and varied. Wind and water action on the young, erodible sedimentary rock formations has created pocket beaches, sea caves, and small coves. "There are miles of beaches south of Ladera Street, as well as a beach at the foot of Hill Street," Gammon wrote in a letter to the Coastal Conservancy.

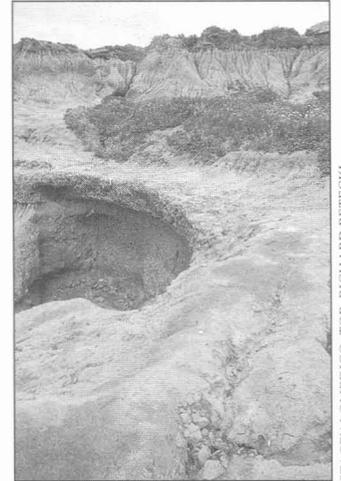
Lt. Lerma urges that any expansion of access include public safety measures, including lifeguards on the beaches of Sunset Cliffs. "At Ladera, a large rip current pulls right off the beach," he says. "If we put in more access, the whole dynamic here will change. We will add more mainstream people," who are not as adept at navigating coastal hazards as surfers are.

The unique mix of beauty and danger at Sunset Cliffs is part of the area's attraction. Recently a lengthy planning process has been completed, resulting in the Sunset Cliffs Master Plan. The Coastal Conservancy is working with the City of San Diego and local residents to study potential access sites and improvements. The hope is that within a year construction can begin on a new accessway down to the water.

At Sunset Cliffs, watching surfers bobbing offshore waiting for the right moment to take off, or watching a long beautiful sunset, the deepening twilight, the star-filled night, you can forget the noise of urban existence and fall in love with the world again.

At the same time, however, Lt. Lerma points out, no matter what is done to promote safety, "history has shown that if someone wants to go to the edge of a cliff and flirt with death, they will do it." ■

*Richard Retecki is a Coastal Conservancy project analyst.*



STACEY LOMEDICO, TOP; RICHARD RETECKI

**Opposite: Chris Hubbard traverses Lizard's Wall.**

**Top: Looking north from Luscomb's Point**

**Above: Eroding bluff**



# Can ITQs End Overfishing?

KAITILIN GAFFNEY

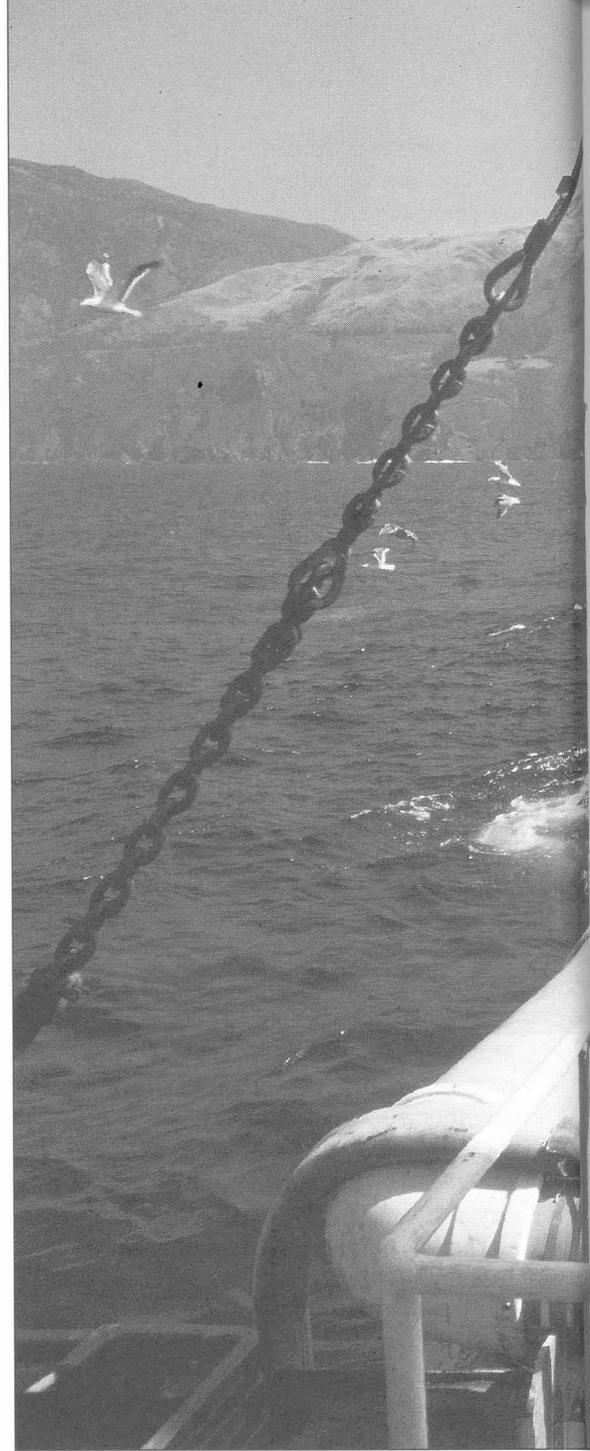
**C**ONVENTIONAL wisdom attributes the problems facing marine fisheries to the open-access nature of the resource. Because no one owns the fish in the sea, fishers have no incentive to conserve. The result, to use a phrase coined by Garrett Hardin, professor emeritus of the Environmental Studies Department at the University of California, Santa Barbara, is the "tragedy of the commons": users compete to get as much as possible, each for himself, thus inevitably depleting the resource all share in common. Attempts to manage the resource by traditional methods, such as restrictions on fishing gear and limited seasons, may only exacerbate the self-defeating competition. Fishers invest in bigger boats and more sophisticated gear in a race to catch as much as they can while the stocks last, thus accelerating the fishery's decline.

In the latest attempt to find a way out of this dilemma, some economists recommend that fish stocks be privatized via a system of transferable harvesting quotas. Such Individual Transferable Quota (ITQ) systems in effect create limited property rights to the fish in the sea, since only those who own a quota are allowed to fish. Advocates claim that ITQs ensure biological sustainability while simultaneously promoting economic efficiency.

The basic idea is this: After government fisheries biologists determine a sustainable

total catch level for a fish stock, the total is divided into ITQs. Each unit of quota entitles the holder to harvest a predetermined percentage of the total catch. Advocates argue that by giving fishers ownership rights to the resource, ITQ systems end the tragedy of the commons, instead fostering a sense of stewardship and encouraging conservation. Critics, however, point to issues that have emerged as such systems have been put into practice, and argue for caution.

Because ITQs can be bought and sold, market forces determine who participates in the fishery and at what level. It is expected, for example, that fishers with low oper-





ROLAND AND KAREN MUSCHENETZ

ating costs will buy ITQs from their less efficient competitors.

Described by some as the "emission trading program of the sea," ITQs are being promoted as a cost-effective management tool. They are gaining popularity, in this era of growing privatization, as an opportunity for government to step back and let the free market manage marine resources.

Currently, ITQs are not used in any California fishery. In 1995, the Department of Fish and Game considered adopting individual fishing quotas for the southern California sea urchin fishery, but dropped the proposal when it failed to gain industry support. At

the federal level, ITQ regimes are currently limited to the Alaskan halibut and sablefish, Atlantic quahog and surfclam, and South Atlantic wreckfish fisheries. During the 1996 reauthorization of the Magnuson Act, which governs federal fisheries management, Congress directed the National Academy of Sciences to study ITQs; it then enacted a four-year moratorium on new ITQ regimes pending the outcome of that study. A committee appointed by the Academy has held hearings around the nation and is currently developing recommendations regarding a national policy on ITQs. Its report is due to Congress in October.

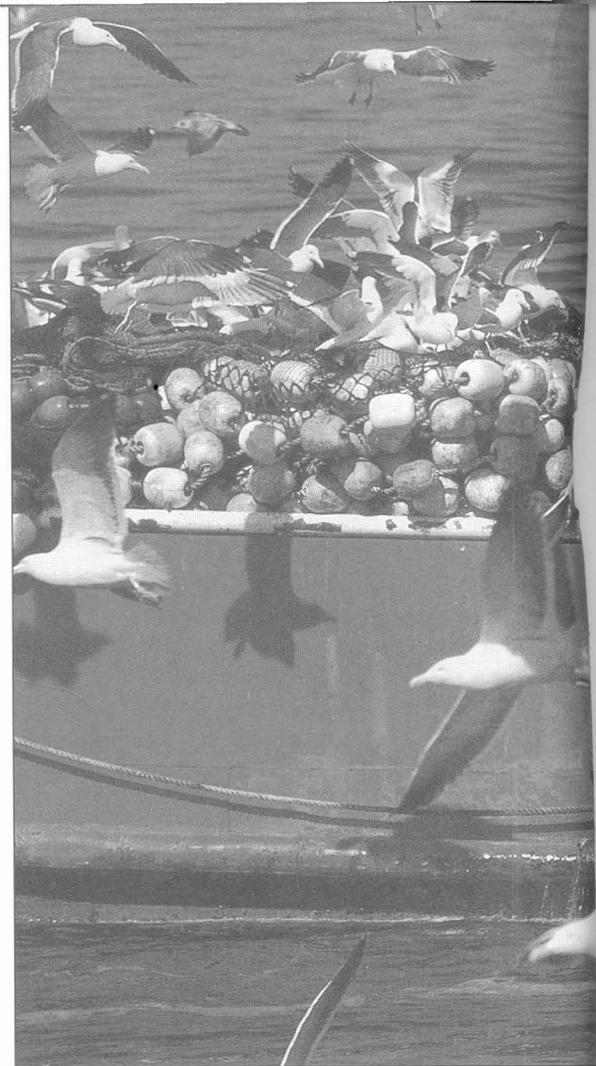
**Brown pelicans and gulls look for an easy meal as a net is set in Morro Bay.**

ITQ advocates have criticized the current U.S. moratorium as a political maneuver by Alaskan legislators concerned that ITQs might benefit the Seattle-based fleet over home-state interests. Local communities in southwest Alaska, however, argue that the allocation of halibut ITQs essentially rewarded highly overcapitalized fishing fleets that had put the resource at risk, while punishing communities that had fished sustainably for hundreds of years.

