

ESTUARY



Y O U R B A Y - D E L T A N E W S C L E A R I N G H O U S E

YEAR-END KUDOS

ESTUARY would like to thank its 500 individual subscribers for supporting our efforts to provide an invaluable news clearinghouse on Bay-Delta water issues.

We'd also like to thank the U.S. EPA, U.S. Fish & Wildlife, the Army Corps, the S.F. Bay Regional Board, the S.F. Bay Commission, the State Department of Water Resources and the CALFED Bay-Delta Program for their past and current financial support as sustaining subscribers and grant contributors.

Last but not least, special year-end thanks to the following ESTUARY editorial board members for contributing so many good story ideas and advice in 1995: Gary Bobker of the Bay Institute; Marcia Brockbank of the S.F. Estuary Project; Michael Carlin of the S.F. Regional Board; Bruce Herbold of U.S. EPA; Ellen Johnck of the Bay Planning Coalition; Paul Sheppard of Cargill; Will Travis of the S.F. Bay Commission; and Leo Winternitz of the state Department of Water Resources.

And a warm welcome to new editorial board members Arthur Feinstein of the Golden Gate Audubon Society, Judy Kelly of the CALFED Bay-Delta Program and Margaret Johnston of the S.F. Estuary Institute.

Thank you all!

INSERT ALERT

If you have a new study you'd like to share, a new program you'd like to describe, a progress report you'd like to give or an event you'd like to publicize that simply cannot be covered in a standard ESTUARY article, you may want to consider funding an extra four pages of the newsletter entirely devoted to your topic. Subject matter must have a direct relation to efforts to protect and restore the Estuary and its beneficial uses, or to implementation of the S.F. Estuary Project's *Comprehensive Conservation and Management Plan*. For a fact sheet on insert costs, benefits and restrictions, call Ariel Rubissow Okamoto at (415)989-2441.

Purging Ships of Aquatic Invaders

As Asia's clams and crabs take America's Pacific ports by storm, everyone's pointing the finger at ships' ballast where aquatic species often hitch a transoceanic ride. At least 2.4 million gallons of ballast water arrive in U.S. harbors from foreign ports every hour, according to a recent Sea Grant study (see *Now in Print*). The average ship coming into S.F. Bay to tank up on oil or load up on cargo may unload 10,000-50,000 metric tons (3-13 million gallons) of ballast water with an accompanying menagerie of foreign invaders. In the face of this onslaught — which Sea Grant study author James Carlton calls "invasion roulette" — concerned officials and experts are considering control options ranging from simple precautions such as not taking on ballast water at night when more critters are out in the water column to complex on-board ultrasonic treatment measures and tough preventive laws.

First, a few basics on ballast — water pumped in and out of ships to compensate for changing cargo loads. "A ship is basically a big metal box with a point at the front and a propeller in back," explains retired ship's officer Alistair Hamilton of the Nautical Institute. "It's designed to carry say 20,000 tons of cargo but only weighs 4000 tons, so when it's empty it sits high up in the water with the propeller spinning in the wind. From the point of view of getting anywhere, you need ballast."

The current preferred method for purging ballast of unwanted plants and animals is for ships to dump their ballast from the previous port at sea and to then replace it with ocean water. The theory is that the saltwater marine organisms in the replacement ballast are un-

likely to survive if discharged in the fresher, more temperate waters of a subsequent estuarine port of call. This prevention method is outlined in 1993 International Maritime Organization guidelines that recommend ballast exchange in waters at least 2000 meters deep.

Though Hamilton sees the need for ballast exchange, and has carried it out himself, he says it's a dicey thing to pull off at high sea. Even in good weather the roiling ocean exerts a lot more force on the ship than the relative calm of a protected harbor.

Ballast water exchange is a dicey thing for a ship to pull off at high sea.

Emptying and filling a ship's 6-30 ballast tanks can create weaknesses and imbalances in the vessel.

"Imagine a whole bunch of boxes lightly glued together," says Hamilton. "If you put weight in one and take it out of the other you get one pushing down and the other buoying up, causing a shear at the join." Hamilton says such maneuvers can actually break a ship in half.

Hamilton prefers the more gradual approach of pumping sea water into a full tank and letting the overflow go out the ventilator shafts. This method has its own engineering problems, he cautions, mainly the pressure build up from the fact that the ventilator shafts (designed to convey air not water) are often half the diameter of the pump-in pipe.

This method takes a long time and requires careful supervision, says Hamilton. "It's too easy to turn the pump on and go off to lunch," he says, adding that the decade-long depression in bulk shipping means that many older ships have been poorly maintained. "If you pass rules to just overflow tanks, you're going to see a series of shipping accidents due to blown tanks," he says.

In addition to the engineering challenges, ballast exchange also places a certain financial

- continued on page 6

HARD SCIENCE

INDICATORS POW-WOW

A "major shift in Bay-Delta scientific thinking" occurred at an October workshop where some fifty scientists gathered to discuss possible indicators of the Estuary's ecological health, according to Bill Alevizon of The Bay Institute. The workshop was jointly sponsored by the Institute, the UC Berkeley Center for Sustainable Resource Development and the Environmental Defense Fund.

