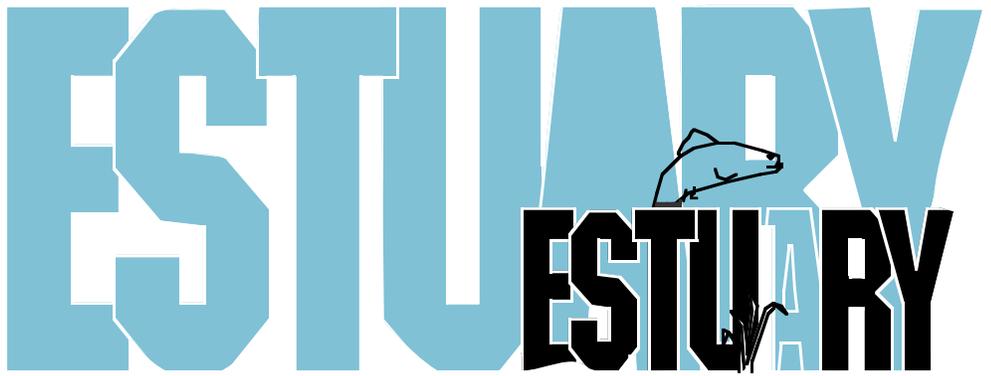


# ESTUARY



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

## VIDEOS SELL CREEK CLEAN UP

"This is what people think of our neighborhood," a child says distastefully as the camera pans across a trash-strewn creek bed. "They come in here and dump their garbage."

The youngster is one of many Oakland residents featured in two videos released as part of Alameda County's new "Clean Creeks" campaign. Officials are making neighborhood pride a major theme of the \$200,000 campaign, which aims to stop people from dumping trash into urban streams and encourages them to report others who unload anything from bags of lawn clippings to old car engines into the water.

It's no small problem — the county's Patty Spangler says it costs \$500,000 a year to remove an estimated 1000 tons of debris from the water. The county hired Mason Tillman Associates to conduct the campaign. In addition to producing the videos, MTA is placing signs in local busses, contacting neighborhood and church groups and asking private companies to include campaign material with their bills.

The campaign will run through July. It covers Oakland and Berkeley, and, if successful, could be extended to the rest of the county. Spangler says the campaign isn't part of the county's compliance with the Clean Water Act. But it is in keeping with the S.F. Regional Board's goal of promoting proactive watershed cleanup efforts, says the Board's Tom Mumley.

MTA president Eleanor Ramsey says the firm decided on the "clean neighborhood" approach for several reasons. Although trash dumping does cause some pollution problems and can potentially block water flow, it would take an extensive and expensive outreach effort to get that message across. "It doesn't take that same level of public education to get people to think they don't want trash floating in their creeks," she says.

Contact: Patty Spangler (510) 670-5563  
O'B

## What Price Restoration?

Ask five experts what it costs to restore wetlands, and they'll all say it depends on the site and what you want to do with it. The site might be anything from a diked cow pasture to a trashed-out marsh, and the goal might be anything from pickleweed flats to winter duck ponds, but it's how closely the before and after resemble each other, and what it will take in terms of human intervention to transform one into the other, that creates vast differences in dollars and cents.

"Just breaching levees is pretty cheap," says hydrologist Bob Coats of Philip Williams & Associates. "If toxics are involved, things can get very expensive." In the restoration trade, the word is that average costs are \$20,000-\$30,000 per acre, with big ticket items reaching \$80,000 per acre.

"One of the biggest cost factors can be whether the land you want to restore is at or near the grade you need to get tidal action," says engineer Andrew Leahy. "Another is if you have to excavate large areas and you have no place to put the dirt, so it has to be hauled away. Then the price can really escalate."

"You've got to pick your sites," says Cal Fish & Game's Carl Wilcox, "and do what lends itself most to the physical situation — restore it to what it most wants to be." All the experts agreed that the suitability of the site to the proposed project is paramount to the cost. Wilcox explains that if your site is full of transmission lines, roads and other infrastructure that may need to be raised if tidal action is restored, for example, it's going to cost more. So you have the option

of raising the bucks necessary to get your environmental goal or setting a different, less costly goal, such as seasonal ponding.

## FROM IDEA TO PAPER

Once the appropriate goal is set for the site, cost considerations can be easily organized into a number of basic activities ranging from planning and permitting to actually bulldozing through levees, carving out new channels, installing tide gates, raising land levels or conducting post-restoration monitoring. The list goes on. On pages 4-5, readers will find profiles and price tags of four projects discussed here.

In general terms, the paperwork — the up-front planning and engineering costs — can run into the hundreds of thousands of dollars. At a minimum, as in the case of a recent 46-acre Petaluma marsh restoration, this is done in-house by an agency staffer like Wilcox (one consultant called the project "the people's simple and cheap marsh"). At a maximum, you may have a bevy of biologists, hydrologists, engineers, lobbyists and other consultants to write your environmental impact statements,

handle community and special interest feedback, and push your permits through the multi-agency wetlands regulatory apparatus.