In fact, small local fishers were pushed out before the system was even in place. When the season was severely restricted, they could no longer compete with overcapitalized boats. It was not worth it for them to go out for two days: they only had small boats; the weather might be bad; it was dangerous. They therefore bowed out in the face of hundreds of big boats. Then, a few years later, ITQs were allocated based on a time period in which they did not participate. Because they had let their halibut fishing lapse, they were left out of the allocation.

## Pluses and Minuses

**A**LTHOUGH ITQs are the most recent trend in fisheries management and appear to be the tool of choice for many, much of the critical acclaim the system has received is based on theoretical benefits rather than actual results of ITQ systems. A review of ITQ implementation, both in the United States and abroad, suggests that Congress may be



right to approach ITQs with caution.

The benefits of ITQs, though still debated, are potentially significant. By guaranteeing fishers a right to harvest a share of the catch, the quotas provide a level of security that, in turn, promotes rational harvesting that benefits both fishers and consumers. There are positive impacts for both fisher and consumer as well. In Alaska's halibut fishery, the season was limited to two 24-hour periods each year before ITQs were introduced. Hundreds of vessels participated in the frantic "race to fish." Boats were filled dangerously beyond capacity as skippers tried to maximize catch during the short—but incredibly valuable—season. Now under ITQ management, the Alaskan halibut season runs from April 15 to November 15 each year: eight months. Longer seasons provide fresh fish for consumers for a longer period and allow safer harvesting conditions for fishers.

There is a downside to the system as well, however. ITQs have major socioeconomic impacts on fishers and the fishing fleet, encouraging concentration of fishing rights in fewer hands; they may be prohibitively expensive to administer; and they may fail



ROLAND AND KAREN MUSCHENETZ

Top: Sardine fishing along the coast of Baja California, Mexico  
Right: Captain Tim Sullivan watches squid flow into his boat's hold in Morro Bay.



FRANK BALTHIS, FROM FACES OF FISHING

to resolve—and, indeed, may aggravate—the waste of resources known as the bycatch problem.

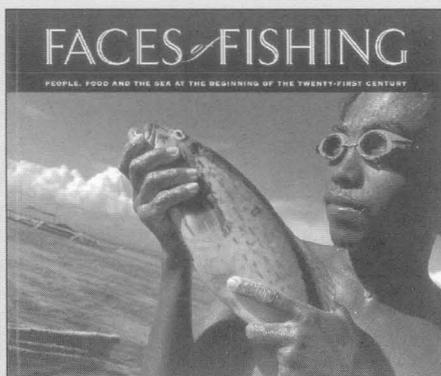
The initial challenge of ITQ management is allocation. Who should receive ITQs? Quotas are usually distributed on the basis of historical catch during a defined eligibility period, with the amount allotted to individual fishers designed to reflect the level of participation in the fishery during the designated period. Claims of unfairness and inequity may be inevitable. They may also be accurate. When New Zealand adopted ITQs, part-time commercial fishers were excluded from the allocation, and more than 2,000 people whose livelihood depended on fishing were left out of the system.

ITQs can cause changes in the structure of the fishing fleet as individual owner-operators sell their ITQs to larger-scale fishing companies and quotas are consolidated into fewer and fewer hands. When ITQs were introduced in Iceland, many fishers sold their quota and then leased it back, fishing for a percentage of the catch. Crew members who had traditionally been paid a fixed share of the catch had to accept only a

## An Urgent Message

**T**he message was loud, clear and shocking, a raw bolt from the planet that struck the heart of a human population that, until then, had only whispered the truth in the most abstract terms: We are outrunning our food supply. We have exploited every niche for agriculture and grazing and now we know the sea won't feed all of us forever. The ocean, it turns out, probably won't sustainably produce much more than ninety million metric tons of food for human consumption and animal feed a year no matter how much horsepower we throw at it. If we overfish, we will get less.

—*Faces of Fishing: People, Food and the Sea at the Beginning of the Twenty-first Century*, by Bradford Matsen (Monterey Bay Aquarium Press, 1997). In



powerful photos and compelling words, this 120-page volume offers a view of ocean conservation issues through the lives of people who rely on the sea for their food or livelihood. Available from the Monterey Bay Aquarium, 886 Cannery Row, Monterey, CA 93940-1085; phone: (408) 648-4800; FAX: (408) 648-4810; web site: [www.mbayaq.org](http://www.mbayaq.org).



share of the captain's share. Decreases in crew wages led to social unrest that culminated in national strikes in 1994 and 1995. In 11 years under ITQs, New Zealand's three largest fishing companies increased their combined percentage of total ITQ holdings from 25 to 55 percent, and ten companies now own more than 80 percent of all ITQs. Similar issues of ITQ concentration and changed industry structure are

reported from Nova Scotia.

As for the issue of cost-effectiveness, it is possible that ITQ systems may turn out to be prohibitively expensive to administer and enforce effectively. They require regulatory agencies to monitor each fisher's catch to ensure it does not exceed the allotment. And because fishers want to fill their quotas with the highest-grade fish possible, ITQs constitute an incentive for smaller or less valuable fish to be discarded.

## THERE MAY BE NO WAY BACK

**I**TQ SYSTEMS SHARE limitations with other management models. They depend on accurate and timely scientific research—which is sometimes impossible to come by. To set total catch at an appropriate level, scientists must know the population size and biologic characteristics of each species and must understand environmental factors that affect the species. This is no easy task. As one frustrated fisheries biologist noted, it's hard to get an accurate head count under water, for fish generally don't raise their fins when you call attendance.

Other management regimes use the total allowable catch concept too, but usually it's applied more loosely, for instance by corre-

lating the season length with the amount of fish that managers think is sustainable. If fishers increase their capacity, they might exceed the target total; if conditions are poor or the stocks aren't doing so well, the fish are harder to catch and total catch may be less. With ITQs the season is longer—maybe even lasting all year—so the total will likely be caught even if the stocks are dropping and harder to catch. Therefore, ITQs appear to be more dependent on good science, though all management regimes are clearly vulnerable to poor information.

New Zealand learned the importance of fisheries research the hard way in the late 1980s, when its most valuable fishery collapsed after catch levels were set too high. First discovered in the 1970s, orange roughy was subject to intensive exploitation in spite of the fact that scientists lacked even the most basic understanding of the species. New Zealand's orange roughy fishery was managed by ITQ. (In the Winter 1997-98 issue of *Coast & Ocean*, Wesley Marx described ITQs as a "promising management tool" and criticized Congress for delaying further use of ITQs in the United States. In a sidebar, he mentioned the orange roughy collapse, but did not state that it occurred under ITQ management.) Although the necessity of rigorous research is not unique to ITQ systems, the orange roughy example serves as an important reminder that ITQs have inherent limitations.

ITQs are not a panacea. Although they may prove a useful tool for fisheries managers, the jury is still out on whether the benefits they provide outweigh their costs. Caution in adopting ITQ regimes is further warranted because once they are adopted they may be practically irreversible: the fact that they create individual property rights means there would be enormous resistance to any attempt to abolish them.

The challenges facing fisheries, both in California and around the world, do not have easy answers. It is to be hoped that a legacy of the International Year of the Ocean will be an increased commitment to exploring a wide range of potential solutions to the management challenges presented by the sea and the coast. ■

*Kaitilin Gaffney is an environmental attorney in Santa Cruz, California. She spent 1997 studying New Zealand's ITQ system under a Fulbright Fellowship.*

## "Air Pollution Credits," and Other Precedents

**T**he premise of regulating limited resources by allocating tradable use privileges is not limited to ITQs. It has been applied in a variety of regulatory contexts from emissions trading to sale of water rights in the arid southwest. In an attempt to provide economic incentives for polluting industries to develop cleaner technologies, some cities in southern California have established tradable permits for air pollution, allowing polluting industries to buy and sell the rights to emit air pollutants. A similar system has been proposed to encourage water conservation.

# Caltrans Goes Wild —and Native



LISA OWENS-VIANI

**O**NCE PLANTED WITH water-guzzling exotic species that were difficult to maintain, many of California's state-managed roadsides now sparkle with bright orange poppies, sky blue lupines, and silver-green native grasses.

The switch to a wilder, less tended look did not come about overnight, nor did it come easily. As so often in cases of radical change, it took citizen pressure to convince the California Department of Transportation (Caltrans) to alter its roadside management practices, which "in the 1980s," according to Caltrans Landscape Architect Ralph Carhart, "took a hard, chemically-reliant, economics-driven approach."