Alevizon says that to assess the system's well-being, scientists have historically relied on population-level indicators like species abundance — indicators that in themselves are "not enough." Alevizon says, "There was broad consensus at the workshop that we also need to develop habitat-, community-, ecosystem- and even landscape-level indicators. So in addition to counting clapper rails, for example, we'll look at flow regimes and sedimentation rates for wetlands — the processes that allow the ecosystem to produce and evolve naturally."

The scientists came up with an initial list of roughly 40 indicators based on such factors as hydrology, key natural habitats and water quality, but the debate over what the list should include continues. "If we base indicators on distant history or primeval California, we won't get anywhere," says U.S. EPA's Bruce Herbold. "There have been too many introduced species; too many irreversible changes."

"It's difficult to select gauges when there is so much we don't know and so many variables all acting on each other in the Estuary," says Water Resources' Leo Winternitz.

"Ecosystem management may be motherhood and apple pie right now," says consultant John Williams, "but I feel strongly that we're not going to find a small set of indicators that tell us if we're where we want to be."

The scientists will reconvene in late January to refine their list and attempt to begin the process of establishing target levels for the indicators. Alevizon says such indicators are "integral" to determining appropriate restoration goals and believes they will in turn guide the CALFED Bay-Delta program, the Wetlands Ecosystem Goals Project and other long-term planning efforts that promise to influence the Estuary's future. Contact: Bill Alevizon (415)721-7680 KA

BULLETIN BOARD

THE RESTORATION OF SAUSAL CREEK, which wanders down from Shepard and Palo Seco canyons to the flatlands of Fruitvale and industrial Alameda, will be the subject of a \$35,000 watershed-awareness project administered by the S.F. Estuary Institute but directed by the citizens who live near the creek (see calendar). The project follows a similar Institute-led effort to restore the San Leandro Creek watershed, which resulted in a booklet that outlined points of natural and cultural interest along the creek, a science fair, several creek clean ups, citizen monitoring of water quality conditions and a stormdrain stenciling project. Unlike the San Leandro project, which was confined to a section of the creek, this effort will stretch the length of Sausal Creek, which takes in economically and culturally diverse neighborhoods. The new project will try to involve volunteers and educate residents from all these neighborhoods. Both creek programs are funded by the Alameda County Public Works Agency. (510)231-9539 ext. 566

BAY AREA DREDGING EMERGED FROM MUDLOCK this fall marked by flocks of shorebirds, deepened harbor channels and fresh reams of purple prose on the subject. In the North Bay at Sonoma Baylands — a recently completed wetland restoration using material dredged from the Oakland Harbor and Petaluma River — thousands of gulls, ducks, stilts, avocets and sandpipers thronged to the new mudflats topped with standing water. Meanwhile 55 miles outside the Golden Gate, the first bargeful of port mud to be dumped in the ocean in over a decade was released at the region's brand new offshore disposal site this November. And up in the downtown office towers, government staff have promised to burn the holiday oil to get a much-anticipated draft Environmental Impact Statement/Report on a long-term strategy for regional dredged material management to print this January. (415)744-1979

A NEW SOUTH BAY STUDY TARGETS NINE METALS and hopes to determine which are significant contributors to stormwater pollution from Santa Clara County, which have controllable sources, and which do not. The study, slated to begin sometime after the New Year, will help fulfill a provision in the county's recently renewed NPDES permit for stormwater discharge requiring a "metals control plan." Known South Bay concentrations of the nine metals (cadmium, chromium, copper, lead, nickel, mercury, silver, selenium and zinc) led the State Water Board to list the extreme South Bay as an impaired water body under the Clean Water Act in 1986. (408)927-0710 ext.2721

A HUGE PROPOSED WATER SALE

hundreds of miles to the south could be the most important development of the season for the Bay-Delta, says Assemblyman Richard Katz. The San Diego County Water Authority is considering a century-long water deal to acquire 500,000 acre-feet of water from the Imperial Irrigation District. The authority now buys all its water from the Metropolitan Water District, a Delta diverter. Katz, a long-time proponent of laws to create a free market for water, says the sale could not only do much to alleviate the pressure on the Delta but also serve as a model of cooperative water sales and alleviate fears about the motives behind water marketing proposals. San Diego spokesman Maurice Luque says benefits to the Delta were one of the key attractions to the deal. But the Metropolitan Water District has announced its own plans to acquire Imperial Valley water and responded to the San Diego plan by saying it was suspending plans to build a new pipeline to San Diego, according to press accounts. San Diego Water Authority board members characterized Metropolitan's moves as an effort to stall their sale, according to a press release. A May 1996 vote by the San Diego Authority on the water sale is planned. FH

