

# CA CALIFORNIA Waterfront Age

SPRING 1987

VOL. 3, NO. 2



### **Guidelines for Contributors**

*California WaterfrontAge* is glad to consider contributions of articles and shorter items related to the state's waterfronts. We aim to provide a forum for the description and discussion of public programs and private initiatives relating to waterfront restoration and development in California. Resource management and economic development are our major themes.

We will consider articles of up to 3,000 words on the following subjects:

1. Economic development, project finance, waterfront restoration, the impact of changing uses.
2. Tourism, waterfront parks, public access.
3. Maritime industries.
4. Water quality, resource restoration, enhancement.
5. Cultural and historical issues.

We will also consider the following shorter features:

Conferences: We publish summaries of waterfront-related conferences.

Book reviews: We seek relevant reviews, about 500 words in length, of current books and other publications of interest to our readers.

Essays: Reflections on themes related to waterfronts are welcome. They can be verbal, photographic, graphic, or in cartoon form.

Interested contributors should call or write the editor. Send self-addressed stamped envelopes with submissions. (1330 Broadway, Suite 1100, Oakland, CA 94612)

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To receive *California WaterfrontAge*, or for information on the programs or projects of the State Coastal Conservancy, please send a note with your name, organization, address, and affiliation (civic group, government agency, consultant, development/financial, maritime industry, other) to:

California WaterfrontAge  
State Coastal Conservancy  
1330 Broadway, Suite 1100  
Oakland, CA 94612

### **Check your copy**

Readers report that some copies of last winter's issue lacked pages 17 to 32. If yours was incomplete, call or write and we will replace your copy. —Ed.

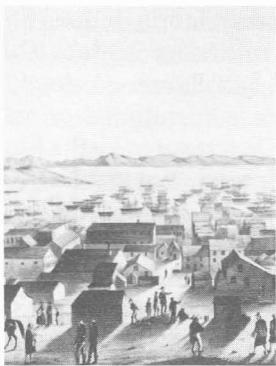
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**(Cover) Painting of San Francisco circa 1849, by unknown artist. Courtesy California Historical Society**

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**V**ARIOUS COMMENTATORS on the changing waterfront scene decry the demise of the "working waterfront." As shipping and other marine activities vanish or become concentrated away from historic waterfront centers, they are replaced either by decaying and vacant areas—often amounting to hundreds of acres—or by commercial development unrelated to the unique setting. The intensive, distinctly working-class feel of the waterfront has been supplanted by antiseptic watering holes for the chardonnay crowd, and the offices and commercial blocks that typify our service economy. At best, new development takes the form of "festive market-places." So goes the criticism. The cry is to

bring back the working waterfront; restore not just public access but public "life" to the water's edge.

Easier said than done. The kind of "fine-grain" urban diversity that Jane Jacobs de-

scribed so vividly does not, apparently, generate enough revenue to compete successfully for highly valued space by the water. At the same time, container terminals require fewer humans and much more land. They are not conducive to lively gatherings and bustling activity, nor can they be accommodated in congested old central locations.

Harbor cities throughout the industrialized world face the same dilemma, though there are local and regional variations. Europe is not nearly as badly off as we are. The Europeans' long urban tradition has enabled them to retain and restore many historic central city harbors after modern shipping migrated to new container terminals at the more spacious estuaries

downstream. The congested old harbors have often remained at the physical centers of urban life. In addition, in some cases, wartime destruction has simplified the problems of rebuilding.

We, on the other hand, have been called an anti-urban nation. The suburbs are our invention, not the Europeans' or the Asians'. Shifts in industrial uses or residential patterns in our cities are likely to leave gashes in the urban fabric. It does not naturally stretch to accommodate the change. What shall San Francisco do, for example, with all those abandoned or rotting "finger piers"? They used to be the hub of Pacific Coast shipping, but no longer. How many millions of dollars will be needed either to tear them down or to repair them? And if the latter, for what purposes? No consensus has surfaced. And what is to be done with the many acres of vacant or wasted land behind the piers, across the Embarcadero? No grand vision has come to the fore. These are rare public resources, they obviously should not be squandered on ill-planned development or hasty demolition. Careful study is essential. Land use decisions leave their mark for a long, long time. But there are no quick and easy answers.

Los Angeles and Long Beach have taken over as California's principal ports, and they will remain in the lead for the foreseeable future. Yet the Pacific Rim shipping picture is full of uncertainty. How much new container traffic can San Francisco really expect to capture? There is no reliable estimate. What of the break-bulk cargo and other non-containerized shipping? Is there really much opportunity for expanding this activity in San Francisco? Opinions differ.

If shipping alone cannot be expected to regenerate the working waterfront, because of its changed technology and relative decrease in physical presence, then in what forms and in what measure can "public uses" be expected in those old piers and elsewhere along the waterfront? Here again



**Hamburg Harbor**

the vision is hazy at best. One can imagine all sorts of possibilities, but are they economical? Should such activities and locations be subsidized? If so, how? Is a rock-and-roll museum a "legitimate" waterfront use? Does it matter, especially if dancing is allowed? After all, Santa Monica's famed pier once supported the Lamonica Ballroom, reputed to hold up to 10,000 happy couples.

How can "visitor-serving commercial uses" be provided that are neither trinket shop tacky nor slick covers designed to entice more high-value consumption? On the other hand, what kind of atmosphere is really desired—and desirable? And by whom? Consider just a few West Coast possibilities: Fisherman's Wharf, the Venice Boardwalk, Santa Barbara's seafront, the Santa Monica Pier, Morro Bay, Laguna Beach, and Sausalito.

And what of other marine-related activities that require waterfront locations? Interest is increasing, for example, in strengthening the commercial and sports fishing industries. With national consumption of fish rising steadily, attention is gradually shifting to the possibilities for modernizing this ailing but economically potent sector. In San Francisco, the needs for physically upgrading fishing activities are fairly clear, but their spatial requirements are not that great. There is still plenty of waterfront left and it represents a major opportunity—and challenge. Concepts like the Port's proposed "Institute of the Sea" marine and fisheries research center are worthy of close examination. They represent new possibilities for reusing the old waterfront in ways that support existing waterfront-based activities while serving the general public, both residents and visitors, with novel educational and recreational opportunities.

The Monterey Bay Aquarium is a great recent success story of waterfront reuse. It is not based on retail consumption, yet has been a substantial revenue generator (al-

though revenues seem to be tailing off after the initial flush of public enthusiasm). Now, while a single facility does not a waterfront revival make, such an attraction clearly draws the public, and thereby can help support other activities. Of course the Monterey Bay Aquarium is unique, but it suggests possibilities—not an aquarium in every harbor, but new opportunities for public use of the waterfront, incorporating that particular community's unique assets.

Such opportunities should be viewed in the context of a city's overall image and development. For example, San Francisco's waterfront is its image (along with its hills), and as such should be an integral part of the city's physical and financial plans. But a revived San Francisco waterfront will not be what it was; it will be something different, with a new mix of people and activities, and a new ambiance. What it is, and whether it is "working," remains to be seen. The opportunity and the challenge certainly exist. □



**Monterey Bay Aquarium**

## ***Sinkyone Battle Ends***

A two-decades-old environmental battle ended in January when the Mendocino Board of Supervisors approved a compromise plan for forest land adjacent to Sinkyone Wilderness State Park in Mendocino County. The plan was developed by the State Coastal Conservancy in consultation with all sides of the controversy: landowners, the International Woodworkers of America, environmental and Native American groups, the Board of Supervisors and the Trust for Public Land (TPL). A \$1.1 million loan from the Conservancy, approved in December, enables TPL to acquire 7,100 acres. Over half the property will remain open for hunting, fishing, and future logging. All significant archeological sites and all significant stands of virgin redwoods will be saved, to be included in the state park. Maxene Spellman, project manager for the Conservancy, said "the compromise solution could not have been reached without the commitment of the worker, Native American, and environmental groups to reach a settlement. All sides approached the issues in an intelligent and cooperative manner."

## ***Port of San Francisco Grant***

The Conservancy awarded a grant of up to \$245,000 to the City and County of San Francisco, acting through the Port of San Francisco, to fund public access improvements, site design, and pre-project development plans for expanded and improved access at Pier 7 and to prepare design and preliminary development plans for Pier 24. The Conservancy also authorized disbursement of up to \$60,000 for professional consultant services to prepare economic feasibility analyses of commercial fishing facilities and related public access improvements at Fisherman's Wharf.

## ***Other Actions***

In November, the Conservancy authorized:

- A grant of up to \$50,000 to the City of Marina to prepare a coastal restoration plan for about 812 acres of coastal dunes west of Route 1 between Fort Ord and the Salinas River in Monterey County. These dunes provide habitat for at least five rare and endangered species or candidate species, including Smith's Blue Butterfly, Menzies' Wallflower, and the California Legless Lizard. The restoration plan will develop plans to preserve and protect these habitats and identify appropriate sites for development.
- A grant of up to \$24,750 to San Luis Obispo County to prepare a Habitat Conservation Plan for the endangered Morro Bay Kangaroo Rat which, according to the U.S. Fish and Wildlife Service, has been reduced in numbers to about 100 animals. The habitat formerly occupied a range of four square miles in the south Morro Bay area. It has shrunk to 850 acres within four disjunct locations. The Habitat Conservation Plan, a mechanism provided in the federal Endangered Species Act, will allow the county to resolve long-term land use conflicts within the range and habitat of the Kangaroo Rat. The Plan will be prepared under the guidance of a steering committee consisting of representatives of all regulatory agencies, landowners, and environmental groups to assure the cooperation of all concerned.
- Expenditure of up to \$1.1 million to acquire a two-acre property in Malibu as an addition to Dan Blocker State Beach. The land is located on Latigo Shores Drive between the Pacific Coast Highway and Latigo Bay, adjacent to the State Beach. The Conservancy acquired the property, at substantially less than the appraised fair market value, on an interim basis for the State Department of Parks and Recreation, which is unable to purchase the property during the current fiscal year.



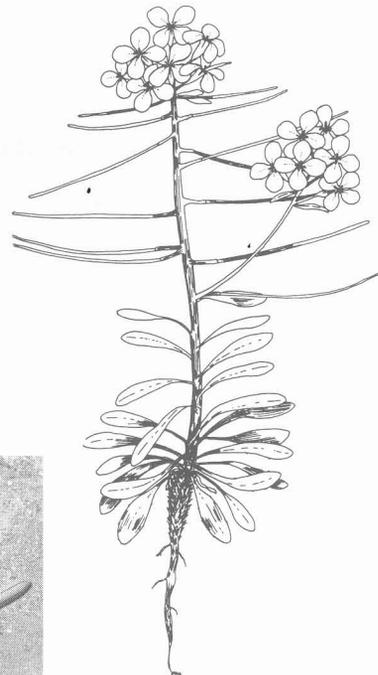
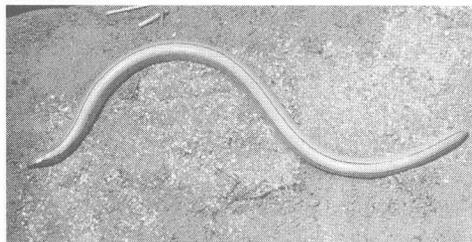
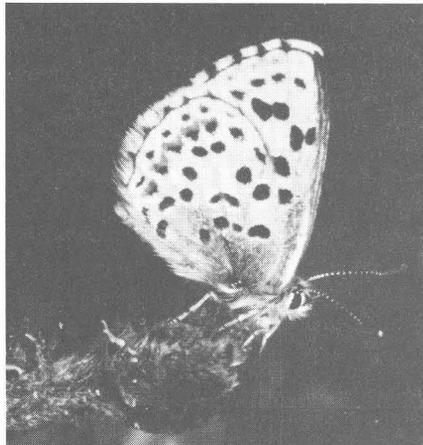
In December, the Conservancy authorized:

- A memorandum of understanding with the Port of Santa Cruz, the State Department of Fish and Game, and the California Coastal Commission for the purpose of locating and completing a wetland enhancement project in Santa Cruz County. The Port will deposit \$100,000 into an escrow account controlled by the Conservancy in exchange for the Conservancy's completing a wetland enhancement project that would satisfy the Port's mitigation requirement for constructing upper Santa Cruz Harbor.

- The relocation of the existing Environmental Defense Fund demonstration waste water treatment plant to Tijuana, seizing an opportunity to develop an advanced secondary treatment facility with full support of the Mexican government. The plant will treat between 300,000 and 500,000 gallons daily. After treatment, the water will be used to irrigate community parks and gardens. Now waste water flows untreated into the Tijuana River, ultimately affecting the Tijuana River National Estuarine Sanctuary on the United States side of the border.

In February 1987, the Conservancy:

- Authorized a grant of up to \$175,000 to the City of Pismo Beach to implement the public access element of the city's approved Urban Waterfront Restoration Plan. The grant will fund construction of a 15-foot-wide concrete pedestrian walkway along the city's waterfront, between Hinds Avenue and Addie Street, to provide continuous lateral access from the newly reconstructed pier to Pismo Creek and vertical connections to the ocean at four loca-



tions, including two handicapped accessible ramps. The project will also implement the final element of the city's waterfront restoration plan.

- Approved a grant of up to \$45,000 to the City of Santa Barbara for the purchase and installation of a prefabricated footbridge to cross Sycamore Creek in the 1200 block of Cabrillo Highway. Currently, pedestrians are forced to walk along congested Cabrillo Boulevard to get from the parking lot area to the main beach and volleyball area. The footbridge will provide a safe way to cross Sycamore Creek and will also help disperse visitors along the beach. The City of Santa Barbara has also agreed to accept nine lateral public access easements located within the city.

- Awarded \$90,000 to the County of Del Norte for four property acquisitions along western Pebble Beach Drive. The acquisitions will consolidate public ownership of the oceanfront lands from Crescent City north to Washington Boulevard, a distance of more than three miles. This will allow the immediate construction of a pedestrian walkway and guardrail along the blufftop

**Smith's Blue Butterfly**

**California Legless Lizard**

**Menzies' Wallflower**

*Continued on page 48.*

## **Native Plant Conference**

"As we destroy the biota of the planet—we all lose," keynote speaker Paul Ehrlich noted at the California Native Plant Society's first international conference, Rare and Endangered Plants: A California Conference on their Conservation and Management, held November 5–8, 1986, in Sacramento. The conference was a resounding success with representatives from every state in the nation and a distinguished panel of speakers. Over 700 biologists, botanists, land managers, and representatives from local, state, and federal agencies came. Among them were several well-known scientists and a number of heads of agencies. It was certainly the largest gathering ever devoted to rare endemic plants and how to protect, maintain, and manage them.

"It's not easy for people to understand why the birds are declining here in North America because of fragmentation of forests in Central America, but it's important for the ordinary citizen to become involved," said Ehrlich, professor of biological sciences at Stanford. "Our educational system is all wrong when it's possible to get through Stanford University without knowing where your food comes from."

Formal talks and informal conversations at the conference covered a wide range of issues, including plant systematics, ecology, and population dynamics; monitoring and survey techniques; mitigation, including restoration and revegetation; preserve design and long-term population survival; and protective policies, laws, and programs for endangered habitat. An educational symposium for teachers and science educators explored the subject of how to develop an awareness of California's flora.

The California Native Plant Society (CNPS) was founded in 1965 to support the Native Plant Garden at Tilden Park in Berkeley, then threatened with relocation. Today, CNPS has 27 chapters around the state and a membership of several thou-

sand. It maintains an employee in the Department of Fish and Game to track rare plants around California, gives grants to young botany researchers, publishes a quarterly journal, *Fremontia*, and increasingly plays a role in the decision making process in the state on behalf of the plants.

CNPS members are proud of this latest endeavor. The conference was the first in the United States to emphasize conservation and management of rare and endangered plants and it was clear that, at least with the agencies, California's flora has achieved standing at last. The proceedings, dedicated to the eminent plant geneticist, G. Ledyard Stebbins, will be available from the CNPS office, 909 12th Street, Suite #116, Sacramento 95814, by July 1987.

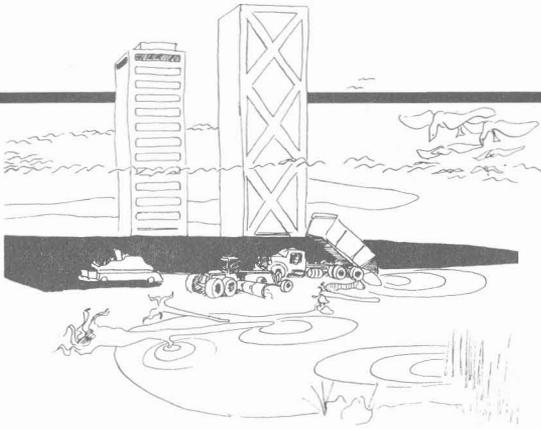
—Phyllis Faber

## **Bay-Delta Conference**

On February 19 and 20 the Environmental Protection Agency and several State agencies sponsored the second meeting of the San Francisco Bay-Delta Project. The project's goal is to develop a regional plan to protect and restore the Bay-Delta ecosystem. Participants in this ambitious five-year effort include a wide range of public and private organizations that either use the Bay and Delta or have governmental powers over some aspect of the estuary.