When coastal residents in Marin, Mendocino, and Humboldt counties won an injunction preventing Caltrans from spraying herbicides along Highway 1, "we came to our senses," says Carhart. "We realized we needed a lot more tools in our toolbox to solve problems in an economic and safe way." Until then, "safe" had meant ensuring visibility and reducing fire hazards. Now "safe" also came to mean reducing worker and community exposure to herbicide spray.

At about the same time, the California Coalition for Alternatives to Pesticides and other citizen groups, aided by the Sierra Club Legal Defense Fund,

Plant drawings by Margaret Warriner Buck, from M.E. Parsons, *Wildflowers of California*, 1897. From left to right: suncups, zygadene, soap-plant, blue-and-white lupine

threatened to seek a statewide injunction against Caltrans unless it agreed to complete an Environmental Impact Report (EIR) on the impacts of its maintenance programs. Caltrans agreed to do so, examined several approaches to vegetation management, and in August 1992 committed to establishing an integrated pest management program that would reduce herbicides by 50 percent by the year 2000 and 80 percent by 2012.

The agency began to implement the new practices that same year, and Carhart says things are on target so far. Instead of routinely spraying herbicides to reduce fire hazards, maintenance workers now analyze each site before deciding whether to apply chemicals. "We only spray where we absolutely have to," says Carhart. "We've also decreased the width of our spray strips, and in many areas we no longer spray at all. And we use a lot more mulch." Caltrans also came up with a "smarter" shoulder design that provides more of a buffer zone between the road and roadside vegetation. The new shoulder includes a flat-

ter berm that is safer than earlier designs, acting as a barrier between muffler sparks and dry vegetation.

To prevent erosion, Caltrans has begun to sow wildflowers and native grasses rather than relying on invasive exotics. Instead of ice plant or African daisies, wherever possible, the agency now plants native shrubs and trees like ceanothus (wild lilac), elderberry, oak, and toyon. George Hartwell, wildflower and native vegetation coordinator with the Caltrans Office of State Landscape Architecture, says these plants save money and time. "I'd get laughed out of the front office if I argued for natives on their ecological value," he says. "But when I explain that native trees, shrubs, and wildflowers thrive on the natural rainfall we receive and have aesthetic appeal—that people drive for miles to see wildflower displays—they start to listen."

But is it simple to establish and maintain wildflowers and native plants along highways? Not at all. It was far easier to blast the roadside with herbicides. Many site-specific

choices have to be made now. Carhart and Hartwell agree that the key to success is giving native plants a head start and helping them to outcompete invasive weeds. This can mean extensive maintenance in the first few years.

Caltrans uses a combination of techniques to help the natives along, including hand-pulling weeds, mowing, herbicides, and biocontrols. Some of this work is labor-intensive and dangerous for workers, Carhart says. The department is also considering selective use of controlled burns to destroy exotics and encourage native grasses and wildflowers to reseed. Burning requires special permits, however, and smoke can reduce visibility for motorists.

Hand-weeding is done by Caltrans maintenance crews with help from state penitentiary probationers and inmates, who in fact perform about half of Caltrans' maintenance work. In some areas, citizen groups and private sponsors adopt and maintain wildflower sites as part of the Adopt-a-Highway program.

Caltrans is also working with native plant experts to complete a database of California's 300-some native grass species. Its data fields (more than 165) include historical geography, soil type, elevation, and species characteristics. This information will help Caltrans select, establish, and maintain native grasses. Frank Chan, cohead of the Native Grass Database Group, says that eliminating existing weeds and their seeds before planting will be critical.



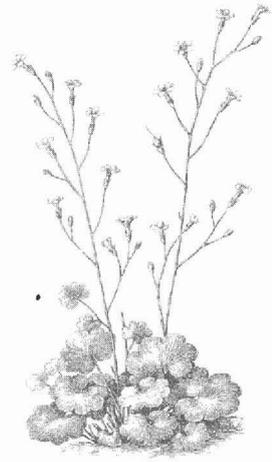
Shooting star

He says native grasses are just as good—if not better—at controlling erosion as introduced grasses, historically thought to be the best option. “We’re seeing now that was an erroneous assumption,” he explains. “These native grasses have that same potential—there is such a range of conditions where they are particularly valuable.”

Protecting native grass and plant communities is at the heart of Caltrans's new “botanical management area” program. A team of consultants is inventorying every plant on each of 12 study sites throughout the state to come up with site-specific management plans that will, as Hartwell puts it, “encourage propagation and revegetation of native plants while effectively combating invasive weeds.” The first of these sites to be established, the Vina Plains Wildflower Demonstration Project, extends 4.5 miles along Highway 99, from the Butte-Tehama County border northward beside the Nature Conservancy's 2,000-acre Vina Plains Preserve.

So far, all designated botanical management sites are in rural settings. Along Highway 101 in Del Norte County, the uncommon Columbia lily lives alongside native rhododendrons. At State Roads 16 and 20 near Colusa, showy natives include tidytips, lupines, and goldfields. On Highway 58 in San Luis Obispo County, along Shell Creek, a spectacular wildflower display takes place each spring. On Highway 168 in Kern County near Fresno, in an area managed by the Bureau of Land Management and the U.S. Fish and Wildlife Service, the endemic *Carpenteria californica* can still be seen.

“There are some magnificent remnant plant communities even in urban areas,” also says Hartwell. “If anyone knows of such a site and it meets certain criteria they can nominate it for inclusion.” (Plantings must not obstruct drivers' ability to see the road, for example.) Already many urban roadsides—even Highway 80 in the San Francisco Bay Area—have been planted with wildflowers, including large patches of a stunning rose-colored clover. But, Hartwell says, many cities



Mist-maidens

still want formal landscaping that looks like “America's front lawn.” While Caltrans tries to be responsive to those desires, its landscape designers now urge roadside managers to use natives wherever possible. “Why use a nonnative when you can just as easily plant a native?” Hartwell asks. Ralph Carhart points out that for years, the only thing people found attractive was irrigated landscaping. “But we’re finding that people are much more tolerant of perennial wildflower meadows and native grasses than we thought.”

Somewhat surprisingly for an agency in the business of altering the landscape, Caltrans's new practices are designed to disturb roadside environments as little as possible, to the extent that maintenance crews now often collect native seeds before work begins at a site, so they can later try to reestablish what was there.

Carhart admits that “there's a certain inertia you have to overcome” to change long-established management practices. He, Hartwell, and others are making decisions that will affect California's roadside environments for years to come. But can these well-intended but limited efforts make a difference? “If you preserve or create even a small area, you're providing a native plant for a native pollinator or an access corridor for wildlife,” says Hartwell. In a state where urban sprawl and freeways have become a way of life, perhaps little bits of natural are better than none at all. ■

*Lisa Owens-Viani lives in Richmond and writes on environmental topics.*

# Can We Protect Wild Abalone from Farmed Abalone?



WESLEY MARX

IT WAS TO BE A WIN-WIN situation for California's marine resources. The aquaculture industry would raise the world's largest abalone—the red, native to our local waters—to help meet the

world's expensive taste for this succulent snail. At the same time, these growers would supply young abalone to be transplanted to the wild, to help replenish severely depleted stocks. Abalone aplenty!

Not quite. Instead of a savior, the cultured abalone has turned into a threat to California's wild abalone. It has become another example of how aquaculture, if not properly managed, can prosper at the expense of wild stocks.

There are now about a dozen abalone farms along the coast between Crescent City and Carlsbad. The abalone are raised in tanks filled with water pumped from the ocean. They are fed primarily with kelp harvested in nearshore waters. In the late 1980s, farmers noticed that the shells of some of the cultured abalone were deformed: rather than growing outward, they were growing upward in a domelike manner that stunted the development of the animal inside. The deformed abalone turned into a major economic liability.

Sold live in the shell, abalone fetch a premium price (up to \$70 a pound) in Japan, a prime market for California growers. But Japanese buyers do not appreciate misshapen shells. Some growers destroyed their deformed crop and discharged some of the shell debris into coastal waters. Others took a lower price.

What was deforming this prized shellfish? At first growers blamed a mud worm that can burrow into the



CARRIE CULVER



CARRIE CULVER

shells. Then in 1993 an expert on marine worms, Dr. Kirk Fitzhugh of the Natural History Museum of Los Angeles County, identified the culprit as a sabellid, a marine worm that had never before been recorded in California. The tiny animal's native home was traced to South Africa. How did it wind up in abalone tanks a continent and an ocean away?

Growers routinely experiment with abalone species from around the world in an endless search for faster-growing, more delectable products, and the worm had hitchhiked on abalone brought from South Africa. Unbeknownst to anyone, its population literally exploded among the densely concentrated captive abalone. The hosts' shells were riddled with the tubelike homes of the multiplying marine parasite. Growers in California routinely exchange seed and adult abalone; such exchanges ensured the worm's rapid spread. By now all farms in California, as well as in Oregon and northern Baja California, have become infested.

The fear among marine biologists and others now is that this parasite might infest wild abalone stocks,

including the giant red. These stocks have already been severely damaged by a series of man-made and natural impacts: overfishing, the recovery of abalone-loving sea otter herds, and a natural bacterial disease called Withering Syndrome. The last thing these stressed-out stocks need is a debilitating parasite. Ominously enough, the worm has also infested small native marine snails in an intertidal area adjacent to the Abalone Farm in Cayucos in central California, where deformed shell debris has been discharged.

With assistance from the California Department of Fish and Game and marine biologists at the University of California, Santa Barbara, the farm has undertaken an intensive cleanup of shell debris and infested snails from the impacted area. Armand Kuris, a marine biologist at UCSB, is cautiously optimistic that this effort will contain, if not eventually eliminate, this particular infestation.

