



A NEW BALLAST WATER BILL,

championed by Assemblyman Ted Lempert, would prohibit the discharge of ships' ballast water into California waters without a permit issued by the State Water Resources Control Board, starting April 1, 2000. AB 703 creates a new state-run program to minimize and control the flow of live exotic organisms into California waters. Exotics are increasingly undermining everything from water exports to ecosystem restoration, lending the new bill support from diverse camps, including the Farm Bureau and the Center for Marine Conservation. The bill would also require more formal ballast water reporting on the part of shippers and compliance monitoring on the part of the State Board. Contact: (916)319-2021

A CONSENSUS-BUILDING

HANDBOOK—to be released later this year by Sage Publications—will feature a chapter on the San Francisco Estuary Project and its consensus-based *Comprehensive Conservation and Management Plan (CCMP)* for the Bay and Delta. The chapter draws on a research paper done by U.C. Berkeley's Judith Innes and Sarah Connick, who concluded that the CCMP may be a less significant achievement than other results of the process, including agreements on technical descriptions of the Estuary and methods for measuring water quality, new networks of relationships among participants, education of participants about the Estuary and each other's responsibilities, and other consensus processes that built on the CCMP process. Although, when the CCMP was adopted 1993, there were complaints that the consensus was thin and the prospects for implementation uncertain, researchers concluded that "there's no doubt that the Estuary Project has changed the practices and politics of water management in California."

LAWSUITS OVER FISH & FROGS—No

sooner had the U.S. Fish & Wildlife Service finally listed the Sacramento splittail as threatened than the State Water Contractors filed a notice of intent to sue the Service over the listing, claiming that the science underlying the listing was flawed and that abundance of the species is at or near record high levels. Meanwhile, a coalition of environmental groups, led by the Earthjustice Legal Defense Fund, is suing the Service for failing to designate critical habitat for California's celebrated red-legged frog when it listed the species as threatened in 1996. According to the Service's Patricia Foulk, the Service's position is that the Act provides sufficient protection of frog habitat, and that designating habitat would require detailed mapping of frog hold-outs that would actually put the frog in greater peril.



Wising Up on Rehab

"An ecosystem shaken to its roots," is the way editor Bill Jordan of the University of Wisconsin described the Bay-Delta watershed at the March 1999 State of the Estuary Conference. Over 600 earnest folk hunkered down in the Palace of Fine Arts auditorium for the event and watched images of the Estuary splash and seep across the slide screen—visions of long-lost ecological exuberance, comparisons of the snake of a river meander or marsh slough pre- and post- "restoration," snapshots of near-extinct thistles and minnows, and charts depicting progress, failure and uncertainty.

By the time the conference wound to a close three days later, one thing had become very clear: though the idea of "restoration" has the power to make us all fired up and "dewy-eyed," as Jordan put it, the practice is a far less straightforward endeavor. The government may be spending billions on restoration to soothe the smoldering California water wars, but there's no guarantee that unhitching a few of the shackles binding the estuarine workhorse is going to make it break into a joyful gallop.

The shackles are indeed daunting. First speaker Matt Kondolf of U.C. Berkeley painted a stark picture of damage done to the ecosystem—the dams, reservoirs and levees controlling its spill from the Sierra to the ocean. Only one of nine rivers—the Cosumnes—runs free; only three of dozens of creeks have healthy populations of spring-run Chinook salmon while less healthy salmon venture forth from hatcheries that Kondolf likened to "methadone maintenance programs." Reservoirs in the Sacramento and San Joaquin River basins are so extensive they can now store more water than actually runs off. Real restoration of this system would

require removing whole dams from the headwaters and whole cities from the floodplains.

Perhaps that's why conference organizers chose the theme of "rehabilitation," rather than restoration—a choice second speaker Jordan scolded them for. "It's a mistake to dumb down what we think our vision is, you have to look at the power of these words to generate social energy," he said. "Rehabilitation means fitting or refitting something out for use, it's so unspecific it doesn't mean very much. But everybody knows what restoration means, it means putting something back the way it was, going back to something better. We can come from the top down, with money from the government, with expertise from the universities, but it's not going to work without grassroots social support."

"It's a mistake to dumb down what we think our vision is, you have to look at the power of these words to generate social energy."

Whatever the word, putting it back the way it was, using the natural historic landscape and ecological processes as a guide, was the theme of speaker after speaker at the conference. Hydrologist Phil Williams donned an imaginary white coat and diagnosed the Estuary as suffering from many pathological conditions including blocking (dams), narrowing (channelizing) and hardening (levees) of the arteries (rivers), persistent bleeding (exports), flatlining of the rivers (no more peaks and pulses and floods), and anemia (inability to capture sediment). He called the purchase of floodplain lands without making provisions for creating flood flows "cosmetic restoration" and said it was time to retrofit California's "obsolete" water project infrastructure and rethink operation of the dams—many of which operate based on outdated 1940-50s policies and science. "It's time to free ourselves of the legacy of decisions made 60 years ago," he said, calling for serious evaluation of the potential to remove some major dams, possibly through the extension to all dams of the current federal relicensing process (FIRC).

continued page 7

THE MONITOR

HIP INDICATOR SEARCH

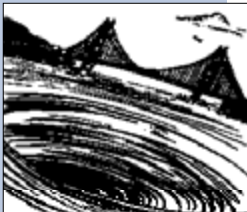
The contest for a "hip" indicator of Estuary health (announced by *ESTUARY* in December) yielded only three entries. Terry McCrae of Hornblower Cruises suggested the lowering of a standard 10" white dinner plate into the water as an indicator of clarity, which Hornblower apparently does from its dining yachts in Lake Tahoe (in a clean lake, you can see the plate up to 100 feet below).

Judy Dumm of Santa Rosa suggested an annual health message from King Crab, a large crab model or puppet or person inside a crab suit. Dumm's suggestion traces back to her uncle, who as a child in the 1920s asked the question "Who pulls the plug so they can clean San Francisco Bay?" Eventually, her grandfather began weaving tall tales about King Crab, king of sea life in the Bay; Captain Nimbo of a flying ferryboat; and Joe "Dobe"; a gigantic adobe mudman who is built by a child and comes to life to help pull the plug. Dumm wrote up these family tales in a book called *The Flying Ferryboat* and visits schools with a King Crab puppet to talk about keeping the Bay clean.

Dale Sweetnam of Cal Fish & Game, meanwhile, suggested putting leading estuarine scientist Wim Kimmerer at the head of pack of kayaks paddling from the Golden Gate to the location of X2 (water managers now manage fresh water outflows to try and keep X2—the two parts per thousand isohaline of salt to water—within a certain range of positions in Suisun Bay associated with estuarine health and productivity). "The shorter the trip, the better the environment," suggested Sweetnam.

Kimmerer in turn gave his own two cents on all the "ranting and raving" these days about indicators. "The general consensus among scientists working in the system seems to be that there is no such magic index," wrote Kimmerer, pointing out that S.F. Bay's problems are much more diverse and complex than just clarity.

For the moment, *ESTUARY* is not declaring a winner (WE NEED MORE ENTRIES!) and extends the deadline to July 1—the winner gets a life subscription to *ESTUARY* newsletter. E-mail of fax entries to (415)989-9024 or bayariel@aol.com



REPORT CARD

ESTUARY GETS A "C"

A recent accounting by the San Francisco Estuary Project of efforts to address its ten top priorities for environmental action suggests moderate but not earth-shaking progress. The accounting, released in March 1999 in a *Bay-Delta Environmental Report Card* (see *Now in Print*), documents who has done what to save wetlands, reduce urban runoff, control exotic species, coordinate science and management, expand ecological monitoring, and educate the public about the Estuary since 1996. The accounting builds on a prior review covering the 1993-1996 period. The following is an excerpt from the report's executive summary describing progress on most of the ten priorities (see summary chart back page for information on all ten).