Organization of the management and working groups was the main topic of this latest meeting. Conflict arose when Citizens for a Better Environment, representing 20 environmental organizations, proposed that the composition of the management committee be changed from a group of public agencies to user groups. The composition of the management committee is critical since that committee makes recommendations to the sponsoring committee regarding the use of federal funds for the project and will be instrumental in choosing the priorities for the project as a whole.

After discussions by the local agency



committee, the public advisory committee, and the technical advisory committee, it now seems likely that some change in the makeup of the management committee will occur. It is probable that user groups will be added. In addition, the local agency committee recommended that the State Coastal Conservancy be added to the management committee. The State agencies now on this committee are generally concerned with regulation and management of the Bay and Delta but are not geared toward restoration and enhancement as is the Conservancy.

—Neal Fishman

### **Legislative Symposium**

The annual Legislative Symposium of the Planning and Conservation League brought together environmentalists and legislators at Sacramento State University on January 31 and February 1. Among the participants were public agency officials, legislative consultants, and representatives of private organizations.

In a keynote address, Sen. David Roberti, President Pro Tem, stressed his commitment to coastal protection and to ensuring that Proposition 65, which protects drinking water from toxic chemicals, is not overturned by legislative action. In a luncheon speech, Assemblyman Richard Katz, chair of the Assembly Transportation Committee, stressed his commitment to the \$1.5 billion bond act for transportation he is sponsoring and said that unlike the Governor's transportation proposal, his would allow for some of the proceeds to go to mass transit. While Katz is sympathetic to environmental concerns, he is concentrating on a major initiative in the transportation area.

An afternoon workshop on coastal protection focused on the shortage of staff funds for the Coastal Commission and on recent Commission decisions that many participants found unacceptable. Offshore oil development was also discussed. The Coastal Conservancy was unrepresented on the panel. No mention was made of current issues such as mitigation banks or active restoration.

An informative workshop dealt with the California Environmental Quality Act (CEQA). The panel on CEQA consisted of three private attorneys who work on environmental cases and a community activist working on growth control in Walnut Creek. They stressed the importance of a record of public input at the earliest stages of an environmental impact report's development. Lack of public input is a major cause of action against agencies in their handling of CEQA compliance.

—N.F.

### **Land Trust Gathering**

More than 250 land conservationists from more than 30 states and five foreign countries assembled at the Asilomar conference grounds in Pacific Grove, California, to participate in the annual conference of the land trust movement on February 8–11, 1987. From the State of California 16 local land trusts, four conservation organizations, and two State agencies (the Coastal Conservancy and the Wildlife Conservation Board) sent representatives. The conference borrowed its theme, "Lighting a Prairie Fire of Local Action," from the recent recommendations of the President's Commission on Americans Outdoors, which highlighted the role that land trusts play in meeting national recreational and conservation needs.

The conference was sponsored by the Land Trust Exchange, a national network and service center dedicated to improving the effectiveness and capacity of local nonprofit land conservation groups. It was hosted by the Big Sur Land Trust, one of

California's most active local groups.

The organizations that gathered at this second biannual conference share common purposes and approaches. Land trusts provide private alternatives to traditional methods of public land conservation and are managed by community leaders who serve voluntarily as directors. Nationwide the land trusts movement has protected more than 1.7 million acres of special lands for a variety of public purposes including recreation, scenic and open space enjoyment, historical preservation, and scientific research.

The conference began with a reception at the Monterey Bay Aquarium and a "Call to Local Action" by Patrick Noonan, president of the Conservation Fund. Noonan spoke of his participation with the President's Commission on Americans Outdoors and used the Commission's findings to issue a challenge to the assembled land trusts. He called for increasing the number of nonprofit land trusts from 550 to 5,000 in the next generation, and doubling the amount of charitable contributions that Americans donate for conservation purposes.

The next two and a half days were filled with practical advice, moments of inspiration, some modest self-congratulations, much trading of experiences, and some quiet time to walk along Asilomar Beach. Workshops addressed topics such as obtaining agricultural easements through rescheduling Farmers Home Loan Administration debts, implementing the President's Commission recommendation for a system of greenways across the country, the tax implications of charitable giving, planning for long-term protection, and managing an endowment. Two workshops on the topic of limited development revealed an apparent split in the land trust community—on one side are trusts that see limited development as a necessary way of funding important conservation objectives; on the other are those that see involvement with development as antithetical to their perceived goal of preserving land.

Informal evening sessions followed up on topics discussed during the day. The American Trails Network hosted a meeting to discuss a national Trail Days USA celebration scheduled for May 1988. There were

also sessions focusing on building support for the President's Commission recommendation to establish a \$1 billion annual endowed fund to replace the Land and Water Conservation Fund and others dealing with combining land conservation and a sense of social responsibility.

The conference marked the beginning of a new era in the operations of the Land Trust Exchange. Jean Hocker, formerly the director of the Jackson Hole Land Trust in Wyoming, is the newly-elected executive director of the organization. She will be moving the Land Trust Exchange office from Bar Harbor, Maine, to a new location in the mid-Atlantic states, and several staff members will be leaving the organization as part of that transition.

—Don Coppock

## **Permits and Planning**

"Managing and Planning Environmentally Responsible Shoreline Development—What Business and Government Need to Know," was the theme of a conference held November 19, sponsored by the Bay Planning Coalition, an association of San Francisco Bay ports, industries, local governments, shoreline property owners, and related businesses.

State and federal agency panelists discussed what is expected of agencies and permit applicants, and how the permit process can be made more efficient. Also considered were new regulations and permit requirements, agency jurisdiction issues, wetland policies, public access, endangered species, the public trust, agency priorities, and future political and economic realities.

The 4-year-old 200-member Coalition is working toward a cooperative and effective government/Bay business partnership that would minimize delays, confusion, and conflict in the process of permits and planning. Thus, the conference panels were designed not only to provide information and to update participants, but also to create an atmosphere of understanding for each other's concerns. About 250 attended the gathering in Burlingame. A list of questions and answers from the conference is available from the Coalition at (415) 543-3830.

—Bradley C. Mart

*WaterfrontAge* is a forum for discussion and welcomes letters to the editor. The following exchanges are in response to our special Winter issue on wetland mitigation.

### **The Shorelands Maligned?**

Editor:

*California WaterfrontAge*, in its Winter 1987 edition, was kind enough to publish two photographs we furnished—one showing marshes we intend to acquire and dedicate, and one showing the proposed project site.

Barry Nelson comments, "... some developers now propose to mitigate by buying and protecting existing wetlands, with no enhancement. The developer for the enormous Shorelands racetrack project in Hayward, for example, proposes to compensate for the loss of some 300 acres of the most valuable Bay marshlands, along with 200 acres of preserves, ponds, and seasonal wetlands by purchasing and protecting 500 acres of pristine tidal marsh. But these wetlands are already protected by BCDC and the Corps, and are for all practical purposes undevelopable. Such proposed mitigation is no mitigation at all."

The first sentence, "... some developers..." incorrectly states the intentions of the Shorelands, since the Shorelands proposes over 200 acres of *constructed* mitigation lands. We propose to build plover nesting islands, and to increase the wild bird feed in the area by the development of brine shrimp pond habitat which should produce over 1 million pounds of wild bird feed per year.

We know of *no* "valuable marshland" whatsoever that will be lost. We intend to develop not *one* single acre of valuable Bay marshland. We do intend to purchase and protect some 300 acres of tidal marshlands. Mr. Nelson is somewhat incorrect in his statement that "... these wetlands are already protected by BCDC and the Corps,

and for all practical purposes are undevelopable." If he were to stand on the marshes we intend to acquire and look immediately to the north, he would see the former Oliver Brothers and H.A.R.D. marshlands, which were destroyed through the simple act of Mr. Oliver's closing a floodgate. Thus, the "protection" of BCDC and the Corps didn't help the marsh very much. Reasonable people may differ on what degree of mitigation is adequate, but to say, "such mitigation is no mitigation at all" is hyperbole—not fact.

Those of us who are preservationists tend to be startled by the fact that the best intentions of mankind tend to cause the destruction of nature, either by assuming that it doesn't need to be protected, or that it shouldn't be. Man certainly does not have a notable record when it comes to preservation of his environment. We all tend to be so focused that we are like a horse with blinders on—most of us miss an awful lot!

John M. Thorpe

*President, The Shorelands Corporation*

**Mr. Nelson responds:** Mr. Thorpe's entire project includes a racetrack, industrial park, and commercial areas. It would fill about 700 acres of some of the most valuable seasonal wetlands in the Bay area. Fish and Game and the Fish and Wildlife Service have indicated that these wetlands provide endangered species habitat and support the largest breeding concentration of snowy plovers in central California. Over the last six years, bird counts by biologists from both agencies have regularly shown that this site is used heavily by water birds. A recent count showed about 50,000 water birds on the site in a single day. The Bay has already lost too many wetlands to allow this type of project.

*Continued on page 46.*

It's not too late

# TBT-Based Paints Menace Marine Life

by Paul Siri

**W**HEN CHEMICAL ACRONYMS turn into household words, they tend to mean trouble. To the list that begins with DDT and PCB, another lethal compound is now being added: TBT, tributyltin. Used in paints to treat the hulls of boats and ships, it is one of the most toxic substances to have been introduced into the marine environment. It has damaged oysters, mussels, clams, and other marine animals, and has begun to show up in the human food supply. During the past year, a growing number of people, ranging from fishermen to marine ecologists to legislators, have begun to sound the alarm.

Paints containing TBT are highly popular as bottom (hull) paints because nothing can match their effectiveness against fouling—the attachment of barnacles, algae, and other marine organisms that hasten decay of wood and cause drag on boats. However, TBT leaches into the water, where, in amounts as small as 100 parts per trillion, it kills nontarget aquatic organisms. And that is the problem.

Any man-made structure submerged in the shallow water of a healthy marine or

as long as boats and piers have existed. Many materials have been tried against it. Wharf pilings are treated with creosote. The pitch in tar used as caulking in wooden boats provided a short-term inhibitory effect prior to the advent of bottom paints. Use of metal over wood in the early 1900s prevented decay caused by burrowing worms but did not inhibit fouling. Currently, all exterior surfaces of boats and ships are treated in some way. The most common treatment is paint.

The search for bottom paints with increasingly efficient anti-fouling (also described as biocidal) capabilities led to copper-based paints, with copper added in the form of cuprous oxide. Copper-based paints have been used for decades and have proved highly effective. But their biocidal properties require that boats be hauled out, cleaned, and repainted annually—a huge expense for very large vessels. As ships grew in size, culminating in the largest naval aircraft carriers and super tankers, and as world prices for oil climbed, the expense of fouling, and of drag, took on new dimensions. TBT was introduced into bottom paints in the mid-1960s.

To understand the legislative and practical problems associated with control of TBT, one needs to know how TBT-based paints are formulated and used, and how they enter the environment.

Emanating from a class of compounds described as organotins, TBT has one tin atom bonded to three butyl chains. Paints containing the compound come in two formulations, with different leach rates. In the first, the free association variety, TBT is freely associated as an oxide or fluoride and incorporated into the paint matrix. It diffuses rapidly into the marine environment

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## *Alaskan salmon raised in sea pens treated with TBT were shown to have high levels of TBT in their muscle tissue.*

estuarine environment—wharves, pilings, oil platforms, boat hulls—becomes home to myriad small organisms. Burrowing animals and fungi speed the decay of wood surfaces while algae, barnacles, and other organisms create drag, reducing efficiency and increasing operating costs, especially for motor vessels.

Fouling has been the bane of sailors for



***Routine boat maintenance figures largely in the TBT problem both when hulls are cleaned and when new paint is applied.***

when a freshly painted boat hull comes into contact with sea water. In the other formulation, copolymer paint, TBT is bonded to another substance in the paint. The leach rate is slower because the intermediate chemical reaction of hydrolysis, the splitting of the chemical bond, must occur before the compound's release.

In 1985, firms in the United States produced about 800,000 pounds of TBT. About a third of the volume was used in anti-fouling paints. The rest went about equally into wood preservatives, including fungicides and mildewcides, and into insecticides. It is also noteworthy that other forms of organotins are used in manufacturing. Dibutyltins, for example, stabilize polyvinylchloride (PVC) in plastics used in plastic bottles and plastic film. They, along with organotins used as insecticides and wood preservatives, are also entering the environment, at undetermined rates.

### ***Implications for Marine Habitats***

In Great Britain and France, TBT is now regulated, because it has caused serious problems in oyster fisheries. Oyster culture declined dramatically in the mid-1970s in areas near marinas with significant levels of TBT. In addition to an inadequate juve-

nile oyster (spat) settlement, scientists in both countries noticed unusual abnormalities in the shell formation of adult oysters. The healthy oyster is elongated and compressed, with a tight, hard shell. When exposed to chronic levels of TBT, oysters assumed a balled shape and their shells delaminated. These symptoms are associated only with chronic exposure to TBT.

In the United States, TBT is being used without regulation. The compound was registered with the Environmental Protection Agency as an insecticide, without much testing as to chronic health risks or the problem of accumulation in the environment. At this time, researchers working on TBT do not know what the cumulative effect of organotins on the environment might be. California marine scientists are mobilizing to establish a statewide monitoring program in an attempt to understand the cumulative impact of organotins on marine organisms in local marinas. This effort was initiated after Professor Edward Goldberg of the Scripps Institution of Oceanography completed analyses of water collected from 80 California marinas. His research documented TBT levels ranging from 20 to 600 parts per trillion. He also observed that marine fauna seemed conspicuously absent from sites where TBT

levels were highest.

In October 1986, the University of California's Bodega Marine Laboratory hosted a TBT workshop in an attempt to disseminate current research findings and to begin shaping ideas that might lead to a TBT monitoring program. Among the 50 who attended were biologists, chemists, physicists, ecologists, and regulators. The atmosphere was one of unusual cooperation and enthusiasm, stimulated by Goldberg's work and the sense of urgency based on information from Europe. The participants identified some areas of scientific agreement and uncertainty and made key findings. They also drafted a ranked list of necessary research.

The first priority, the group concluded, is initiation of field research to determine the impact of TBT on marina and estuarine ecosystems. Other needs include investigating which oyster fisheries are at risk, how TBT accumulates and perhaps magnifies in the food chain, and the extent to which TBT is entering birds and mammals. This last question is very important. Jeffery Short and Frank Thrower, scientists from the National Marine Fisheries Service, recently published findings providing evidence that organotin has entered the human diet. Chinook salmon, reared in

Alaskan sea pens treated with TBT and later sold in the market, were shown to have high levels of TBT in their muscle tissue. Common cooking practices do not destroy or remove butyltins from fish.

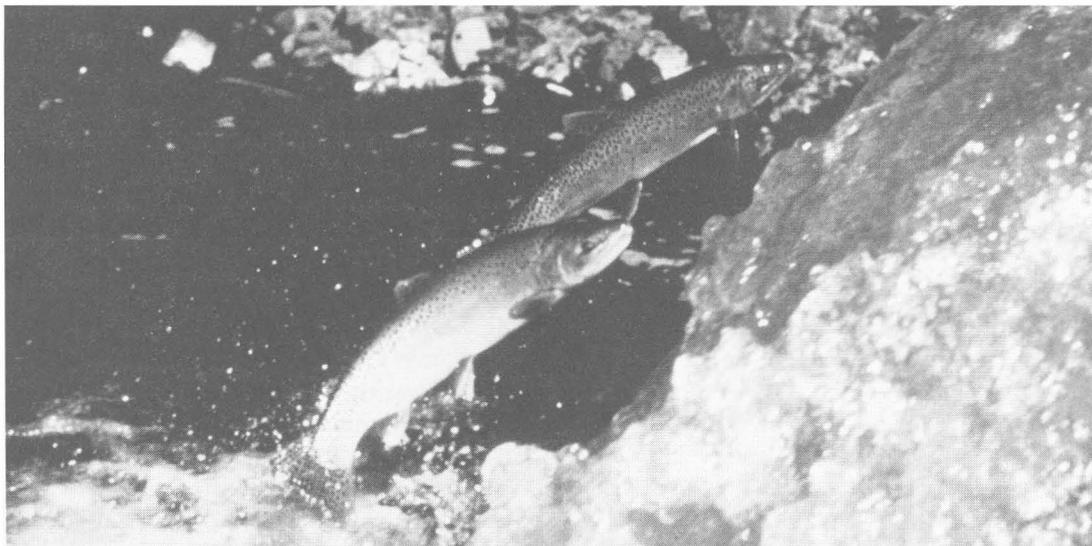
Current scientific information on TBT has been passed on to concerned legislators (see article by Mary Morgan).

