



## WATER PEACE

When was the last time you heard about a group of environmentalists pushing for a new water diversion project, or a building contractors' association advocating increased flow rates to help endangered fish species? Well, you're likely to find that happening more in the future, now that representatives of over three dozen business organizations, environmentalists, water purveyors and local governments in the Sacramento and Foothill regions have signed on to the 30-year Water Forum Agreement.

Their autographs cap over six years of negotiations and thousands of hours of meetings aimed at two goals: preserving the ecology of the lower American River for the next three decades and at the same time providing a "reliable and safe" water supply for those who depend on it for drinking, agriculture and other needs. Those two objectives — the source of so much conflict practically since the state's inception — are "sacrosanct," says the Forum's Jonas Minton.

Each Forum participant agreed to make these goals "co-equal" and, more importantly, to take specific steps toward meeting them. It was a true give and take. Surface water diversions are projected to increase dramatically over the next three decades and environmentalists agreed to support a number of proposed water projects, including treatment facilities, pumping plants and pipelines throughout the region. Agencies, in turn, agreed to more aggressive conservation programs, and to back an updating of the flow standards in the lower American, in order to benefit downstream fish habitats. In addition, the agreement states everybody will join together when dealing with state and federal agencies, even if that may mean supporting positions that were anathema to them in the past.

Some of that has already begun to happen. Forum members have gone before the State Water Resources Control Board, asking for an update of the water flow standards. They also successfully lobbied the federal government to allocate \$3.5 million for a temperature control device at Folsom Dam, something regarded as critical for enhancing steelhead and salmon runs on the American.

Each water purveyor, meanwhile, has submitted a detailed conservation plan. Water meters, generally regarded as a key to any major conservation effort, were a big issue in the talks. Many districts are already being required under the Central Valley Project Improvement Act to install

*continued page 2*

## Could T.R.E.E.S. Save Bay?

Forward thinkers often lament that efforts to solve pressing environmental problems tend to be fragmented among many different agencies, although the problems themselves are often interrelated. Which may be why some Bay Area agency insiders are waxing enthusiastic about a promising Los Angeles project that is simultaneously addressing stormwater runoff, water conservation, groundwater, flood control, air quality, urban forestry and energy conservation.

Through an unusual coalition of government agencies and environmentalists, Trans-Agency Resources for Environmental and Economic Sustainability — T.R.E.E.S. — is creating a blueprint for an integrated approach to environmental problems by applying a series of Best Management Practices (BMPs) to industrial sites, commercial buildings, schools, apartments and single family homes. The BMPs include planting trees in strategic locations, installing cisterns, dry wells and graywater systems, mulching and removing pavement.

"The project brings together all of the different agencies involved with water quality and related issues in the Los Angeles Basin and takes a strategic and integrated approach to how we can begin retrofitting our watersheds," says Jovita Pajarillo of EPA Region 9, which provided some funding for the project.

A project of the environmental organization TreePeople, T.R.E.E.S. kicked off in 1997 with a design charrette that teamed city planners, landscape architects, engineers, urban foresters and public agency staff to

develop the BMPs. The project then devised a cost-benefit analysis that was used to select the BMPs with the greatest potential for widespread implementation, and created an interactive GIS-based computer model to help policy-makers assess the economic, social, health and safety benefits of the BMPs. The project is hopeful that if the BMPs could be implemented citywide, they would cut L.A.'s dependency on imported water by 50%, while lessening the threat of flooding and the quantity of toxic urban runoff, reducing the flow of solid waste to landfills by 30%, improving air and water quality, decreasing energy dependence and creating up 50,000 new jobs.

"This is a huge opportunity to get California on the path to true sustainability," says TreePeople's Andy Lipkis.

Using several of the BMPs, the project has retrofitted a single-family residence in South Los Angeles as a demonstration site. The site now features retention grading and a cistern that collects rainwater from rain gutters and stores it for irrigation during dry months and can also act as a flood control device. According to the T.R.E.E.S. website, if cisterns were used in large numbers throughout the Los Angeles basin, they "could be equipped with remote control switches that would enable flood control authorities to use them as a networked reservoir, creating a highly effective water conservation, pollution prevention and flood control system." The demonstration site also has a mulched swale composed of recycled green waste from the property and designed to slow the flow of stormwater and filter pollutants, and a driveway drywell system that retains and cleanses rainwater.