A NATIONAL PROPERTY RIGHTS SHOW-DOWN won't focus on 12.5 acres of scattered rainwater-fed seasonal wetlands in Newark owned by the Cargill Corporation. On October 30, the Supreme Court refused without comment to consider Cargill's latest appeal challenging federal regulatory power under interstate commerce law over development of isolated wetlands used by migratory waterfowl. But the question of whether use by feathered travelers should put isolated wetlands under federal protection based on this law remains unresolved, says Cargill's Jill Singleton. "In a global sense the controversy is still alive," she says, adding that Cargill would still like to see federal regulatory power and use of civil penalties in this arena clarified. The Army Corps' John Eft says the Supreme Court refusal means that federal protection of isolated wetlands, particularly seasonal pools in the Santa Rosa area, wouldn't change. FH



THE PICTURES ON A WATERY WALL

CALENDAR mirror his organization's hopes for a long-term strategy for the Estuary, according to David Behar of The Bay Institute. Behar says the Institute's new full-color pin-up evokes an ecosystemwide approach to environmental management by capturing the bays, rivers, delta, creeks and wetlands of the Estuary from its headwaters high in the Sierra to its ocean outpouring at the Golden Gate, and by matching these photographs with text on the natural riches of the watershed and the impacts of dams, droughts and other factors (see *Now in Print*). (415)721-7680

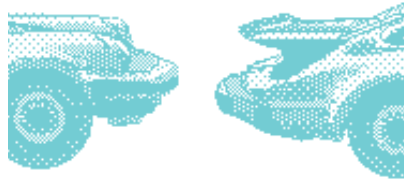
INSIDE THE AGENCIES

THE STATE'S \$2 MILLION BAY PROTECTION AND TOXIC CLEANUP

PROGRAM faced an uncertain future as this issue went to press. The program (funded primarily by shoreline industries, businesses and ports statewide) requires the State and Regional Boards to identify and characterize toxic hot spots, plan for the prevention and control of further pollution and develop cleanup plans. Dischargers objecting to the program's "scientifically flawed and unworkable" requirements, "inequitable" discharger fees and "duplicative" mandate (with existing Board authority) recently recommended that the State Board abolish it, according to the Bay Planning Coalition's Ellen Johnck. But environmental groups and legislators voiced strong support for the program during a November hearing process. As a result, the program's Public Advisory Committee and Monitoring and Surveillance Task Force will jointly convene a December 12 meeting to discuss the program's future direction and potential legislative changes. The State Board's Craig J. Wilson says he expects a program revamp that includes at the least some provisions for bay and estuary monitoring and watershed management. (916)657-1108

A NEW TASK FORCE TO COORDINATE BAY AREA ENVIRONMENTAL ENFORCEMENT held its first meeting November 15th. "All of us are short on enforcement dollars and manpower," says the S.F. Bay Commission's Will Travis, whose agency's single enforcement officer has a Baywide beat. Task force members include all the primary regulatory agencies, among them the Commission, U.S. EPA, the Army Corps and the S.F. Regional Board. Participating agencies hope to train field staff to collect information and evidence for multiple agencies at once, to bring all their enforcement staff together for monthly meetings, and to share and better allocate their dwindling enforcement resources. (415)557-3686

HIGHWAY EXPANSION AND WETLAND RESTORATION have a new \$100,000 study in common. The roadway in question is the North Bay's accident-plagued Highway 37. The study, funded by the regional Metropolitan Transportation Commission and overseen by a new advisory committee of environmental and transportation agencies and local governments, will explore how to increase the highway's capacity while restoring wetlands on the north side (via creating causeways and culverts through which tides can move in and out under the highway). The study will also examine how to improve recreational trail access to the area. (415)557-3686



LOCAL BRAKE PAD POLLUTION CONCERNS GOT A NATIONAL NOD this fall, when U.S. EPA's Washington headquarters officially endorsed a new national Brake Pad Partnership. The push to start the national partnership came from Bay Area stormwater agencies, the City of Palo Alto, Stanford University and the Estuary Project's CCMP Implementation Committee and South Bay Geographic Subcommittee. These groups brought the issue to the attention of the national environmental protection agency — pointing out studies showing that up to 40% of the South Bay's copper pollution comes from brake pad dust carried into the Bay via stormwater. Brake pads can also contribute lead, zinc and other metals. U.S. EPA will likely assess brake pads' effects on other water bodies and may soon initiate talks with brake pad manufacturers. "The partnership's particular focus is on the brake pad design issue, which is more appropriately addressed at the national or even international level," says the City of Palo Alto's Kelly Moran. (415)329-2421

STATE RESPONSIBILITY FOR PESTICIDE REGULATION WILL SHIFT in early 1996 when an agreement between the State's Water Board and the Department of Pesticide Regulation is finalized. Under the agreement, the board essentially turns pesticide pollution problems concerning water quality over to the department for solving, according to the Central Valley Regional Board's Rudy Schnagl. Schnagl says the department is better set up than the board to work with individual growers, as it has close ties with county agricultural commissioners. But environmentalists are concerned that the department has a tamer track record in terms of cracking down on pesticide pollution than the board. They point out that this tame record is hardly surprising given that the department's funding comes from a mill tax on chemical sales — a tax slated to sunset or be cut by Republicans within the next year and a half. How then, if the department stands to lose a good portion of its budget, can it take on more responsibility? Schnagl says he's unaware of a current mechanism for state board money to be channeled to the department and that funding is not addressed in the new agreement. (916)255-3101

BURNING ISSUE

WATER WHEELING & DEALING

Longtime enemies in the North-South water wars are negotiating to present a late Christmas gift to the State Water Resources Control Board sometime in early 1996—Northern California water.