### **Toward Controlled Use**

The necessary research will not be without expense or controversy. TBT is, without question, the most efficient biocide ever used as a bottom paint. As such, it can represent enormous savings to large fleets. At this time, the Navy is beginning a pilot program of TBT use in bottom paints on 30 boats at two sites, in Florida and Hawaii. Should the Navy succeed in its current effort to repaint the entire fleet with paints containing TBT, the quantity of the organotins in the environment would rise enormously, especially in the vessels' home ports.

The ambient levels of TBT are already alarming. Dorothy Soule, a biologist at the University of Southern California, believes that TBT is primarily responsible for the disappearance of 24 species of fish in Ma-

*Continued on page 14.*



**Traces of TBT have been found in some salmon.**

# Toward TBT Control

**A**S OF EARLY THIS YEAR, TBT use in this country has been virtually uncontrolled. Only Virginia has passed a law regulating TBT-based antifouling marine paints, and North Carolina has limited the discharge of TBT into its waters. Legislation restricting the use of the compound in paint has, however, been introduced in several other states and in Congress.

In an unusual multi-state effort coordinated and led by members of the Pacific Fisheries Legislative Task Force, bills have been introduced in Alaska, California, Oregon, and Washington to ban the use of TBTs in marine paints used by commercial and recreational boaters. In some of the participating states, legislators would also go further, requiring monitoring, the establishment of dry dock discharge levels, and setting allowable TBT levels for both salt and fresh water.



The Virginia law, which was sent to the governor for signature late in February, bans the use of TBT-based paints on all recreational vessels less than 25 meters (80 feet) in length, except on aluminum hulls. The law is similar to the French regulations. In North Carolina, regulations went into effect January 1, 1985, to limit discharges from industries to 2 parts per trillion (ppt) for salt water and 8 ppt for fresh water. (One ppt is equivalent to one drop of water in 10 million gas trucks.) Hundreds of textile firms had been using TBT to control odor-causing bacteria in textiles or to control slime in piping. Some of the discharges from the mills were high enough to kill

aquatic organisms.

At the federal level, SB 428, The Tributyltin Act of 1987, authored by Sens. William S. Cohen of Maine, and Paul S. Trible and John W. Warner of Virginia, would prohibit the use of TBT-based antifouling paints with a set measured release rate certified by the Administrator of the Environmental Protection Agency (EPA).

In addition, HR 5015, introduced by Rep. Stan Parris of Virginia, calls for a temporary ban on TBT-based paints on the hulls of commercial and recreational vessels until "EPA



has completed their ongoing studies to determine the safety of such paints and their impact on the aquatic environment." The EPA began a special review of the nine most common TBT antifoulant paint formulations on January 8, 1986.

France was the first to take action on the paints. The British acted subsequently, on the basis of their own research and the French experience. Germany and Switzerland have banned all TBT-based antifouling paints for freshwater usage. Japan has banned the use of TBT compounds in household products, such as house paints and textiles, but has not restricted its use in ves-

sel antifouling paints.

The EPA has reported that TBT levels shown to affect fish and shellfish adversely have been found in several U.S. locations. Tests were conducted in San Diego, Annapolis, Norfolk, Lake Superior, and Lake Ontario. The highest reading was at

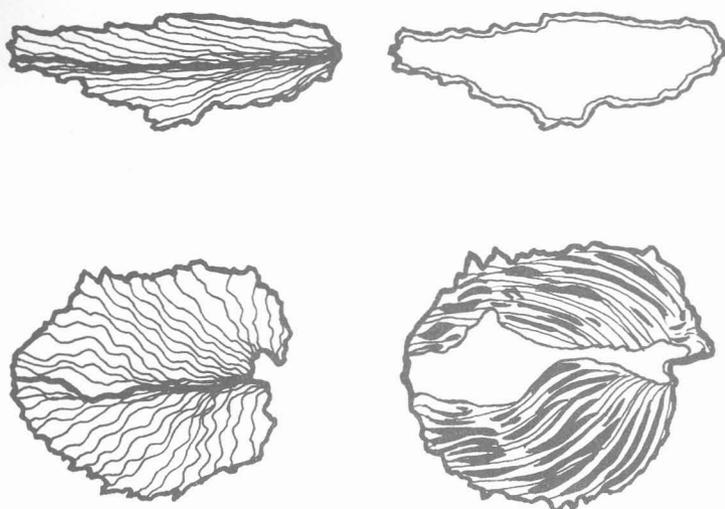


a San Diego marina, where 900 ppt were measured. England allows only 20 ppt. A recent study found that 62 percent of California marinas exceeded allowable levels established by Britain. Research has shown that TBT accumulates in fish. Safe allowable levels for human consumption have not been established.

After extensively reviewing the scientific literature, I suggest that since there is a readily available alternative to TBT-based paints, namely copper-based paint, TBT should be banned for use in commercially available marine paints. The copper-based alternative is not as effective against fouling, nor is it harmless to the environment. But it is safer.

—Mary A. Morgan

*Mary A. Morgan is consultant to the Pacific Fisheries Legislative Task Force.*



**(Left)**  
*Side views of normal (top) and malformed oyster (bottom) showing the "balling" effect of TBT exposure.*

**(Right)**  
*Side view cross-sections of normal (top) and malformed oyster (bottom) showing delaminating shell.*

rina Del Rey, where she has been measuring marine life for the past 12 years. But it would be difficult to substantiate these claims accurately without the statewide monitoring proposed by scientists.

Our healthy harbors and estuaries are nurseries for many important commercial and recreational fisheries. The Pacific Coast Federation of Fishermen's Associations (PCFFA) has taken an early and active role in the lobbying for TBT controls. In November 1986, the PCFFA endorsed a voluntary ban on TBT use. Subsequently, it passed resolutions asking Congress to ban the manufacture and use of TBT in the United States.

Whether an all-out ban on TBT use in antifouling products is politically feasible is a difficult question to answer when one considers all the players involved. The precedent provided by England and France will need to be examined. France banned the use of TBT paints on vessels less than 25 meters long (about 80 feet), while England prohibited the sale of paints containing more than 7.5 percent organotin by dry film volume (percentage of dry paint). Discussion on TBT control centers on a number of alternatives: limiting TBT by volume or

formulation and limiting what size boats may use it.

The French experience is somewhat encouraging. Five years after the imposition of control in 1982, French scientists are seeing the recovery of oyster beds that had been sites of TBT contamination. The French method of control, banning the substance on small boats, protects harbors where large numbers of small vessels are berthed. The British experience is too brief to evaluate, but earlier this year the allowable TBT paint volume was reduced to 5 percent due to increased environmental concern.

If California or federal controls are imposed, many will ask if continued monitoring is necessary. Researchers believe that monitoring TBT levels for a few years after control begins is necessary to ascertain that the legislation is effective and to determine whether future changes in the diversity and abundance of marine organisms are attributable to carry-over effects. An example of such an effect would be unforeseen future TBT problems stemming from current depositing in the food chain. There is also the very real problem of people stockpiling TBT paints because they fear a ban and would like to enjoy the use of this convenient, but indiscriminant, poison a little longer.

Those working on the TBT situation, including fishermen, legislators, agency analysts and many scientists, can only hope that we learn from the European experience. But perhaps we can also move ahead a little and assess the other problems associated with the use of TBT. These would include impacts on freshwater environments, where problems are also coming to light. Whether organotins in the environment derive from antifouling paints, industrial processes, or agricultural practices, TBT contamination poses a challenge we must confront. □

*Paul Siri is the assistant director for administration at the University of California Bodega Marine Laboratory. He coordinated the statewide TBT workshop in October 1986 and a TBT research planning meeting the following January.*

# A Good Tool That Needs Sharpening

by Robert Batha and Alan Pendleton

**M**ORE THAN 80 PERCENT of the historic marshes of the Bay have been lost due to filling and diking. Before 1965, when the San Francisco Bay Conservation and Development Commission (BCDC) was created, about 2,300 acres of tidelands were filled each year. Now only about 15 acres are filled annually—all for critical water-oriented uses. Further, through the judicious use of mitigation, the Commission has succeeded in reversing the historic trend of shrinking Bay wetlands. Over the last 14 years the Bay has actually increased at the rate of about 70 acres a year.

Mitigation, as used by the Commission, refers to any action taken to avoid, reduce, or offset environmental impacts from Bay fill that affect Bay resources including fish and wildlife habitat, water quality, and water circulation, volume, and surface area. Changing a project's design to avoid harming the Bay is a key part of the Commission's regulatory program for San Francisco Bay. The Commission's law and plan do not allow the approval of projects that could be changed to reduce or eliminate adverse impacts on the Bay. But there are some projects such as ports, wildlife refuges, marinas, airports, and certain industries that provide such important economic or public benefits that the Legislature has found that fill should be allowed. Though such projects may be carefully designed, they may have unavoidable adverse impacts on the Bay and its resources.

When fill for such purposes has been proposed, the Commission has required project sponsors to provide mitigation to offset unavoidable adverse impacts. Mitigation has usually taken the form of wetland creation or enhancement. While the California Environmental Quality Act refers to mitigation, it requires an indepen-

dent authority for an agency to impose an offsetting requirement. The McAteer-Petris Act, the Commission's enabling legislation, provides ample authority for the Commission to require mitigation. It states that the Commission cannot authorize a fill project unless the public benefits of the project outweigh the detriment from the loss of water area. The Bay Plan, the Commission's policy document, states that mitigation consists "of measures to compensate for the adverse impacts of the fill to the natural resources of the Bay, such as water surface, volume or circulation, fish and wildlife habitat or marshes or mudflats."

The Commission has favored a flexible approach to mitigation, determining the need for and amount of offsetting environmental benefit as it reviews each individual project. Such an approach allows the Commission to tailor mitigation so that it offsets the project's specific adverse impacts and ensures that new knowledge on how to restore and enhance wetlands can easily be incorporated into BCDC permit conditions. This flexible approach means that approved mitigation has taken many forms. Two approaches that have shown promise have been marsh restoration projects and mitigation land banks.

Most marsh restoration projects in San Francisco Bay have occurred since 1974 and have varied greatly in size and somewhat in approach. The smallest marsh project was 1,900 square feet and the largest 200 acres. Work on most of these projects has only recently been completed. These projects have been both hailed as milestones in recapturing some of the Bay's lost marshlands, and criticized as not providing the type or diversity of habitat that the review-

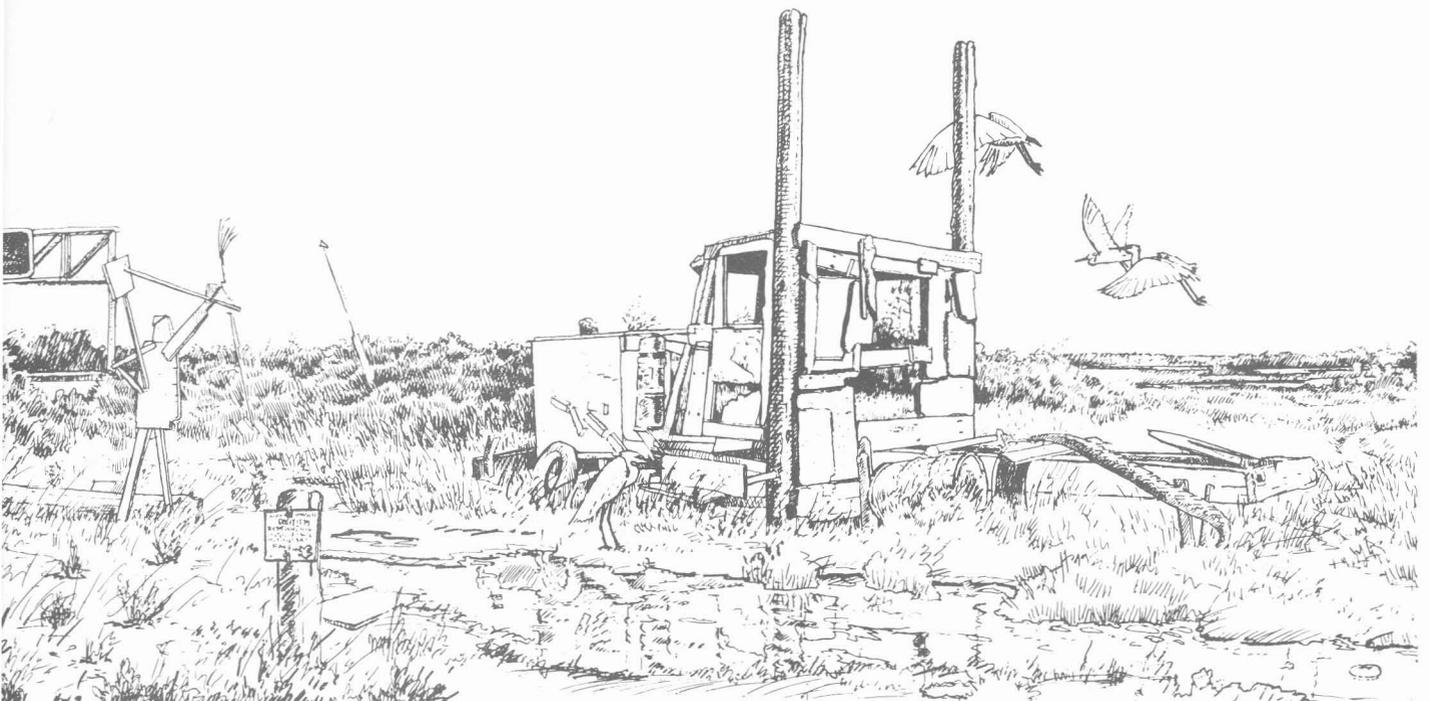
ers believe are most needed or provide the greatest habitat value.

It should be no surprise that some of the earlier restoration projects had varied success. As with any new activity, the learning curve will likely ensure that later projects have fewer problems than earlier ones. Despite some differences about which land elevations, tidal regimes, and plant species are most appropriate, the result of the Commission's wetland mitigation requirements is that considerable wetlands have been added to the Bay system, certainly more than would have been added without the requirement of mitigation. Some, such as the 130-acre Muzzi Marsh in Corte Madera, have closely met the wetland objectives agreed to by a panel of wetland experts. Others, such as the 220-acre Johnson Landing project in Hayward, are in the early stages of marsh development, already attracting heavy waterfowl use and giving every indication that a diversity of habitats will eventually be established. Nevertheless, conflicting reports about the "success" of marsh mitigation efforts have appeared in the press and in technical reports. Partly

in response, the Commission has undertaken a study to evaluate whether mitigation requirements involving new or restored wetlands have met the Commission's goal of offsetting the adverse impacts of approved projects.

As knowledge and skill in how to create and enhance wetlands increase, attention has turned to practical problems in meeting mitigation requirements. Major issues now include: accelerating land costs, particularly of lands suitable for wetland mitigation projects; limited wetland expertise among developers; and concerns that providing buffer areas and seasonal wetlands in the Bay area may be as important as adding wetlands to the Bay system. In addition, proponents of small fill projects that have unavoidable impacts have had great difficulty locating suitable mitigation areas and designing appropriate offsetting projects.

Mitigation land banks may be the best solution to such problems. Land costs are unlikely to be reduced in the future, and it is usually more economical to purchase larger rather than smaller tracts for mitigation purposes. Such banks also help en-



sure that sufficient wetland expertise is devoted to developing a wetland enhancement project and, after it is developed, to managing and monitoring. In addition, management agencies will sooner devote their limited resources and personnel to significant wetlands than take responsibility for very small areas. (See Winter 1987 issue for article on mitigation banks.—Ed.)

Lack of suitable enhancement sites at reasonable cost and conflicts among agencies as to what type of habitats are of greatest importance to the Bay system greatly concern all people interested in the future of San Francisco Bay. Most biologists agree that marshes provide a high level of biological productivity in comparison with other habitat types. Rapid urbanization will make the possibility of adding wetlands to the Bay increasingly difficult in the future.

Should offsetting projects no longer be feasible, the Commission will face the hard choice of either denying otherwise approvable fill projects, or approving projects without any mitigation because mitigation cannot feasibly be provided. If the latter oc-

curs, the Bay will suffer the unavoidable adverse impacts of Bay fill without any offsetting benefits.