T.R.E.E.S.' accomplishments are not limited to demonstration projects, however. According to Lipkis, the Los Angeles Unified

*continued page 6*

**A promising Los Angeles project is simultaneously addressing stormwater runoff, water conservation, groundwater, flood control, air quality, urban forestry and energy conservation.**

## BULLETINBOARD

**HOMES FOR GOLFERS BECAME HOMES FOR THE BIRDS** this February, when the California Coastal Conservancy signed a preliminary agreement to buy the 1,600-acre Bel Marin Keys property in Marin for \$16 million.

Environmentalists have long viewed the developer's plans to build 800 homes and an 18-hole golfing green as a disaster for local wetlands, migrating shorebirds and endangered marsh birds and mice, resulting in a war of words and lawsuits that has raged for nearly two decades. Once secured, restored and paired with adjacent marshmaking on the former Hamilton Airfield, the Bel Marin Keys property will become part of one of the largest environmental restoration projects on the West Coast. Contact: tnevins@igc.org

**A STEP FOR SMART GROWTH** Legislation that would ban new residential developments of more than 200 units unless water agencies verify in writing that there is an adequate water supply to serve them was approved by the State Assembly on January 29. Backers of the bill, sponsored by Sheila Kuehl (D-Santa Monica), hope to strengthen it in the Senate by adding language addressing drought year conditions.

**A NEW BALLAST WATER EXCHANGE METHOD** developed by Brazilian engineers working for a state oil company proved safer and more economical than conventional methods in 1998 trials. The method involves simultaneous loading and unloading of ship's ballast water — a contributor to exotic species invasions in estuaries worldwide — while maintaining a constant flow rate and tank level. The International Maritime Organization recently listed this Brazilian Dilution Method as a new alternative in its draft code on ballast water management. Contact: dtv6@petrobras.com.br

**CARGILL TO SELL OUT?** — After insisting for years that its South Bay salt operations were here to stay, Cargill, Inc. has offered to sell its salt ponds to government agencies for a cool \$300 million, according to several published reports. If the deal goes through it would be the second-largest state-federal land acquisition in California history, and could lead to the restoration of approximately 18,000 acres of marshland. Although many environmentalists and agency officials are clearly excited about the prospect of acquiring the long-coveted ponds, they are concerned about some aspects of Cargill's proposal, principally the price and the responsibility for clean up of concentrated salts and other materials on the property.



**DAM REMOVAL GRABBED THE HEADLINES** of two new reports this millennium. One documents 465 dam removals across the country and 25 detailed case studies of successes resulting in restored fish habitat, improved irrigation and better public safety. The other zeroes in on potential removals in California, and explores issues to be resolved. For a copy of *Dam Removal Success Stories*, call (202)347-7550; for *Rivers Reborn: Removing Dams and Restoring Rivers in California*, call (916)442-3155.

**CHLORPYRIFOS TURNED UP** in the urine of 8 of 10 adults and 9 of 10 children in a recent survey by the U.S. Environmental Protection Agency. This common insecticide is one of 30 organophosphates EPA is studying to determine health risks to children.

**A BOTCHED RESTORATION AT TOLAY CREEK** in Sonoma County has U.S. Fish & Wildlife working hard to be a better neighbor in the future. Since this major riparian and wetland creation project was implemented, more water has been seeping into the backyards and farmfields of adjacent private properties than anyone anticipated. To address such problems, the service has since built a new and less permeable core to one farmer's levee, met with the owners of 6-8 homes to resolve flooding and water quality concerns, and examined erosion issues along Highway 37, which may need to be settled with CalTrans. "This was a very narrow restoration project along a creek, so we had greater impacts along the edges than in a project involving a wide open wetland," says the service's Marge Kolar. "Next time we might think about doing this kind of project in stages, so we can see what happens each step of the way."