Northern California interests say they are willing to volunteer water to stay out of court and to help fix the Delta. But environmentalists say a settlement between Delta exporters and Northern California water rights holders must be just the first step in acquiring the water needed to satisfy the environmental goals and requirements of the December 15, 1994 Bay-Delta Accord.

Under the Accord and the State Water Quality Control Plan for the Delta that backs it up, interests in all camps of the water wars agreed on a short-term fix and a long-term process (see *CALFED* page 6) for saving the Bay-Delta ecosystem. Part of that short-term fix is more water for the environment. The question now before the State Board, as it holds workshops over the next three months and begins preparing an Environmental Impact Statement, is how and from whom to acquire that water. The report will be the foundation for a new water rights decision, according to the Board's Tom Howard, possibly as early as 1997.

For these reasons, the State Board is particularly interested in the negotiated settlement promised in early 1996 between the long-thirsty CUWA-AG group of Delta water diverters (representing urban and agricultural water users statewide) and a consortium of officials from Northern California, where abundant water supplies are protected by senior water rights.

In the absence of such a negotiated settlement, regulatory action by the State Board would be the only way to get water for the Bay-Delta process from users other than exporters, who hold junior water rights, and contractors, who get water from the state and federal water projects.

The Northern California Water Association's Rich Golb says upstate water rights holders have stepped forward to avoid a costly legal battle in which long-term water rights might be threatened. As this issue

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ENVIRO-CLIPS

PUSH AND PULL OVER TUG REGS

New regulations requiring tug boat escorts for oil tankers and barges navigating the Bay were drafted by the S.F. Bay Harbor Safety Committee this fall. Environmentalists agree the new regs are an important step forward in preventing a disastrous oil spill, but say the rules don't go far enough.

A 1990 state law mandates that the committee draft tug escort regs for the "best achievable protection" of the Bay. Marci Glazer of the Center for Marine Conservation says that under the new rules, tankers will have a 10-knot speed limit, but they are only required to have an escort capable of stopping them at six knots. She's also upset that the committee rejected a study that would have required tugs to be able to handle a "dual failure" (i.e., simultaneous loss of propulsion and steering) aboard a tanker.

The committee's Roger Peters says there's never been a documented dual failure in U.S. waters, and that providing that level of protection would cost shippers an extra \$50 to \$100 million annually. He says that shippers have to guard against many potential disasters, including navigation hazards, communication breakdowns and human errors. "More protection is always better. It's a question of how to wisely use our resources," he says.

The state Office of Oil Spill Prevention and Response will hold hearings on the regulations in early 1996 and make a final decision on whether or not to adopt later in the year.

A major spill is "everybody's nightmare," Glazer says, adding that nobody's going to come to San Francisco to see an oil-blackened Alcatraz. The state spill prevention office's Bud Leland says dangerous failures are quite rare. "But, as any Exxon executive would tell you, 'all it takes is one,'" he says. Contacts: Marci Glazer (415)391-6204; Harbor Safety Committee (415)441-7988; Bud Leland (916)323-4649

O'B

FRESH FILL & A FISH KILL

BayKeeper's eyes on the water and ears to the phone paid off for Estuary waters around Alameda Island this year. In the first instance, a volunteer skipper from the citizen-based watchdog group noticed some fresh fill. The group reported it to the S.F. Bay Commission, which found no record of a permit for the fill. "The only way this could have been found is by boat," says BayKeeper's Michael Lozeau. "We've been through there enough times to know what's different." The Commission contacted property owner Francis Collins, who responded by removing the 1500 cubic yards of dirt this November. In the second instance, a call came into BayKeeper's pollution hotline reporting a fish kill just off Alameda's bird sanctuary. A sign posted in the tidal zone indicated that the herbicide Rodeo



had been sprayed by a shoreline homeowners' association the previous day. A BayKeeper volunteer, sent out to collect some of the 20-30 dead fish, noted that even the clams and other sedentary critters had suffered. Lozeau says this latter fact is more indicative of a chemical source than of a sudden temperature change or other cause. BayKeeper froze the fish and passed them on to regulatory agencies, which are now investigating. Lozeau says the effectiveness of such citizen watchdogging will be bolstered this January, when an official DeltaKeeper is launched from a new upstream base on the Calaveros River near Stockton. BayKeeper (415)567-4401; Pollution Hotline (800) KEEP-BAY; DeltaKeeper (209)464-5090