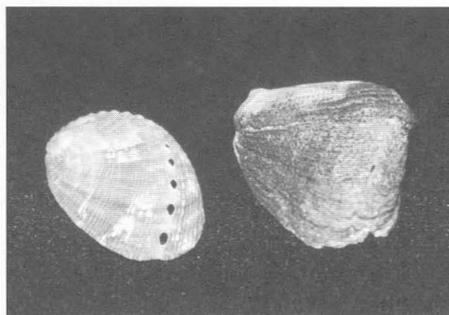
To further reduce the risk to wild abalone stocks, the Department of Fish and Game has temporarily banned out-planting of cultured abalone to replenish wild stocks. Fish and Game is also

requiring growers to develop and implement clean-up plans to eliminate the infestation in their facilities. Because no biological or chemical agent has been found that can eliminate the worm without also killing the abalone, growers must continually monitor their stocks and destroy infested animals. Fish and Game requires that discharges be screened to prevent more worm-infested debris from reaching the marine environment, and that abalone slated for exchange between growers be inspected and certified as worm-free. Such steps have helped to control this opportunistic pest, but they have not eradicated it. Workers who handle infested abalone in one tank can transfer worm larvae on their hands to another tank. Seabirds and raccoons, who regard tanked abalone as fair game, can also carry the worm. The spread of this parasite to wild stocks remains an ever-present threat.

Despite the ongoing battle with the pest, the California abalone industry is still managing to expand. In 1996, growers produced a record 292,416 pounds, worth some \$3 million. Indeed, the severely depleted status of

wild abalone stocks helps to guarantee the financial viability of the operations. In 1997, after catch limits failed to arrest wild abalone declines, the California Legislature imposed a statewide ban on all commercial harvesting until a recovery plan is developed and implemented. Fish and Game biologist Peter Haaker believes that this ban will not be lifted for a decade or more. One effect of the California ban has been to increase pressure on Mexico's remaining stocks, both from legal harvesters and from poachers.

As abalone farms expand, so does the risk of further environmental run-ins. To raise more abalone, you need to harvest more kelp. Kelp in the wild serves as food and habitat for wild abalone as well as many other species. How much kelp can you take from the wild before



Healthy (left) and sabellid-infested cultured red abalone

you begin to affect its key ecological role? Ed Cooper, a diver and member of the Monterey Bay National Marine Sanctuary Advisory Council, is concerned that kelp harvesting by growers is already disturbing sea otters, a popular attraction along Monterey Bay. The

growers contend that kayakers and scuba divers disturb otters more.

With coastal aquaculture sites becoming scarcer, operations have begun to move offshore, raising the ante on accidental introductions. With these offshore operations, where abalone are raised in cages rather than tanks, currents can quickly disperse pests, known or unknown, throughout the marine system. Some growers display a rather dim appreciation of their potential impact on the marine environment. In California, two growers raise abalone in nearshore cages. This year, one of them moved cages to a site in Tomales Bay without even bothering to get a required permit from Fish and Game or to present proof that his crop was worm-free.

There is an increasing concern worldwide about the spread of pathogens from shrimp and salmon farms. The World Watch Institute in Washington, D.C., recommended recently that all offshore aquaculture operations be banned until a global system is in place to insure pathogen-free exchange of aquaculture products. Australia is helping to lay the groundwork for such a system. It has established a research center devoted to detection of marine pests and their biological control. In the United States, the National Sea Grant program has funded similar research, including investigations by marine biologists at the University of California, Santa Barbara.

In California, the problems in the abalone farms have stretched thin the resources of the Department of Fish and Game, which is responsible both for regulating this industry and for protecting wild stocks. Its staff must now devote more time and effort to inspecting abalone farms while also stepping up activities to prevent lucrative poaching of wild stocks to ensure their recovery. At the same time, the ban has deprived Fish and Game of a prime source of revenue: income from a tax on commercial landings of wild abalone. This is a dilemma common to marine management throughout the world, and it will continue to grow until citizens back up concern for marine resource protection with the necessary funds. There are no magic solutions. ■

## Can Abalone Survive Poaching?

Abalone poaching is so lucrative that it threatens to undermine the recovery of abalone stocks despite the current ban on commercial harvesting. The stricter the limits are on commercial harvest, the higher the price is on the black market and the greater the incentive for illegal take. Until it was caught in 1994, a band of poachers was taking some 20 tons of abalone a year, mostly from California's north coast. This illegal harvest was worth about \$2 million when exported to Asia.

The Department of Fish and Game has created a Special Operations Unit that specializes in "sting" operations on poachers. An undercover agent poses as a recreational diver along the north coast, where recreational divers are still allowed to take four abalone a day. The agent proudly exhibits his catch to inquisitive souls until, sooner or later, someone offers to buy this catch on a regular basis. An illegal transaction is arranged and caught on videotape. The buyer faces a \$30,000 fine and up to three years in prison.

Some buyers, including seafood markets and restaurants, are careless. They are supposed to keep records that identify their sources, such as receipts that show their abalone came from farms or from foreign exporters. Asked for his receipt for abalone, one seafood operator produced a check written out to cash. Today his mail is being forwarded to a state prison.

A more sophisticated abalone ring, based in Los Angeles, used to "launder" abalone illegally procured from the north coast by mixing it with abalone imported from Mexico. Members of this ring are now serving prison time. They also face prosecution for federal wildlife violations.

Despite this enforcement, poaching persists, for those who engage in it know that Fish and Game lacks the resources to patrol 1,100 miles of coastline, including the rugged north coast. To help out, a group of recreational divers has formed the Sonoma County Abalone Network. "We became outraged after seeing underwater reefs stripped clean by abalone poachers," member Rocky Daniels explained. The Network has posted signs stating that Fish and Game is willing to pay rewards of up to \$1,000 for tips on potential poaching. It also helps Fish and Game collect catch data on the recreational abalone harvest. If these data show that recreational divers are expending more effort to catch less abalone, the current recreational take may have to be reduced and enforcement efforts stepped up. Otherwise, recreational abalone divers, too, may lose their right to harvest this succulent sea creature.

—Wesley Marx

## IS THERE A PLACE FOR DOGS IN URBAN PARKS AND ON BEACHES?

# Dog Days in the City

RASA GUSTAITIS

**S**OME OF THE luckiest dogs in the world run on Carmel Beach, romping as they please as their dotting owners look on. When David E. Clark, a surveyor and musician, joined this crowd, he discovered “a subculture of dog walkers who love watching dogs be happy. . . . I always suspected a community here, and I was right,” he writes in his book, *Gods of Frolic: Dogs of Carmel Beach*, “It just took a dog to grant me entrance.”

His 60-page self-published book of photographs and dog biographies started out as a Christmas present. But so many people asked for a copy, he says, that he printed 250, then more. To his surprise, it's now in local bookstores, and the third printing is 2,500

copies—once again showing that many people love dogs.

How different the story in other coastal cities, where dog walkers chafe under leash-law restrictions. With more and more humans using parks and beaches for an array of activities, and more and more wildlife species losing habitat, canine opportunities are shrinking. More dogs come, more piles of droppings are left behind, and more people complain, prompting cities to enforce leash laws or adopt new restrictions.

### DOG OWNERS UNITE

**M**ANY DOG WALKERS behave much like parents at playgrounds. They tend to cluster in groups, admiring, rebuking, exchanging stories and advice. When someone gets a \$50 ticket because an officer fails to understand a pet's need to run free in a “No Dogs” or “Dogs On Leash” area, the victim gets sympathy. So it was probably inevitable that dog owners would begin to organize, form networks, and lobby for more leash-free parks.

In Venice, Los Angeles, as in several other cities, a police crackdown provided the spark. People used to ignore the long-standing prohibition against dogs



on sand. “Everyone would go out with a cup of coffee and run their dogs before they went to work,” says Daryl Barnett, who lives by the beach, “until we were totally inundated with law enforcement.”

True, “there was a problem with picking up,” she admits. “The lifeguards complained.” Police gave advance warning, then made good on it. After collecting several \$77 tickets, Barnett and friends founded a group, Freeplay, to campaign for “an area for dogs to run as long as people were responsible.” With the help of City Councilmember Ruth Galanter, an enclosed park near the beach has already been secured, the first dog park in west Los Angeles. “Some good came out of [the crackdown],” says

PHOTOS BY ALAN S. HOPKINS



Snowy Plover



Barnett. "People are picking up much more now. And dog owners are so grateful to have Westminster Park, they come from an hour's drive away."

Dog activist groups have sprung up in La Jolla, Huntington Beach, Santa Barbara, San Luis Obispo, Redwood City, Half Moon Bay, Berkeley, San Francisco, and elsewhere along the coast. They are campaigning for more space for dogs and also encouraging more responsible dog ownership.

Santa Barbara's Dog Pac was organized after the city "hired some patrol people and started giving tickets," said member Kristi Solberg. The city has 53 parks, but none allowed leash-free dogs, she said. The Dog Pac succeeded in winning permission to unleash pets in Los Positas Park and, at least for

now, to keep them unleashed in the city's recently acquired Douglas Family Preserve (the former Wilcox property), which has long been a popular place for exercising and training dogs.