WETLANDS—With only 3-4% of the Bay-Delta's historic wetlands still intact, it's no wonder that local interests have identified protecting and restoring wetlands as a top priority. Major leaps ahead on the wetlands front since 1996 include much more detailed scientific research documenting the historic and current extent of Bay wetlands, better (but still inadequate) accounting of wetland losses, better monitoring of the success of restoration efforts, and new science-based goals for where and what kind of wetlands we need to create in the next 100 years to have a healthy Bay. These efforts, combined with some government-driven planning efforts in the North Bay and CALFED's efforts upstream, provide the essential building blocks for creation of regional wetlands management plans. But such efforts have also raised the ire of private landowners, shoreline businesses and duck club owners whose lands may be targets for restoration.

In terms of the numbers, fewer wetlands and riparian zones have been protected through acquisition since 1996 than in the prior three year period, falling from 18,677 acres in 1996 to 10,983 in March 1999. During the earlier period the vast majority of reported acquisitions were baylands (namely the unusually big purchase of almost 10,000 acres of North Bay salt ponds), whereas the more recent review included much larger acreages of riparian zones and floodplain (6,106 acres in the San Joaquin River Wildlife Refuge alone). Acreage protected by perpetual conservation easements over private lands in the Central Valley and Suisun Marsh grew from 67,292 to 75,000 acres between 1996 and 1999.

On the restoration front, the number of acres actually restored or enhanced grew from at least 8,137 acres in 1993-1996 to at least 13,656 acres of wetlands in 1996-1999. The number of restoration projects in the planning stages, many with no guarantee of construction funding, also swelled, from at least 12,693 acres as of 1996 to 19,109 acres in March 1999. Where most projects might have been undertaken as mitigation for

development of wetlands in the past, the vast majority of current projects are aimed at the health of the ecosystem. The acreage of wetlands restored far outpaced that lost, if inventories of permitted development projects are to be believed. Finally, programs providing incentives to individual landowners to flood their land for seasonal waterfowl and wetlands continued to grow—enhancing or restoring over 90,000 acres as of 1999—but did not keep up with demand (the owners of at least 47,000 acres still want to sign up).

INTEGRATION & REGIONAL MONITORING—Those outside of government have long clamored for the bureaucratic behemoth to become more efficient, and for it to catch up faster with the latest science and politics. These priorities call for better integration of the myriad regulatory, planning, management and scientific research programs being undertaken on behalf of the Bay-Delta Estuary, and its users, and for expansion of existing scientific monitoring programs. But progress remains slow and elusive on this front.

Since 1996, the S.F. Estuary Institute's Regional Monitoring Program (RMP) has certainly improved and broadened its \$2.9 million per year, discharger-funded testing of Bay waters and sediments for contaminants and water quality violations. The S.F. Bay Regional Water Board, in turn, has used the data generated as a consistent reference point for its regulatory actions and policies. The Institute, meanwhile, has expanded scientific research into other areas identified as critical by the priorities, among them wetlands, watersheds and exotic species. There has been little examination of how land use affects pollution, water management and restoration efforts, however.

Better integration may result from the fact that research efforts throughout the Bay-Delta now include much more work on ecosystem processes and linkages, with the Institute, U.S. Geological Survey and Interagency Ecological Program all undertaking studies targeted at filling data gaps so that water and restoration managers can make more informed decisions.

Lastly, an increasing emphasis on "watershed" management—in which sources of pollution, land use and restoration efforts are looked at on a watershed scale—has great potential to break governments and local interests out of their boxes. Likewise, recognition of the need to address cross-media pollutants like diazinon and dioxin—which are traveling through air, water and land—is forcing air and water agencies to talk turkey. All these efforts are still only in the fledgling stages, however. As a whole, progress on integration and monitoring expansion has fall-

FARMING

CREEK SEEPS RAISE LOCAL IRE

Environmentalists hope that the 435-acre, \$1.1 million Tolay Creek wetlands project will help provide badly needed habitat for such rare creatures as the California clapper rail, the salt marsh harvest mouse and the Suisun ornate shrew. But farmers near the project, located just off Highway 37 in Sonoma County, worry that their own livelihoods may be endangered by the restoration work.

On December 1, U.S. Fish & Wildlife breached a levee, restoring tidal flows to a three mile section of creek and creating a fifty acre pond on a field formerly used for growing oats. According to the farmers, however, the agency got more than it wanted: they say water levels are higher than predicted and that salt water is seeping into their land.

"It's higher than high tide, and it's higher at low tide," asserts Norm Yenni, who farms 2,300 acres adjacent to the project. There has always been some seepage through the levees, but it's gotten considerably worse since December. Fred Dickson, owner of 650 acres just to the west of the creek, says the soil is in danger of becoming permanently waterlogged. "We may never be able to get into our fields."

Repair work can be expensive. Yenni's landlord, the Vallejo Sanitation District, has already spent \$85,000 to shore up 3,400 feet of its levees and, says the District's Ron Matthews, "That's not even half the levees we're responsible for."

Fish & Wildlife's Louise Vicencio acknowledges that the water level "does appear" to be higher than predicted. She says that the agency is currently trying to figure out whether engineers miscalculated the elevation of the land, or if predictions about the amount of water flowing through the breached levee were wrong. Fish & Wildlife will also determine if seepage is as extensive as farmers claim.

Restoring the wetlands around Tolay Creek has been difficult from the beginning. A tidal lagoon built part way up the creek in the early 1980s diverted tidal flows, leaving two miles upstream largely dried out and bereft of wildlife, although it proved to be fertile ground for mosquitoes. In order to bring back the tidal action and restore historic wetlands, the new project was begun in 1992.

The farmers are clearly frustrated. "They've got all the engineers in the world and all these mistakes to learn from," says Dickson, adding half jokingly, "the salt mice are swimming to our levees," in order to escape high waters. More seriously, he contends that farmers have been chafing under increasingly stringent regulations for decades. He says he now needs a permit to use mud from his own fields in order to do routine maintenance on the levees protecting his farm, and that farmers were once threatened with fines for plowing their fields because the displaced dirt constituted "fill" in one agency's eyes.

When the levees were first built in the 1890s, marshlands were regarded as useless, or worse, and reclaiming the land for agriculture was seen as a public service. "We were the farmers, the wonderful people," Dickson says. "Now we've become the bad guys."

Vicencio is sympathetic. "It's not just the farmers. Everybody is being subjected to more governmental restrictions than they were ten years ago."

"I know the farmers are very anxious to see this resolved," she adds. "But we need to understand the problem, and that's not going to happen overnight." Fish & Wildlife is planning to convene a meeting of the project stakeholders and evaluate the engineering data in the near future, she says.

Dickson says that he appreciates the agency's efforts to resolve things. "They've shown interest, which is good, but they haven't solved the problems." *O'B*

SPECIES SPOT

UNCONVENTIONAL CRABS

Prickles ran down the spines of the 100 attendees to the March mitten crab conference as they watched a shimmering mass of juvenile crabs—caught on video by German researchers—rise up and crawl out of a river to circumvent a small dam.

"It was unbelievable. It looked like a huge ant hill after it's been disturbed," says Kim Webb of U.S. Fish & Wildlife, one of several sponsors of the Sacramento conference including the S.F. Estuary Project, U.C. Davis and the Western Regional Panel on Aquatic Nuisance Species.

Topics ranged from biocontrols for the swelling population of the Chinese invader (controls viewed with caution because of their potential impacts on native crustaceans) to structural controls, details on the crab's spread and research on the crab's life cycle. Stephan Gollasch, with the Institut für Meereskunde (marine science) in Germany, presented findings indicating that the crabs greatly increase in numbers every 15 years, after which they decline before their next cyclic increase. Ted Grosholz of U.C. Davis discussed possible parallels between European green and Chinese mitten crab invasions, noting findings that the green crab's impacts in California's Bodega Bay, the eastern U.S., and South Africa have been quite different. Thus, Grosholz speculated, mitten crab habitat use, body size distribution, timing of reproduction, and even diet, may prove different here than in their native Chinese waters.

"The bottom line," says Kim Webb, "is that we still need more information about the crabs before we can come up with a good management plan." Webb and other conference attendees were surprised to learn, after hearing about Denver BurRec's experiments with live crabs under various flows and conditions, that mitten crabs seem to primarily scurry along the bottoms of rivers. "We had no idea what they were doing before," says Webb. One potential control measure in certain situations might be to install angled barriers right along the bottom of intake valves, says Webb.