*MONTEZUMA CORRECTION*—In a December 1999 story about the Montezuma wetland restoration project, ESTUARY made the following error: the size of the rehandling facility to process dredged sediment for reuse is 165 acres, not 2,400. In addition, the "rezoning of 57,000 acres of Suisun Marsh for industrial use" that ESTUARY reported concerned environmentalists was actually, according to project managers, an amendment to the Suisun Marsh Protection Plan clarifying that restoration can occur within the marsh using approved dredged sediments and within areas reserved for water-related industry.

## PEACE CONTINUED

water meters, but they have agreed to speed up the process so that they will begin a phased-in retrofit program starting in the year 2004.

The city of Sacramento is exempted from the water meter requirement because its charter specifically prohibits mandatory retrofits. Instead, it will undertake a voluntary effort to convince people that they can save money by having a meter installed and then lowering their water use. It will also undertake additional conservation efforts, such as offering indoor plumbing retrofits and rebates for people who install ultra low flush toilets. The city's James Sequeira estimates it will cost the city about \$2 million a year to institute the programs.

Environmentalists will still be able to lobby for a citywide retrofit program, or for legislation that mandates meter installation statewide, but Sequeira doesn't think that any local pols are likely to back them. Unmetered water, he says half jokingly, "is a religious issue here."

The agreement covers a number of other issues as well, including conjunctive use programs and groundwater management. Coming to agreement on such a wide range of topics wasn't easy. "A lot of the people involved were traditionally adversaries," notes Jim Ray, who represented the Building Industry Association on the Forum. One of Ray's "traditional adversaries," Ronald Stork of Friends of the River, says that at the beginning, he was told there would be a meeting a month for maybe two years. Instead, it took six years, and he says, "for long periods, I was going to a negotiating meeting a day."

All sides agree that the intense process allowed the participants to get to know each other and appreciate each other's viewpoints. But they still built in a number of safeguards to make sure everyone adhered to the agreement. "Assurances are critical," says Minton. Environmental groups will automatically be given "third party beneficiary" status in contracts signed by water agencies — this makes it much easier for them to sue if they feel the contract doesn't meet the requirements of the Water Forum Agreement. The participants will continue to hold regular meetings, and the agreement recognizes that circumstances, such as federal regs and scientific data, are going to change over the next three decades. Agencies will be allowed to make needed alterations to their programs, so long as they meet the overall objectives

# RESTORATION

## STRAWBERRY CREEK FOREVER

Berkeley is no stranger to creek restoration — it was one of the first Bay Area cities to daylight a creek. That was back in the early 1980s, when the city brought a block-long stretch of Strawberry Creek out of the underground darkness and into the sunshine. Since then, it has daylighted sections of two other creeks and become the home of the Urban Creeks Council, as well as of some of the leading practitioners in stream restoration.

But the true test of the city's commitment to creeks lies ahead. In December, the city held a series of community workshops to unveil Wolfe Mason Associates' year-long study of options for the nine-block downtown stretch of Strawberry Creek, which flows underneath those blocks — and most of the city — in a pipe. The public voiced their opinions on several options ranging from a full flow restoration, which would involve daylighting the creek and allowing it to have a generous floodplain, to a partial-flow daylighting (in which some water would still flow beneath the ground in a pipe), an "aesthetically pleasing canal" or a "symbolic acknowledgement" of the creek's presence beneath the ground.

Most of those attending said they'd like to see a "full flow" restoration, even though such an undertaking — in the middle of downtown Berkeley, crammed full of vehicles, pedestrians, and bicyclists — could be tricky. Truly restoring the creek, says landscape architect Gary Mason, means "restoring its integrity, its habitat and geomorphology," which will require enough room for the creek to move freely from side to side and for its banks to bloom with willows, dogwoods, and alders. Such full restoration would make perfect sense in Civic Center Park just off downtown's main drag, says Mason, but he acknowledges that there may be different