If contaminants on the restoration site need to be immobilized or removed, plan on beaucoup extra bucks for exhaustive soil sampling and risk assessment. Glenn Young of Harding-Lawson Associates, a firm working on removal of several small pockets of contaminated soil at a San Leandro Citation Homes Central development with a wetland component, says up-front consulting and chemical testing costs will be almost as much (\$100,000-\$200,000) as actual removal of the 600-900 cubic yards of material (\$160,000-\$200,000).



*In the wetland restoration trade, the word is that average costs are \$20,000-\$30,000 per acre, with big ticket items reaching \$80,000 per acre.*

- continued on page 4

## SPECIES SPOT

### TRACKING PEEPS

About 70 Western Sandpeppers will be taking something extra with them when they start their northward migration this spring — tiny radio transmitters glued to their backs. Researchers hope the one-gram devices will yield new data about the birds' migration strategies and the sites they use along the Pacific Flyway. Although the birds are among the most common shorebirds — estimates for their total numbers range between 1.2 and 6 million — scientists understand little about their movement and habits.

They will tag 30 birds from San Francisco Bay (the other 40 will be from Grace Harbor, Washington, and Honey Lake, California, in the Great Basin). Researchers in airplanes will track them to nesting spots in Western Alaska, noting how long the birds spend at each stopover point. Fifteen agencies, including U.S. Fish & Wildlife and the Estuary Project, are cooperating on the \$120,000, two-year project. Mary Ann Bishop of Alaska's Copper River Institute and Nils Warnock of the University of Nevada are the principal investigators.

Up to 500,000 of the gregarious, six- to seven-inch-long "peeps" inhabit the Bay during the peak spring season in late April. Some birds winter here; others stop by as they migrate to and from Central America. They feed in the mudflats at low tide and frequently roost in the Bay's salt ponds and other marshlands.

This tendency of the birds to congregate in large numbers makes it especially critical to learn about their migration patterns, because destruction of any of their major stopovers could impact hundreds of thousands of birds, says Bishop. Nobody knows how long individual birds spend at any one site, nor do they know if they follow a regular annual route from one resting place to the next.

"I think it's important to keep an eye on species that are abundant," adds Warnock. "If something goes wrong with these birds, then very likely something is going wrong with other species as well." Contact: Mary Anne Bishop (907)424-7212; Nils Warnock (702)786-4535 O'B

## NEWS ROUND-UP

**DELTA DUCKLINGS MAY GET NEW PONDS** under a \$40,000 grant program launched by Ducks Unlimited and the Delta Protection Commission this spring. Grants will be available to landowners within the legal Delta for projects that provide permanent duck habitat. Potential projects include brood ponds (shallow, secure waters where mother ducks and young can hang out before the ducklings learn to fly) and seasonal wetlands managed to maximize their food and habitat resources year-round (summer irrigation can spur seed production among floral duck delicacies like swamp Timothy and smart weed). (916)776-2290

**PRESERVING A 7,000-ACRE MOSAIC OF WETLANDS**, diked historic baylands and associated upland habitat areas between San Rafael's Canalways and the Sonoma County border is the aim of Marin Baylands Advocates, a new coalition of Marin County environmental leaders. According to Advocate founder Barbara Salzman, about 2,500 Baylands acres face development for housing, office space, golf courses and other uses. (415)388-0930

**A HORIZONTAL-AXIS WASHING MACHINE** that uses 40% less water, 60% less energy and 40-60% less detergent than conventional vertical axis machines may finally give the Maytag repairman something to smile about. The machine's washer tub (which by design only fills to one-third its capacity) rotates around a horizontal axis, cleaning clothes as they plunge through the water. Horizontal spinning requires less electricity and distributes detergent more efficiently. Many horizontal models load from the front, allowing a dryer or cabinet to go on top. PG&E and some local water districts plan to offer rebates to customers who buy the energy-efficient washers. (415)973-8890

**PENN MINE WILL GET A \$10 MILLION CLEAN UP**, thanks to a new agreement on the parts of the State Water Board and the East Bay Municipal Utility District to each kick \$5 million toward permanently ridding the Calaveras

County mine of toxics. Despite construction of catch nets and holding ponds, toxic runoff sometimes spills into the nearby Mokelumne River. EBMUD's contribution is provisional on the feds' providing the rest of the \$16 to \$20 million cleanup costs. The agencies hope their actions will help end the extensive litigation over the property. (510)287-1380