Now that the agencies have better identified what research and actions are still needed, and who is doing what, says Webb, they will draft a coordinated management plan to send to the National Aquatic Nuisance Species Task Force for adoption, which will hopefully trigger funding for more crab studies and control. Contact: Kim Webb (209) 946-6400 ext. 311. *LOV*



REPORT CARD CONTINUED

en far short of what's necessary.

ECONOMIC INCENTIVES—Whatever the regional, state and federal initiatives to save wetlands, creeks and watersheds, nothing will really happen until local governments make protecting these resources part of the fabric of their land use decision-making. A fair amount of progress was made in providing economic incentives to local government with passage of state Proposition 204 in November 1996, which provided \$15 million for counties and local agencies to undertake restoration projects in the Sacramento, San Joaquin and Trinity River watersheds (\$10 million has since been awarded). Apart from this single source of new incentives upstream, the Clean Water Act's 319(h) program continued to provide funding for watershed management and nonpoint source pollution control—providing dollars to 10 local agencies in 1997-1998. But as a whole, not nearly enough is being done to encourage local government action on a substantial scale, and new development—which often impacts wetlands, creeks and watersheds—continues to be the best source of revenue to local governments, an inherent conflict.

URBAN RUNOFF—Recent years have produced a proliferation of city, county and community programs aimed at controlling the urban runoff that is the central thrust of this report card priority. Most of these programs rely heavily on public education activities ranging from storm drain stenciling programs to COKE cans carrying pollution prevention messages to a pilot Integrated Pest Management project focusing on stores selling garden pesticides. A particular new target of latter days is erosion from development construction sites—with the association of Bay Area stormwater agencies and the S.F. Regional Board doing an effective song and dance of education and enforcement. Meanwhile, the S.F. & Central Valley Regional Boards recently began developing new measuring sticks and regulatory hammers aimed at curbing mercury, pesticides, and several other pollutants in the Bay-Delta watershed. These take the form of setting total maximum daily allowable loads (TMDLs) for each pollutant in each water body, but work on this front is still very much in the R&D phase.

One massive source of pollution flows to the Bay—transportation systems—remains largely unaddressed, however. Likewise,

BUREAUCRACY

REIMAGINING FLOOD CONTROL

Flood control agencies have long relied on dams, levees and culverts to protect the homesteads and cities that Californians insist on building along the banks of predictably unpredictable rivers and creeks. Now, however, encasing creeks in concrete is becoming passé. At a handful of Bay Area flood control agencies, a new generation of leaders is trading cement mixers for a more natural approach, and embracing a broad new mission that includes watershed stewardship, water quality and habitat restoration.

"There is a clear public mandate that we change the way we approach drainage and flood control," says Mitch Avalon, of the Contra Costa County Flood Control and Water Conservation District. In early April, the District co-sponsored a symposium designed to identify common ground and improve cooperation among those involved in watershed and creek issues—an event that some observers say in itself shows a marked departure from the agency's cement-oriented historical practices. Later this summer, Avalon's agency will sponsor a one-week bioengineering course to teach creek engineers how to use plants to repair bank erosion or failure.

"I think there's going to be a movement to convert flood control channels back into creeks," says Avalon. One of the alternative strategies he is considering involves digging low-flow channels and planting trees and vegetation along banks. This approach would require either a wider-than-normal channel or a detention basin upstream to offset the loss of capacity and provide adequate flood protection, he says.

Avalon warns that the big changes he envisions will not happen over night. "We're talking about a 50-year horizon here," he says. He is pushing for a long-term county-wide Creek Enhancement Plan that "reflects the community's vision for its creeks." In the meantime, the District is in preliminary talks with one city regarding a pilot project that would examine the entire system of creeks within their watershed and develop a comprehensive flood control and creek restoration plan for it.

Pam Romo of Friends of the Creeks is "cautiously optimistic" about the direction the District is headed, in part because of what she says is a new willingness on the part of historically concrete centric agencies, such as the Army Corps of Engineers, to explore alternative approaches. The Corps' Karen Rippey agrees. "We have a great opportunity to start doing things in a new way right now, in part because of the leadership of the Administration and especially the Bay Area congressional delegation." Rippey points to the Water Resources Development Act of 1996, which authorizes the Corps to provide technical, planning and design

assistance to non-federal agencies for watershed management and restoration projects, including "demonstration of technologies for non-structural measures to reduce destructive impacts of flooding."

The San Francisco Regional Board's Larry Kolb says he thinks the creek restoration movement will only grow with time and "flood control agencies are the logical leaders, since they know the area's waterways better than anyone. They're starting to use their expertise to work with streams rather than against them."

Of course, the biggest constraint on Avalon's plans is money, and to that end public education about the County's creeks is a priority. "We want to increase citizen interest in the creeks because with interest comes funding." Avalon hopes that by developing proactive environmental restoration and enhancement plans, his agency will be in a good position to apply for state and federal grants.

Money is also an issue for the Santa Clara Valley Water District, widely acknowledged pioneer of the new ethos of flood control. Next year a benefit assessment that provides much of the District's discretionary funding will expire; the District will seek voter approval of a new tax to fund a comprehensive program that includes vigorous watershed management. The district's George Fowler says he's hopeful that the tax will receive the required two-thirds vote. "Whenever we interact with the community we get the same message: environmental protection is a major priority," he says, adding that most people seem to understand that addressing this priority has a cost.

In the meantime, Fowler's agency is continuing its existing menu of environmental protection measures, including water quality protection, fish barrier removal, and the use of lower-impact flood protection measures such as bypass channels, setback levees and revegetation projects wherever possible. The District is also staking out a position with regard to new development in the area, which increases runoff and therefore flood risk and water pollution. "We are not trying to take over control of land use, but we are being more proactive in conveying the district's vision" of what constitutes responsible land use, says Fowler. The District recently doubled the number of staff charged with working with city and county planners to evaluate development proposals in terms of their impact on streams and flood flows.

Despite all these good intentions, Contra Costa's Avalon warns that in the urbanized Bay Area "we can never go back to the pre-European creek, the primordial forest. But we can do a much better job of protecting the environment as well as people and property." Contact Mitch Avalon (925) 313-2203 or George Fowler (408) 265-2607 [CH](#)

COMMUNITY

FAITH AND FURY SURROUND CREEK

Two acres of land in the Berkeley Hills are the eye of a stormy conflict involving a creek, a congregation, and a community. Neighbors worry that landowner Temple Beth El's plans to build new facilities may compromise the future of an oak grove, a community garden and Codornices Creek.

When Temple Beth El purchased the property from the East Bay Chinese Alliance Church in 1996, it began making plans to build a new two-story building, parking lot, and driveway to accommodate its growing congregation. What the Temple didn't plan on was community opposition. Neighbors argue that the scale of the project is inappropriate for the neighborhood, that the Temple's parking lot would destroy the oak grove and community garden, and that the increased runoff from all of the new pavement would end up in Codornices Creek.

"It's the largest creek in Berkeley and the closest to having a functioning ecosystem," says John Nacherud, with the Live Oak Codornices Creek Neighborhood Association (LOCCNA).

Harry Pollack, president of the Congregation Beth El board of directors, says the creek on the site "is in terrible shape" and that anything the Congregation does will "only make it better." While the Temple has held several meetings to discuss the situation with the neighborhood, and hired the reputable Waterways Restoration Institute (WRI) to analyze how to stabilize the open section of creek, the conflict—like the creek's ravine—only seems to be deepening.

The solution, in terms of site planning, isn't all that obvious. Two small buildings and the old Chinese church sit on the south part of the site while the north side hosts the community garden, live oaks, and historic Berryman Path, each of which has passionate advocates. Through the middle of it all runs Codornices Creek—partly above and partly below ground in a culvert. A waterfall and plunge pool have formed where the creek spills out of its culvert, resulting in downcutting and undermining of the creek's bed and banks.

Nacherud's group points out that the city of Berkeley has an ordinance that prohibits building within 30 feet of a creek, plus it signed an agreement with three neighboring cities to restore its creeks whenever possible. LOCCNA says Berkeley should live up to that pledge by requiring the Temple to daylight the underground stretch instead of putting a parking lot on top of it.