ARO

CALIFORNIA'S LOVE CANAL

"California's Love Canal" is what a coalition of Delta water users and outdoor recreation interests is calling the reopening of a 28-mile section of the San Luis Drain approved November 3. Though the purpose of the partial reopening is to separate selenium-tainted agricultural drainage water from channels serving area wetland refuges, and though officials insist this "bypass" project will be terminated if it worsens San Joaquin River water quality, Compy Compomizzo of the Citizens for Safe Drinking Water Coalition still thinks

RESOURCE REVIEW

REPORT'S INFLUENCE SWELLS

Changing the Course of California's Water — a landmark Lindsay Museum report released last spring — is changing the way Californians think about the water that runs from city streets and front lawns to storm drains and waterways. The Museum's Jennifer Kaiser says the report grew out of a need to educate journalists about nonpoint source pollution. "Typically, the press just covered fines or put a 'Don't Dump' sidebar in the lifestyle section," she says. "We wanted journalists to write about the stormwater issue on its own merits."

The 30-page report reveals the enormity of the runoff problem — responsible for some 50-80% of water quality problems in the state — and points to individual action as the only effective way to control it. Not only did the report attract local, state and international media coverage (and a complimentary letter from the White House) but it had an unexpected ripple effect as well.

"It's become a tool for agencies and non-profits in the stormwater area to use to educate city planners, boards of supervisors, teachers and legislators and other officials," says Kaiser. She says though only 1,500 copies were printed initially, an additional 9,000 were subsequently commissioned by 15 public agencies and other users. "People take issues more seriously once they've been validated by the media," she says. Contact: Jennifer Kaiser (510)935-1978

KA

the project will just pass the pollution to wildlife, water drinkers, fisherpeople and duck hunters downriver. "That a few rich farmers can get away with murder, can put up nothing while Chevron and Shell spend millions cleaning up their selenium, makes me mad as hell," he says. His group has already collected 1500 signatures on their Ban-the-California-Love-Canal petition. "They don't even know how much selenium they're putting into our water now. How can we trust them to monitor it accurately in the future?" says Compomizzo. (510)757-4798

ARO

RE HAB

ECO-FRIENDLY FLOOD CONTROL

What do riprap, coconut skins and creeping wildrye have in common? They're part of a plan Save the American River's Frank Cirill calls the river's "first real chance for meaningful restoration in 50 years."

The plan is the lesser known half of an October recommendation made by the Sacramento Area Flood Control Agency (SAFCA) to Congress and the Army Corps which includes multiple measures for protecting area cities and farms from floods. Most of the attention has riveted on the upstream Auburn Dam part of the plan — an environmentally unfriendly project with a \$934 million pricetag many doubt the government can ever afford. The downstream levee and riverbank improvement half of the plan, however, has both solid funding and the hearty endorsement of environmental interests such as Cirill, Cal Fish & Game and U.S. Fish & Wildlife. This endorsement is attributed largely to the trust built up between natural resource protection and flood control interests over 22 months of participation in the consensus-building Lower American River Task Force, whose recommendations concerning the lower 26 miles of the river have been largely adopted by SAFCA.

"Flood protection used to mean lining the river bank with rock and letting nature take its course," says Scott McCreary of CONCUR, which facilitated the task force. "But this cooperative planning process has enabled engineers to sit down with

biologists and develop a more careful, biotechnical approach."

This biotechnical approach — aimed at preventing erosion on at least four known critical reaches of the lower 13 miles of the river by 1999 — is a repair and restoration combo which begins with adding a rocky armor to the banks. Coconut fabric pillows or blankets are then placed over these fortifications, and filled or underlaid with soil and plant seedlings (see diagram). The fabric keeps the soil in place until plants can become established.

Washburn says getting plants to grow in the "harsh environs" of the river is a huge challenge, as most of the time in such human-controlled river conditions it's either too wet, too dry or too hot to be very hospitable. Enter — creeping wildrye. This rye, as well as a sedge that goes by the Latin label of *Carex barbarae*, are both rhizomatous grasses native to the American River plain and tolerant of both sun and shade. As resource ecologist Jeff Hart explains it, they have a very dense matrix of underground stems called rhizomes — "a whole army of plants to hold the soil for our restoration work in place."

The earth and vegetation overlays, designed by Inter-Fluve's Dale Miller, will provide on-site mitigation for habitat lost during the extensive bank stabilization work called for by the SAFCA plan. The plan also includes off-site mitigation — 160 acres of hayfield planted on a elevated river terrace. The river level has sunk so much over the years with drought and diversions that "in a sense, the river has lost its intimate relationship with the flood plain," says Hart. "We're trying to recreate that nexus."