## PROTECTING PLOVERS

**I**N SAN FRANCISCO, recent trouble has been blamed, in part, on a rare small bird that roosts and feeds right in the middle of Ocean Beach, where dogs (and people) have run happily unleashed for years. In 1993, the coastal population of the western snowy plover was listed as threatened under the federal Endangered Species Act. It is believed that only 1,200 to 1,600 of these shorebirds remain, and five percent of them use this beach

**Arf! Arf! It's so fun to chase all these birds.**

most of the year. The plover avoids predators by remaining motionless. Its coloration and behavior make it "virtually undetectable" on a broad sandy beach, according to the U.S. Fish and Wildlife Service.

Looking for ways to prevent this species' extinction, the Golden Gate National Recreation Area (GGNRA) fingered free-ranging dogs. A study, together with expert advice, indicated that of all forms of disturbance, including beach walkers and joggers, dogs were the most serious. A person or vehicle can pass within a dozen feet without causing a plover to move; if they come too close, it usually runs a

# A DOG OWNER'S COMPLAINT

ANDREW J. MOORE

I HAVE TO ADMIT THAT I BREAK THE LAW. I do it almost every day. In the mornings and evenings I take my dog to one of San Francisco's parks, keeping her on leash as we walk through parking lots and picnic areas to a trail or road where cars won't bother us. I then reach down and unsnap the leash—and in so doing, I violate the law.

As I walk, throwing balls for her to retrieve (sort of), I enjoy the fresh air and views of ocean, trees, meadows, or dunes. Other people walk by, with or without dogs, and some stop to strike up a conversation. "How old is your dog?" "She's so pretty." "Can I pet her?" I really like to do this. It's fun, we meet people, and it's good for my health, for she compels me to get out and walk. How unfortunate that my form of urban recreation makes me a criminal.

Almost none of San Francisco's parks allow dogs to walk off leash, and the few that do are often so badly maintained that they aren't worth visiting. I used to go to an off-leash park not far from our house, but after my dog cut her foot on broken glass there twice within a month, I started to take her to parks where leashes are required; these are better maintained. So far I have managed to avoid a ticket. Many of my friends haven't been so lucky.

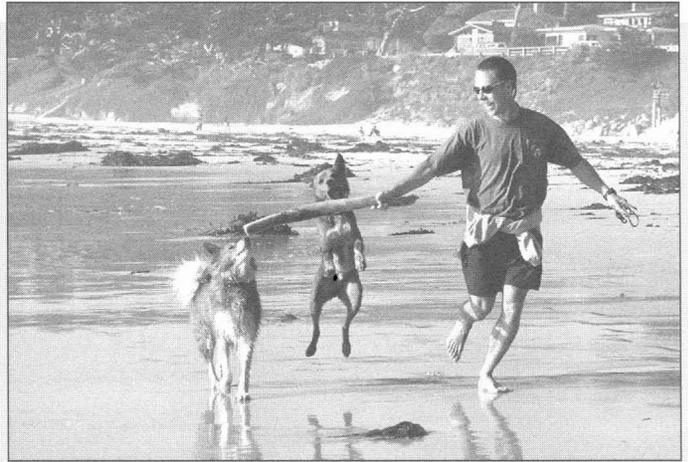
In the last two years, leash rules have been imposed on most of the parklands within the city where dogs used to be allowed to run free. Most of these are in the Golden Gate National Recreation Area (GGNRA). When dog walkers asked why, they mainly heard two reasons: dogs bother people, and they are destructive to native animals and plants.

There are *at least* 100,000 dog owners in San Francisco, and some of them became irate enough to revive the San Francisco Dog Owners Group (SFDOG), a long-defunct lobbying organization, with the goal of getting the new restrictions rescinded, except where endangered species protection is at stake.

We also decided to address the issue of irresponsible dog ownership, realizing that the actions of a few people often cause problems for everyone. SFDOG recommends strictly enforced fines for not cleaning up litter, including dog droppings; strongly worded warning signs; placement of plastic bag containers in parks; park cleanup days by local dog owner groups (SFDOG leads them monthly); control of dogs to prevent digging, bird chasing, and other destructive behavior; and proper dog care, including adequate exercise—off-leash exercise.

Some people who don't own dogs will say: "What's your problem? You can still exercise your dog on leash in the parks." They don't understand that dragging (or being dragged by) a dog on leash is definitely not exercise for your dog, and definitely *not* recreation for the owner. Even if your dog is well trained and stays glued to your left knee, such a walk, by my definition, is not recreation. It's neither relaxing, refreshing, nor a form of play.

The controversy about leash laws at San Francisco's Ocean Beach has been cast in the media as a conflict between protectors of the snowy plover, which rests and feeds on the beach, and selfish dog owners who don't care about this threatened species.



DAVID E. CLARK

Never mind that horses and people are still allowed to walk around snowy plover sites; and that the GGNRA also banned off-leash dogs in the Presidio, at Land's End, and in Fort Miley, which are not plover sites. I am willing to abide with the leash law where plovers are present, even if I am not convinced that it will help this rare bird.

As to native plants, they can't survive in an urban landscape without a lot of help—dogs or no dogs. They are extremely vulnerable to invasive exotic plants, pollution, trampling, and other human impacts, as well as loss of the natural systems that enabled them to flourish.

Dogs off leash do create some problems. They annoy some people, scare others, and could even knock a person over (although in 30 years of dog walking I have seen this happen only once). Some dogs chase birds, causing them to take flight, some dig, and some run off the trail, stepping on plants. They also produce particularly obnoxious litter that some dog owners ignore.

But don't bicyclists, horseback riders, skaters, joggers, and even golfers also annoy some people? A skater or bicycle rider can knock you over, or at least scare you, appearing suddenly from behind as you stroll along a path. Some children chase birds, and many people who can't tell a dune tansy from an iceplant also walk on plants. Irresponsible people leave food wrappers, soda cans, and other litter in parks. Soccer fields and golf courses are maintained with fertilizers and pesticides, which may degrade water quality in nearby lakes and streams. They also remove from general public use large sections of what could be multiuse parklands. Can't we try to work on the problems that degrade urban parks more creatively than by leashing dogs?

I am talking about *urban* recreation. We have every right to expect to enjoy wilderness activities, including wildlife watching, without serious intrusions on the natural environment—but not in a city. I want to be able to keep walking my dog in my city, sometimes letting her romp and have a good time, without worrying about getting a ticket. For me and thousands of others, to watch a dog do what it likes best is to observe sheer joy in action. Sharing this joy with a creature that has been bred for thousands of years to be my companion gets my mind completely off the toil of life, allowing me to refresh my spirit, improve my health, and, most important, play. In other words, it's my recreation.

*Andrew Moore, who has lived in San Francisco for many years, is a founder of SF Dog. He is devoted to his dog, and also likes to backpack in the wilderness and study natural history.*

short distance and settles again. But at the approach of an unleashed dog—a domesticated predator that, out of curiosity or instinct, will chase perceived prey—plovers fly off.

Long known for its tolerance of dogs “under voice control,” the GGNRA began to enforce a leash regulation within the 2.2-mile stretch of beach used by plovers. This still left areas at both ends of this 3.1-mile beach open to dogs under voice control, as well as the clifftop area of adjacent Fort Funston, much of Philip Burton Beach, and two other beaches in the city. But the hackles of some dog walkers rose, to the point that one animal advocate urged that people protest by refusing to leash dogs in the plover area. He argued that the GGNRA had no firm scientific basis for its new policy.

At about the same time, the GGNRA reviewed policies elsewhere in the city. Mindful of its mission to protect natural resources while providing for recreation, it began to enforce leash requirements in other places where dogs had run free either because no leashes had been required or because requirements were not enforced. All this prompted dog walkers to organize in protest. A widely shared point of view is that of Andrew J. Moore, of the San Francisco Dog Group (SFDog), who freely admits that he violates leash regulations because he believes that his dog’s well-being, as well as his own, requires it. (See p. 32.)

Some dog-less people, meanwhile, take the opposite view. “Dogs have use of most of the parks of the city. It’s ridiculous that there aren’t places for people to go without finding dogs,” says Alan Hopkins of the Audubon Society. “A lot of parks just reek in the summer because people who bring dogs aren’t responsible.” The sight of dogs also tends to bring frowns to the faces of some volunteers who have been working to restore native plant communities in the GGNRA.

Some people continue to let their pets explore snowy plover territory, seeing the \$50 tickets they get simply as the luck of the draw. But Field Ranger George Dugerian of the GGNRA has found that most willingly comply when

they realize that they can help birds survive by leashing their dogs.

“Shorebirds are limited to a narrow area where things wash up that they can eat,” Dugerian tells people, offering a look through his binoculars. “Every wave brings in food.” Not just plovers, but other shorebirds too must eat and rest. Although dogs seldom catch birds, they flush them, forcing them to burn energy needed for long migrations. Dugerian figures that about half the dog walkers now keep their pets leashed in the plover area. Biologist Daphne Hatch, however, who conducted the plover study, guesses 20 percent. “The rangers are in uniform,” she points out.

Dog advocates have recently gained ground in San Diego, but had no luck in Oceanside, where dogs are banned from beaches. Residents of a 550-unit beachfront condominium complex where no pets are allowed prevailed in opposing a proposal for opening a 500-foot beach strip to dogs.

In Half Moon Bay, San Mateo County, Barbara Judge of the Coastside Dog Club says that unlike other groups, “we do not want to be political activists.” Though the group started as an effort to win more space, it now focuses on promoting “responsible ownership and good canine citizen-

ship.” This dog club recently held its second annual Doggy Day, with a veterinarian present to offer vaccinations, and intends to participate in setting up and maintaining a dog park on the ocean side of Highway 1. “We don’t want to force ourselves on the community and have animosity from our neighbors,” said Judge.