At a March meeting, WRI's Drew Goetting presented several alternatives for stabilizing the creek. All of the alternatives would grade

the creek's banks back to a more gentle slope. Three alternatives recommend daylighting the underground section in order to create a more gradual downhill gradient and thus reduce the downcutting and bank erosion. "The culverts at the top and bottom of the site are like two points on a line," says Goetting. "If we daylight the underground section, we'll have more distance between those points in which to create a gentler gradient, which would also more closely resemble the historical conditions," says Goetting.

How will the dilemma be resolved? Since the Temple has shown no willingness to scale back its plans or to open the creek, says LOCCNA, the group will go before the Berkeley City Council with its own alternative proposal. It is also looking for funding to buy the land back from the Temple. Contact: Jon Nackerud (510) 524-2640; WRI: (510) 848-2211
LOV



BANKROLL

MINT GREEN FOR GREEN SPACE?

After years of fiscal drought, California may once again have money for habitat acquisition and restoration if pending state and federal legislation succeeds.

In the state legislature, four different versions of a parks and natural resources bond act have been introduced, ranging in amount from \$854.5 million to \$2 billion. AB 18, SB 2, SB 57 and SB 74 are similar in content and would provide funds for the acquisition, development, improvement, rehabilitation, restoration, enhancement and protection of park, recreational, cultural, historical, fish and wildlife, lake, riparian, reservoir, river, and coastal resources. According to John Woodbury of the Bay Area Open Space Council, the bills have powerful political sponsors, giving some version of the bond the best chance of legislative approval in over a decade. The measure would go to the voters in 2000.

The biggest obstacle to the natural resources bond may be competition from other large bond measures, including a revived water bond, according to Woodbury, who says there is a limit to the bond dollars the legislature is likely to approve. Senate President Pro Tem John Burton, Senator Jim Costa and Assemblyman Mike Machado have introduced bond measures of an unspecified amounts to finance safe drinking water, water quality, water supply and flood protection projects. Last

year, a water bond measure died in the legislature, the victim of a dispute between then Governor Pete Wilson and Democrats over whether it should provide funding for new storage facilities.

In Washington, several competing measures to fully fund the Land and Water Conservation Fund established by Congress a quarter century ago to acquire and protect natural resources using offshore oil drilling royalties—have been introduced in Congress. The most ambitious of these, "Permanent Protection for America's Resources 2000," jointly introduced by the Bay Area's very own Senator Barbara Boxer and Representative George Miller, would provide \$2.3 billion per year for a wide range of land acquisition, preservation and restoration and species recovery programs, including \$900 million a year for the LWCF.

Meanwhile the Clinton Administration's FY 2000 budget request includes a number of significant environmental funding proposals. Chief among these is the \$1 billion Lands Legacy Initiative, which includes \$183 million to increase protection for the nation's ocean and coastal areas (including estuaries), and \$150 million in matching grants for land or easements for wetlands and other types of open space. The Administration's Department of the Interior budget proposal also includes \$75 million to continue CALFED ecosystem restoration program implementation. Contact John Woodbury (510) 654-6591 CH



OPINION

PORTER-COLOGNE AT AGE 30

Lawrence P. Kolb, *Water Quality Engineer*

Excerpts from Kolb's speech at the March 1999 State of the Estuary Conference (presenting his own views and not those of the Regional Water Board).

"The Porter-Cologne Act is California's basic law for water. It created the current structure for the State and Regional Boards, and defined much of the way California regulates water. It's been 30 years since PC was passed in 1969, a good time to review how well it has worked. This history falls under two headings: water quality, or pollution control, and water rights, which is the system by which water is allocated in California (acknowledging, however, that most of California's water rights law is in the California Water Code and not part of Porter-Cologne). California water issues can only be understood in terms of both quality and quantity.

"Passage of the Porter-Cologne thirty years ago redefined the regional water quality control boards to regulate pollution, and greatly expanded their powers. One key enforcement element added was a provision that allowed regional boards to stop new hookups to sewage treatment plants that were not meeting standards. This provision has made pollution control a major priority for cities and sanitary districts in California.

"The ink was hardly dry on PC when the Federal Clean Water Act of 1972 passed, which basically required permits for all discharges to surface waters, and more treatment to remove pollutants. The federal government also offered to pay 75% of the cost of upgrades to municipal dischargers.

"Thus, in the early 70s, we had in place strong state and federal laws for better pollution control, and an institutional framework to implement them. Did this system work? In fact it worked very well. There was nowhere in the country where upgrading of pollution control facilities went more rapidly than in the San Francisco Bay Area. The pollution loading to the Bay has declined by about 85% since the mid-60's, even though the population is about half again higher.

"This progress was not without conflict. Of the 50 or so sewage treatment agencies in the Bay Area, the Regional Board found it necessary to adopt connection restrictions at one time or another on about half. These actions were necessary as a last resort to overcome foot-dragging on sewage upgrade projects. One moral from this experience is that you cannot make major environmental changes through persuasion alone. All carrot and no stick is a recipe for failure.

"While this dramatic improvement was taking place in pollution control, other changes were taking place in water diversions and water rights. In the 1970s, elements of the California Water Plan, approved by the voters in the 60s, began coming on line, in addition to earlier diversions for the larger federal Central Valley Project. This process has since turned into one of the great environmental catastrophes in North American history. For striped bass, salmon, steelhead, and other migratory species, some critical threshold was clearly exceeded. In a single generation we have seen these species, once at world class abundance, becoming candidates for the Endangered Species List.

"It's worth comparing this fisheries collapse to other North American ecological disasters, such as the extinction of the passenger pigeon, or the near extinction of the buffalo. In those cases there was neither the scientific understanding of what was taking place, nor the legal mechanisms to prevent it. In contrast, the California fisheries disaster has been exceptionally well studied, and it has taken place with an agency, the State Water Resources Control Board, in place with the legal power to do something about it.

"Thus we have this extraordinary juxtaposition of major improvements in pollution control on one hand, together with a catastrophic decline in the fish that this multi-billion dollar pollution control effort was supposed to protect. This disaster was entirely due to actions of government. All the dams and diversions were government projects, and all the decisions as to where that water would go were made by government agencies. This point is worth remembering when someone tells you that government is now unable to remedy these problems.

"Was this disaster necessary, a kind of price that must be paid for progress? And, can this damage be undone? To answer the first question it's necessary to briefly look at how we use in water in California. Of the water we divert from rivers or pump from the ground, our so-called developed water supply, over 80% is used by irrigated agriculture, and less than 20% is used by cities. Our conflicts over water in California are not between north and south, since all the urban users together are not very important, but between aquatic habitat and agricultural use.

"California's crops have a combined value of about \$20 billion per year, the highest total in the nation. But this is only about 2% of California's trillion dollar economy. So irrigated agriculture in California uses over 80% of State's developed water supply to grow crops that add about 2% to its economy.

"How does California agriculture use water? The largest users of water are the lowest value crops. For example, irrigated pasture uses almost as much water as all the cities in California put together. Four low value crops—irrigated pas-

ture, alfalfa hay, cotton, and rice—use about 40% of California's water. Together these crops add only about one quarter of one percent to the state's overall economy. Moreover, all these low value crops are widely grown elsewhere. If we took some water away from these crops for people and fish, we would still have water for all our oranges, lemons, tomatoes, almonds, pistachios and grapes.

"The way we spend water in California suggests that we have not a shortage, but rather, more water than we can wisely use. A truly water-starved agricultural sector would not make its largest use the spraying on grass for cows to eat. Our alleged shortages are really an artificial result of the way the State of California misallocates water.

"And this brings me around to California's water rights process as administered by the State Water Board. The water rights function of the State Water Board has sometimes been seen as a counterpart to the State Water Board's water quality program. However, the two are very different. The problems of this weak and inadequate system for regulating water allocations in California have three root causes. First, weak appointments. With a couple of exceptions, the appointments by our last two governors to the Water Resources Control Board have been of people who could be relied on to protect the status quo on water, despite an ongoing disaster with the fish.

"Second, weak water law, which gives the State Board the authority to better allocate water, but not the obligation. Third, a woefully underfunded Division of Water Rights, which has fewer staff for the whole state than the S.F. Bay Board has for pollution control alone. Only four staff are budgeted to enforce water rights law for the entire state. These low funding levels are not based on lack of money, but rather on a conscious decision by previous administrations to starve the regulators.