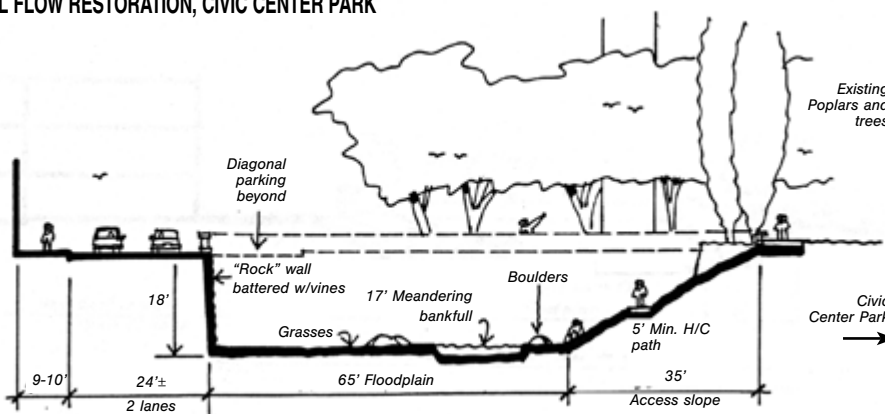
options for other areas, especially where space is at a premium. "I don't know about a cascade of willows in the middle of Center Street. Downtown might benefit from a more diverse treatment — maybe having some areas that are very natural and others where the creek is in a canal or channel and is more of a water feature than a completely natural creek." The Urban Creeks Council's Carole Schemmerling suggests cribwalls — logs layered into the banks "Lincoln log style" and planted with willows and other natives — as an alternative to a concrete channel that "works well in tight spaces and at least provides some habitat."

If a full-scale restoration is done downtown, says Mason, the public needs to be educated about what the project will look like during the first few years. The thick, scrubby look many restoration projects have in their youth may not be to everyone's taste. "The real question here is 'what kind of nature are people willing to accept?' They have to recognize that it will take a few years for this to become a mature riparian corridor."

Creek advocates argue that if there's a will, there's a way, and cite Berkeley's previous experience daylighting creeks. Schemmerling points out that downtown San Luis Obispo began to thrive when that city restored its downtown creek, and in the process, repaired its old flood control channel. "Daylighting the creek is the perfect, and less expensive, way for Berkeley to repair its damaged storm drain culverts and infrastructure and show the community that it is committed to undoing some of the environmental wrongs of the past," she says.

Perhaps Berkeley will continue to be the hub of urban stream restoration. In February, the city council decided to move forward with further studies and public meetings, and to begin to identify potential funding sources for restoration. Contact: Deborah Chernin, Project Manager (510)665-7554, Gary Mason (510)594-8160 or Carole Schemmerling (510)540-6669 **LOV**

### FULL FLOW RESTORATION, CIVIC CENTER PARK



## NEXT GENERATION

### SHRIMP SAVERS BECOME BIRD WATCHERS



When kids, enviros and a rancher teamed up to save a tiny pink shrimp from the hoofs and habits of a farm full of portly cows in 1993, they had little inkling that so many others would follow their lead, nor that they'd gain a few feathered friends.

Fourth-graders at San Anselmo's Brookside Elementary School began working with dairy farmer Paul Martin in 1993 to restore habitat for the endangered California freshwater shrimp and to help control erosion and other damage from grazing. When other ranchers saw the results, they expressed interest in working with the students too, and the project quickly grew from a few classes of elementary school children and a couple of ranchers to over 50 elementary and high school classes working at a dozen ranches and a dozen suburban sites this year.

The STRAW project (Students and Teachers Restoring a Watershed) is now a collaborative effort of schools, restoration experts, ranchers, The Bay Institute, the Center for Ecoliteracy and others. STRAW's newest interest is in birds, inspired in part by Martin's desire to see quail return to his ranch and in part by The Bay Institute's realization that riparian restoration creates nice bird habitat. "We also realized that this was a tangible way to help people connect their watersheds to the Bay," says the Institute's Grant Davis. To help develop the bird theme, the Institute asked Point Reyes Bird Observatory (PRBO) to become a partner.