In many urban parks and on beaches, dog owners easily get away with being scofflaws. In San Francisco, only nine animal control officers enforce leash laws and respond to calls about raccoons in basements, cats in trees, wild birds in someone’s kitchen, reports of neglected animals, and other emergencies. Dogs that do no more than run off leash are not a priority. “Enforcement goes in cycles,” says Captain Alan Kerstein of the Los Angeles Police Department. When the complaints build up, agencies respond. Park officials say dog advocate groups are helpful in promoting responsible behavior among the human companions of dogs.

In the end, much depends on increasing awareness of others’ diverse needs, be they humans or other creatures. “I had a dog, and I used to take it to the Palo Alto Baylands and let it run around in the pickleweed,” says Hopkins. “Would I do that now? No. It’s an educational process.” ■



DAVID E. CLARK

# Coffee for the Birds

HAL HUGHES

**Y**OU KNOW ABOUT latte and mocha and cappuccino; Kona coffee, Columbian, and Sumatran; tall double low-fat, soy milk, high-caffeine depth charges. And you probably realize that organic coffee is an option. But chances are you don't yet know about shade-grown coffee.

Shade-grown coffee is not a new kind of coffee. It is simply coffee that is grown the traditional way, with other shrubs under a canopy of trees. The shrubs and trees provide habitat for many bird, mammal, and insect species—habitat that is especially important in areas where the forest is disappearing to logging or development. "In many areas where deforestation

is a fait accompli, shade coffee farms provide a refuge for many forest-loving birds and other organisms," according to a 1996 report, "Coffee, Conservation, and Commerce in the Western Hemisphere," by the Smithsonian Migratory Bird Center and the Natural Resources Defense Council (NRDC).

In the last twenty years, many of these traditional farms have been replaced by treeless monocultural operations that grow coffee in full sun and rely on chemical fertilizers and pesticides. At least 40 percent of coffee-growing acreage has been converted to "technified" plantations, as they are known in the coffee-growing regions of the Americas, according to the above



Above: Broad-tailed mot-mot

Below: Yellow warblers on nest



PHOTOS THIS PAGE: CORNELL LAB OF ORNITHOLOGY

report. Meanwhile, surveys have shown steady declines of songbird populations—as much as 25 to 50 percent for a few species that winter in Central and South America's coffee regions. Recent studies by the Smithsonian Migratory Bird Center found up to 180 species of birds on a single shade-coffee plantation, while full-sun plantations had a few dozen or less.

In response to such alarming information, the Bird Center and other bird-related organizations have launched a campaign aimed at conserving bird habitat by promoting consumer demand for shade-grown coffee.

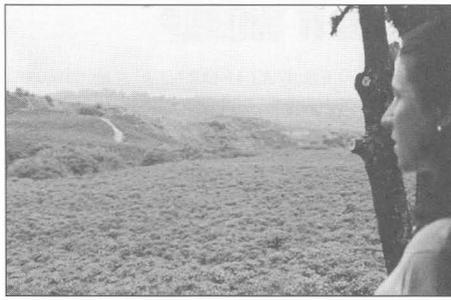
## Sorting Out the Labels

**T**HE CAMPAIGN IS STILL in its infancy. Sun-grown coffees dominate the world market, and most supermarkets sell only the cheaper sun-grown varieties. Among specialty coffees, "organic coffee" accounts for just one or two percent of

the \$5 billion worldwide market," states the Smithsonian/NRDC report. "However, organic coffee currently exhibits the fastest growth among specialty coffee types." The U.S. gourmet coffee market more than doubled between 1990 and 1995.

Organic coffee is not necessarily shade-grown in the traditional sense, nor is shade-grown coffee always purely organic. "If it's organic it almost assuredly has tree cover," according to Russell Greenberg, director of the Bird Center, but the companion trees and shrubs may not be as diverse. And although shade farmers rely on natural predators to minimize pest problems, they may occasionally also use some chemical pesticides. Bird advocates are still working to sort out these distinctions and arrive at common criteria. They hope that "shade-grown coffee" will do for songbirds what "dolphin-safe tuna" did for dolphins. Meanwhile, a consumer niche for the product is developing.

Sustainable Harvest, an importer based in Emeryville, deals only in shade-grown coffee, supplying beans to roasters and distributors including Thanksgiving Coffee, of Fort Bragg, which works with the American Birding Association to produce Song Bird Coffees. These are sold in bird stores, and are becoming available in some specialty coffee shops. Sustainable Harvest is also the source for the organic Aztec Harvest coffee used in Ben & Jerry's Ice Cream. The Smithsonian Bird Center and the National Audubon Society are collaborating with the Eco-Organic Coffee Company to market Coffee Audubon. Wildbirds Unlimited, a national franchise, has contracted to carry shade-grown coffees. "Bird enthusiasts seem to be willing to put their money into an issue they care about," says David Griswold, president of Sustainable Harvest.



Overlooking a full-sun plantation

## Healthy By-products

CONSUMERS WHO SELECT shade-grown coffee can also enjoy the satisfaction of knowing that they are helping to support sustainable farming. The traditional coffee plantation also produces hardwood timber, bananas, citrus, and other crops and thus offers some security to the grower against fluctuations in markets, prices, and weather conditions. It may also help to protect threatened forests.

Nathalie Boyero, a buyer for Sustainable Harvest, reported on a visit to traditional growers in a remote region of Nicaragua, near the Honduras border:

The only way to get there is by jeep, along deeply rutted dirt

roads hugging steep mountainsides. We passed through miles and miles of complete deforestation, the land so stripped for cheap timber that it's no good now even for pastureland. . . . We rounded a corner and suddenly before me were rolling hills of lush tropical forest. The contrast was shocking and I was compelled to ask why such a difference. The answer was simple—"coffee." It was the clearest example I had ever seen of how coffee can save a forest.

While focusing on coffee consumers in this country, ornithologists and conservationists are also working with growers and government officials in coffee-growing regions. They hope to persuade coffee-producing nations that by encouraging shade-grown cultivation they can stay ahead of market trends while conserving imperiled habitat.

To learn more, contact the Smithsonian Migratory Bird Center, National Zoological Park, Washington, DC 20008; web site: [www.si.edu/smbc](http://www.si.edu/smbc); or Sustainable Harvest, 1480 66th Street, Emeryville, CA 94608; web site: [www.organic-coffee.com](http://www.organic-coffee.com). ■



PHOTOS: THIS PAGE: SUSTAINABLE HARVEST

## Border

*continued from page 7*

fies repeat offenders; seismic, magnetic and infrared sensors; and boroscopes, a new technology that reveals hidden compartments in gas tanks. It has 2,300 agents, compared to about 900 before October 1994. As a result, except during storms and on foggy nights, not many people attempt to cross at the estuary now. In June 1998, the number of people apprehended in Imperial Beach was 1,537, compared to 17,614—more than ten times as many—in June 1994, and not all were illegal travelers. However, Stitt explained, there is no guarantee that the current level of funding will continue. The \$12 million for the fence project is available now, and Congress expects prompt action.

Among local residents who support the fence project is Carolyn Powers of Citizens Against Recreational Eviction, who “has had a lot of input into this project,” according to Rep. Hunter’s aide Gary Becks. “Once that money—almost an excessive level of funding—dries up,” she said, “we will once again be besieged.” Her daughter, who lives in Imperial Beach, used to hear dogs barking, car doors slamming, and footsteps “all night long,” before Operation Gatekeeper.

While riding or hiking, Powers would meet groups of illegal travelers. “I didn’t mind, truly, running into them on the trail,” she said. “They’d stand back and wave me on. But the criminal Mexican smugglers, with identical backpacks and tattooed tears on their faces, they’d stand across my path. I carry a machete and have a fast and intuitive horse, but I’d assume a humble position, I’d subjugate myself, and they’d let me pass. I’d hate to see the money cut off and a return to that.” However, she said, “instead of topping the fence with razor—concertina—wire, why not top it with Mexican and U.S. banners? Have a celebratory fence.”

(There is no wire atop either of its fences, says the Border Patrol, and none is planned. “That would be inhumane.”)

## WOULD IT WORK?

**W**ITH CALIFORNIA’S economy booming and many employers continuing to seek cheap labor, people from south of the border continue to arrive. The traffic has shifted, however, to the mountainous Cleveland National Forest and to the All-American Canal, beyond the county. Most people found dead of hyperthermia, hypothermia, or other traumatic causes near the border are now found on the east side of the county, according to Mandy Reyes, a computer specialist at the County Medical Examiner’s office. Still, in fog and rain, some people do try to cross the estuary and drown. It will take much more than a strong fence to stop the flow of poor people driven by despair and hope.

Operation Gatekeeper has reduced chases across the wetland and the consequent damage by tires and trampling. A second fence might eliminate them. Meanwhile, illegally set fires, a new network of trails, and other damage has increased in the Cleveland National Forest, according to Michael Jerrett, assistant professor of geography at San Diego State University, who is researching the costs of environmental degradation on both sides of the border.