To help regulatory agencies achieve highly beneficial wetland restoration and enhancement projects, fish and wildlife agencies should consider acquisition of lands that they believe can best be enhanced as wetlands. In this way, the agencies with the greatest expertise in resource management and with the most knowledge of which types of habitats are needed could make available lands suitable for mitigation. Such a banking system would also greatly reduce delays and expense for project sponsors. But most importantly, a coherent and comprehensive wetland plan for the entire Bay system would come into being, and small, haphazard efforts would be avoided. Of course the identification of suitable lands should include close consultation with the environmental groups and regulatory agencies. □

*Robert Batha is a planner with the Bay Conservation and Development Commission. Alan Pendleton is executive director. This article reflects their views and does not necessarily represent the views of BCDC.*



## In Search of Brando's Waterfront

**L**ENGTHS OF ROPE dangle from boom cranes, hooks reach into the bowels of a storm-beaten freighter to grip the impossibly heavy wooden crates stenciled "ARGENTINA" and "IVORY COAST." Longshoremen swarm about the cargo as young Marlon Brando, in a ragged wool sweater and watch cap, leans against a piling, smoking a cigarette on his break. He's squinting at the mid-morning sun, blocking out the groan and squeal of pulleys and the foreman's bark.

This is a port, indelibly defined for me by Brando in Elia Kazan's 1954 film "On The Waterfront." But had Brando been down at the Port of Oakland the day I went to check my mental image against today's



*The myth...*

reality, I would have missed seeing him. In fact, I spent much of my time searching for a glimpse of shoreline or the prow of a ship. Driving up Oakland's Maritime Street, all I saw past the chain-link fences and the rows of metal shipping containers were the spines of the towering black and white gantry cranes, their hunched figures looming over the dock like science fiction

monster/machines marching in formation.

Tractor-trailer rigs roared past my tiny car, jostling me in their wake. I parked alongside a pitted road sliced by ancient railroad tracks, and consulted my map. Dust swept in my window and diesel exhaust hung in the air. I was at the port, but couldn't even smell the water.

The Port of Oakland is the largest container port on the West Coast. Its 19 miles of East Bay coastline encompass far more than marine terminals and piers. It also includes an international airport, a business park, the marina-shopping complex of Jack London Square, two marinas, and marshland. Ships are not the Port's main feature, trucks are. Fewer than 30 ships may call any given week, but the trucks seem to dominate the Port, coursing through it continuously.

Containerization—shipping in sealed truck and train cargo boxes measuring 40 feet or 20 feet by 8 feet—has rendered obsolete the old saw that "A ship makes money at sea and loses it in port." Unloading used to take days or even weeks; now it takes as little as 12 hours. Today virtually every major port in the world uses containers.

Sea-Land Service Inc., the Port's largest shipping company, was the first in the United States to use containerization. At the company's gate, a guard told me that photographs were forbidden, even from outside. Why? "Security." The shipping companies' docks are generally off limits to all but military personnel and company executives on guided tours, I soon found out.

Continuing my search for the waterfront, I bounced along frontage roads and skirted shipping terminals and the Southern Pacific Yard. Between high fences was Middle Harbor Park, a tiny strip of lawn, some benches, and a fishing pier beside a channel of grey-blue water. At last, some water—looking north I could see the Bay Bridge, and across the channel, on Alameda, the grey shapes of fighter jets at the U.S. Naval Air Station. A swift tugboat cut through the channel, forcing small waves against the muddy shore.

I continued toward Jack London Square, with its colorful sailboats in the harbor, seafood restaurants and T-shirt shops on the esplanade. Still wanting to catch a glimpse of the Port's business, I searched for its offices and found public relations officer Bob Middleton. Where could I see the docks being worked?

"Access, in general, is good for the Port," he said. "Whenever a new terminal is built, for instance, we are forced to create open space such as the park you visited. In addition to following the law, this counters possible public alienation. Along the same lines we have a boat tour program from May to August. People wonder, 'What are they doing out there?' and this way we can show them."

But Brando's waterfront is gone forever. "It used to be, 30 years ago, a man going to work in San Francisco would get off the ferry or the bus in downtown, and ships would be all around him. He wouldn't be able to avoid it. But now that's impossible," Middleton said. "You need something like 600 acres of ter-

minal facilities. So the ports had to move away from downtown."

But, surely, there must be *some* way to see the longshoremen at work? I inquired. "Well, there are security and safety matters to think about," he said. "But we have created some vantage areas." He produced a map, and pointed out some locations where the life of the Port might be observed—Northpoint Beach, Franklin D. Roosevelt Pier, Estuary Park, Embarcadero Cove, and Port View Park.

So I traveled south, wandering through the tattered warehouse section along the Embarcadero. North of the Ninth Avenue Terminal a collection of old wooden fishing boats was being overhauled in dry dock. Further south was the Embarcadero Cove Marina, with restaurants and blue and white leisure boats. I continued up 7th Street past the Matson Terminal. At the end of the street lay Port View Park, sunny and windswept, the cold choppy Bay waters framing a beautifully designed fishing pier, a manicured lawn, and a small concession stand. A few people sat on benches, eating sandwiches. Climbing a three-story wooden observation tower, I saw the Port stretching to the northeast, cranes hulking in the distance, ready for vessels. Below me, a hundred feet away in the Public Container Terminal, I saw, at last, a ship! A freighter from Germany cast a long shadow over the dock to which it was moored. But no longshoremen were in sight. Turning west I saw the Bay Bridge stretching toward San Francisco's skyline.

I lingered on the tower, in the Bay winds and the afternoon sun, then



... and the reality of waterfront life

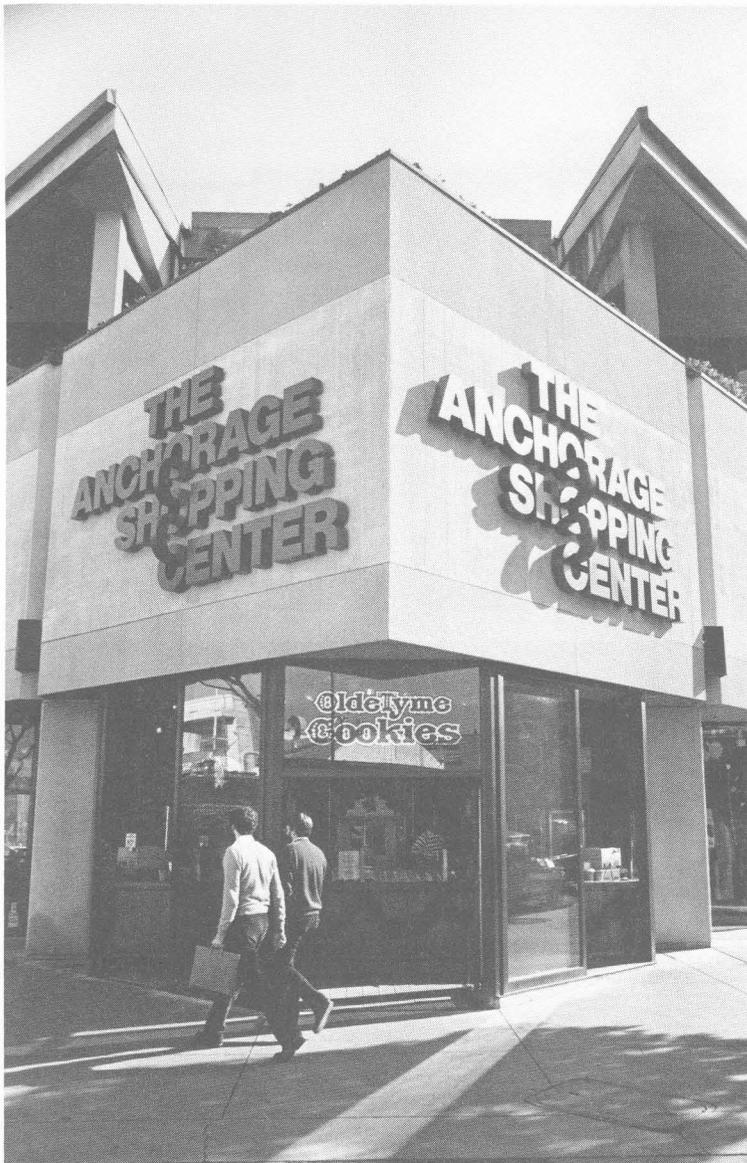


left the park and headed home. But as I passed a lone, squat building, I caught sight of a sign—the Apostleship of the Sea. Inside was a coffee shop/ministry serving sermons, lunch, and Anchor Steam Beer, with billiards for the asking. Since lunch was long over, the building was deserted except for the janitor. I paused by the guest log open on a wooden pedestal by the door and glanced over the names: Bill Strode. Juan Estevez. Sato Okisawa. Igmur Swenson. . . . No evidence of Brando.

The life of the sea continues, I reflected. The modern waterfront can be found—with perseverance.

—David L. Fore





*The nautical nature of this shopping center seems to be all in the name.*



# Visions of c

by Jim Burns

*"It is a combined social and working centre; visitors promenade the quays and treat the fish market as a free entertainment; coloured sails and flags and the whirling wings of seagulls combine to create a stimulating effect—that of a busy industrial scene permanently en fête."*

*—Gordon Cullen, describing the waterfront atmosphere of the fishing-boating community of Brixham, on England's south coast, in The Concise Townscape.*

**T**HE OPERATIVE TERM HERE is "a busy industrial scene permanently *en fête*," a scene of commonplace but colorful work, perpetually in celebration. Cullen has described the quality that has traditionally made urban waterfronts such interesting, pungent environments, such a lure to people of all ages and conditions. Unfortunately, with the same phrase he also has described exactly those qualities now being sanitized out of many waterfronts by the process of prettification-for-profit.

Nowhere is this lamentable process so evident as along the San Francisco waterfront. Where once there was an incredibly active scene of shipping, trade, commerce, boat building and repair, of fishing, seafood processing, and all the support systems for

# Vital Waterfront

these activities, today there remain only pockets of the former life, ghettos of real-life water-related uses. The repair yards and docks of the southern waterfront are still there, and a diminished Fisherman's Wharf, where commercial fishermen continue to haul in their catch backstage, as it were, of the tourist show.

The bayshore is increasingly bedizened with tourist traps, tangential open spaces, hotels and motels, and with inappropriate commercial and institutional uses such as law offices, ad agencies, and the San Francisco Eye Institute. Wharves and piers formerly abustle with shipping and fishing pursuits that created what Cullen called a "combined social and working centre," have been replaced in many places with a travesty of a real-life waterfront, a public relations marketing figment of a disappearing reality.

The decline of the San Francisco waterfront is best expressed, for me, by Pier 39, that elephantine "recreational shopping" center extruding like hardened lava into the bay. It symbolizes both literally and figuratively what has gone wrong. It does not invite acquaintance with the Bay and the waterfront. Quite the contrary. As with department stores and urban malls, this megastructure is designed to get you in and keep you in amongst the 100 shops, dozen

or so restaurants, and "family recreation center." It bespeaks no maritime uses. The ancillary marinas for recreation craft dangle off it like epaulets on the shoulders of an overstuffed rear admiral.

San Francisco's real waterfront has been under siege for more than 20 years. The implacable linear thinking of highway engineers slashed the elevated waterfront freeway between downtown and the Bay until, in 1966, massive citizen opposition stopped it and cut it off at Broadway and the Embarcadero. (Twenty years later, automobiles having become a life-support requirement of society, a resolution to demolish the downtown-Embarcadero section of the same freeway was defeated by the voters.)

Container shipping and automation began to take hold in the Bay area during the 1960s, but the City and the Port of San Francisco failed to seize their potential and challenges. Consequently, for more than two decades, shipping and cargo steadily drained away to Oakland, Los Angeles, and the Northwest port cities. While automation and containerization produce, perhaps, a less colorful port environment than 19th century tars singing sea chanties or Harry Bridges leading his longshoremen against the shipping magnates, still a working seaport can be a far more interesting

***Around 1855, when San Francisco was swiftly becoming an international city, the waterfront was the lively seam between the community and the Bay. Town and waterfront were an integrated organism, "a busy industrial scene permanently en fête." The view is from Stockton Street between Washington and Sacramento streets.***



***Pier 39 extrudes more than 100 stores, a dozen or so restaurants, a "family entertainment center," and the services and equipment needed to maintain them into the Bay. This megastructure bespeaks no maritime qualities. Its ancillary marinas for recreation craft dangle off it like epaulets on the shoulders of an overstuffed rear admiral.***

tourist lure than the evanescence of souvenir shops and wax museums.

### **Building on the Past**

The misjudgments of the '60s and '70s are barely beginning to be readjusted for the '90s, conceivably too late with too little. A container facility has been proposed for Piers 30-32, where the great Matson Navigation Co. floated a flotilla of 24 or so freighters between the two world wars. Pier 50 near China Basin also has been proposed for container shipping. "Love Boat" type cruise ships still tie up on the beleaguered north waterfront, close to Fisherman's Wharf, and produce a \$70-million-a-year business. Indeed, a recent report by the Port of San Francisco warns of losses to other port cities unless a new expansion program is undertaken very soon. There will be little room for this expansion if the waterfront is increasingly occupied by non-maritime uses. San Francisco has negotiated with Israeli and Chinese cargo shippers for their use of Piers 94-96 further south along the Bay between Islais Creek and India Basin, near the industrial-military uses of Hunters Point.

This is in laudable contrast to the continuing push by developers, their design and planning consultants, and such groups as the San Francisco Planning and Urban Research Association (SPUR) for a waterfront dedicated principally to shops, offices, cafes and restaurants, tourist lures, and some housing, along, no doubt, with the ubiquitous urban decoration of information kiosks, twinkling designer lights and beguiling graphics, mini-parks, stalls for croissant and T-shirt sales, photo-opportunity sites for tourists, and places for performing mimes, all of which are more appropriate to Market Street, Union Square, or Columbus Avenue than to a marine environment.

The people of San Francisco, in contrast, have spoken out loudly in favor of a "combined social and working" waterfront by voting by a ratio of 3-to-1 in 1984 for maritime expansion embodied in a \$42.5 million bond issue. More than a decade ago, when powerful Rockefeller interests wanted to build a skyscraper out in the Bay off the

downtown shoreline, the people rose up and said, "No way!"

Still, much of the bayshore remains in jeopardy. Between non-maritime Pier 39 and historic Fisherman's Wharf, the Port Commission itself wants to thrust a 500-room hotel into the Bay. This would conflict with a proposal by the late Congresswoman, Sala Burton for the creation of San Francisco Seaport National Historic Park stretching from Fort Mason to Aquatic Park and the Hyde Street Pier, by imposing a giant non-maritime neighbor for one of the world's most noted collections of historic ships. It would also overwhelm the fishing and processing activities, the very activities that give their essential qualities to the Fisherman's Wharf area and bring in the tourist trade. Such a hotel belongs on the land side of the Embarcadero, not squatting amongst the fish scales and crab pots like a conquering invader. The Ferry Building and its precincts were targeted for a large "reuse" project by architect I.M. Pei, but it is currently in limbo. Piers 1-1½, north of the Ferry Building, are the potential site of a multi-use development, more of which appears to be maritime; it would include offices, shops, stores, and cafes.

The real-life waterfront is in danger from the Ferry Building on north to Aquatic Park. On this wonderful stretch, where San Francisco was born as an international city

*The magnificent old pier-head houses along the Embarcadero have been tenanted by all manner of inappropriate businesses and institutions more properly located on the land side of the waterfront.*

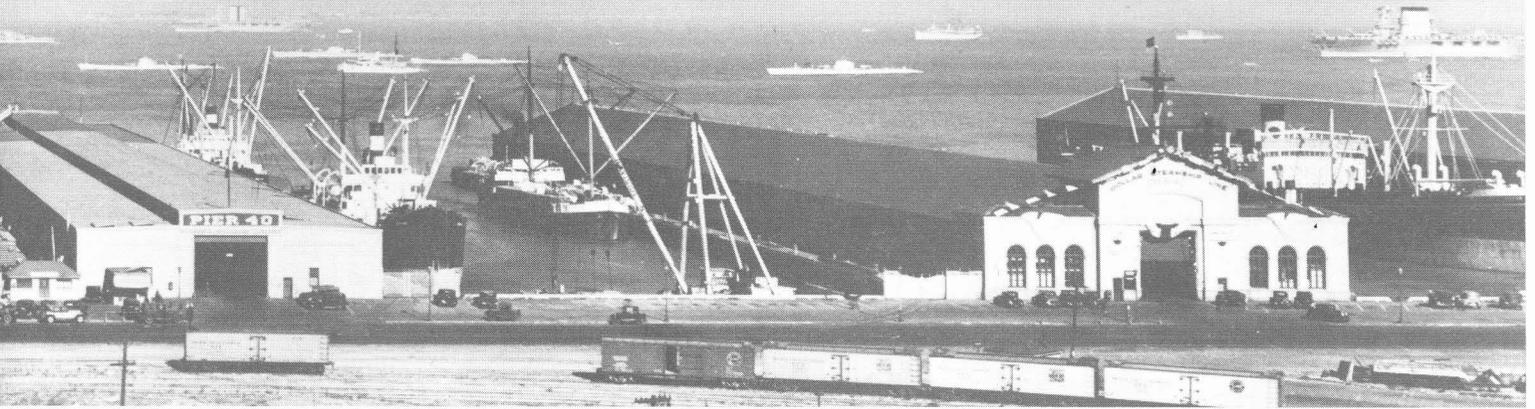




*A positive glimmer that may herald the return of the San Francisco waterfront to its appropriate maritime uses is a container terminal proposed for Piers 30-32 near downtown.*



*The vestiges of the waterfront's Golden Age, such as Red's Java House which has hosted a faithful clientele of long-shoremen, sailors, and waterfront enthusiasts for many years, could be the seeds around which a revived waterfront could grow.*



**San Francisco waterfront, circa 1930.**

a century and a half ago, the spoor of speculation seems to be heaving in the waters. Developers are circling slowly in what appears to be the overture to a feeding frenzy. This is the section of waterfront most appropriate for the expansion of cruise ship facilities that the Port itself considers so vital for the future.