Since then, the Institute, PRBO, Prunuske Chatham, Americorps and the Marin and Southern Sonoma Resource Conservation Districts have been working hands-on with students, revegetating streams with willows and other riparian species. PRBO, meanwhile, has been taking teachers into the field to help them identify birds by sight and song and providing them with checklists and natural history information for the birds in their area. "We really try to stress the science behind the project," explains PRBO's Melissa Pitkin. She says the most exciting part is that all of STRAW's efforts are clearly paying off: "We found 22 species of birds in one restored area compared to only eight in a non-restored site." Contact Laurette Rogers (415) 721-7680 or Melissa Pitkin (415) 868-1221, ext. 33 **LOV**

## HOW SEE IT

## REDEFINING REASONABLE USE



SCOTT SLATER

The doctrine of "reasonable and beneficial use" is generally understood throughout the West as a "means-ends" test that obligates an authorized user to apply water for a "beneficial use" in a reasonably efficient manner. Today, however, a different approach is gaining popularity in California. This new view holds that "reasonable use" does not mean "reasonably efficient" as judged by the standard, custom and habit of similarly situated users — it means the "highest and best" or "optimal" use of the water. The difference in approach and effect is substantial.

Currently, an applicant for an appropriate water right must satisfy the State Water Resources Control Board that a proposed use comports with the public interest. However, once the use is approved and initiated, a property right vests in the user to continue the use under reasonable means. Thus, if it is no longer reasonably efficient to engage in furrow irrigation, an individual might be obligated to adjust to drip. For an urban user, installation of low flow toilets and efficient distribution systems might become a minimum standard. A user is not, however, obliged to give up avocado farming so that a school can be built — at least not without compensation.

Conversely advocates of the optimal use approach would make reasonable use a comparative test of relative social utility with the ultimate balancing being done by a judge. In theory, if one segment of society or even one judge, sees one use as more worthy than another, water may be confiscated from one industry and given to another.

Prospective users of a proposed cancer hospital may argue that water for the tobacco farm might be eliminated without compensation. The fact that the specific tobacco farm was the most efficiently irrigated farm in California is not determinative as it would be in most states.

There is nothing in the California Constitution or any reported decision to date that would require "optimal" rather than "reasonably efficient" use.

While there are appellate court decisions acknowledging the issue, they have reserved the final word on the subject for a later date. In the interim, litigants fueled by the unresolved issue make competing arguments in

**Last November, the S.F. Estuary Project held a day-long symposium on the current state of California water rights law. Water attorneys Scott Slater and Antonio Rossmann both addressed the, "reasonable use doctrine," a provision of the state constitution requiring that water resources be put to beneficial use, preventing waste, unreasonable use or unreasonable method of use. Here they offer additional perspectives on the doctrine.**

lower courts without definitive resolution.

There are large economic and social costs that should give advocates of optimal use pause. First, "optimal use" is not easy to define. Second, it operates at cross purposes with the Governor's Commission recommendations and the California Supreme Court's repeated efforts to enhance certainty in our water rights allocation decisions. Outcomes are not predictable if "optimal social utility" is the test. Third, the optimal use approach leads to an erosion of private property rights and confidence in the trading of water rights. Fourth, and most important in litigious California, potential buyers have less of an incentive to purchase or lease a water right if they can attack the existing user's claim and obtain the water for free.

Lawyers can help their clients by not making such arguments because winning that argument means losing in the end. Clients can also help themselves by questioning a lawyer who advocates a path that by definition leads to a declaration that their own rights are only as good as one judge's interpretation of optimal social utility on any given day.

In the future, legislative direction on how the reasonable and beneficial doctrine use should be applied by the courts and the State Water Resources Control Board may serve to limit opportunities for mischief. The Board itself can provide direction through its water rights decisions. However, in the end, final responsibility may lie with the courts.



ANTONIO ROSSMANN

The big question that we should be asking is: Who makes the determination of what is reasonable use? If the state water board makes the determination, should the courts defer to that decision if it is supported by substantial evidence, or should the courts render their independent judgment? Since reasonable use is a constitutional standard, it would seem that the latter would apply.