CALFED BRIEF

APPROACHING CRITICAL MASS

By March, CALFED will complete its first rough cut on all alternative actions to restore the ecological health of the Bay-Delta ecosystem and to improve water management for its beneficial use. By May 1996, this cooperative federal and state effort — set up to follow through on the 1994 Bay-Delta Accord — should have a final cut ready for evaluation via an Environmental Impact Statement/Report. To get this far, the program has been soliciting ideas, sharing information and gathering feedback on every front and in every corner of the Golden State. Over the past six months, CALFED has held four stakeholder workshops, four public meetings and four citizens advisory committee meetings, and more such events are scheduled for early next year (see calendar). (916)657-2666

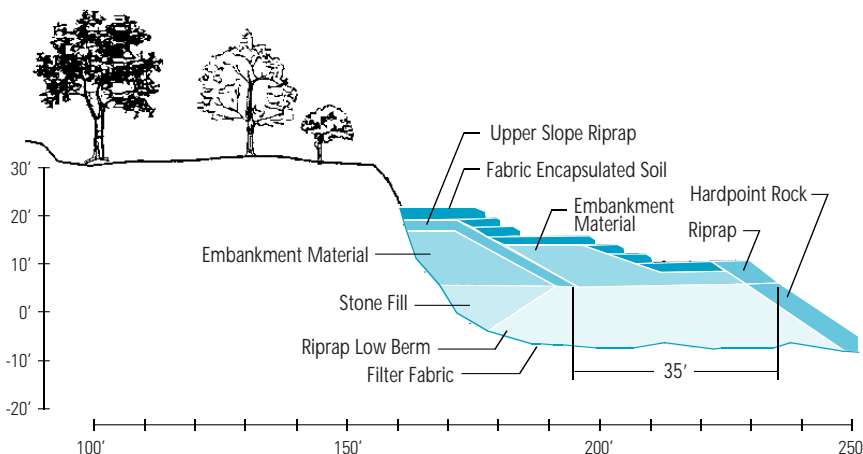
Hart's design for this mitigation site in the Discovery Park/Woodlake area will excavate 160 acres back down to a more frequently floodable level, then grade and irrigate (with stormwater) to restore riparian and seasonal wetlands. The design breaks the site down into eight modules that can be developed incrementally over the years and function both independently or in concert. Washburn says the restoration of each module will be financed by a nearby local public or private works project in need of the excavated soil. Washburn says the site could also serve as a mitigation bank for the Sacramento region.

Such bank protection and restoration measures will help the region emerge from what has been a largely reactive and consequently environmentally destructive flood control mode, says Washburn. The 1986 flood, for example, led to emergency rip-rap dumps up and down the river. "We've now institutionalized a collaborative, task force approach that will enable us to stay ahead of the game," he says.

"We're doing restoration we'd never be able to fund unless we'd coordinated it with flood control," says Hart. Contact: Tim Washburn (916)440-7606 ARO

BANK STABILIZATION USING FABRIC-ENCAPSULATED SOIL

Source: Inter-Fluve



AQUATIC INVADERS CONTINUED

burden on shipowners. A full exchange, by whatever method, can take a day and a half or more and use 250 gallons of fuel per day for pumping alone, according to Hamilton. Then there's crew labor and time delay on the voyage to factor in.

With all the difficulties and costs, deep sea ballast exchange may not be the silver bullet everyone's looking for. Indeed the Sea Grant shipping study says a combination of different ballast exchange, treatment and management options may be more like it. The study describes and evaluates 32 different control alternatives, including specialized shoreline treatment facilities to provide and accept ballast water; on-board mechanical filtration to prevent organism uptake; on-board extermination of organisms by agitation or salinity alteration, or by chemical, thermal, ultrasonic or ultraviolet treatment, or by oxygen deprivation; passive disinfection via increasing the length of the voyage; micromanagement in which ships refrain from ballasting in places (such as disease hot spots) and at times (such as night) where more organisms may be present; and ballast exchange in calmer waters closer to port.

Many of these measures are long-term, requiring changes in the way ships are designed and ports are equipped. Whatever the approach, shippers are likely to prefer an international standard so that the regs aren't different in every port. Currently, no international law exists, just the maritime organization guidelines. In the U.S., the Great Lakes — ravaged by a European zebra mussel — is one of only two regions that mandate at-sea ballast exchange. As local lore has it, the first time the Coast Guard notified a vessel entering the Lakes region that it was planning to test the salinity of the ship's ballast water, the captain poured table salt into his tanks to comply.

"Spot checks with good enforcement and high penalties bring a pretty high level of compliance," says marine biologist Andrew Cohen, who just completed a major study of exotic species intrusions for U.S. Fish & Wildlife. "There's no reason why the same laws couldn't be applied to the San Francisco Bay, and with great benefit."

SPECIES SPOT

MITTEN CRAB DIGS IN

Scientists are now certain that the Chinese mitten crab is widely distributed throughout the South Bay's numerous freshwater channels. So far, nothing suggests that the experience here will be any different than it was in Europe in the 1930s, when the same burrowing invader spread across the continent — damaging dikes and clogging dam spillways. During the height of a German government program aimed at eliminating the crab, workers hauled in more than 3 million crabs a year.