**TURNING SEA WATER INTO DRINKING WATER** may finally become cost-effective thanks to new carbon-based aerogels originally developed for classified military uses. Scientists at Lawrence Livermore National Laboratory have created a desalination prototype system that pumps water through aerogel stacks that look like thin sheets of brittle black construction paper. The aerogels act as electrodes and attract dissolved salt from the water when an electric charge is applied. Key to the system's success is the aerogels' enormous salt-storing surface area — a piece 6.9 centimeters square and only 0.0125 cm thick has a surface area of roughly 2.8 million square centimeters, which means a lot of desalination can occur in a relatively small space. The lab's Joseph Farmer says the prototype system requires less electricity than either reverse osmosis or electro dialysis, other desalination technologies currently available. Several water agencies and industries are now looking for ways to bring the aerogels' production costs down. (510)423-6574

**A NEW GUIDE EXPLORES THE 400-MILE LONG RING** that will one day be the Bay Trail, winding in and among the cities, ports, parks, marshes, marinas, wildlife refuges, salt ponds, cow pastures, coastal hills and beaches that comprise the Bay shoreline. Currently just over 170 miles of Bay Trail, an ambitious project started in the 1980s via state legislation, have been completed. The new 198-page guide offers mile-by-mile maps of the trail and shoreline; hundreds of tidbits about the natural and human history of the Bay's fringes; details on boat ramps, fishing piers, swimming beaches, duck ponds, bike paths and wheelchair accessible waterfronts; and basic how-to-get-there information. For a copy (\$14.95), contact the California State Coastal Conservancy: (510)286-1015

# NATURAL VENTURES

## NO RAVE REVIEWS FOR WETLANDS MITIGATION

Making the Army Corps as mean as the IRS may be the only way to yank the practice and science of wetlands mitigation out of a bureaucratic quagmire, states a new U.C. Berkeley review study.

The review, which analyzed all published findings on wetlands mitigation over the past decade, notes that powerful new partnerships have pushed wetlands mitigation into the public eye, that wildlife managers have increased their use of mitigation as a management tool and that the general population has even begun to understand the concept. But it also finds that the practice of compensatory restoration has broken free from its scientific anchor. "Despite evolving sophistication by the research and management community, the results are not encouraging, and the success of mitigation remains in serious doubt," it says.

The review study, authored by U.C. Berkeley's Margaret Race and National Marine Fisheries' Mark Fonseca, also found consistent evidence that wetlands regulatory bureaucracies still can't work together. It also claims that nobody follows up on mitigation projects once they're approved.

"Unless we change the status quo of compensatory mitigation, we fear that the baseline of wetland acreage will continue to erode in the face of faulty policies and poor implementation," it says.

The review recommends that wetlands regulatory agencies use an IRS approach with random audits, fines and civil penalties to bring the system into line. It also recommends that research and inventory tasks be de-emphasized in favor of enforcement. "Once acreage is assured, only then does it make sense to emphasize the debate over how to measure wetland quality, function, natural equivalency or persistence," says the review. Those interested in seeing the review in full may have to wait for its publication in the journal *Ecological Applications* next February. Contact: Margaret Race (510)642-7171 FH

## NEW NATURE BANKS

Interior Secretary Bruce Babbitt and a room full of leaders from the state and the Bank of America announced the opening of California's first conservation bank in San Diego at a press conference April 7. The 180-acre Carlsbad Highlands Conservation Bank seeks to protect gnatcatcher habitat, not just the gnatcatcher, with contributions from landowners within a 6,000 square-mile area.

The San Diego site fuses the practice of mandatory wetlands mitigation banking and the state's so far mostly theoretical Natural Communities Partnership Planning Act into a multi-species conservation bank. The Resources Agency's Andy McLeod says the state hopes that conservation banks will quicken the pace of both development and wildlife preservation in California. He says the San Diego bank is being eyed as a national template. Under this template, all landowners and agencies in a given area

agree to a preservation plan for an entire ecosystem and also to the physical location of a shared conservation bank or refuge, to which all landowners could contribute.

McLeod says the Resources Agency may be willing to open a similar-style conservation bank in the North Natomas development area near Arco Arena in Sacramento, where developers have proposed forming a wildlife conservancy. Development in that area has long been restricted by protections for the Swainson's Hawk, the giant garter snake and wetlands and vernal pools.

"Now that the state has a formal policy for conservation banking, we are hoping landowners like those in the North Natomas area will come forward with proposals to open conservation banks," says McLeod. Contact: Andy McLeod (916)653-5792 FH

## HOW I SEE IT

### DELTA PLAN ON PAPER

**TOM TORLAKSON**  
PAST CHAIR, DELTA PROTECTION COMMISSION

"A new comprehensive land use and resource management plan developed specifically for the Delta was just completed and adopted February 23 by the Delta Protection Commission. It offers a comprehensive set of policies and includes recommendations designed to protect the Delta's rich resources — its fisheries and wildlife, its farming and agricultural soils, its recreational opportunities. To develop this plan, we had an open process with advisory groups of people and agencies with a 'stake' in the Delta. The consensus building that went on over this two-year process led to a workable, acceptable plan that can be implemented by local government and is backed up by state law.