South of the Ferry Building, potential still exists to create or re-create a social/working waterfront. The indigenous Red's Java House can continue its jovial symbiosis with its neighbors and also welcome the new container terminal on Piers 30–32. More appropriate and enlightened uses than gentrification should be found for the stretch between the Bay Bridge and China Basin.

From China Basin on south to Central Basin is a richly textured shoreline with lively piers, coves, inlets, wharves, and ship-building and repair facilities. Access for residents and tourists exists today in the form of a public fishing pier and mini-park, restaurants like Mission Rock Resort, Olive Oil's, and The Ramp, and small-scale boat clubs. This area is the essence of a "busy industrial scene permanently *en fête*," where the activities of a working waterfront draw visitors, be they tourists with Instamatics or nearby office workers seeking a change of pace for an outdoor lunch. Unfortunately, this environment is currently under siege by the San Francisco Planning Department. For the past six years, Santa Fe-Southern Pacific Realty Corp. has sought in several plans to change 300 acres of former railroad yards into a multi-use de-

velopment of offices, another 500-room hotel, shops and stores, a professional baseball stadium, and apartments and town houses—virtually an entire new community next to downtown San Francisco. Interestingly enough, not the Port of San Francisco, but City Planning Director Dean Macris recently announced plans for a two-mile-long Bay-front park from China Basin southward, along the shoreline of this proposed new town. Such a prettification would greatly diminish the present interesting maritime uses of this waterfront, as



**The old pier-head houses interact with their environment in many colorful and exciting ways. Here the Bay Bridge soars over Pier 28 in a thrilling three-dimensional structural display. It is imperative to conserve these evocative qualities on the San Francisco waterfront.**

well as cause the Port to sell land and piers planned for reuse as container facilities in order to buy areas southward from private owners for these uses. This is gentrification with a vengeance, the obvious motive being to provide a genteel front porch on the Bay for the Santa Fe-Southern Pacific Realty development.

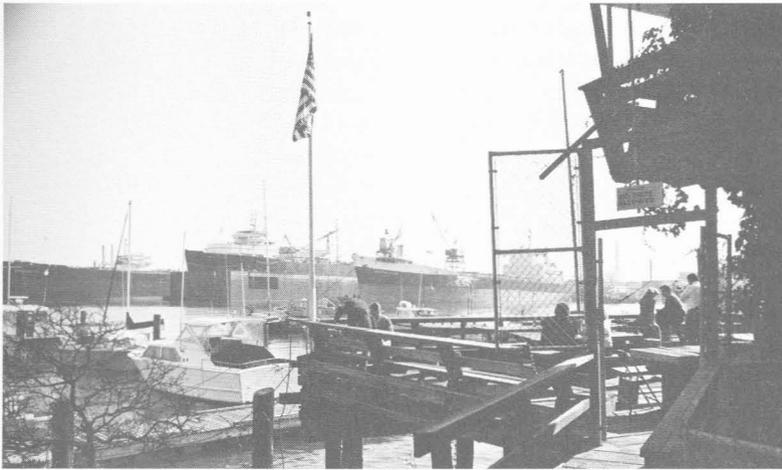
Former Port commissioner and San Francisco supervisor Jack Morrison, a leader of the environmental group San Francisco Tomorrow, denounced the plan as a "raid on port property," and San Francisco Tomorrow members were quoted in the *San Francisco Chronicle* as stating "We think it is outrageous to plan this way—to give up the future of the port well into the next century when the city may need all the

made and concentrate on places that can still be brought into a healthy social/working relationship with and for San Francisco. Let's bring intensified and economically viable maritime uses of all sorts—old and new ones—back into a rejuvenated maritime environment. Many of these uses exist now, though sometimes in poor health. These include shipping of all types and technologies, commercial fishing and seafood processing, more ferries and tour boats, sports fishing, expanded cruise ship facilities, appropriate waterfront businesses such as ship chandleries, boat-building and repair yards, related public recreation areas, maritime associations and unions and, yes, places where residents and tourists can rest and refresh themselves and enjoy the experiences offered by such a vivacious environment. (It goes without saying that polluting industries must be kept from the waterline, particularly downtown.)

Waterfronts have always been known for their various responses to human needs—dockside cafes, bars, rooming houses and hotels, as well as tourist locales and facilities catering to even more basic human appetites (for example, the old International Settlement). But developers, public agencies, and their consultants who would graft fashionable economic formulas such as "festival marketplacing," "recreational shopping," and "multi-use office-residential complexes" on to San Francisco waterfront have their priorities stuck in the corporate board room and their creativity stifled by refusal to explore the potentials that exist along the waterfront. They create inward-oriented zones that implode and relate neither to the community nor to the waterfront. Like Pier 39, these zones become enormous barriers between the life of the City and the life of the Bay.

In her landmark manifesto, *The Death and Life of Great American Cities*, Jane Jacobs cites the distinction of urbanologist Kevin Lynch between a barrier and a seam—a barrier being something that irrevocably separates lives and environments in a community, and a seam being "a line of exchange along which two areas are sewn together." Jacobs observed that "waterfronts, too, can be made to act much more

**The spirit of the waterfront still lives in the busy, many-textured piers, docks, and inlets south of China Basin. The spark that lingers here could rekindle the whole waterfront into bustling life.**



piers it can get." Macris defended his waterfront proposal by saying it is instrumental to the developer's plan: "This kind of intense development cannot occur without massive amounts of open space." This seems to me a colossal misalignment of priorities on the City's part.

### **Reviving the Waterfront**

Last October, in the *San Francisco Examiner* Sunday magazine, *Image*, Reg Theriault, a longshoreman and author, concluded, "One of the great ports of the world is dying, and not enough people seem to give a damn." He may very well be correct; I hope he's not. Even at this late day, there are enough salvageable pieces left to alleviate the mistakes made by prettification-for-profit. Let's ignore the blunders already



like seams than they ordinarily do today. The usual form of rescue for a decayed waterfront is to replace it with a park, which in turn becomes a border element—usually appallingly underused, as might be expected—and this moves the vacuum effect inland. It is more to the point to grasp at making the shore a seam. Waterfront work uses, which are often interesting, should not be blocked off from ordinary view for interminable stretches, and the water itself thereby blocked off from city view at ground level. Such stretches should be penetrated by small, and even casual, public openings calculated for glimpsing or watching work or water traffic. . . Penetrations into working waterfronts need to be right where the work (loading, unloading, docking) goes on to either side, rather than segregated where there is nothing much to see. Waterfront activities can help to make a seam, instead of a barrier, of that troublesome border between land and water.”

San Francisco’s waterfront still has unique qualities both for people who work and live there and people who visit—the potential still exists for a reborn social/working maritime environment of great interest and variety. Aquatic Park and much of its neighborhood are unparalleled as an urban waterfront visitor precinct. William Turnbull’s elegant Port Promenade, just south of the Ferry Building, is a textbook example of how to open a wonderful window onto the Bay and yet be unassuming

enough to let the spectacle of that scene become the “design.” The Port’s plan for rebuilding Pier 7 as a public pier will allow people to view tugboats and ferry boats at close range and open a new downtown site for sports fishing and strolling.

The remaining pier-head houses lining the Embarcadero—of quasi-Renaissance design on the north waterfront and of an amusing hybrid—neo-Spanish-Mission on the south—are handsome emblems of past maritime glory. They must be retained to house real-life maritime tenants and for other uses. Fisherman’s Wharf, though distorted into tourist caricature and shrunken by developer encroachment, still possesses some magic as well as the hint of possible rejuvenation and expansion. The remnants of San Francisco’s lusty seaport that increase in density as one moves south from downtown to China Basin to Central Basin to Islais Creek and on to Hunters Point give unmistakable evidence that life is there. Let’s hope that it will be encouraged to flourish over time, and bring about the maritime revival of the entire waterfront.

### **A New Vision**

Here are some things that can happen, given a totally new attitude of concern and care for the waterfront by the City and Port: The fishing industry (both fishing and processing) should be encouraged to upgrade and grow on the north waterfront. Instead

***Aquatic Park embodies all the positive elements of a public waterfront facility: open spaces and walkways leading directly to the beach and the circular pier embracing the small harbor, a Maritime Museum designed in crisp marine style, repositories for floating historic vessels, a wide amphitheater facing the Bay, and adjacent busy commercial streets offering many varied opportunities, with Fisherman’s Wharf close by.***

of being ghettoized in small enclaves tucked behind the tourist eateries at Fisherman's Wharf, fishing should become more prominent and accessible as one of San Francisco's prime historic and contemporary pursuits. There is room all along the northern waterfront for this to occur, in place of the present trend toward gentrification and prettification-for-profit. Related visitor facilities can accompany and be mixed in with such development, such as a museum/aquarium devoted to the unique ecology of San Francisco Bay as well as to its fishing industry.

In late 1986, State Assemblyman Art Agnos, a prominent aspirant to the San Francisco mayor's chair, introduced Assembly Bill 45 to evolve a commercial fishing and marine environmental research and training center at Pier 45 and Fisherman's Wharf. As he stated in the *Oakland Tribune*, "People don't travel here from across the country just to buy a T-shirt or buy a franchise ice-cream cone or play pinball. They want to see a working fishing port." Commercial fisherman Ray Nicholai backs him up: "The Port has put all its money into tourism, and left the fleet to just fade away. As long as they have the illusion of fishing, they think that's good enough for unsuspecting tourists who don't know anything about it." Agnos wrote me that "Unfortunately, we are in a Catch-22 in that presently the only way that we can keep the dealers and processors at the Wharf is if we build a hotel to provide revenue for replacing the existing structures at Fish Alley. I, of course, remain hopeful that a better financing idea will come along." For the continued existence of any sort of maritime qualities along the San Francisco waterfront, it had better come along soon. There's no need to wait two years for an election, however. The current mayor and her administration can seize the initiative and put these changes into motion.

Along the southern waterfront, from the neglected fire station pier and Pier 24 beneath the Bay Bridge to Central Basin and Islais Creek, a true urban maritime-based waterfront should be reborn. Where necessary, thoroughly updated shipping technology and practices should bring the Port of San Francisco at last into a state-of-the-

art excellence to rival Oakland, Los Angeles, and the Northwest ports. Shipping unions and pilots' associations presently contemplating moving their main activities to Oakland should be persuaded to remain, perhaps by providing offices and hiring halls in the refurbished pier-head houses.

Houseboat communities in coves and inlets and live-aboards on craft along the shoreline should be encouraged instead of abolished; they provide the marine equivalent of Jane Jacobs' "eyes on the street" that keep watch in healthy urban neighborhoods. They would produce a waterfront that is secure and has a 24-hour life. Public "penetrations into working waterfronts" should occur the length of this bustling shoreline, so that people can visit and experience its excitement and variety. The seeds of these opportunities exist now at places like the Ramp Restaurant, Mission Bay Resort, and Red's Java House, which share their locations with boat yards, docks, repair facilities, fishing piers, and the innumerable activities that make the south waterfront even in its present neglected state "a busy industrial scene permanently *en fête*."

The rejection of the extravagant schemes for transforming the Santa Fe-Southern Pacific Realty property into an up-scale office-condo-marina utopia presents the opportunity for a reassessment of this waterfront neighborhood with plans more appropriate to its location and to the needs and wishes of the people who will live and work there. If the City and the Port and the owners reject manicured front-porch landscapes along the Bay and hearken to these needs and wishes, and instruct their professional consultants to plan and design accordingly, a rare opportunity for San Francisco's waterfront can be realized.

What choice do we have, after all, when the only other options we are offered feature 500-room hotels suffocating the Bay and shopping-office-condo complexes poised as death spikes above the heart of our fragile and wondrous waterfront? □

*Jim Burns is a consultant to professional, public, and community organizations interested in community participation in design and planning projects. He is a long-time observer of the San Francisco waterfront.*



*Battered but unconquered, Fisherman's Wharf has weathered the ignominies of tourism and speculative development. If the priorities of City and Port were to make the fishing fleet and related processors a healthier industry instead of a quaint relic sustained by tourists ingesting walkaway crab cocktails, a better waterfront would begin to flower.*



*Port Promenade was designed by architect William Turnbull in a commendable self-effacing manner that lets the spectacular scenery become the "design." To the Port Commission's credit, it rejected previous designers' attempts, featuring the usual exterior decoration of busy street furniture, in favor of this approach.*

## The Invisible Fishermen

**A**N OPAQUE TUBE SNAKES down from the sky into the hold of the boat and fish begin to fly. Thousands of small silver fish are being sucked up and spewed into large wooden crates containing ice. A man lifts a basketful out of each crate to determine the average roe content and to see how much the catch is worth. The crates are bound for Japan, where herring roe is considered a delicacy.

In the cold, damp pre-dawn, people are moving about, tending to chores. Huge nylon nets are stretched and checked for tangled fish and seaweed. Supplies are taken aboard. Puddles of fish juice, diluted by the rain, stream off the dock. Below the pier, sea lions wait for any breakfast that might come their way.

This is Fisherman's Wharf. In San Francisco. From 3 a.m. to 9 a.m., an active commercial fishing industry is alive and prospering in the heart of the world famous tourist attraction. By 10 a.m., it's packed up and gone.

"It's a long, hard day," Billy Martino reflected about fishing on an 80-foot drag boat. "You get up about 2 a.m., get down to the boat and get all the gear and supplies on the boat—ice, gas, food, etcetera. It can take about a day and a half to get out to the fishing grounds, so everyone has plenty of time to sleep off hangovers, repair the nets, get everything ready to go. You set out your nets and do a slow drag for about two to three hours. Once you pull up the first haul, you don't sleep again till the end of the trip or when you reach your quota. After you dump the first net you set it back in the water and drag again.

You sort all the fish by species and size and put them on ice in the hold. By the time you're done with that, the second net is up and you start all over again. This usually lasts for five to six days, depending on the fishing and the quotas."

Peter DiLucca, now a bartender, reminisced about his days on a salmon trawler: "It's a hell of a way to make a living. This was a 28-foot Monterey with no radar, no sonar, not even a radio, just a compass and an old man. The 12-cylinder Hicks engine goes kochoonk, kochoonk, kochoonk and keeps you company or drives you crazy or both for the rest of the trip. As you head out to

the Gate, it's usually pretty foggy and chilly. You need a couple of hits of brandy and about four cups of coffee so you're warmed up, jacked up and alert and watching everything. Once you're outside the Gate you really got to watch out for the big tankers, listen for their horns in the fog. And when you see them, you're usually looking straight up at this big bow that just stretches up into the fog and disappears, and if you're lucky, you get the hell out of the way—fast."

On any given day, depending on the season, fishing boats from San Francisco, Fort Bragg, Morro Bay, Bodega Bay, and other points come



*The work begins way before dawn.*

in to unload at distributors' doors at Fish Alley and Pier 45, in the heart of Fisherman's Wharf. Dungeness crab, herring, shrimp, tuna, cod, and flounder are only some of the varied catch that comes in.

The intersection of Jefferson and Leavenworth streets is where it all happens. This is the Grand Central Station of fishing in San Francisco. Here, distributors, truckers, and fishermen all cross paths. Fish are weighed, cleaned and filleted, bought, traded, packed onto trucks (sometimes bound for planes), and delivered throughout the world.

To the people who arrive later by cable car or auto to buy sourdough bread and shrimp cocktails, take photos, and browse in the gift shops, the fishing industry is invisible. Tourists smile and sigh as they look over the fleet of old wooden Mediterranean-style fishing boats that dominate the inner harbor. They are called "dead boats" by some fishermen because most are no longer commercially active and serve mostly for wharf ambiance.