A parallel question arises when a superior court makes the determination: Should the appellate courts reweigh it or just accept the lower court's word if it has some evidentiary support? The practice seems to be that the appellate courts reach their own conclusion on the merits, which is a clear exception to the normal rule of administrative decision-making. But that can be explained for two reasons. One is the unique nature of water in our state and the fact that historically we've always expected our Supreme Court to have the last word on the merits of water conflicts. The second is the fact that "reasonable use" is a constitutional provision, and not a statutory one; as with matters like due process or free speech, we expect the appellate court not to routinely sustain the superior court's (or administrative agency's) conclusions.

One can also argue that reasonable use should reflect popular judgment about where our resources ought to be devoted. If the Legislature were to make a finding that a certain water use is unreasonable, the courts ought either to be bound by that finding or at least defer greatly to it. In general the courts will defer. Yet at the same time if the Legislature made a judgment fifty years ago as opposed to five years ago, and it has never been reconsidered, then the courts through the "reasonable use" doctrine have the means of rendering a contemporary interpretation.

The reasonable use doctrine is California's saving grace. If one has faith in the reasonable use doctrine, part of it is having faith in the judiciary to be the most competent to pass the carefully considered judgment required in these cases.

*To receive a written (\$25) or taped (\$20) transcript of the entire November 2 water rights symposium, send a check payable to SFEP/ABAG to the S.F. Estuary Project, 1515 Clay Street, #1400, Oakland, CA 94612 (510)622-2465*

## LEGAL

### NIT-PICKING DECISION 1641

Twenty-one petitions for reconsideration, four lawsuits — and counting — and criticism from stakeholders of every stripe greeted the State Board's December 29 water right decision allocating implementation responsibility for the 1995 Bay-Delta Plan among certain of the state's water users. The plan is designed to meet the ever-competing needs of farmers, wildlife and cities.

Following 82 days of hearings over the course of 13 months, Water Right Decision 1641 is the latest in a 40-year series of decisions and orders regarding water quality and water right requirements for the Bay-Delta. The decision by no means answers all questions regarding who will be required to give up how much water to meet the plan's objectives. Indeed, the decision covers only the first seven of eight planned phases of hearings. Phase 8, potentially the most controversial, will begin in early June. Pending the outcome of Phase 8 — which will focus on the responsibility of Sacramento River Basin and Delta users as well as the Central Valley and State Water Projects — the decision assigns interim responsibility to the projects for meeting all the plan's Delta outflow and salinity objectives.

Decision 1641 does address the issue of how responsibility will be shared among users on the San Joaquin River, by adopting provisions of the San Joaquin River Agreement. Under that agreement, the biggest water rights holders on the river and its tributaries would provide up to 110,000 acre feet of water a year for the Vernalis Adaptive Management Plan (VAMP), a 12-year experiment designed to determine whether low flows in the river or high exports from the Delta have a greater impact on endangered salmon mortality. Although the VAMP enjoys modest — if not wildly enthusiastic — support from the environmental community, many enviros see the agreement itself as fatally flawed in that it allows any party to terminate the agreement in any year that it doesn't like the operations plan. "This part of the agreement has the potential to completely undermine the environmental benefits of the VAMP program," says Cynthia Koehler of Save the Bay, which has joined Environmental Defense (formerly the Environmental Defense Fund) in a petition for reconsideration of Decision 1641. However, according



to the State Board's Nick Wilcox, the decision includes a provision that if the agreement is terminated, the Bureau of Reclamation would be responsible for meeting the Vernalis flow objectives set forth in the Bay-Delta Plan.

Other objections to the 211-page decision run the gamut from complaints that issues were inadequately noticed to concerns over area of origin protections to the decision's implicit endorsement of a completed San Luis Drain. One provision that has particularly displeased those contracting for Central Valley Project water is the Board's order that all of BurRec's water use permits be amended to include fish and wildlife enhancement as an authorized use of CVP

water. (The State Board issues permits for the use of water that specify where, when and for what the water may be used.) "If including fish and wildlife enhancement as a permitted use results in reduced supplies, it would injure legal users of CVP water," says Westlands' attorney Tom Birmingham, arguing that the state's Water Code prohibits such injury. The Board's position however, is that the contractors are not legal users of water under the code, and therefore cannot be injured by the permit change.