"The plan has several key elements: it seeks to preserve the Delta's unique agricultural character; it identifies important farmlands and sensitive wildlife areas that should be protected from urban growth; it suggests ways to safeguard local water quality and supply; and perhaps most key, it supports an

aggressive program to cut through the red tape that's keeping levee maintenance and repair from occurring easily and economically. The plan calls for the Department of Water Resources, Cal Fish and Game and the U.S. Army Corps to coordinate and expedite their approval process for levee projects. Doing a better job with our levees will enable us to protect the Delta as we know it in its current physical configuration.

"We've also approved the idea of a study of recreational use of the Delta, which would identify areas of demand and corresponding user impacts. With this use plan, we can then go on to balance out how to accommodate more recreational use in the Delta without adversely impacting agricultural use. We may, for example, need to direct users into more specific and controlled points of access so we don't have people fishing off every levee, starting fires, disturbing wildlife and littering.

"In addition to developing a planning document and future goals, we've also succeeded in creating a central clearinghouse for information — an agency, the Delta Protection Commission, that people can turn to when they see that the Delta needs help, a voice for the Delta."

## CASE STUDIES

### PETALUMA RIVER MARSH

<b>Project Goal:</b> .....	Tidal Wetlands
<b>Former Land Use:</b> .....	Hayfields
<b>Restored Acreage:</b> .....	46
<b>Tasks:</b> Two levee breaches and improvements to a substandard interior levee	
<b>Mitigation:</b> .....	Self
<b>Total Cost:</b> .....	\$213,000
<b>Land:</b> .....	NA (nonprofit/public ownership)
<b>Construction:</b> .....	\$160,000
<b>Project Management &amp; Permitting:</b> .....	\$25,000*
<b>Engineering &amp; Surveys:</b> .....	\$10,000
<b>Ongoing Monitoring:</b> .....	\$20,000

\* Does not include Cal Fish & Game staff time

### NAPA RIVER UNIT OF NAPA/SONOMA MARSHES WILDLIFE AREA

<b>Project Goal:</b> .....	Tidal Wetlands
<b>Former Land Use:</b> .....	Salt Ponds
<b>Restored Acreage:</b> .....	560 acres
<b>Tasks:</b> .....	Blowing a hole in the levee
<b>Total Cost:</b> .....	\$400 (for the explosives)

### SAN LEANDRO SHORELINE

<b>Project Goal:</b> .....	Tidal Wetlands
<b>Former Land Use:</b> .....	Degraded Marsh
<b>Restored Acreage:</b> .....	172
<b>Tasks:</b> Excavating channels and building habitat islands (using dredged material); dredging and debris and rubble removal; breaching, sheetpiling, culverting, installing tide gates (four) and armoring the Bayfront levee (and raising an interior levee); improving trails and roads	
<b>Mitigation:</b> The restoration is mitigation for ongoing dredged material disposal from the San Leandro marina and entrance channel on an adjacent site.	

**Special Considerations:** Public access & existing salt marsh harvest mouse habitat

<b>Total Cost:</b> .....	\$993,000
<b>Land:</b> .....	NA (local and state ownership)
<b>Planning, Design &amp; Engineering:</b> .....	\$400,000*
<b>Mobilization &amp; Security:</b> .....	\$79,500
<b>Installation of Culverts, Tide Gates &amp; Control Structures:</b> .....	\$357,000
<b>Road &amp; Trail Improvement:</b> .....	\$108,600
<b>Levee Repair &amp; Improvement:</b> .....	\$36,250
<b>Rubble &amp; Debris Removal:</b> .....	\$29,960
<b>Channel Excavation &amp; Habitat Island Creation:</b> .....	\$380,000

\* Does not include staff management time by city engineers.

## RESTORATION PRICE CONTINUED

If mitigation for the loss of wetlands is involved, whether for a wetland-to-wetland deal or for a new development that impacts wetlands, fees for paperwork can skyrocket. Bud Lyon, a developer in the midst of a major Fremont shoreline development called Warm Springs, has already spent \$600,000 on environmental reviews and permitting for the second phase of his project, and an Army Corps permit is still not in the bag. "In terms of cost, the real unknown and greatest risk is getting the agencies to give the nod," says Lyons.

Lyons' first phase, completed in 1985, included 250 acres of business park, 50 acres of pickleweed stands and a 200-acre shallow water basin with wetland fringes. The latter two added up to a \$2.7 million mitigation for his \$14.5 million development. Whether the new wetlands and wildlife habitat are more environmentally beneficial than those destroyed remains the million-dollar and most side-stepped question of all mitigation projects (see page 3). But at Warm Springs, at least, biologists are already seeing thousands of waterfowl, schools of fish and even the odd endangered salt marsh harvest mouse in restored areas.