## A BIGGER PICTURE

**O**N A JUNE AFTERNOON, I rode with Pat Flanagan, director of education for the San Diego Museum of Natural History, across the valley and into the highlands. Following one of the rough dirt roads that have been cut into the hillsides for the Border Patrol, we arrived atop the mesa east of Smuggler’s Gulch to find a grand view and a fragrant remnant of rare native scrub habitat. Laurel sumac and black sage were in bloom. A kestrel dropped into the grass and rose again; a kite hovered above the western slope. Below us lay the Tijuana River Valley, willows marking the course of the river. Point Loma stood dark against a gleaming sea. The border patrol’s green and white vehicles perched on lookout points carved into canyon sides.

We descended into Smuggler’s Gulch and then worked our way up to Spooners Mesa, along another Border Patrol roadcut. The Army Corps has expressed an interest in running the fence to a peak of 850 feet on the south side of this mesa, which was purchased with Proposition 70 funds for parkland. The federal government would need to condemn it or get approval from the State Legislature, a county parks official said.

Clinging to the steep western edge, a bushmallow was in bloom, its pink-lavender petals almost translucent in the slanting late-afternoon light. Though not a rare plant, it was exquisite, and the ravaged hillside behind it only highlighted its fragility. To the south, beyond the rusted first border fence (built of landing mats used in desert warfare), Mexican automobile traffic was thick, much of it going to or from the San Ysidro border crossing.

“Since we have to have a fence, here on this cherished last mile to the sea, why don’t we just build one that’s able to do the job—like the bollard fence behind the new sewage treatment plant—and take down the ineffective landing mat fence?” mused Flanagan. “Then the roads we have might be enough. The solution is not fences and roads. It’s pretty clear you have to solve the problem in Mexico, not at the border.”

Because so many people care about this landscape and have made their concerns known, a door to more creative approaches to the border problem has now been opened. They now hope that a full review of the effects of the entire 14-mile project will be undertaken in compliance with environmental laws, so that its cumulative impacts are considered. This process would necessarily include public hearings.

These statutes were created for resolving profoundly difficult conflicts, such as those associated with the border fence, by directing focus to project purpose and design, environmental impact, and alternatives. This unique and significant area, which includes delicate, scarce habitats, clearly warrants this work, and the fledgling efforts for binational watershed stewardship demand it. Much is at stake here. ■



## CONSERVANCY FUNDS NONPROFITS

**F**RIENDS OF HARBORS, Beaches and Parks, in Orange County, will plan a 1,000-acre nature park at the mouth of the Santa Ana River with the help of \$4,500 from the Coastal Conservancy, while the Buena Vista Lagoon Foundation, in San Diego County, will use a \$14,000 Conservancy grant in building a trail at Buena Vista Lagoon.

These two projects are among 11 public access and enhancement projects selected from 32 grant proposals received in the third round of the Conservancy's Nonprofit Grants program. Eight of the other proposals are being considered for separate Conservancy funding.

Approved in June, the 11 grants total \$115,000 and include \$8,500 for launching a conservation easement program in Humboldt County, \$12,500 for mapping trails along the Tijuana River, and \$10,000 to restore native habitat along Islais Creek in the City of San Francisco. All projects approved include matching funds.

The Nonprofit Grants program will continue into 1999, with the final funding round beginning early next year. For information call Janet Diehl, (510) 286-1015.

## CORRECTIONS

**O**N PAGE 9 of our spring issue, the words are David Fiscali's, but the face above them is fellow rancher Jan Pedotti's. We regret our error. On page 6, the East West Ranch developer's latest proposal is for a 265 unit (not 365) lot subdivision on land used for grazing and bordered by residential subdivisions and the ocean.

## COASTAL CLEANUP 1998

**C**OASTAL CLEANUP DAY takes place on September 19 this year, nationwide. During last year's event, 49,000 volunteers removed over 500,000 pounds of trash from some 600 California beach and shoreline sites. For infor-



PHOTOS BY DEWEY SCHWARTZENBURG



Mayor-elect Jerry Brown was among those at the opening of Oakland's newest wetland.

mation on this and related events, call (800) COAST4U (262-7848).

## NEW WETLAND IN OAKLAND

**A**BACKHOE BREACHED a levee on June 10, allowing salt water from San Leandro Bay to flow into Oakland's newest wetland. The 70-acre wetland on the Martin Luther King Jr. Regional Shoreline will contain tidal marsh with ponds, channels, and islands; seasonal wetlands; upland habitat; and a perimeter trail. It will provide nesting and feeding habitat for the endangered California clapper rail, burrowing owls, salt-marsh harvest mice, and numerous species of resident and migrant shorebirds and waterfowl, as well as the invertebrates they feed on.

The Port of Oakland provided the land and several million dollars for design, construction, management, and interpretive facilities. The partnership which made the project possible also included the Save San Francisco Bay Association, the Golden Gate Audubon Society, the Sierra Club, the Regional Water Quality Control Board, the East Bay Regional Park District, and the U.S. Army Corps of Engineers.

The partnership came about as part of the settlement of lawsuits that challenged the Port's earlier plan to develop the wetland.

## MORE COASTLINE WILL BE ARMORED

**B**Y MARCH 9, THE COASTAL Commission had issued 55 emergency permits for work to repair structures damaged last winter by waves, bluff collapse, and flooding. Of these, 35 were for projects in southern California, mostly for riprap to protect single family residences in the Malibu area. In addition, Caltrans placed 2,000 feet of riprap to protect the Pacific Coast Highway south of Topanga Canyon.

In Santa Barbara County, access roads, campgrounds, and parking lots were extensively damaged and were closed to the public in Gaviota, Refugio, and El Capital State Beaches. Stearns Wharf's pilings, decking, and sewer and water lines were damaged. In Ventura County, part of the Port Hueneme Pier collapsed. In Los Angeles County, State Parks requested an emergency permit for 700 feet of riprap to repair and expand a revetment to protect a parking lot and two State Parks residences at Leo Carillo State Beach.

In San Diego County, parking lots at North and South Cardiff State Beaches were damaged, as were restrooms,

walkways, and railings. Five emergency permits were issued for riprap adjacent to destroyed or severely damaged homes. At Pacific and Mission Beach, portions of the boardwalk had to be closed to the public. Highway 1 was closed along several stretches of the state's coast.

In the wake of this and other damage, about two more miles of the coast will be armored, according to Lesley Ewing, associate civil engineer at the California Coastal Commission. "We would like to see more state and local programs for beach nourishment," she said, "so you start building a beach in front of what's there." With much of the buffer of sand gone along the coast and with groundwater levels high, coastal bluffs and low-elevation oceanfront development will be highly susceptible to future storms, according to a Commission staff report on storm damage.

## HAVOC AND HELP TO COASTAL TRAIL

**T**HE POWERFUL FORCES of the El Niño-charged winter toyed with the California Coastal Trail, even as work continued toward the goal of its completion. Here are some of the major changes on the north coast.

In Sinkyone Wilderness State Park, winds wreaked havoc on the trail's Lost Coast section between Chemise Mountain and Whale Gulch. Much of the magnificent old-growth fir forest that once shaded the trail now lies pointing seaward and blocking the route, which is passable but difficult. In McKerricher State Park, near Fort Bragg, the Old Road portion of the Coastal Trail was seriously damaged but is still passable.

At Point Reyes National Seashore, storm damage closed almost three miles of the dramatic stretch between Woodward Valley and Sky Trail. The available detour offers a route twice as long and much steeper. Storms also knocked out access to Kelham Beach and Sculpture Beach. Repairs may take until summer's end. Farther south, the Palomarin Beach Trail was closed

indefinitely. In San Francisco, several slides and slip-outs created rough spots between Seacliff and the Cliff House in the Golden Gate National Recreation Area, and parts of the Coastal Trail were closed for repair.

Some of the storm-driven changes have actually improved the Coastal Trail. For six years a massive mudslide south of Centerville Beach at the north end of the Lost Coast had made beach passage treacherous. In February, waves washed away tons of the mud, leaving the beach clear and passable. While many California beaches were severely eroded, sand piled up at Schooner Gulch and Bowling Ball Beach near Point Arena, leaving the beaches larger and accessible at high tides.

In Sonoma County, where driving or cycling Highway 1 near Fort Ross currently requires a storm-wrought detour, another link in the Coastal Trail will be constructed this summer. A new trail will connect Stillwater Cove Regional Park to the upper meadow of Salt Point State Park, eliminating a mile of highway shoulder-walking on the Coastal Trail. —BL

*Bob Lorentzen, author of several guidebooks to the North Coast, hiked many miles with Richard Nichols while working on their guidebook, Hiking the California Coastal Trail. Volume One: Oregon to Monterey, was published in June and will be reviewed in the next issue of Coast & Ocean.*

## TUJUNGA WASH GOLF COURSE APPROVED

**R**EVERSING ITS JULY decision to deny approval for a golf course in the Big Tujunga Wash, the Los Angeles City Council voted on April 28 to approve it. The 10-4 vote, and Mayor Richard Riordan's subsequent signature, came after the prospective developer sued the City for \$215 million and the Council was advised that taxpayers would be held liable for illegally taking the property if approval were denied. The wash is one of the last undisturbed alluvial sage scrub habitats, and the only place in the city where the Los Angeles River flows freely. (See *Coast & Ocean*, Summer 1997.)



### NEW PARK ON OAKLAND ESTUARY

Peter Broken Leg, a traditional counselor with Friendshiphouse Association for American Indians, offers a blessing at the April 25 community rally for a new nine-acre park at Union Point in Oakland. The Coastal Conservancy allocated \$200,000 for the design of the park, which will include children's play areas and a section of the Bay Trail.