"In summary, the State's system for managing water is wildly out of balance. We have undone, through a dysfunctional water rights process, most of the good promised by our multi-billion dollar investment in better water quality. Fish have not been the only victims of California's system of water allocation. Millions of urban users drink substandard water while we apply pure snowmelt to alfalfa.

"Is this situation beyond retrieval? Meaningful restoration will not happen so long as existing allocations are taken as permanent and unchangeable. Giving the fish everything they need—except more water—won't work."

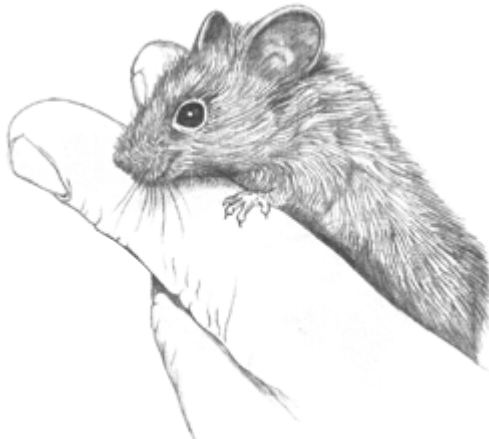
Larry Kolb is a principal engineer and assistant executive officer at the S.F. Bay Regional Water Quality Control Board.

CONFERENCE CONTINUED

The power of dams and levees to shoot water straight through the Estuary, instead of allowing it to sit around for while, was the theme of the following talk, by U.C. Davis' Jeff Mount. Mount said it used to take weeks for water to move through the San Joaquin River system, and now it takes days—largely because the river has been separated from plains where it used to flood, meander and deposit sediments and nutrients. "The best restoration efforts done within the basin will be those that enhance residence times," he said, citing the productivity of the Yolo Bypass where water now floods 59,000 acres for two weeks instead of a few days, spurring growth of aquatic plants and animals and fattening fish.

When water sits around for while, it has more time to seep down and replenish groundwater aquifers and speaker Neil Dubrovsky of the U.S. Geological Survey argued that it's been a mistake to separate management of surface water from groundwater for so long. He reminded the audience that there's three times as much groundwater as surface water, and that the two were once part of an integrated hydrologic system in which groundwater was recharged by infiltration of stream flow and rainfall and in turn supported extensive wetlands along the axis of the Central Valley, as well as sustaining Delta streams during dry months. The valley's aquifers constitute an enormous storage compartment for fresh water (102 million acre feet of usable storage or more than twice the amount stored in reservoirs statewide). Dubrovsky suggested it was time to analyze and confront the long-term costs of groundwater problems caused by overpumping and agricultural drainage—land subsidence and contamination—and to explore storage of water in aquifers rather than new reservoirs, thus re-establishing the hydraulic connection between water above and below ground.

Next on stage was Stanford's Steve Monosmith, who discussed the perils and the promise of using statistical models to predict how Estuary circulation and transport might respond to CALFED's efforts to restore the Delta. Monosmith advocated creation of a 21st century replacement for the Bay Model in Sausalito. This new three-dimensional Bay Model 2000—to be housed in a network of desktop computers—would maintain accuracy by assimilating real time data from sensors throughout the system and could predict such things as phytoplankton dynamics resulting from creation of new shallow



Salt marsh harvest mouse

water areas in the Delta.

The creation of too much pavement in the Estuary watershed was Gary Binger's pet peeve. This speaker from the Association of Bay Area Governments described the challenges of getting 101 governments

to reduce the amount of impervious surface causing urban runoff pollution, and to protect watersheds and stream corridors. Binger gave the Bay Area an environmental land use report card grade of "C-"—arguing that cities need to do much more to halt land- and water-wasteful sprawl with urban growth boundaries, cluster new development, promote urban infill, increase transit-oriented development, and stop zoning for jobs without providing housing. The latter has led to longer commutes and more pavement, hence more pollution.

Pollution caused by restoration was the surprise of the next talk, as the U.S. Geological Survey's Sam Luoma reminded the audience that one good thing does not always lead to another. He warned that removing dams or restoring marshes in areas with known deposits of debris from 1800s hydraulic gold mining might worsen the Estuary's already pervasive methyl mercury pollution (the form of mercury most easily taken up in the food chain). Luoma also pointed out that the proposed construction of a new canal around the Delta to help solve California's water supply and environmental problems would exchange the Bay's current supply of Sacramento River water for lower-quality San Joaquin River water.

Another potential negative impact from restoration is the increase of opportunities for exotic species to settle in. Disrupted soil, temporarily stripped of shading material, is ideal turf for invading riparian plants like *Arundo donax* (a habitat- and water-guzzling species commonly known as the "plant for hell"); likewise, salt ponds recently opened to the tides and newly created wetlands offer a blank slate for Atlantic cordgrass—a fast-spreading wetland plant currently making a folly out of many well-intentioned restoration efforts. According to U.C. Berkeley's Tom Dudley, the "build it and they will come" mentality must be tempered with planning to prevent unwanted vegetation. He also pointed out that the "stable hydrology" of the

OPENING REMARKS

LUNA LEOPOLD'S SPEECH STATE OF THE ESTUARY CONFERENCE

"The restoration, and thus the fate of this unique geographic feature, the Estuary, is influenced by, and ultimately dependent on, three things: science, the application of knowledge derived from science, and the administrative-political forces operating.

"If there is validity to this simplified characterization of a complex subject, then it follows that we should pay attention to these principal forces, and not be satisfied with lengthy discussions of peripheral matters that are of small importance to the larger picture.

"To make the best use of science, it would be well to develop a carefully chosen list of the major scientific questions that stand unanswered. These might be divided into different magnitudes of scale such as regional problems, subregional problems and local ones.

"In what direction will the scientific capability be deployed? It might be argued that more is known about the Bay itself than about the relation of the Bay to its watersheds. We can expect an increasing pressure to develop new knowledge about watershed functions, but it must be realized that the watersheds involve more diverse problems and different circumstances than occur in the Bay's waters and on its shores. This complexity poses a conundrum in that the administrative-political arms want answers that come quickly and with assurance. These expectations are antithetical to the operation of good science which is usually time-consuming and provides a tentative and far from assured answer. Most will require field observations and cannot be solved even with the most sophisticated computer models.

"The kinds of questions that will no doubt arise include the following: Where in the watershed are the principal sources of sediment and contaminants and what processes provide them? What is the effect of tidal marshes on the sediment budget and on the tidal prism of the whole Bay? How do marshes act as filters of sediment and contaminants, and what is the relation of plant architecture in the marsh to the filtering effect?

"Exploring such questions will take time and effort and all proposed shortcuts must be viewed with skepticism.

"With regard to the application of science, we now have an organized and practical program of monitoring trace elements in bay waters. However, we are far from sure how to use this information to influence the pro-

LEOPOLD CONTINUED

duction of, or ameliorate the effects of, undesirable trace elements. "The U.S. Geological Survey has made great contributions to knowledge of the Bay in their studies of circulation of bay waters, of primary production, of benthic cores, to name just a few subjects.

"On wetlands that border the Bay, we have just completed a study of the goals indicating what habitats in what quantities seem desirable for the health and welfare of the ecotypes. This is a real accomplishment in the application of scientific knowledge to practical problems. This project has involved hundreds of experienced people all volunteering their help. The next step, monitoring change and hopefully progress, is still ahead.

"Another valuable application of science to practical problems is the development of the S.F. Estuary Institute's EcoAtlas. It shows in amazing detail on maps the ecotypes in the Bay region as of 1800 AD and again in the present year. Knowledge of original conditions is essential for estimating the possible endpoints of restoration attempts.

"These examples of application of scientific knowledge remind us that science gives us results that are often hesitant, partial and sometimes useless. But these qualifications of the expectations of science should not be considered too pessimistic or too discouraging, in view of the administrative-political milieu in which bay restoration exists. There is a large variety of federal, state, and private organizations, each having particular interests and backing, as well as dedicated public groups devoted to preserving and improving the Bay. All are under the crushing force emanating from the national pursuit of unlimited growth.