### ON-THE-GROUND

Once all the paperwork and permitting are done, the next bill coming in will be for the down-and-dirty steam, sweat and hardware of wetland restoration. Most consultants break down construction costs into the following basic categories: mobilization (getting the heavy equipment in and out of the site), excavation, tide control, levee construction and improvements and debris removal.

"Whenever you install tide gates in a levee, there are a lot of incidental costs," says Leahy. "You have to spend considerable money up front just to reach the point at which improvements can be put into the ground." By way of example, Leahy explains that at the 172-acre San Leandro Marshland Enhancement project he recently worked on (see page 4), breached levees had to be temporarily plugged with giant 4x20-foot sheets of mud

("sheetpiles"), while dewatering and excavation were going on inside. This step — sheet piles and dewatering — alone cost \$60,000 at San Leandro. Equipment access can also play a big role in construction costs — some sites have deep easy access channels or good roads; others can only be reached by shallow, constricted sloughs at high tide.

Plantings — to springload the return of wetland flora — can also tap the wetland wallet. Wetland Research Associates' Doug Spicher says that for the Cadillac treatment in terms of planting expertise and material, he estimates \$2 per "plug." Spicher also cited an Army Corps study that counts on 10 person hours of labor per 100 plugs. One on-the-ground example can be found in a Hayward marsh restored to treat municipal wastewater, where Joe Ernest recently oversaw the harvesting (from nearby flood control channels) and planting of 3500 1x1-foot clumps and 223 3x3-foot clumps of bulrush. Bands totaling two-and-a-half acres in area were planted across two 30-acre basins — total cost \$175,000 including labor, fencing, transportation and levee improvements. Ernest says nurseries also sell the bulrush at \$1 or more a stalk. Most restoration projects do not include



plantings, and rely on tides and rivers to import seeds and nutrients.

Restoration's clutch on the pocketbook doesn't always end when the tides roll in. Leahy says debris will most likely have to be cleared from the San Leandro site at least once a year. Other sites may need monitoring to make sure endangered species or contaminant problems don't crop up. Army Corps permits often require ongoing assessment to see if "what you said would work did," says WESCO's Steve Foreman, another consultant.

### SPECIAL ORDER ITEMS

Upon closer examination, some of the projects examined for this story had special specific costs. At San Leandro Shoreline, for example, the city wanted to make sure that the public was kept out of the potentially dangerous work zone — a public that had easy access to the site in the past. Bid prices received for security fences and patrols ranged from \$3500 to more than \$50,000. In the same vein, the city's goal of continuing public access along the Bay levee while also improving it for future use by emergency vehicles added \$108,600 worth of road and trail improvements that wouldn't be necessary in a wetland restored purely for habitat values. Public access goals also added cost in terms of aesthetics. "We didn't want big obtrusive operating gear like hand wheels and tide gate frames sticking up from the levee," says Leahy. "We hid all that."

At Sonoma Baylands — a 320-acre restoration incorporating dredged material (see *Case Studies*) — the costs were influenced by the dual goals of doing a first-class wetland restoration while finding a home for several million cubic yards of sediments from the Oakland harbor. The potentially high costs of transporting the material from Oakland and then placing it on the Baylands site initially worried the port when the option of wetland restoration over the more traditional open water disposal was first introduced. But project manager Laurel Marcus says as it turns out, adding Sonoma Baylands to the disposal roster on the Port of Oakland deepening ticket increased costs by less than 5%.

In terms of Baylands environmental value, a less tangible cost factor, use of the material will speed up the creation of a

fully functional marsh (rather than relying on natural sedimentation). Marcus says the project might have cost less if they'd maximized the disposal capacity of the site but that was not the project goal. "We filled to the level best for wetland development, not for disposal," she says. But the fact that the project did offer a disposal opportunity in a region strapped for options did have some associated benefits. "We're using industrial public works money for environmental purposes, money not normally accessible to us," says Marcus. "The public gets two — dredged ports and restored wetlands — for the price of one."

### LESSONS LEARNED

The experts offered diverse words of financial wisdom to would-be restorers. Wilcox suggested that contrary to popular perception, more intervention and more cost doesn't necessarily mean better wetlands. "Most of the best restorations aren't engineered," he says. "You can engineer them to death but you're still better served by just creating a simple template and letting natural processes take over." Wilcox points to simple restorations that have worked well on Bair Island near Redwood City and White Slough near Vallejo.