DICK WAYMAN



*The California Coast—A Traveler's Companion*, by Don Neuwirth and John J. Osborn, Jr. The Countryman Press, Woodstock, VT, 1998. 360 pp., \$17.95 (paper).

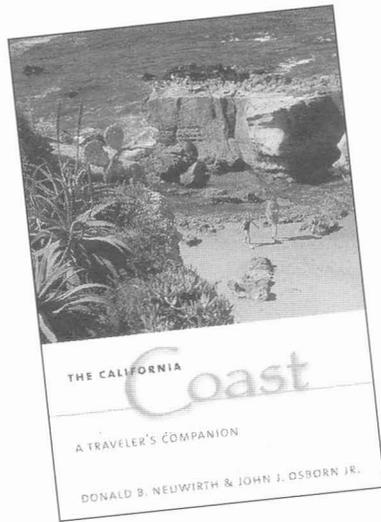
CALIFORNIA'S COAST BENDS, rises, dips, and stretches out for some 1,000-plus miles between Mexico's dry coastal plains and Oregon's lush mountains, a large subject no matter how you approach it. Graced with a variety of parklands and open spaces, and shadowed for most of its length by Highway 1, the state's shoreline is both spectacular and accessible.

In their guidebook *The California Coast—A Traveler's Companion*, Don Neuwirth and John Osborn break the coast down into understandable sections. Based on the geologic changes that occur at Point Conception, they divide the book into southern and northern California. Starting at the Mexico border, they then move northward county by county. Icons represent six "coasts"—Family, Quiet, Living, Sporting, Cultural, and Urban—as an aid to travelers. Each chapter begins with a map (often with more detailed insets within the chapter) and includes site descriptions with precise directions. As simple and understandable as these maps are, visitors may need more precise maps to find some locations.

In addition to providing concise descriptions of destinations, suggested activities, telephone numbers, and directions, the authors list hotels, bed and breakfasts, and restaurants, emphasizing locally owned or unique establishments.

An interesting feature is "Coastal Companions"—short biographical stories: a U.S. Coast Guard petty officer in San Diego, a fisherman in Crescent City, a lifeguard, a surfer, an activist, a California Native American. Interesting though most of these profiles are, I found them somewhat distracting in a guidebook, even one subtitled "A Traveler's Companion."

Comparisons to other guides are unavoidable, and in this case they are important because there already exists



a comprehensive guide to every coastal site that is accessible to the public: the California Coastal Commission's *California Coastal Access Guide*, published by the University of California Press and now in its fifth edition. In fact, Neuwirth produced that book in 1981 when he was the Commission's access program manager. Both *The California Coast* and the latest edition of the *California Coastal Access Guide* carry the same price tag. That begs the question: What's the difference?

The Neuwirth-Osborn collaboration is more talkative than the Coastal Commission's guide, has far less natural history, describes most but not all coastal sites, and includes restaurants and lodging while the *Coastal Access Guide* does not, except for camping sites. So, which is better? For those who prefer more natural history notes and enjoy discovering people, eateries, and places to stay on their own, the *California Coastal Access Guide* should be the choice. For those who don't like too many surprises and want to plan their



Wild black currant

coastal forays more precisely, *The California Coast* may be more useful.

I noted a few minor errors (probably due to the lag between writing and publication) and some puzzling omissions. The authors state in the beginning that they will present only the "good" places, omitting sites "not worth your time." But to pick one small example in my own backyard, why isn't Santa Cruz County's Greyhound Rock access and beach area mentioned? It's on the chapter map but is not described. Certainly the pathway is steep—perhaps one of the steepest on the coast—but the beach and the bluffs are spectacular.

There's a wide variety of books on California's coastline, and *The California Coast* now takes its place, quite rightly, among them.

*Jerry Emory wrote the Coastal Conservancy's San Francisco Bay Shoreline Guide (Berkeley: University of California Press, 1995). His Monterey Bay Shoreline Guide (UC Press and the Monterey Bay Aquarium) will be available in Spring 1999.*

*Restoring Streams in Cities: A Guide for Planners, Policy Makers, and Citizens*, by Ann L. Riley. Island Press, Washington, DC, 1998. 423 pp., \$28 (paper).

RILEY'S *RESTORING STREAMS in Cities* is highly recommended for anyone interested in or involved in a flood control or stream restoration project. It is a carefully researched reference book that provides a detailed historical perspective on federal flood reduction and restoration programs, as well as a discussion of the economic, social, and environmental problems associated with conventional stream channelization. It also describes current programs and new congressional directives that aim to move the Army Corps of Engineers, Natural Resources Conservation Service, Bureau of Reclamation, and other federal agencies into a consolidated "restoration mission."

Since the 1980s the federal government has recognized that streams have a "geomorphic equilibrium" and that

alteration of water and sediment flows often upsets this equilibrium, resulting in unplanned flooding, erosion, sedimentation, and damage to structures. Federal agencies have adopted policies directing engineers to design flood control and bank stabilization projects so as to maintain the river's equilibrium, thus providing more natural conditions and improved habitat values. Riley notes that in spite of recent advances, there remain many barriers to implementing these projects. Foremost, we still must use the objective of economic efficiency as a basis for designing federal water projects. She recommends that multiple-objective resource management be used as a design basis, and that nature be a model for re-creating a river that is in balance and can sustain us. The "flood-control channel design of the near future will be the 'multistage' channel that re-creates the river and floodplain features that are so critical for maintaining the natural functions of rivers," Riley predicts. "Flood-control and river restoration projects should begin to look the same."

The book goes far beyond the discussion of river policy and programs. It provides detailed information that will be useful to growing numbers of people involved with urban and nonurban streams, including citizens, policy makers, and practitioners. It describes the roles, responsibilities, and analytic tools used by river scientists and planners in developing projects; techniques for building community and political support for projects; specific restoration methods; and examples of how citizens can support stream restoration, such as by collecting streamflow, rainfall, and water quality information and by on-the-ground work such as revegetating streambanks and flood-proofing buildings. Riley also presents technical issues and "how to" information pertaining to floodplain management.

A pioneer in the field of urban stream restoration, Riley is executive director of the Waterways Restoration Institute in Berkeley. She works on the

design and installation of stream restoration projects and is involved in the evaluation of national water policy for the National Research Council and federal task forces.

Supporting the text of *Restoring Streams in Cities*, a large number of useful drawings and figures give the reader a clear idea of what the author is discussing. The book also includes a useful glossary of terms, a detailed index, and extensive notes and citations at the end of each chapter.

*Nadine Hitchcock, a Coastal Conservancy project manager, has been involved in the Napa River Flood Management project.*

***Integrated Coastal and Ocean Management: Concepts and Practices*, by Biliiana Cicin-Sain and Robert W. Knecht. Island Press, Washington, DC, 1998. 518 pp., \$65 (hardbound), \$32.50 (paper).**

**I**NTEGRATED COASTAL and Ocean Management: Concepts and Practices is a broad tour of the current international state of coastal planning and conflict resolution, from San Francisco Bay to Turkey, from France to Fiji. It's a book you may want on your bookshelf, if only for the helpful 26 pages of references, seven-page glossary, and four pages of acronyms.

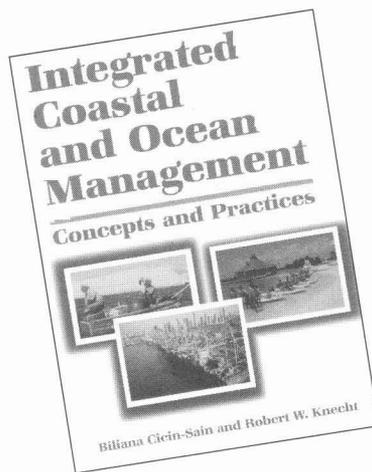
The book is long and heavy going. The authors suggest that "the busy coastal professional interested primarily in establishing and implementing an ICM [Integrated Coastal Management] program" read the chapters on ICM concepts and the practical guide to formulating an ICM program. These

sections are replete with lists of considerations to keep in mind, such as dimensions of integration and how to achieve a continuum of policy integration. They outline hundreds of questions to ask and factors to consider in pursuing coastal and ocean management planning in specific and widely varying national situations.

Part I presents the rationale behind integrated coastal and ocean management; Part II discusses the evolution of global prescriptions for ICM, from the UN Conference on the Law of the Sea starting in 1973 to more recent conventions on everything from biological diversity to coral reefs; Part III comprises the "practical guide" to formulating integrated coastal management; and the last parts offer case comparisons and summaries of ICM practices in 22 selected nations. There's a lot of information, and it's easier to sample sections than to try to read the book straight through. The authors' literature search and syntheses can save the reader much work on aspects of ICM, from the use of scientific information to appropriate levels of participation. The authors also surveyed 29 countries on their practices, so the prescriptions are wide-ranging and comprehensive.

While the book, which is based on literature, lectures, surveys, and social science approaches, confidently states the developed consensus on what to consider when constructing ICM, it lacks an evaluation of programs. The national case studies are short compendiums of practices in each country. The results of field studies are not presented, nor is there any discussion of actual conflicts and resolutions. Photos would have been welcome among all the considerations and analytical tools and lists, to keep us motivated. Despite lacking sizzle and buzz, however, the authors cover a lot of ground and do provide, as promised, essential information about integrated coastal management so coastal and ocean managers "can put functional and effective programs in place."

*Bill Ahern is the Coastal Conservancy's executive officer.*





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