Fishing established tourism at the Wharf, but now tourism more than overshadows the fishing industry, which nevertheless continues to be a major contributor to the State's economy. According to the Department of Fish and Game, commercial fishing, including job spinoffs, brought in \$1.25 billion in 1984. The value of the 1986 catch alone was \$63 million. A major share of that passes through Fisherman's Wharf, mostly unobserved.

The working world of the fishermen is obscured by Jefferson Street, a collage of bright lights and attractions, T-shirts, trinkets, fast food,



**Fishing boats on Fisherman's Wharf**



**An early morning scene**

colored shells collected latitudes away, hotels, parking lots, shopping malls, street artists, restaurants, maritime supply stores, musicians, and sidewalk vendors of crab and shrimp cocktails.

"It's like you can't see the forest through the trees," one Wharf fisherman, Ray Nicolai, remarked. But when asked his opinion of development plans that would try to integrate commercial fishing with tourism, he said, "Well, personally I think it stinks, unless they can fig-

ure out a way to keep people out of our hair. We can't get any work done with people coming in and out of our working space, standing around and asking questions we don't have time for. Plus, it could be dangerous."

For the time being, however, the Wharf fishermen remain invisible, protected by the barrier of Jefferson Street and, most especially, by the time of day. □

—Pia J. Hinckle



## Transferable Development Credits

**L**AND CONSERVATION EFFORTS often founder on property owners' resistance to giving up development potential, which they see as a property right. A promising new method to overcome this obstacle is now gaining ground in several states.

The method is transfer of development credits (TDCs), also known as transferable development rights (TDRs). It is being used to save agricultural land in Maryland, preserve landmark buildings in Chicago and New York, control development in the New Jersey Pine Barrens, and to preserve scenic areas and open space in California.

A TDC program severs the development potential from land and treats it as a marketable item. It can be used to shift development from one area to another without altering the net amount of development. In an era when "privatization" is the rallying cry for regulators and planners, and the "free market" is expected to offer refreshing, efficient new ways out of old regulatory problems, the TDC concept strikes a responsive chord. It is, however, controversial and certainly no panacea.

### The Future of Land Use Planning

Many planners now look to TDCs as the wave of the future. Some go so far as to

# Controversial Land Use Tool

by Prentiss Williams

expect TDCs to replace traditional zoning as basic land use controls. Jerome Rose, professor of urban planning at Rutgers University and a proponent of TDC programs, sees them as "... the most innovative and potentially effective technique of land use control to be introduced since the introduction of zoning and subdivision regulation." To Worth Bateman, former director of the Urban Institute Land-Use Center in Washington, D.C., however, the transfer of development rights "seems like a very crude and limited approach compared to other means."

Experience shows that TDCs can be used to avoid some of the problems of traditional zoning while at the same time offering an effective method for preserving public resources.

Traditional zoning works to shape development through regulations and ordinances that restrict the type and level of development permitted in any given area. A common criticism of traditional zoning concerns the issue of "down-zoning" or the tightening of existing development restrictions. Landowners expect to be able to develop to the level of zoning in effect at the time of purchase. If down-zoning occurs, they lose the expected development potential of their land. Under most systems,

there is no way in which a landowner may be compensated for lost or diminished development potential. TDC programs can offer a mechanism by which the landowner's development potential may be transferred to another site rather than lost.

A TDC program can also achieve a certain amount of "fine tuning" of development patterns by shifting development potential from where it is undesirable to areas where it is more acceptable or desired.

The legal principle that separates the right of land ownership from the rights of land use has long been established in mineral rights, air rights, and water rights, all of which function to restrict or control land use by the owner.

## **How TDCs Work**

Details of individual programs vary tremendously, but generally, a TDC program divides the targeted area into sending zones and receiving zones. In the sending zones development is deemed to be undesirable because the land is of extraordinary historic, scenic, or environmental value. The regulatory agency restricts further development and issues "development credits" to the owners. These TDCs

**The landowner can either transfer the development credits... or sell the credits to another landowner.**



represent the rights to development that the owner cannot exercise because of the new restrictions. They can be used in the receiving area. The landowner can either transfer the development credits to some other parcel in the receiving zone, or sell the credits to another landowner. In the receiving zone, the application of additional development credits allows development at a higher density than is allowable under the current zoning regulations. If this area is zoned for single family houses, for instance, the purchase of development credits might enable a landowner to build a duplex.

### **The Maryland Experience**

An outstandingly successful TDC program in Montgomery County, Maryland, viewed as a model throughout the country, has preserved at least 89,000 acres of valuable agricultural land in the face of strong development pressure. The prosperous county, just north of Washington, D.C., was urbanizing so rapidly that 18 percent of its farmland was lost in less than 10 years. According to county planner Melissa Banach, however, "politics would have made it difficult, if not impossible, to down-zone 89,000 acres of prime farmland." County officials therefore instituted a TDC program. Their intent was not only to preserve the farmland, but also to preserve farming as a viable livelihood. A sending district of 89,000 acres was designated, within which development credits were authorized at a rate of one dwelling unit for every five acres. These credits were salable for use in receiving districts, which were selected from undeveloped sites in the high-growth areas of the county. Development within the preservation district was severely limited: one dwelling unit per 25 acres, to be constructed on lots of no more than 40,000 square feet.

Although it restricted the development potential of the farmers' land, the TDC program provided them with a few more options for raising capital. Prior to the program, farmers had the choice of liquidating their land by selling it all or subdividing it and selling parcels. Now they could maneuver, using their development

rights. They could buy land in the receiving zone and develop it using their own TDCs. They could raise additional capital by selling their TDCs, without reducing the land base of their farming operations. Some farmers expanded their farms with funds from the sale of their TDCs, others have purchased for agricultural use land from which the development rights had already been sold and which was now less costly.

Montgomery County's program has almost completely preserved the 89,000 acres of prime farmland in the sending area. "It's really neat," said planner Banach. "You can drive to the upper part of the County and just about see a line between where the development ends and the farmland begins."

### **The Keys to Success**

Montgomery County's program met all of the criteria essential to success: the existence of adequate receiver sites; a smooth, consistent planning process; adequate economic incentives for both senders and receivers; and a mechanism for facilitating transfers.

During the first transactions, the county planning staff served as informal brokers. "Normally, we as planners don't like to get too close to developers," said Banach. "But [to make the program work] we had to become aware of the profit motive and to become experts in real estate and land economics." Today, the program functions almost entirely through the private real estate market. The credits are multiple-listed and routinely advertised. The county adheres strictly to zoning ordinances set out in the general plan, thus assuring that the advantage gained from buying TDCs will not be eliminated through rezoning.

Though various forms of TDC programs have existed in Great Britain for about 30 years, and though New York City has used the concept since 1967 for historic landmark preservation, TDCs in their modern form date back to 1971. That year saw the publication of the "Chicago Plan," a comprehensive land use and landmarks preservation law which included the use of TDCs as an important component. By using a system of TDCs to mitigate some of the negative impacts of the proposed reg-

ulations on property owners, the city diminished opposition to the plan. The same held true later in New York.

### **TDCs in New York City**

New York City's Landmarks Preservation Act, passed in 1965, faced immediate and fierce resistance from property owners. Owners of potential landmarks fought hard against landmark designation because it severely limited development potential. The landmarks commission, fearing legal challenges to the new statute, was applying it with extreme caution. In 1967, the city's landmarks commission proposed a TDR scheme to the planning commission: that owners of landmark buildings be allowed to separate the unused zoning potential from the landmark lot and transfer it elsewhere. The plan was first used on Grand Central Terminal, which had a floor-area ratio (FAR) of 2 in an area zoned for FARs of 18. The owners were allowed to transfer the height and bulk potential above the terminal to another site downtown.

Early critics of the TDC program contended that it would result in overbuilt downtown areas thus foiling the goals of the original zoning controls. Developers complained that it would be too difficult to use the credits. This latter complaint has been borne out: only 12 landmark buildings have sold off TDCs since the mid-1970s. "In a city as densely packed as New York, where can you put them [TDCs] down?" asks a planning department official. The TDC program has met with some success, however, in that it has reduced property owner resistance to landmark designation.

### **Preserving the New Jersey Pinelands**

More promising is the application of the TDC concept in the New Jersey Pinelands, a million-acre landscape of forests, farms, and cedar swamps between Philadelphia and Atlantic City, stretching across seven counties. In recognition of the ecological uniqueness and natural values of the Pinelands, land use is regulated according to a comprehensive management plan that combines some of the strictest controls in

the country with a large and extremely complex TDC program. Development credits were issued to landowners according to a formula based on the suitability for development. Wetlands, farmlands, and forest lands received differing numbers of credits per acre. The program was plagued by institutional and logistical problems from the outset, and only within the last three years has the program functioned as intended. Pinelands Commission staff are confident, however, that all of the obstacles to the success of the program have been eliminated, and they are looking forward to some large projects in the receiving zones that will use large numbers of TDCs from the sending zone.

### **Coastal Conservancy and TDCs**

The Coastal Conservancy has participated in the shaping of TDC programs in Malibu/Santa Monica Mountains, and in Big Sur. Both programs have been fraught with controversy.

The Malibu program, which was implemented by the Coastal Commission through coastal permit decisions, was intended as one way to address the issue of cumulative development. It provided for the retirement of the development potential of parcels in environmentally sensitive habitat areas or in antiquated small lot subdivisions in exchange for the creation of new building sites in less sensitive areas. The TDC program required that as new land divisions were approved, the development potential of existing parcels be extinguished. For each new single family residence, the purchase of one TDC was required.

Opponents of the program questioned whether cumulative development impacts were really a problem and contended that, even if they were, the TDC program was largely ineffective in addressing such impacts. Landowners were extinguishing the development potential of "junk lots," which were not developable anyway, according to Robert Hoie of the Los Angeles County planning department. "You just got the owners of developable land paying off those with undevelopable land," he maintains. The Coastal Commission could

*Early critics... contended that it would result in overbuilt downtown areas...*



***"We had to find a way to prevent full build-out of all those lots... that would at the same time address the frustrated expectations of the landowner..."***



have achieved its goals more effectively through the use of zoning and developer fees than through an imposed TDC program, in Hoie's view.

Proponents of the program argue that cumulative development impacts seriously threatened environmental quality in the hills. They add that the existing land use control policies were not adequate to preserve valuable open space and environmentally sensitive areas. The TDC program, they say, has been highly successful in limiting development with some measure of equity in this highly constrained area. The program spreads the costs and benefits of land preservation more evenly by requiring that those who benefit from land use controls compensate those who lost out. Roy Gorman, who was Coastal Commission counsel during the planning and execution of the Malibu TDC program, acknowledges that some of the lots retired with TDCs were not readily developable. He adds, however, that the owners of such lots are prepared to push state and county agencies very hard to obtain building permits and are willing to take any measures necessary to render their lots buildable. "We had to find a way to prevent full build-out of all those lots that would at the same time address the frustrated expectations of the landowners," says Gorman. "We had to come up with a mechanism which removes the owner's interests in the lots. TDCs provided that mechanism."

Controversy continues to rage over the Malibu TDC program, and the future of the program is uncertain.

### ***Monterey County's Scenic Corridor***

Unlike the Malibu program, Monterey County's TDC program was initiated by the

county. The aim was to mitigate the impact on landowners of restrictive zoning along a 60-mile scenic corridor through Big Sur, a scenic resource of national importance. Potential development is to be moved from critical viewshed properties to sites that cannot be seen from Highway 1.

Where the construction of a house would not be permitted by the land use plan, the landowner will be granted two TDCs, which may be used to build two houses on sites not visible from the highway. An open space easement is imposed on the donor parcel, allowing for passive recreational or agricultural use. The landowner thus can maintain an economic interest, notwithstanding the stringent environmental regulation.

The Coastal Conservancy has assisted the county with the TDC program in two ways: by providing a grant to enable the county to act as a "last resort" seller or purchaser of TDCs; and by directly purchasing donor and receiver sites to carry out a model transfer project. Through the model project, the Conservancy will help the county to perfect its TDC procedures and to demonstrate to private landowners that the program is viable.

TDCs can be used to preserve valuable land resources and to shape development in an equitable, economically efficient manner. TDC programs can also fall far short of these goals, running into the pitfalls of inconsistency and poor planning, becoming hopelessly mired in controversy.

To work smoothly, a TDC program must always be accompanied by a careful analysis of the real estate market in the affected area, the regulatory climate, and the administrative capabilities of the agency intending to carry out the program. TDC programs do not mean simply letting the free market operate in place of traditional land use controls. Rather, they represent a carefully controlled and regulated use of market mechanisms to achieve land use goals. A TDC program by itself is no substitute for traditional zoning, but it can provide a means of regulating development with greater fairness. □

*Prentiss Williams is an environmental services intern with the State Coastal Conservancy.*

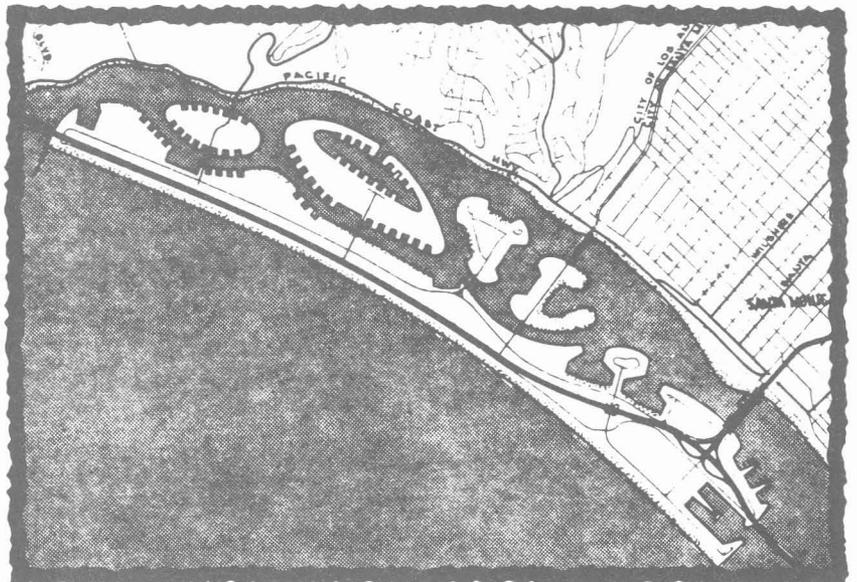
## The Santa Monica Causeway

# Grand Design, Vintage '64

*Once upon a time, there was no Coastal Act. But there was a coast, and many people wanted to live there. In Santa Monica, many people had noticed that waterfront real estate commanded quite high prices. Since there was not enough waterfront real estate to go around, some people thought it would be a good idea to create more.*

*The following paragraphs are excerpts from the 1964 Feasibility Study for the Santa Monica Causeway. This offshore freeway would have struck out to sea at Topanga Canyon Boulevard, in the Malibu area of Los Angeles, and returned to land in Santa Monica, replacing the Santa Monica Pier with a nice new roadway connecting to Interstate 10 (the Santa Monica Freeway) heading east. In its sweep through the ocean, the roadway would have cut off the ocean exposure of Topanga State Beach, Will Rogers State Beach, and Santa Monica State Beach.*

*Since much of the impetus for the offshore freeway came from the desire to create high-priced waterfront lots, the plan also included a series of islands and bays. There is a legend in the Santa Monica Planning Department that what finally killed the freeway plan was the graphic designer's islands. Even in those days, the word "OIL" written out in the water created tidal waves of alarm.*



*Can you see the oil?*

The best plan is a perched beach\* from Topanga Canyon to about Strand Street. The submerged reef of the perched beach would follow roughly the 48-foot depth contour about a mile offshore. The perched beach would comprise a littoral berm [shore ledge] about 1200 feet wide sloping upward from the reef to the crest of the beach on approximately the same profile as that of the existing shore and offshore area at Will Rogers Beach State Park. A 400 foot-wide dry beach and service area behind this crest would be devoted to recreation, parking, service roads and ancillary facilities. The next 200 feet shoreward would be the freeway right-of-way, and between the freeway and existing shore would be the landfills, basins and channels comprising the interior marine-community development.



**Santa Monica—  
without causeway**

Fill material for the perched beach and land reclamation involving about 206 million cubic yards will be obtained from interior channel dredging, offshore hopper dredging and nearby hillside excavations. About 3 million tons of stone from Santa Catalina Island quarries and from deep cuts in the nearby hills will go into the reef and terminal groins. Approximately 124,000 lineal feet of vertical bulkheading will be installed to retain perimeter fills where alongside berthing of small craft is anticipated. The total construction cost, including streets, utilities and bridges is

\*A beach built in deep water by filling between land and an artificial (or natural) submerged reef.

estimated at \$157,000,000, and the net acreage of usable reclaimed land at 1572 acres.