Marcus urges restoration wannabes in public agencies not to underestimate the staff time and resources necessary to stay on top of the thousands of details of a project like Sonoma Baylands. And Leahy suggests one way to keep costs down is for engineers to try and configure their projects to minimize excavation. "You also have to look for trade-offs," he says. "You may not get 100% of your environmental or operational goals on a specific project, but if the cost is 40% less, then maybe that extra money is better spent elsewhere." Other experts say if the Army Corps is involved, never take its estimates as gospel, as they're often orders of magnitude higher than what you'll get from the private sector.

For the experts interviewed here, finding more cost-effective ways to do restoration will be an ongoing challenge. "The value of wetlands to the environment is pretty well documented, and the need for healthy estuaries along our coastline is clear," says Leahy. "We just have to find the most

## CASE STUDIES

### SONOMA BAYLANDS

<b>Project Goal:</b> .....	Tidal Wetlands
<b>Former Land Use:</b> .....	Diked Hayfields
<b>Restored Acreage:</b> .....	320
<b>Tasks:</b>	Grading and construction of a new levee; building a dozen branching peninsulas; raising the land level by pumping in slurred dredged material; installing and removing three temporary outlet culverts and weirs; adding concrete jackets to several power line towers; seeding levees with grasses; decanting return water; restoring tidal action; and short- and long-term monitoring
<b>Special Considerations:</b>	Dredged material from Port of Oakland deepening project and Petaluma River channel used to accelerate marsh development
<b>Total Cost:</b> .....	\$7.1 million*
Land: .....	about \$500,000
Preliminary Planning,	
Design & Engineering: .....	\$290,000**
Army Corps Planning,	
Design & Engineering: .....	\$1.2 million
Excavation & Construction: .....	\$1.3 million
Jacketing of Power Line Towers: .....	\$170,000
Dredging & Transport	
of Port of Oakland Material: .....	\$3.6 million*
Seeding & Mulching Levees: .....	\$38,000
Maintenance & Monitoring: To be determined	

\* Because the Sonoma Baylands project is still underway, some numbers had to be based on construction contract bids and some on actual costs. While the actual dredging cost is not necessarily directly associated with the wetland restoration cost, it is included here for background.

\*\* Includes \$40,000 in initial studies on options for larger 830 site, of which Baylands is a part. Does not include extensive project management contributed by the California Coastal Conservancy.

effective ways to bring them back." Whatever the allure of remaking nature, it may pay us to remember that no matter how much know-how, technology and money we throw at restoration, preserving those wetlands that are still intact may be the most cost-effective option of all. Contact: Joe Ernest (510)790-0100 ext. 266; Andrew Leahy (415)386-5893; Laurel Marcus (510)286-1015; Carl Wilcox (707)944-5525 ARO

## SUPPLY SIDE

### GROUNDWATER TAPS AND TABS

All new above-ground reservoirs have been blocked for two decades by environmentalists and other political interests, prompting calls by state leaders for studies of an underground, geographically defined reservoir. The idea, also called 'conjunctive use' or water mining, could cost \$80-\$113 per acre-foot of water according to new studies of two potential underground reservoirs in Sutter and Yolo counties. Once built, the cost of extracting the underground water would fall to less than \$20 per acre-foot. The state paid \$125 per acre-foot for water during the 1991 drought.

The latest research, released last month and called the *American Basin Conjunctive Use Project Feasibility Study*, concludes that an underground reservoir is technically and economically feasible at a site spanning both Sutter and Placer counties and located 50 feet below farmlands. The reservoir, which would cost about \$14.2 million to build, would be filled to about 5 feet above the usual groundwater level and drained to about 5 feet below that level over a 150 square-mile area. Throw in the proposed Yolo reservoir, and 75,000 new acre-feet of water becomes available to be tapped only during drought years and then recharged during normal and wet years.

In other news, many counties and water districts are moving to keep better tabs on private and state taps on groundwater. The Sacramento Metropolitan Water Agency, the South Sutter Water District, and Butte and Yuba counties are among those in various stages of forming new groundwater management and regulation entities, according to Water Resources' Toccoy Dudley. Dudley says the state hopes these new initiatives may lead to better understanding of the resource and how it may be used as a source of water for export. Contact: Toccoy Dudley (916)227-7590 FH

## FARM WISE



### FARM CHEMICALS CHECK OUT OF B&B

Over half a million dollars will be available over the next two years to apply model biologically integrated farming practices that have already eliminated organophosphate pesticides from acres and acres of Merced County almond orchards to other crops. Behind the grant, funded with money from both Assembly Bill 3383 and from EPA, is the goal of finding voluntary ways to reduce farm chemical use and associated environmental impacts such as polluted runoff.