"This relentless striving for expansion applies increasing stress to all natural systems and is felt in the Estuary in a multitude of ways. The best science and its most useful application may be negated by failure of the administrative political establishment to draw some limits on the exposure of the ecosystem to overpowering destructive pressure. Mitigation of destructive action, even when successful, is ultimately an admission of defeat.

"We must persuade the American public that it is in their interest to slow, if not stem, the forces that tend to destroy our ecological base. It is my opinion that science, and the application of science, will not accomplish the aims that will be elucidated in the present conference. Rather we must give highest priority to altering those administrative-political forces that contribute to degradation of the Estuary."

Luna Leopold is former chief of hydrology at the U.S. Geological Survey and Professor Emeritus of Geology and Landscape Architecture at U.C. Berkeley.

CONFERENCE CONTINUED

current highly controlled water system reduces biodiversity and promotes invasions.

One of the strongholds of native biodiversity, at least in terms of fish, are Bay creeks, said speaker Rob Leidy of U.S. EPA. Compared to Central Valley creeks, Bay creeks have more diverse and healthy assemblages of native fish. Indeed native species dominated 75% of sites sampled by Leidy in 30 watersheds. Reasons for good native fish survival around the Bay may include fewer dams, diversions and reservoirs (major sources of exotics), less distance to the open ocean for migrating anadromous species, and the salt water at creek mouths —preventing movement of freshwater species and invaders between drainages. "These are all strong arguments for focusing restoration on Bay streams," said Leidy, who has developed a list of high priority watersheds for restoration.

Restoration aimed at getting the most endangered fish, animals and plants back on their gills, feet and roots pervaded an information-packed panel on Day 2 of the conference. First up were fish. According to U.C. Davis' Peter Moyle, who reviewed the status of several declining native species, Delta smelt show no sign of recovery and nobody understands what's going on with green sturgeon. Numbers of splittail, salmon, longfin smelt and two other native fishes of concern have grown in last five years as a result of an unusual series of wet years and the accompanying increased river flows. A return of the drought and high rates of diversion will likely cause their numbers to plummet again, however. "Nature has cooperated ever since the Bay-Delta Accord, and bought us some time. We need to make some serious commitments to conservation before the next drought," said Moyle. To help the fish, Moyle called for more and better floodplains, more natural

hydrological regimes, improved access to upstream habitats, and prevention of further invasions by exotic species.

Prevention won't do much for natives of the Estuary's muddy and rocky bottom, however. According to Cal Fish & Game's Kathy Hieb, up to 90% of the benthic community is comprised of exotic species in many places, and no amount of habitat restoration can bring back the natives. Hieb's talk explored the status of various invertebrate species, not just bottom-dwellers. In recent years, native zooplankton continued their decline dating back to the 1980s, she said, but Bay shrimp are on the rebound in part due to increased flows that aid shrimp migration and enhance nursery habitat. The ups and downs were nothing new to Hieb, who completed her talk by throwing up her hands and saying "There's no doubt that variability is the essence of the Estuary."

Owls and frogs could use a little more of that variability said the next speaker, at least in terms of habitats. Three quarters of the uplands once adjacent to the Bayshore have been farmed, grazed, logged, developed or otherwise destroyed, said San Jose State's Lynne Trulio, and today's levees now create a "hard edge around many wetlands, leaving virtually no transition to remaining uplands." Trulio zeroed in on the importance of this transition zone for the many birds, amphibians and terrestrial species (85% of special status species) that cross back and forth over the wetland/ upland edge in search of food and refuge. She said restoration projects are only just beginning to attempt to re-establish this essential habitat connection, listing Hamilton, Montezuma and Ora Loma as projects with planned or constructed interface zones. "The hydrological situation on these transitional habitats is very complex and difficult to replicate. The problem is, we have almost no moist grassland, no vernal pools left to copy," she said.

The hard edge of many wetland restoration sites doesn't do much for floristic diversity either, according to speaker Brenda Grewell of U.C. Davis. As slide after slide of rare petals and foliage graced the screen, Grewell reminded the audience that plants offer both ecological and aesthetic benefits. Habitat degradation and fragmentation, and intruding exotic flora, have diminished many emergent marsh plant communities, and decimated species

NATIVE FISHES IN CENTRAL VALLEY VERSUS S.F. ESTUARY WATERSHEDS

WATERSHED	DEER CREEK	MILL CREEK	NAPA RIVER	SONOMA CREEK	ALAMEDA CREEK	COYOTE CREEK
WATERSHED AREA (KM2)	540	402	1080	396	1800	914
MEAN ANNUAL DISCHARGE (CFS)	373	297	208	65	123	67
NUMBER EXTANT NATIVE FISH SPECIES (WITH EXTINCT SPECIES)	10	8	17	12	16 (17)	12 (20)

SOURCE: ROBERT LEIDY

SHOREBIRD USE OF TIDAL FLATS
VERSUS SALT PONDS*

SHOREBIRD	TIDAL FLAT		SALT PONDS	
	Fall	Spring	Fall	Spring
Black-bellied plover	94	95	<1	<1
Marbled godwit	91	96	2	<1
Willet	90	87	2	3
small sandpipers	90	94	2	1
dowitchers	76	92	10	<1
American avocet	37	32	52	25
Snowy plover	16	40	69	51
Black-necked stilt	4	7	86	60
Red-necked phalarope	<1	<1	99	93

* Median percent of shorebirds on San Francisco Bay tidal flats and in salt ponds from preliminary analyses of PRBO data. Source: L. Stenzel and G. Page unpublished data.

such as soft-haired birds beak, Suisun thistle and Mason's lilaepsis.

"Rare plants are our best barometers of Bay health, we know of some stands have been around since the 1800s," said Grewell. Unlike terrestrial species or fish, plants faced with poor habitat can't just move on to more suitable turf. Suitable for some means a complex combination of soil types, salinity changes and flooding regimes. According to Grewell, restoration opportunities that "link tidal marshes to alluvial soils, seeps and drainages should be a high priority. The current tendency to create tidal marshes as indented pockets within levee systems, separated from the historic margins of the Estuary, will not support historic floristic diversity."

Grewell warned that restoration planners should not assume that remaining marshes are good references of historic conditions—as many important plant species are extinct within these areas. Nor should they assume that the species studied most deserve the most effort—citing the greatest current limit on successful plant restoration as a lack of applied research. "Plants shouldn't have to grow gills to get our attention," she said.

Feathers do get more attention. Birders and scientists regularly aiming their binoculars at the skies and shores of the Bay count hundreds of thousands of waterbirds during their migration down the Pacific Flyway. With over 50% of their historic migratory habitat in the Western United States erased due to human development and agriculture, San Francisco Bay has become a critical stopover. "One can only wonder how birds and wildlife must have scrambled in the face of the disappearance of so much habitat," said speaker Gary Page of the Point Reyes Bird Observatory. Many species adapted to new habitats, such as the shallows and flats of the Bay's salt production ponds. Species favoring the new habitat include ruddy ducks, avocets, stilts, plovers

and phalaropes. Page said that although tidal marsh and mud-flat restoration in the Bay will help many birds, converting salt ponds to this end may not. "We can't turn back the clock for the Bay. Conversion of man-made salt ponds will have negative consequences for many waterbirds, birds that have no place else to go," said Page.

Far upstream where the wide shallows of salt ponds and Bay waters narrow into nine rivers and myriad tributaries, restoration efforts are often short-lived, said speaker Scott McBain of McBain and Trush. Here high flows are quick to damage or destroy the kind of patchwork attempts to restore individual gravel beds or river banks that have occurred without attention to the system as a whole. To better guide restoration, McBain listed ten attributes of a healthy, alluvial, low-gradient, gravel-bed rivers in the Central Valley, among them variable stream flows; frequent movement of riffles and bars by moderate floods; periodic channel migration; access to a functional floodplain; and sediment transport at approximately the same rate as delivered by the watershed. These simple, quantifiable attributes evoke the historic fluvial processes that underpin the river system, according to McBain. Based on these attributes, McBain's recommendations for river rehabilitation ranged from creating more varied stream flows and establishing continuous riparian floodways to increasing coarse and reducing fine sediment supplies and storage.