UC Berkeley's Kathleen Halat says the non-native crab's overwhelming success at colonizing the South Bay can be traced to its extremely high reproductive rate. At the time of fertilization, the female carries between 250,000 and a million eggs on the exterior of her body.

A plan to control the crabs' spread has yet to emerge. Although many people might delight in eating and selling the crab, officials fear that encouraging crab harvesting would lead to introductions into other estuarine systems. The crab's gonads sell for \$16-18 per pound in Hong Kong, and its meat has been found in Bay Area Chinatowns. Though the crab is a secondary host to the health-threatening Oriental lung fluke in its native range, a recent South Bay study by Dr. Armand Kuris of UC Santa Barbara found no evidence of lung flukes in local crabs. Contact: Kathleen Halat (510)642-6315 MB

California law currently does not require at-sea ballast exchange but does require vessel masters to fill out a form describing what's been done with the ship's ballast.

Even though less than 3% of all the exotic species arriving via ballast and other means actually become established in new regions, according to the Sea Grant study, it only takes one species to do great damage — a single species of Asian clam

PIKE WORRIES

Unable to complete environmental documents this fall to allow eradication of the exotic Northern pike from Davis Lake in the low Sierra, Cal Fish & Game is taking special steps to keep the voracious predator from spreading to the upper Feather River.

Patrols have been increased to augment an emergency regulation passed by the Fish and Game Commission that prohibits anglers from possessing pike.



A special Fish & Game World Wide Web page is devoted to warnings about the Davis Lake situation, showing drawings of a Northern pike and of the squawfish and alligator gar, fish with which the pike is often confused.

Fish & Game's Ron Decoto says the worry is the pike will make it to the Delta, where it would devour baby salmon. He says the decision has already been made to eradicate all fish from Davis Lake but the department will have to wait until October 1996 to get the right temperatures for the toxin Rotenone.

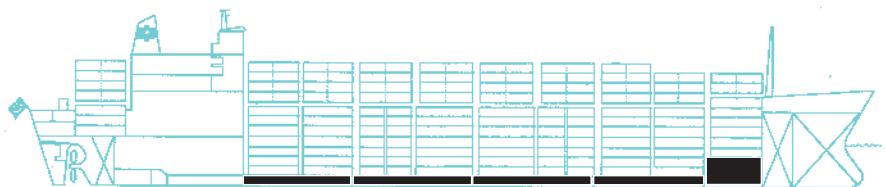
Contact: Ron Decoto (916)596-3693 FH

was recently credited with grazing the entire Suisun Bay phytoplankton food supply down to aquatic stubble.

Cohen says one exotic aquatic species has been introduced into S.F. Bay every 24 weeks since 1970.

Contact: Andrew Cohen (510)848-1029 or Alistair Hamilton (707)557-0758 ARO

BALLAST TANKS ON A CONVENTIONAL CARGO VESSEL



■ Ballast Tank

PLACES TO GO & THINGS TO DO



WORKSHOPS & SEMINARS

Urban Streams Restoration Training

WED•1/17•All day

Topic: Innovative urban stream restoration techniques.

Sponsors: Coalition to Restore Urban Waters and Urban Creeks Council

Various East Bay locations

Cost: \$110; \$50 for students (510)540-6669

Water Summit '96: Solutions for the Future

FRI•1/26•All day

Topics: How collaboration can successfully address the issues and challenges of meeting water needs.

Sponsors: Sacramento and Foothill Water Forums, Water Education Foundations and Sacramento Chapter, American Public Works Association

Sacramento Convention Center, Sacramento

Cost: \$150 (916)444-8014



HANDS ON

Shorebirds of Bolinas Lagoon

SAT•12/23•10 AM-3:30 PM

Activity: Kayak around acres of pickleweed marshes and view wintering shorebirds.

Sponsor: S.F. Bay Wildlife Society

Western Marin County; call for exact location

Cost: \$65 (510)792-4275

Marshlands Film Festival

SUN•12/24•11 AM-4 PM

Activity: Learn about America's wetlands, the National Wildlife Refuge system, the Farallon Islands and other wildlife issues through a variety of films.

Sponsor: S.F. Bay National Wildlife Refuge

1 Marshlands Road, Fremont

(510)792-4275

Christmas Bird Count

WED•12/27•All day

Activity: Help count the birds that live in and migrate through the Estuary (excellent birding skills not required).

Sponsor: Golden Gate Audubon Society

Oakland & San Francisco

(510)843-2222



MEETINGS & HEARINGS

San Francisco Joint Venture

TUES•1/9•1-3 PM

Topics: Continued discussion of working agreement.

1330 Broadway, Rm 400, Oakland

(510)286-6767

Bay Commission

THUR•1/18•1 PM

Topics: Public hearings on consistency determination for Concord Naval Weapons Station, on environmental assessment and revised Bay Plan Seaport Policies and Designations and on final strategy for eliminating unnecessary regulations.