The official title of the new grant program is Biologically Integrated Farming Systems, or BIFS, and it will be administered by the U.C. Sustainable Agriculture Research and Education Program. BIFS promotes use of a model with another four-letter name, BIOS, which was developed by the Community Alliance with Family Farmers and is now considered a nationally replicable model for voluntary reduction of chemical use. The two four-letter acronyms share the "biologically integrated" in common. But BIOS has focused on orchards (that's where the "O" comes from) to date, using locally proven farming systems that emphasize cover crops, beneficial insects and other biological practices over chemical fertilizers and pesticides.

"BIOS is a template for BIFS and represents a departure from most previous ag extension models in that it relies heavily on farmer-developed practices," says the U.C. program's analyst Dr. Bob Bugg. "Farmers are the great integrators, and a lot of times they're going to be on the cutting edge."

Early this April, the U.C. program completed a four-page request for proposals from growers associations, commodity boards, marketing cooperatives, resource conservation districts, U.C. farm advisors and other groups interested in the \$585,000 grant program (the proposal deadline is July 6). The request details criteria to be used to evaluate the proposals, including whether a proposed project addresses soil fertility and pest management decisions in the context of the whole system, and how the project plans to reach out to interested farmers and agricultural consultants. Aggregate chemical reduction from each funded project will be calculated annually. Contact: Bob Bugg (916)754-8549 ARO

### RURAL WATER JOINS CHORUS

In the small rural farming town of Mendota, things have gotten so dire (unemployment soared to 45% in 1992) that residents have been known to steal groceries off the back of pick-ups while leaving tools and other more valuable items behind. Mendota is just one of many small communities up and down the Central Valley whose farms and ag support businesses have been hard hit by water cutbacks due to drought and regulation. To give this rural backbone of California a voice, a sizable group of farmers, local elected officials, ag advisors, social service agencies and others recently launched the Rural Water Impacts Network.

"We felt the debate between water users was too black and white," says the network's newly hired program director, Adrienne Alvord. "Big ag users and water districts, who have historically monopolized rural water policy discussions, haven't represented the interests of rural communities — we're just 'third party impacts' to them." Alvord says what galvanized such a diverse group into action was general concern about the impacts of water transfers on the economies of local communities and small farmers concerns about effects on groundwater supplies (farmers selling their surface water allocations may overtap groundwater — a communal resource — to replace it).

According to Alvord, the network will be working to educate others about rural concerns in four primary policy areas: water reallocation and rural community health; watershed management; land use and urban sprawl; and ag drainage and reclamation reform. She says the network is also supporting research into two areas: how water transfers specifically have and could affect rural communities and how to encourage community development in ways that preserve the rural character of the valley. By way of example, she noted a recent proposal to start a community development fund based on a tiered system of water transfer fees for transfers that would promote both water conservation and save farm jobs.

"When you get the community involved in problemsolving, and when you encourage local entrepreneurial talent, that's when you get good results," she says. Contact: Adrienne Alvord (916)756-8518 ARO

## PLACES TO GO & THINGS TO DO



### WORKSHOPS & SEMINARS

#### Beyond the '95 Floods: Flood Management Issues in California

MON•5/1•All day

**Topics:** Lessons learned from the '95 floods, national and local flood control policies and floodplain management.

**Sponsor:** Water Education Foundation  
Hyatt Regency, Sacramento

**Cost:** \$125-\$150 (916)444-6240

#### Swamp Meet

THUR-SUN•5/4-7•All day

**Topics:** Preserving wetlands and agriculture, the "Wise Use" movement, land trusts and other wetlands protection and restoration issues.

**Sponsor:** Campaign to Save California Wetlands

Pepperdine University, Malibu  
**Cost:** \$90-\$280 (510)654-7847

#### California Takes Control of Its Own Destiny ACWA 1995 Spring Conference

WED-FRI•5/10-12•All day

**Topics:** Key legislation and policy developments, plus a wide range of water issues.

**Sponsor:** Association of California Water Agencies

**Cost:** \$375-560

Caesar's Hotel, South Lake Tahoe  
(916)441-4545

#### Whole Earth Festival

FRI-SUN•5/12-14•All day

**Topics:** Alternative environmental education and various methods for preserving the earth.

**Sponsors:** U.C. Davis student organizations  
U.C. Davis Campus, Davis  
(916)752-2569

#### Erosion Control and Land Restoration

THUR-FRI•5/25-26•All day

**Topics:** New information on revegetation, new products for erosion control and the latest on stormwater permit regulations.

**Sponsor:** Association of Bay Area Governments  
MetroCenter, 101 8th Street, Oakland

**Cost:** \$360-\$450 (510)464-7964

#### Land Hazard Analysis and Mitigation

MON•6/5•All day

**Topics:** Landslide hazards and mapping, slope stability and landslide analysis and urban landslide causes and identification.