With the information and recommendations flying fast and loose for 13-hours straight, it's a wonder conference attendees didn't drift off to sleep in the deep red chairs and dark of the auditorium. Some may have succumbed by mid-afternoon on Day 2, but they sat up straight to hear well-known Joy Zedler from the University of Wisconsin.

Zedler and several other speakers described the critical follow-up task of monitoring the results of restoration efforts. Zedler's case in point was a 300-acre San Diego mitigation project called Sweetwater Marsh. In her evaluation of project success, Zedler looked at the degree to which compliance criteria had been met for three endangered species damaged by the development. Using remote sensing

YOUR LETTERS

MAD HATTER

Dear ESTUARY,

The three days of the recent State of the Estuary Conference were a little like attending the Mad Hatter's tea party in Alice in Wonderland. There seemed to be a total disconnect between the scientists' presentations, Wednesday and Thursday, and the political presentations on Friday. I don't think the speakers even attended each other's presentations and certainly their goals appeared far apart.

On Wednesday we heard a unified appeal from leading physical scientists in California that to restore the health of the Estuary, the basic physical processes of the Sacramento-San Joaquin watershed need to be addressed (repaired). We have constructed dams on every drainage except the Cosumnes River in this huge watershed that significantly alter the whole system. These dams have transformed natural flow regimes and have interrupted sediment flows so that there is a systemic sediment deficit causing riverbed downcutting and loss of fish habitat. These alterations adversely affect the whole ecosystem of San Francisco Bay. We have diversions, ripped channels, riprapped rivers, and altered floodplains. The ecosystem is badly damaged and to restore the fisheries alone (a major goal of CALFED) the physical processes need to be addressed. All of the scientists said this in their own way, each looking at the problem from their own discipline. There was unanimity of opinion on Wednesday and Thursday.

What we heard on Friday was that there were a myriad of projects that create a multitude of spots on a map but on closer inspection, few if any of these, address basic physical processes. Not one explores a dam removal for example. There are vast amounts of dollars being spent but are they just palliatives? Are they repairing the watershed? There was a phrase cynically used by the Wednesday/Thursday scientists that these were "bus shelter" projects. In a residential development required to mitigate for the increased traffic the development creates, bus shelters are a favorite but meaningless mitigation often selected. Is CALFED just building dozens of bus shelters around the Sacramento-San Joaquin watershed?

I hope it is not too late for the bureaucrats and politicians to listen to the scientists and to undertake a meaningful step towards the restoration of this once-great watershed. On Friday there appeared to be a notable lack of vision or leadership. We did not hear of watershed repair or restoration. California deserves to have a new administration take a new look at the goal of watershed restoration and lead the way.

Sincerely,

Phyllis M. Faber

Phyllis M. Faber is a wetland biologist long involved in wetland restoration and monitoring and author of two wetland field guides.

continued over

REPORT CARD CONTINUED

enforcement of existing laws regulating discharges of contaminated stormwater continues to lag.

WATERSHED MANAGEMENT—No matter how many pollution problems get fixed, creeks get cleaned and wetlands get restored down on the waterfront, what happens upstream can easily ruin progress. State and federal policies and programs increasingly emphasize coordinated watershed-based approaches to water quality issues. Since 1996 watershed management plans and programs have been developed throughout the Estuary region, including major initiatives on the Sacramento and Napa Rivers, and in the Santa Clara basin, and smaller programs focusing on Bay Area and Central Valley creeks. However, all are essentially volunteer and stakeholder based, and most are hampered by the enormous research and consensus-building requirements necessary to address large land areas and diverse land uses and human activities. Full implementation of this worthy priority will require much more political will and funding.

EXOTIC SPECIES—Three years ago scientists announced that San Francisco Bay was the most invaded estuary in the world, and since then a lot of local momentum has built up for stronger state and federal regulation on the issue. Most of the invading clams, worms, crabs, fish, plants and other organisms arrive from foreign ports via ships' ballast water, and once discharged into our waters there's very little anyone can do to control their spread, short of poisoning the entire system. So considerable effort, largely on the part of Baykeeper and the Marine Conservation Center, has gone into focusing attention on the ballast water issue. As a result, the Port of Oakland plans to adopt mandatory ballast water exchange requirements for ships docking at its berths early next century, the S.F. Regional Board has listed exotic species as a pollutant threatening beneficial use of the state's waters under the Clean Water Act, and the U.S. EPA has received a petition backed up by a letter from 17 legislators urging them to roll back Clean Water Act exemptions for discharges "normal to the operation" of vessels. The Coast Guard, meanwhile, will soon release voluntary national guidelines for ballast water management, a possible prelude to mandatory regs. Fish and wildlife managers, meanwhile, have continued to battle problem exotics already in the Estuary since 1996 and many organizations

CONFERENCE CONTINUED

and satellite imagery as tools, Zedler examined habitat development over time and found that criteria for two species—the California least tern and salt marsh birds-beak—had been met. Habitat for the light-footed clapper rail, however, had serious short-comings, namely coarse soil, low nutrient supplies, short vegetation, scale insect outbreaks and inadequate nesting habitat. "Clapper rails never came to the site designed for them," said Zedler, "The cordgrass was too short to build nest canopies. The science eventually showed that all the problems were related to the soil, and that nitrogen wouldn't match desired levels for at least 40 years. In other words, the site would never achieve what was envisioned for it."

According to Zedler, lessons learned from the San Diego project pinpoint five ecosystem components that should not be ignored in restoration: anthropod predators (there were no beetles to prey on the scale insects); plant canopy structure; soil structure; soil nutrients and site-landscape interactions.

Another follow-up effort was described by Charles Simenstad from the University of Washington, who compared several different restoration projects of different ages in the Pacific Northwest to local control sites. Looking for a possible correlation between project age and fish utilization, he found that the numbers of juvenile Pacific salmon and a resident sculpin generally increased in the older marshes. Surveys of insects and benthic invertebrates also suggested that available prey and consumption became more diverse as marshes matured. "Now we need to look at the local channel complexity may have played in these findings," he said.

Simenstad felt that although the promise of restoring tidal marsh ecosystems has increased over the years, efforts still suffer from the following pitfalls: "functional forcing" (restoring only one or two functions or habitats rather than a whole multi-functional

ecosystem); "demand for instant gratification," (expecting marshes to mature in far less time than natural processes allow, and intervening to make things speed up, which is often counterproductive); and "maladaptive monitoring" (monitoring response without exploring the underlying ecological processes at work in the system).

As the conference progressed, speakers touched on myriad other topics ranging from restoring Delta islands, managing stormwater and working with wildlife-refuge neighbors to developing publicly palatable indicators of restoration success and coming to scientific consensus on ecosystem goals. Though managers and politicians followed the scientists onto the podium, their comments fell more into the category of speechifying than responding to the challenges outlined in prior presentations.

Clearly the pipeline between science and action isn't as direct as it needs to be to shift from mending the ecosystem's cuts and bruises to really relieving the immense pressure of our American way of life — what the conference's opening speaker Luna Leopold called "the national pursuit of unlimited growth"—on the salmon, smelt, sandpipers, stilts, thistles, willows and waters of the Estuary.

In the end, all the science in the world is nothing unless restoration generates the necessary social and political energy to make use of it.

As engineer Jeff Haltiner of Philip Williams & Associates put it in the waning hours of the conference: "It's nice to be involved in the restoration movement, it's kind of messianic, religious... When it gets boring and mundane, that will be when it's successful, because it will be ingrained in the culture of the country." **ARO**

Contact: (415)989-2441 to get speaker phone numbers. *A State of the Estuary Report* summarizing conference proceedings will be published in late summer. For other conference related stories, see p. 6 Opinion, and pp. 7-10 sidebars.



PLACES TO GO & THINGS TO DO



WORKSHOPS & SEMINARS

MAY
WED - THURS
5
THRU
6

NEGOTIATING EFFECTIVE ENVIRONMENTAL AGREEMENTS

Topic: Seminar focuses on how face-to-face negotiation can augment traditional policy making with creative agreements. Participants will learn the principles of mutual gains bargaining and apply them in simulated disputes.