Bay Model, 2100 Bridgeway, Sausalito

(415)557-3686

CALFED Public Meeting

WED•1/24•7 PM

Topics: General overview of CALFED process and specific discussions on ecosystem and water quality, water supply reliability and vulnerability of Delta levees and channels.

Ramada Inn, 324 E. Shaw, Fresno

(916)657-2666

Sausal Creek Watershed Program

WED•1/24•7-9 PM

Topic: A kickoff meeting for a new watershed education and restoration program.

Diamond Branch Library

3565 Fruitvale Ave., Oakland

(510)231-9539, ext. 566

Friends of the Estuary Board of Directors

FRI•1/26•9:30 AM-12:30 PM

Room 4 B/C--S.F. Regional Board

2101 Webster Street, Oakland

(510)286-0734

State Water Resources Control Board Public Workshop

TUES•1/30•All day

Topic: Receive comments on proposed alternative approaches to meeting requirements of the Water Quality Control Plan for the Bay-Delta Estuary in preparation for a draft EIR.

First Floor Auditorium, Twin Towers Bldg.

744 "P" Street, Sacramento

(916)653-2516

CCMP Implementation Committee

FRI•2/2•10 AM-12:30 PM

Vacaville

(510)286-0924

NOW IN PRINT

The California Dream...Just Add Water
(educational brochure)

California Water Clearinghouse

Copies from (916)441-4545

California Marsh Manual

(activist handbook for wetlands preservation and restoration)

Campaign to Save California Wetlands

Copies at \$25 each from (510)654-7847

50 Ways to Work on Water

Earth Day 2000 Working on Water Project

Copies from (415)495-5987

The Presidio Conference Transcript

(International conference on sustainable development)

Environmental Policy Center. Cost: \$28

Copies from (415)775-0791 or

envpolicyctr@globalcities.org

*Recycled Water Master Plan
and Groundwater Master Plan*

San Francisco Supplemental Water Supply Program

Copies available at San Francisco libraries or from
(415)989-1446, ext. 14

The Shipping Study:

*The Role of Shipping in the Introduction of Nonindigenous
Aquatic Organisms to the Coastal Waters of the United
States (other than the Great Lakes) and an Analysis of
Control Options*

Carlton, Reid & van Leeuwen

National Sea Grant College Program/Connecticut Sea
Grant Project

Contact the National Technical Information Service,
Springfield, VA 22161 re: Report No. CG-D-11-95

Teacher's Water Resource Guide

Earth Day Resources

Copies from (800)727-8619

*1994 Draft Annual Report: San Francisco Estuary
Regional Monitoring Program for Trace Substances*

San Francisco Estuary Institute

Copies from (510)231-9539

*1996 Bay, Delta & Rivers Calendar
From the Headwaters to the Golden Gate*

The Bay Institute and the S.F. Chronicle.

(The 12 full-color photographs in this 12x12" calendar
are winning entries in a contest sponsored by the
Chronicle.) \$11.95; bulk gift order rates available.

Copies from (415)721-7680

WATER DEALS CONTINUED

went to press, the amount of water being discussed ranged from 50,000-250,000 acre-feet, according to Golb. Under the settlement, Northern California would be paid by CUWA-AG to allow this water to continue down the rivers to the Delta as requested by environmental agencies. At press time, CUWA-AG's Byron Buck suggested the purchase price could be anything from \$1-\$100 per acre-foot. Buck says CUWA-AG is also negotiating for other water with San Joaquin water interests.

"No one wants this to go to court," says the Natural Heritage Institute's David Fullerton. "The upstream users don't want to lose their water rights, and the downstream users don't want to be made fully responsible for meeting the new water quality standards."

Even a successful deal doesn't mean the environmental needs of the whole watershed will be taken care of, says the Bay Institute's Gary Bobker. That responsibility still lies with the State Board and its workshops and EIR process, he says, when environmental interests and state and federal water suppliers will get their chance to comment on the proposed water transfer settlements, offer improvements and consider other alternatives. "Let's hope the Board rises to the occasion," says Bobker.

The California Waterfowl Association and Cal Fish & Game say the environmental costs of the "third party" impacts of removing water from Northern California (impacts on area wetlands, for example) must be examined by the Board, despite the obvious benefits of using the water to fix environmental problems in the Delta.

In addition to any water squeezed out of negotiated settlements, Fish & Game's Greg Zlotnick thinks the Board should consider bolstering supplies by creating a water market. Environmentalists such as Bobker and Fullerton have long been interested in exploring ways in which a market-based water transfer system, such as the state water bank of the early 1990s, could be used to augment basic environmental protections. "The environment needs to become a full-fledged player in the water markets, instead of having to just wait around for regulatory water," says Fullerton.

State Board workshops exploring alternatives for meeting the requirements of its Bay-Delta water quality control plan begin this January (see calendar). Contact: Gary Bobker (415)721-7680; Byron Buck (916)552-2929; Dave Fullerton (415)288-0550; Tom Howard (916)657-1873; Rich Golb (916)442-8333; Greg Zlotnick (916)653-4207 FH

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