The Division of Highways evaluates its alternative routes on the basis of costs and traffic (user) benefits. In this method of evaluation, the shorter the route the more travel time and distance the highway user saves, other factors being equal. . . . While the Division of Highways has no objection to acceding to the desires of any local community, per se, the guide lines within which the Division now operates do not allow cooperation which reduces the traffic benefits, or raises the cost so as to reduce the benefit-cost ratio of a project.

. . .



Residential development along the waterfront has become extremely popular in southern California. Shore-front living is an accepted way of life for the fortunate few in this area who have found homesites on the limited privately owned lands along the beaches and coastal lagoons; it is a hoped-for way of life for thousands more who cannot now find such homesites. Since the wishes of these people cannot be gratified at the expense of the State, County and City beach parks,

*it is desirable that as many more waterfront residential sites as possible be made available. It is apparent that only on made land can these sites be provided.*

Several marine-oriented land-development ventures have been undertaken in southern California areas in recent years. The oldest and most successful is in Newport Beach where a large coastal lagoon has been converted into a high-class marine community on islands, peninsulas and improved perimeter lands built up to design grade with fill material dredged from adjacent channels and basins. Shore-front property sells for \$1500 to \$3000 per front foot in spite of its distance of 50 miles from the Los Angeles civic center. About 5000 homes have been built on or near the water's edge, and the remaining lowlands in the upper bay are now in process of being similarly

reclaimed. This development began in the early 30s and is now about 75 percent complete. . . .

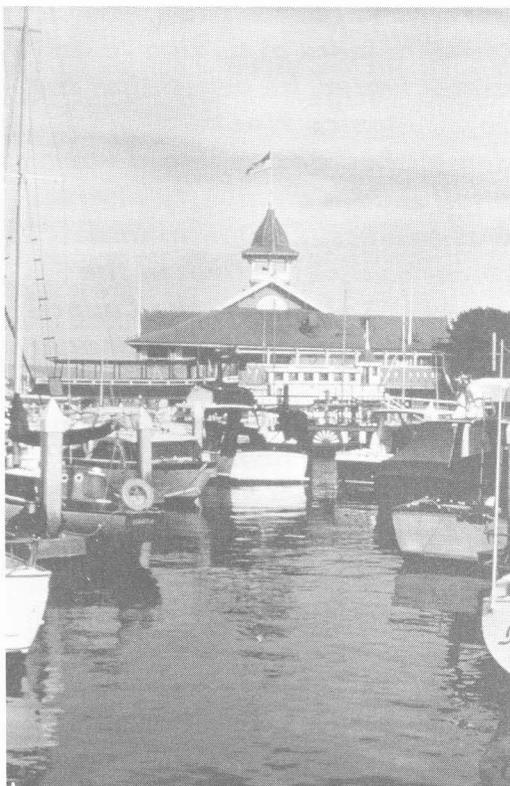
*Residential marinas are currently being planned for nearly every remaining coastal lagoon in southern California.*

The general concept of the proposed development envisions the creation of an offshore earth-and-sand mole [a massive stone wall used as a breakwater or to enclose a harbor or anchorage] enclosing a protected and quiet deep-water area adjacent to the existing Santa Monica shoreline. . . .



The new ocean-facing beach has been planned in the shape of a sweeping arc, the usual configuration of natural beaches, and the form that experience and observation have shown to be a natural characteristic of stable beaches. Openings to the sea at each end of the mole will be left to provide for navigation and water circulation in the sheltered area in its lee. While the mole itself is intended primarily as a site for the new coast freeway, additional land fills will be built in the form of peninsulas and islands of various configurations

#### **Newport Harbor**



shoreward of the mole to support a new and unique marine-oriented community.

*The existing beach will no longer be exposed to ocean waves, but otherwise it will not be disturbed. . . .*

A secondary feature of the causeway project, which is in the nature of a by-product of the overall planning, is the expected increase in value of the hilly land which will be terraced to provide material for the causeway. The excavation for borrow [moving fill from one location to another] is proposed to be done in such a way as to develop many hundreds of view sites for houses and apartments.



This is more than just a grand scheme for land development and for provision of badly needed recreation facilities, although these features should not be depreciated. It must be remembered that the recreation features—the beach, the marinas and the waterways for cruising—will fill a need, and the land development will be the big contributor toward financial feasibility. However, the provision of a new route for a freeway—one which will not destroy anything or occupy land better suited for other uses—is the novel and salient part of the plan.

If the perched beach functions exactly as the existing beach with respect to littoral transport, about 250,000 cubic yards of sand a year would reach the downcoast terminal groin and have to be pumped by dredge and pipeline back to the natural beach near Pacific Ocean Park to prevent erosion of beaches farther south.



Finding a suitable source of fill material is presently the greatest single problem of the entire project. In most of the plans considered, about one-third of the required fill is available from channel and basin dredging within the project limits. The Corps of Engineers' study revealed a

limited supply of sand on the continental shelf beyond the site of the submerged reef, which could easily be placed in the fill area by hopper dredge. The quantity required for the recommended plan is so great, however, that if all the material were taken from the continental shelf, only opposite the project site, it would require cutting deeply (20 to 25 feet) into the bottom over a one-mile width of dredging area. Although this would cut well into the pleistocene terrace material, recent operations by the Corps of Engineers hopper dredge in similar material off the entrance to the U.S. Naval Weapons Center at Seal Beach indicates that this could be done. In fact, during a visit to Holland, Seaway Enterprise personnel were assured by Dutch dredging interests that they could build any special equipment needed to obtain fill for the Sunset Seaway project. Nevertheless, the cost of such hopper dredging would be high.

If the causeway project between Santa Monica and Topanga Canyon can be tied into a "Skyway to the Sea" project in the Malibu Hills area, a ready solution to this problem may be found. Under this concept,

*large quantities of surplus material excavated from the freeway will become available from cuts in the foothill area just west of Topanga Canyon. It is also possible that large-scale terracing of the foothills could be accomplished, providing not only fill for the causeway, but highly desirable homesites as well. Potential slide areas also could be sloped back to a safe angle of repose to produce additional fill material.*

The marinas provided in the plan are intended primarily to enhance the value of the residential land by providing boat slips for non-waterfront residents, as well as to help create the nautical atmosphere that has been found to be so desirable.



The beaches are an integral part of the plan. . . . Just how the new beach will be

financed is not yet known. Although the project is economically feasible without repayment for the beach, this feature is exceptionally costly but equally valuable and should be paid for in one way or another.

. . .



This report shows the Santa Monica Causeway project to be legally, financially and engineeringly feasible. . . We feel that the beneficial impact of the project on the City will be so great that it is the duty of every Santa Monica citizen to give it his most serious consideration and support. Because of its far-reaching effects, the City of Los Angeles, the County of Los Angeles and the State of California should all join Santa Monica in bringing the project to early fruition. □

**Postscript: In 1972, the offshore freeway was pretty well dead, but the Santa Monica City Manager proposed that the City replace it with two offshore islands containing highrise hotels, landscaped lawns, and an underwater (of course they called it underground) parking garage. To reduce the inconvenience of having to drive across water, he urged that the Santa Monica Pier be demolished and replaced with a toll road. Community distress was universal, intense, and remarkably effective. In the June 1973 elections, the Council majority and the City Manager were dismissed from office and joined the offshore freeway on the shelves of history.**

—Ruth B. Galanter

Ruth B. Galanter is a planning consultant in Los Angeles and former chairman of the South Coast Regional Coastal Commission.

The "Santa Monica Causeway Project Feasibility Study" was prepared by Moffatt and Nichol, Engineers; the Real Estate Research Corporation; Musick, Peeler & Garrett; and Robert B. Krueger and Franklin T. Hamilton at Nossaman, Thompson, Waters & Moss.

## Book Reviews

### ***Of Dams and Rivers***

**Endangered Rivers and the Conservation Movement**, *Tim Palmer*. University of California Press, 1986. \$24.95, 316 pp.

The history of dam building and the save-the-rivers movement is chronicled in the latest book by Tim Palmer, author of three other books on rivers. This well-researched description of American water development contains many detailed accounts of environmental battles over the damming of rivers, diversion of waterflows, and creation of barge canals from river beds. The colorful personalities of dam builders and conservationists emerge and illuminate issues and viewpoints surrounding each controversy. Throughout the book Palmer takes an evenhanded approach in describing the merits and effects of various dam projects and in explaining the pork barrel politics involved in most large public works projects.

Beginning in the late 1700s with the creation of the Army Corps of Engineers, Americans have "harnessed" rivers for municipal water supply, irrigation, flood control, and hydroelectric power. Early development of a water supply for New York City involved re-routing streams that once drained through the Delaware River into Philadelphia to flow into the Hudson River. Many Eastern rivers were drastically changed to allow barge canals and to make an interior transportation system.

But nowhere has water supply caused greater controversy than in the arid West. Stretching far beyond their boundaries to control water supplies, the City of San Francisco dammed the Hetch-Hetchy Valley in Yosemite National Park and the City of Los Angeles drained the Owens River and tributaries to Mono Lake. Arguments over the allocation of water from the Colorado River have raged between Utah, Colorado, Arizona, and California for years and continue to smolder. The construction of Boulder Dam (now Hoover Dam) on the Colorado River signaled a new age in public works

projects and was a prototype of the plumbing system that was to accompany population growth and expansion of farmland in the West.

The real theme of the book, however, is the growth of the anti-dam movement. Palmer tells how it all began with John Muir, the fervent but

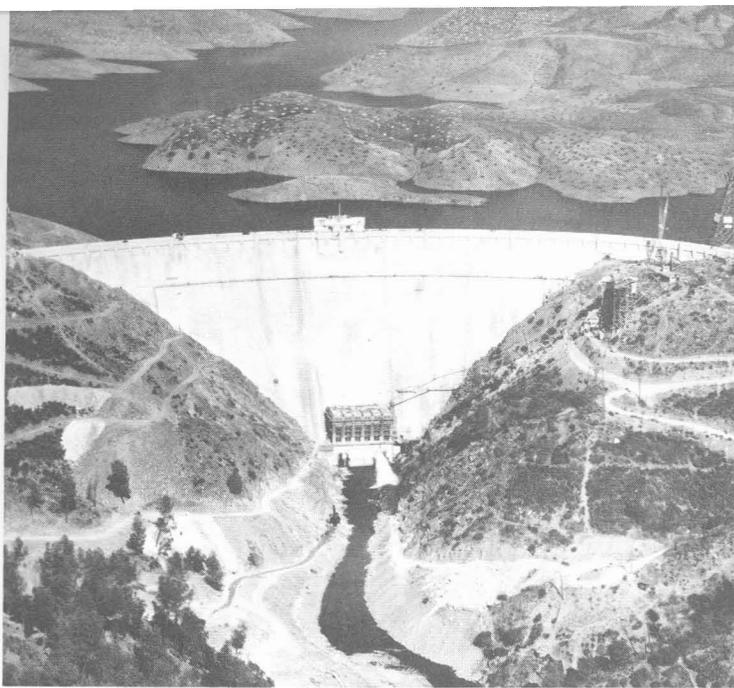
unsuccessful protector of Hetch-Hetchy Valley, and grew to include David Brower, founder of Friends of the Earth and main protagonist against the damming of the Grand Canyon, and Mark Dubois, a river activist noted for chaining himself to a rock to stop the damming of the Stanislaus River canyon. Numerous examples of river battles from around the nation, including detailed accounts of congressional lobbying, quotes of elected officials and local activists, as well as critiques of Army Corps and Bureau of Reclamation benefit/cost ratios, build the case for river preservation and give an inside look at how a grass-roots political movement begins and gains strength. The long-term accomplishment of this movement has been the passage of the National Wild and Scenic Rivers Act and preservation of many thousands of miles of wild rivers.

Examples of congressional wheeling and dealing to authorize large "pork barrel" dam projects to further the careers of particular legislators are fascinating. The relationship between federal water development projects, subsidies to floodplain real estate developers, corporate farms, power companies, and barge companies and congressional actions are well-documented and would anger any taxpayer.

One controversial project that should interest Californians is the Auburn Dam, which has recently been resurrected from



**Stanislaus River  
below Camp Nine**



**Mokelumne Dam**

the bureaucratic graveyard. Originally proposed as part of the Central Valley Project, the Auburn Dam would be the fifth tallest dam in the United States and flood 50 miles of the American River. Delayed by a lawsuit in 1974, the Auburn Dam was largely the dream of one local and influential congressman who chaired the House Public Works Committee. Despite the enormous cost of the project and questionable benefit/cost ratio, Congress authorized the dam and construction began. Only discovery of a fault at the dam site, after an earthquake, halted construction. Numerous studies and hearings followed. The Bureau of Reclamation has spent over \$400 million to date. The latest price tag is \$2.2 billion and local legislators are pushing for funding. The question of seismic safety, which remains unanswered, and the effects on San Francisco Bay, fisheries, and river recreation have deterred even the pro-development Reagan administration from supporting the dam. However, the dam has not been de-authorized.

The final chapters of the book review the alternatives to dam building and stress that constant vigilance by citizens is essential if rivers are to be preserved. As Palmer points out, population growth in the West is ever increasing while water and power supplies are not. This situation makes water grabs and dam projects all the more appealing to the politicians, profitable to the developers, and expensive for the taxpayers.

—Laurel Marcus

## **Lighthouse Tales**

**Lighthouses of the Pacific.** By Jim Gibbs. Schiffer Publishing Ltd., West Chester, Pa., 1986. \$29.95, 258 pp.

We stood with lumps in our throats, that beautiful day on Point Bonita, fewer than a hundred souls: a handful of Coast Guardsmen who had served at Bonita Light, their families, and our group of walkers who had come to explore one of the Marin Headlands trails in the surrounding park.

Against the backdrop of the Golden Gate Bridge, framing the Camelot towers of San Francisco beyond, we watched as the flags came down slowly for the last time at the Bonita Light Station, the last of California's 59 lighthouses to be automated. Solemnly, precisely, the Coasties folded them. Then with the simplest of gestures, Admiral Jim Gracey, then commanding officer of the Twelfth Coast Guard District, presented the Stars and Stripes to William Whalen, at the time Superintendent of the Golden Gate National Recreation Area.

More than one of us reached for a handkerchief. We all knew that the light would continue to flash and the fog signal to moan as they had since 1855. We also knew that the National Park Service would renovate and reopen to visitors the Bonita Light signal building and its unique bridge. But an era was over.

It is this era that Jim A. Gibbs, a former Coast Guardsman and for 20 years editor of *Marine Digest*, the Seattle maritime trade weekly, has chronicled in his big, beautifully illustrated book, *Lighthouses of the Pacific*. Gibbs is a man who loves his subject so much he lives in a lighthouse—the Cleft of the Rocks, at Yachats, Oregon.

"Where have all the lighthouses gone?" Gibbs asks in the introduction to this fascinating book. "Many have vanished. One day there is a bonfire and from the ashes rise a skeleton tower, or an ugly pole with a light on top. The Coast Guard's *Notice to Mariners* informs us only after the building has been eliminated.

". . . a century of history, a storehouse of memory, a seamark, a landmark. . . unique expressions of human creativity, architectural genius, complex solutions to triumphantly solved engineering prob-

lems, colorful personalities. . . all gone in a puff of wind."

This is no exaggeration. The Coast Guard has indeed been cavalier in its treatment of historic buildings. The famous "otter-hunter's house" of stone on the Farallones was knocked down by order of Coast Guard brass without consulting anyone. It was also my dubious privilege during a walk near Lands End in San Francisco, to witness a helicopter lift part of the lighthouse off Mile Rock, swing it toward shore and drop it at the tideline in a nearby cove noted for a grinding surf.

But it is only in his introduction that Gibbs touches, briefly indeed, on such destruction. In the rest of the book, with great good humor, he has caught the romance, drama, and nostalgia of the manned light stations. Each chapter begins with a pertinent quotation, usually in verse. These give an insight into the way other writers have looked at the subject during the long heroic years of sail and steamships. There is in one chapter the complete text of Fred Morong's classic, the poem that begins:

"Oh, what is the bane of a  
lightkeeper's life,  
That causes him worry and  
struggles and strife,  
That makes him use cuss words and  
beat up his wife?  
It's brasswork. . . "

Tales of heroic rescues, for which the Coasties are famous, abound, and are to be expected, as are the many legendary anecdotes. But who would have expected a long chapter on "Ghosts, Apparitions, Unsolved Mysteries and Tragedy"? Accompanying it are fine photos of Baranof's Castle, the Russian building that supported Alaska's first lighthouse; of Heceta House, viewed through a sea-carved rock; and a spooky trick shot of Muriel Tevenard, whose spirit is supposed to climb the circular staircase at the old Yaquina Bay Light.