Sponsor: Concur
Location: U.C. Berkeley
Cost: \$450
(510) 649-8008
www.concurinc.com

MAY
WED - FRI
5
THRU
7

ACWA 1999 SPRING CONFERENCE

Topic: Investing for the Millennium
Sponsor: ACWA
Location: South Lake Tahoe
(415) 441-4545

JUNE
FRI - SAT
4
THRU
5

STREAM BIOLOGICAL MONITORING COURSE

Topic: Using macroinvertebrates to monitor water and habitat quality in streams.

9:00 AM--5:00 PM
Sponsor: U.C. Berkeley Extension
Location: Berkeley
Cost: \$415
(510)642-4111



MEETINGS & HEARINGS

APRIL
FRI
30

CENTRAL VALLEY REGIONAL BOARD MEETING

Topic: Conclusion of triennial reviews of Sacramento/San Joaquin Basin Plan and Tulare Basin Plan. Also Bay Protection Toxic Cleanup Program plan.

Time: TBA
Location: Sacramento
(916)255-3093

MAY
FRI
7

CCMP IMPLEMENTATION COMMITTEE MEETING

Topic: Projects to propose to the State Revolving Fund

10:00 AM--12:30 PM
Sponsor: SF Estuary Project
Location: Vacaville
(510) 622-2325



HANDS ON

FEB
SAT - SUN
THRU

AWAKENING FROM THE CALIFORNIA DREAM: AN ENVIRONMENTAL HISTORY

Topic: Exhibit examines changes in California's environment over the past 150 years and the way these changes relate to the state's social history. Includes panel discussions, lectures, and an environmental fair.

Sponsor: Oakland Museum
Location: Oakland
(888)625-6873 or www.museum-ca.org

SEPT
SAT - SUN
12

APRIL
SAT
24

KIDS IN GARDENS

Topic: Teacher workshops provide information on using gardens to teach science, math, language and arts, and demonstrate the connection between pesticides and urban runoff pollution.

9:00 AM--4:30 PM
Cost: \$20
Sponsors: Aquatic Outreach Institute, Alameda Countywide Clean Water Program
Location: Union City
(510) 231-5704

MAY
SAT
1

MAY
SAT
8

SACRAMENTO RIVER WATERSHED FESTIVAL

Topic: Activities include bird walks, a teachers' workshop on water resources and fly fishing demonstrations.

8:00 AM--5:00 PM
Sponsors: Sacramento River Discovery Center, Water Education Foundation
Location: Red Bluff
(916)444-6240

MAY
THRU
21

CENTRAL CALIFORNIA WATER TOUR

Topic: Land use and growth, water supply, wetlands, salmon restoration and agricultural drainage are discussed on this tour, which includes stops at Panoche Irrigation District, San Luis Reservoir, Westlands Water District, Grasslands Water District, Mendota Pool, Friant Dam, the San Joaquin River parkway, local farms and agricultural processing plants.

Cost: \$525
Sponsor: Water Education Foundation
Location: Sacramento
(916)444-6240

NOW IN PRINT & ON LINE

A Crash Course in Bay Area Transportation Investment

Urban Habitat Program
Copies (\$20) from (415)561-3333

Baylands Ecosystem Habitat Goals: A Report of Habitat Recommendations

San Francisco Bay Area Wetlands Ecosystem Goals Project
Copies from (510)622-2465

Baylands Ecosystem Species and Community Profiles

S.F. Bay Area Wetlands Ecosystem Goals Project
Copies (\$25) from (510)622-2465

Bay-Delta Environmental Report Card CCMP Workbook: Comprehensive Conservation and Management Plan Implementation Progress 1996-1999.

San Francisco Estuary Project
Copies from (510)622-2321

Clean Water Action Plan Report

U.S. EPA
Copies from: (202)260-5700.

Stream Corridor Restoration: Principles, Processes and Practices

National Technical Information Service
Copies from (800)553-6847

The Fountains of Columbia (video documentary on water in California history)

Water Education Foundation
Copies from (916) 444-6240

Tracking Ecosystem Restoration Activities

(Details physical and financial status of activities funded through the Bay Delta Act and CVPIA)

U.S. Bureau of Reclamation
www.tera.mp.usbr.gov

San Pablo Bay Stewardship Plan






Save the Bay
Copies from (510) 452-9261 or
www.savesfbay.com

JUNE
WEDS - FRI
16
THRU
18

UNDERSTANDING THE BAY-DELTA TOUR

Topic: The tour travels through the Delta and San Francisco Bay, with a houseboat ride on Delta waterways and visits to the Delta farms, Harvey O. Banks Pumping Plant, the Skinner Fish Collecting facility, the Delta Cross Channel, the Bay-Delta model in Sausalito, Los Vaqueros Reservoir in Contra Costa County and Suisun Marsh.

Cost: \$525
Sponsor: Water Education Foundation
Location: Sacramento
(916)444-6240
www.water-ed.org/deltaitinerary.htm

PRIORITIES	FULL	SUBSTANTIVE	MODERATE	SOME	NEGLIGIBLE
WETLANDS		1.5 Restore non-wetland areas to wetlands	1.1 Regional wetlands plans 3.1 Expand acquisition programs 3.2 Expand assistance to landowners	2.2 Enhance wetland biodiversity	
INTEGRATION			1.1 Refine and coordinate monitoring	2.2 Set sediment quality objectives 4.3 Develop ocean and upland testing procedures	
ECONOMIC INCENTIVES			5.1 Create economic incentives for local government		5.4 Identify financial barriers
URBAN RUNOFF			2.4 Improve urban runoff management 2.5 Long term pollution prevention education	2.1 Pursue a mass emissions strategy 2.5 Develop transportation controls	
WATERSHEDS		4.1 Educate the public about human impacts	3.1 Prepare watershed management plans		1.1 Watershed management through local general plans
EXOTIC SPECIES			2.1 Control ballast water discharges 2.3 Control problem exotics 2.4 Educate the public on exotics	2.2 Prohibit intentional introductions	
CCMP AWARENESS	1.5 Provide a central Estuary clearinghouse			1.1 CCMP awareness 1.2 & 1.3 CCMP citizen involvement	
ESTUARY AWARENESS		2.2 Build awareness of need to protect Estuary			
REGIONAL MONITORING			2.1 Develop regional monitoring strategy		
CCMP INCLUSION					
					

Rating Notes

- NEGLIGIBLE No or negligible or peripheral progress.
- SOME Minimal progress (up to 25%).
- MODERATE Fair level of progress, clear strides ahead (25-50%).
- SUBSTANTIVE Major progress (50-75%).
- FULL Full implementation completed or on the horizon (75-100%).

The ratings given to each action in this summary and in the *CCMP Report Card* were added as a rough, ballpark evaluation of the level of implementation progress. This evaluation sought to measure how items listed as progress in the workbook stacked up against the specific language and intent of the

CCMP (particularly the "WHAT" sections detailing each action). In some cases therefore, there may be many items listed in the workbook but a low implementation rating (because of their peripheral nature to the intended action).



CHANGE SERVICE REQUESTED

PRESORTED
FIRST-CLASS
MAIL U.S. Postage
P A I D
Oakland, CA
Permit No. 832

APRIL 1999 VOLUME 9, NO. 2

Editorial Office: PO Box 791
Oakland, CA 94604
(510)622-2412

Estuary Web site at
www.abag.ca.gov/bayarea/step/news/newsletter/index.htm

Subscription Q&A: (510)622-2321

STAFF

- Managing Editor: Ariel Rubissow Okamoto
- Associate Editor: Cariad Hayes
- Graphic Design: Darren Campeau
- Production: Bobbi Sloan
- Contributing Writers: Bill O'Brien
Lisa Owens-Viani
- Illustrations: Matt Day (pp3,7,10)

ESTUARY is a bimonthly publication dedicated to providing an independent news source on Bay-Delta water issues, estuarine restoration efforts and implementation of the S.F. Estuary Project's *Comprehensive Conservation and Management Plan* (CCMP). It seeks to represent the many voices and viewpoints that contributed to the CCMP's development. ESTUARY is funded by individual and organizational subscriptions and by grants from diverse state and federal government agencies and local interest groups. Administrative services are provided by the S.F. Estuary Project and Friends of the S.F. Estuary, a nonprofit corporation. Views expressed may not necessarily reflect those of staff, advisors or committee members.