**Sponsor:** Association of Bay Area Governments  
MetroCenter, 101 8th Street, Oakland

**Cost:** \$160-\$195 (510)464-7964



### HANDS ON

#### Walk in the Park

SAT•4/29•10 AM

**Activity:** Walk with Senator Bill Lockyer from San Francisco's Crissy Field to Ft. Point to celebrate publication of *The San Francisco Bay Shoreline Guide* (see page 2).

**Sponsors:** University of California Press and California State Coastal Conservancy  
(510)286-1015

#### 40th Annual Mothers' Day BBQ

SAT•5/14•11 AM-3 PM

**Activity:** BBQ to benefit Audubon Canyon Ranch and the Marin Audubon Society.

**Sponsor:** Marin Audubon Society  
Audubon Canyon Ranch, Bolinas  
(415)663-8361

#### The Human Race

SAT•5/13•8:30 AM

**Activity:** Walk and run a 5K or 10K route along the San Francisco Bay shoreline to raise money for the Marine Science Institute.

**Sponsors:** The Marine Science Institute and local volunteer centers  
Coyote Point, San Mateo (415)364-2760

#### First Annual Bay Area Water Festival

SAT•5/20•All day

**Activity:** Learn how water affects our health and the environment and how this resource is used in California through an interactive exhibit.

**Sponsor:** The Lindsay Museum  
The Lindsay Museum, Walnut Creek  
(510)935-1978



### MEETINGS & HEARINGS

#### CCMP Implementation Committee

FRI•5/5•10 AM-12:30 PM

**Topics:** CALFED Bay-Delta program and Category III projects and local government involvement in CCMP implementation.

Rooms B-C—Reg. Water Quality Control Board  
2101 Webster, Oakland  
(510)286-0780

## NOW ON DISK

### ESTUARY MAP

Need a high quality, easy-to-use base map of the Estuary (Bay and Delta) for your computer? This map is based on a recent GIS file provided by the S.F. Regional Board and adapted to Aldus Freehand. Basic and customized versions are available.



#### Basic

A basic black land and white water version in TIFF for PC or Mac with no labeling. Cost: \$40 (includes disk copying and shipping).  
For a copy, call (510)286-0734.

#### Customized

A version customized to your needs. Our designer can provide the map in PC or Mac and TIFF or EPS format, label various land and water bodies, assign solids or colors to land or water, or customize your map in other specific ways. Cost depends on his time. Contact: Darren Campeau (415)258-9199

### NOW MANNING THE PHONES

President Clinton has set up the Clinton Comment Line to solicit citizen input on laws and policies. Call (202)456-1111 to give the Chief Executive Officer a piece of your mind.

#### S.F. Regional Board

WED•5/17•9:30 AM

Board Room—BART Headquarters Building  
800 Madison Street, Oakland  
(510)286-0533

#### Bay Commission

THUR•5/18•1 PM

**Topics:** Consideration of proposed B.D.N. for revised Bay Plan Seaport Policies, Caltrans briefing on Hayward bridge widening project and public hearing on Caltrans I-580 Albany project.

Room 455—State Building, San Francisco  
(415)557-3686

## CLEAN WATER ACT DILUTIONS

If radical changes to the Clean Water Act adopted by a key House committee this month had been enacted in 1972, there would be no Bay-Delta accord, and half the wetlands now protected around the Bay would be open to development. Changes in legal definitions of wetlands and in water quality and stormwater regulation are just some of the drastic revisions in a Clean Water Act marked up in the House Transportation and Infrastructure Committee on April 6 and expected (at press time) to sail through a floor vote.

Although the revisions — won in a bitter fight between Rep. Bud Shuster (R-PA) and former committee chair Rep. Norm Mineta (D-CAL) — are clearly meant to favor industry, Roger James of the Santa Clara Valley Water District says California businesses could actually find themselves at a disadvantage if they are adopted.

"One of the things the 1972 Clean Water Act did was create a level playing field nationwide," says James. "If you have so much flexibility on the state level, industry in California, where the state regulations are fairly strict, wouldn't be competitive with other states where rules are lax."

That could be why support for the Republican-sponsored changes has been guarded, even among the business community. "The jury is still out on whether the new revisions to the act go too far," says Ellen Johnck of the Bay Planning Coalition, which works with Bay industry and municipalities. But Johnck says her group does favor the principles of property rights and risk assessment included in the changes to the bill.

Eric Federling, a spokesman for Mineta, was less qualified in his assessment. "It's a health, economic and environmental disaster," he says. "This bill would eviscerate coastal zone management and non-point control. It's a frontal assault on wetlands. The South Bay was way ahead of the game on in-house secondary treatment. This bill says that they could just turn those things off."

If it passes the House, the revised act will move on to the Senate, where opponents are counting on it being stalled by John Chafee of Rhode Island, a fairly staunch environmentalist who heads the Environment and Public Works Committee, or failing that, by presidential veto. Contact: House & Senate: (202)225-3121 SZ

# ESTUARY



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