Antique lithographs, engineering plans, plates of entire stations, maps and photos, many in full color, illustrate the book throughout and must represent years of scholarship.

Californians will be pleased to discover that four chapters are given over to the lighthouses of this state. One is on the San



**Point Bonita  
Lighthouse**

Francisco Bay exclusively. Lighthouse buffs who have climbed up and down those 438 steps at Point Reyes to watch the whales, or have had the pleasure of a moon-watching walk across the little bridge at Point Bonita will be surprised to see how these look in photos taken from the sea.

Even if one has had the pleasure of a weekend at East Brothers Light, which is now a bed and breakfast inn, or enjoyed the hostels at Point Montara or Pigeon Point Light, the book has a bittersweet quality. Of 58 lighthouses that were open to the public and operating 20 years ago, today there are only 27.

Gibbs might have ended his book on this somber note, but there is more love than hate in his relation to the Coast Guard. Instead, appreciative of "Fog, the ghostly wraith that haunts the sea and shore in mystic silence," he concludes good naturedly on an "Ode to the Foghorn."

The only thing of consequence I missed in this delightful coffeetable-sized treatise was an indication of what the reader could do to help save the few lighthouses that remain in jeopardy. Lighthouse buffs will certainly want to buy this book. If they also want to help save the remaining stations, annual membership in the U.S. Lighthouse Society, started in California in 1983, costs \$15 per year. This includes a subscription to *Keeper's Log*, a quarterly magazine. Address inquiries to 130 St. Elmo Way, San Francisco 94127, or call (415) 585-1303.

—Margot Patterson Doss

**Editor's note:** This space invites readers to express views on topics related to urban waterfronts. This issue's contribution is by environmental reporter Robert Sollen, who last wrote in *WaterfrontAge* on local planning for offshore oil development.

### **Warning of the Warming**

**M**OST STATE AND LOCAL PLANNERS are ignoring scientists' warnings that the Greenhouse Effect will significantly raise the sea level in the next 40 years. Though scientists don't expect the first impacts before the turn of the century, planning should begin now, especially in coastal communities.

That the oceans will rise because of a global warming of the atmosphere is widely accepted among experts, though there is disagreement over the extent and rapidity of the process. Projections of the rise in sea level range from five inches to two feet by the year 2025, and three feet or more within a hundred years. A 12-inch rise would erode most shorelines over 100 feet wide unless special barriers are in place to fend off the ocean, according to James Titus, project manager for sea level rise in the Environmental Protection Agency's Office of Policy Analysis.

If 40 years still seems a long way off, consider that every shoreline erosion control barrier and every structure permitted by coastal communities is expected to stand much longer than that. Many in office today in coastal communities will live to see the results of their decisions. They were warned; they knew, or should have known.

Atmospheric warming is expected because of the sharp increase in fossil fuel combustion, which creates carbon dioxide that absorbs infrared radiation given off by the earth. "The sudden injection of CO<sub>2</sub> into the atmosphere has greatly overwhelmed the capacity of the biosphere and oceans to absorb CO<sub>2</sub>," explains John S.

Hoffman, director of EPA's Strategic Studies Staff. "In essence, each year's fuel combustion restores a quantity of carbon to the atmosphere that had taken plants thousands of years to remove," he writes in *Greenhouse Effect and Sea Level Rise*, the report of a 1983 conference sponsored by the Environmental Protection Agency.

Also contributing to the warming is the use of aerosols called chlorofluorocarbons (CFCs), which rise to the upper atmosphere and there release chlorine, which depletes the ozone layer. This layer shields the lower atmosphere, where we live, from much of the sun's ultraviolet rays. Weakening this ozone layer also warms the earth's atmosphere. CFCs were widely used in aerosol spray cans in this country until they were banned for that use here in 1978. This use continues in other countries. But even in the United States, CFCs are still used widely for refrigeration and air conditioning, for foam blowing, for insulation, and as solvent.

Because impacts of the sea level rise will vary according to local shoreline characteristics, every coastal community must consider its own special confrontation with the ocean. High solid cliffs will be more secure than broad sandy beaches or unconsolidated bluffs. Some waterfronts are currently subsiding and some are rising, and these conditions will increase or decrease the effect of a rising sea level.

"In areas of beach front or back beach construction, such as northern Monterey Bay, a foot of sea level rise begins to be of significance, particularly when combined with high tide and storm surge," according to Gary Griggs, a geologist at the University of California, Santa Cruz, and co-author of *Living with the California Coast*. "The crucial issue is not a higher sea level in and of itself but the foundation that this elevated water surface provides for wave attack on ocean-front development."

In Southern California, Santa Barbara "can expect more trouble maintaining the

## EFFECTS OF ATMOSPHERIC POLLUTANTS

Concerns mount over two alarming effects of atmospheric pollution:

- The 'greenhouse effect': a dangerous global warming trend which could lead to weather-pattern disruption, dried-out farmlands, and flooding and coastal erosion caused by melting glaciers
- The diminishing ability of the earth's protective ozone layer to filter ultraviolet radiation that causes skin cancer and other biological damage

### GREENHOUSE EFFECT

Large-scale fossil fuel combustion (by industry, cars, etc.) is releasing a thickening blanket of carbon dioxide, methane and nitrous oxide into the air. These gases absorb the sun's heat, trapping it near the surface. The atmosphere's temperature rises as long as emissions steadily accumulate. Slight increases in atmospheric temperature can have major global effects.

Blanket of pollution caused by fossil fuel combustion

Trapped infrared radiation (heat)

Incoming solar radiation

Sources of pollution caused by fossil fuel combustion

### OZONE DEPLETION

Chlorofluorocarbons (CFCs), used in styrofoam manufacture, aerosols, refrigeration and air-conditioning, rise to the upper atmosphere where they promote the breakdown of ozone, a layer of gas that normally shields the earth from harmful levels of ultraviolet (UV) radiation. A rise in UV exposure at ground-level follows ozone loss and has many biologically disruptive effects.

Ozone layer depleted by CFCs (6 to 30 miles in altitude)

Incoming solar radiation, including ultraviolet, which has penetrated ozone layer

Sources of chlorofluorocarbons (CFCs)

©TIGER GRAPHICS

Sources: NOAA; Robert J. Foster, *Earth Science*

wide beach," says Robert Norris, a geologist recently retired from the University of California, Santa Barbara. "At Carpinteria, rip-rap seawalls will suffer more frequent and more severe storm damage as the sea attempts to reach a new equilibrium with the land... Bad news for those who have houses at the edge of the cliff."

The total impact of the anticipated global warming is expected to be immense. Drastic changes will occur in climates, economies, agricultural practices, food production regions, land forms, population centers, lifestyles, water sources, and wildlife habitats. But we are concerned here only with the rise of oceans, fed by melting glaciers, and what it means to land use planning and shoreline erosion prevention. Common sense dictates that local communities, with state and federal help, should seek to broaden their shorelines now. In attempting to bring this issue to the

attention of officials in Santa Barbara and Ventura counties, I get a polite reception, but no indication of much immediate concern.

But Congress recognized the problem last October when it declared that "increasing scientific evidence indicates the level of the ocean will rise significantly over the next seventy-five years." The Water Resource Development Act of 1986 authorized \$3 million for a study of "shoreline protection and beach erosion control policy... in view of the prospect for long-term increases in the levels of the ocean."

But coastal communities shouldn't wait for word from Washington to review their land use plans in light of the probable consequences of rising oceans. Those in responsible positions who choose to disregard the warning have an obligation to explain their skepticism and inaction. □

—Robert Sollen

*Continued from page 9.*

### **More Facts to Bear**

Editor:

The winter issue was of particular interest to our agency since we have been involved in wetland mitigation projects. However, Dr. Joy Zedler's article was unfair and, in several instances, inaccurate. While she certainly is entitled to her own opinions on the value of prior wetland mitigation projects in the southern part of the state, I believe a differing perspective may be of interest.

She asked: "Why is habitat still being lost?" given the existence of the California Coastal Act. One reason is that the Act allows it under certain circumstances. The Act states in part that if a wetland area has been designated as degraded by the California Department of Fish and Game, 25



***Batiquitos Lagoon***

percent of it may be developed for a boating facility provided the remainder is restored. At Bolsa Chica this Act has been applied to a proposed marina development. The potential exists for the loss of about 300 acres of degraded wetlands in exchange for restoration of about 900 acres to fully functional wetlands.

The Army Corps of Engineers also has an important role in regulating coastal activities by issuing permits under the Clean Water Act and the River and Harbor Act. A

decision to issue a permit, in theory, depends on the conclusions of a "public interest review process" conducted by the Corps that evaluates a host of factors concerning the proposed project, such as considerations of property ownership, economics, aesthetics, and fish and wildlife values. Therefore, if the benefits of a particular project outweigh the detriments, including possible habitat loss, a project may be permitted. In practice, however, most activities that will result in habitat losses are not permitted unless mitigation is included. Given this regulatory environment, perhaps a second look at some of the mitigation/restoration projects cited by Dr. Zedler would be of value.

*Batiquitos Lagoon.* This lagoon system is essentially a seasonally inundated area rarely subject to tidal influence. Consequently, the lagoon in its current condition has limited value to marine resources. However, it does have considerable seasonal value for waterfowl. Dredging has been proposed to mitigate losses associated with the filling of about 140 acres in the Port of Los Angeles (the Pacific Texas Pipeline Project) and to provide added habitat credits to offset future developments within the Port. What are the effects of both projects? In the Port, 140 acres of deep water habitat will be lost, primarily impacting marine fishery resources. At the lagoon, nearly 400 acres will be subject to tidal action. A team of biologists from three resource agencies has evaluated this proposed change and believes that not only will existing avian values at the lagoon be preserved but also that the proposed dredging project will enhance these values by providing new habitat for shorebirds. From a marine fishery resource perspective, this project will result in nearly 400 acres of new intertidal and subtidal habitat, which will be used by many of the species impacted at the Port fill site.

*Upper Newport Bay.* According to the State Department of Fish and Game and the U.S. Fish and Wildlife Service, the dredging of Upper Newport Bay completed in 1985 did not result in the loss of any cordgrass, nor were dredged spoils placed along the excavated channels as was suggested by Dr. Zedler. All spoils with the exception of

those used to construct an island were removed to an upland site. There was no discernible loss of clapper rail habitat. Any reduction in the number using this area does not appear to be directly attributable to the dredging project.

Preliminary results from an ongoing fishery study funded by the National Marine Fisheries Service indicate significant use of the newly created tidal areas by numerous fish species. While there have been no similar studies on bird use of the restored area, it is apparent that greater numbers, both species and individuals, are using the area.

*Buena Vista Lagoon.* The dredging of this system was completed as an enhancement project by Fish and Game. While it is true that the islands created from dredge spoils are not vegetated, this was partially intentional since the larger two were meant to be Least Tern nesting islands and vegetation is not desirable for this purpose.

*San Diego Bay.* Dredge spoil islands were created in south San Diego Bay as mitigation for the dredging of the Chula Vista boat basin. The islands were intended as a marine fishery mitigation measure since the primary species impacted at the boat basin site were fishery resources. There never was any intention to establish clapper rails at the mitigation site.

Unfortunately, the engineering assumptions used to determine the amount of dredge spoil the islands could accommodate were inaccurate. Consequently, today a considerable area is at an elevation too high to be of value to fish. However, least terns have nested in these high areas. Discussions are underway with the Port of San Diego regarding removal of some of the excess dredge spoils for greater benefits to fishery resources.

These projects, although perhaps controversial in terms of their respective habitat value, are not the only examples of wetland mitigation/restoration projects in Southern California. Among numerous others are those completed in the western arm of Mugu Lagoon and the Seal Beach Wildlife Refuge. Both have been unquestionably successful.

Many of these efforts require dredging or

sediment removal. This can result in some short-term negative impacts from construction work as well as the displacement of species. However, the long-term benefits of returning a system to its former value and productivity would appear worth this cost, particularly if the only other alternative is to witness the gradual loss of a wetland through further sedimentation. Often mitigation projects are the only effective way to remove accumulated sediment and control additional input—local ordinances are ineffective in controlling this problem.

Realistically, all mitigation/restoration projects rely on the conversion of one type of habitat to another. The basic premise is that what is being changed is either in much greater supply or is of significantly lesser value than the newly created habitat. Given the realities of continued development in the coastal areas of California, those agencies with responsibilities to manage wildlife resources often must make subjective choices regarding the mix of habitat types needed and the best way to achieve this mix.

While there may be a difference of opinion on the value of prior mitigation/restoration projects, implying that the mitigation policies of the resources agencies contribute to the problem of habitat loss simply does not recognize the fact that they only function in an advisory capacity to the regulatory agencies. Rather than criticize the resources agencies for projects that they have little control over, perhaps a more constructive approach would be to try to change economic and developmental policies at the local, state, and federal level that encourage these habitat-destructive projects to proceed.

—Robert S. Hoffman

*Fishery Biologist  
National Marine Fisheries Service*

**Ms. Zedler responds:** Neither Mr. Hoffman's nor my view is unfair. Our conclusions differ when we measure success by different criteria and have access to different information. (Sources for, and reviewers of, my

*Continued on page 48.*

manuscript included agency biologists; I erred in attributing all 400 acres of fill planned for Los Angeles Harbor to the Pac-Tex project—only 140 acres were for that use; the rest would support other developments.)

Mitigation agreements requiring construction of higher quality habitat must include before/after comparisons that can withstand detailed review. At present, conditions before and after restoration are not adequately documented. There is a clear need for detailed accessible records, more thorough assessment of wetland functions before and after restoration/enhancement projects, and broad-based evaluation of mitigation success.

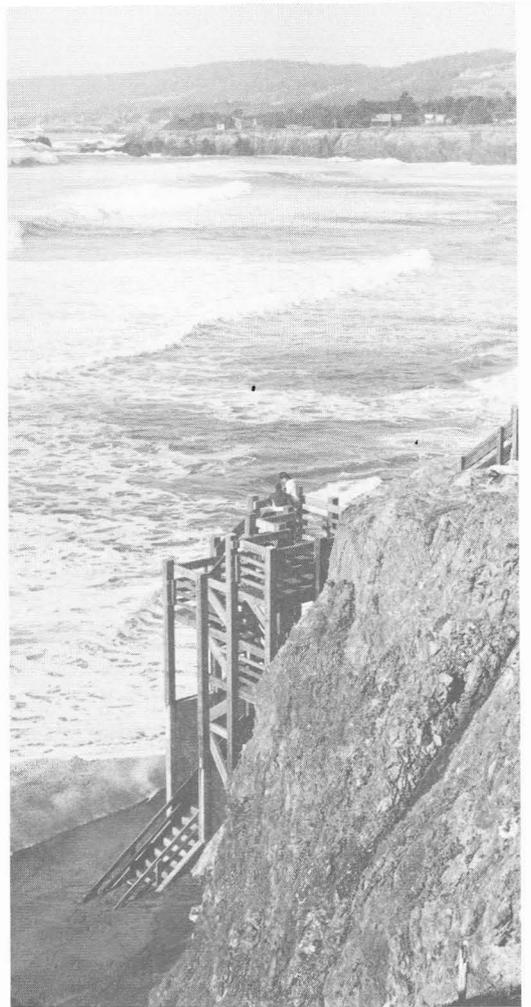
I agree wholeheartedly that policies that encourage reductions in habitat area should be changed.

***Continued from page 5.***

west of Pebble Beach Drive and the eventual development of a series of access improvements in the future, when further funding is secured.

### ***Sea Ranch Access***

In no single development along the California coast has the public's constitutional right to access created as much controversy, or generated as much litigation, as at the Sea Ranch. In 1980, to provide a solution to the prolonged litigation, the Legislature enacted a settlement known as "the Bane Bill." This statute provided for public access to the shoreline at the Sea Ranch through the conveyance of six public access easements, and scenic view easements, to the Coastal Conservancy. In 1982, the Conservancy conveyed the easements to the County of Sonoma, along with a grant of \$255,800 for the development of public accessways on the access easements. In 1985, three of the accessways were opened to the public. In February, the Conservancy awarded the county a grant augmentation of \$174,000 to complete the two remaining accessways and trailheads at Stengel and



***Sea Ranch***

Walk-On Beaches and the blufftop trail from Gualala Point Park south to Walk-On Beach. In addition, the county will add a handicapped-accessible path from the parking area at Gualala Park to the northern section of the blufftop. The Sea Ranch accessways will provide entirely new access to five spectacular beaches previously inaccessible to the public, consummating ten years of effort to carry out state and local access policies at the Sea Ranch.

### ***New Booklet***

A booklet, "The California State Coastal Conservancy," is now available on request. It describes the nature and functions of this agency and gives examples of its varied activities. Write to: Public Information, California State Coastal Conservancy, 1330 Broadway, Suite 1100, Oakland, CA 94612.

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