Despite all the objections, Wilcox says he believes the Board's decision is a fair one. "If this decision is contentious it's a reflection of the fact that this is an over-allocated system and a zero sum game," he says. "No matter what, everybody is going to be somewhat unhappy." Contact: Nick Wilcox (916)657-0446 **CH**

## BURNING ISSUE

### NO ELBOW ROOM ON REDWOOD SHORES LEVEE

Back in 1996, environmentalists feared that if the Army Corps issued Redwood City a permit to upgrade the levee surrounding Redwood Shores, new development — and new impacts on the endangered species living in the marsh — would result. The permit was issued, 100 new homes were built, and now the endangered clapper rail and salt marsh harvest marsh are paying the price, say environmentalists, as walkers, joggers, bicyclists and dogs dominate the levee trail. Although the city agreed to fence and gate off the levee and build an alternative interior trail along part of the levee, according to Ralph Nobles with the Friends of Redwood City, it has done none of those things, causing regulatory agencies to issue warnings and Redwood Shores residents to rise up in arms (and even seek help from their congressman) over possible restrictions on trail access.

In November, the Sequoia Audubon Society sent the city a 60-day notice of intent to sue under the Endangered Species Act, which, says Nobles, seemed to finally make the city realize the seriousness of the situation. In response, the city has proposed a "compromise" solution in which it would hire a guard to enforce a no-dog rule and protect predator-control traps, as well as to close the gates to the levee at night and during extreme high tides when the rails and mice need refuge from the rising waters.

U.S. Fish & Wildlife's Ken Sanchez says the proposal is too vague, and adds that the rails and mice need to use the levee more often than just during extreme high tides. "The city got their houses, and the rails and mice got this little marsh," says Sanchez. "It's just too small an area to manage all of these competing interests." Redwood City Councilperson Colleen Jordan disagrees. "I think there are solutions that will satisfy both the objectives of the Endangered Species Act and the public who would like to continue to use those trails," says Jordan.

Craig Breon of Sequoia Audubon points out that to protect the rail and mouse, only 1.5-2 miles of levee would actually be closed off, and that the rest of the levee — approximately 7 miles — would remain accessible to everyone. "I sympathize with people who like the continuity of the trail," says Breon, "but at the same time we're dealing with lots of lay people who don't comprehend the impacts they're having. They think that just because they don't see dead rails there's not a problem."

One thing everyone seems to agree on is that the city should not only live up to its promises but also make a concerted effort to boost mice and rail numbers so that those species can eventually be delisted.

One way to help increase numbers might be to create additional marsh habitat nearby. In the meantime, says Breon, "the city made some really poor development choices and now they're dealing with the consequences." Contact: Craig Breon (408)252-3748 or Ken Sanchez (916)414-6625

## TREES CONTINUED

School District, based in large part on the project's research and cost-benefit data, decided to replace 30% of the asphalt at 400 schools — 20 million square feet — with trees and permeable surfaces. In addition, the L.A. Regional Water Quality Control Board has adopted regulations requiring certain new developments — parking lots with 25 or more spaces, commercial projects of more than 100,000 square feet, restaurants of more than 5,000 square feet and subdivisions with at least 10 houses, as well as gas stations and auto repair garages — to retain or treat the first three-quarters of an inch of rainfall on site.

"This is a huge breakthrough, says Lipkis, "We designed for 10-inch, 24-hour storms and used our demo sites to prove it was feasible. The fact that we did it weighed very heavily on the Board's decision to go ahead when the opposition resisted with statements that it couldn't be done." And the L.A. County Department of Public Works has organized a taskforce to explore the feasibility of retrofitting a 2,700 acre urban watershed with the T.R.E.E.S. BMPs instead of building a \$42 million stormdrain.

All this has caught the attention of Bay Area water-watchers. After Lipkis spoke about T.R.E.E.S. at last year's California Water Policy Conference, the East Bay Municipal Utility District (EBMUD) invited him to the Bay Area for a December 13 briefing to the agency's board of directors. "There is great potential to apply the T.R.E.E.S. concepts in the Bay Area," says EBMUD staffer Doug Wallace. He cautions, however, that anyone undertaking such a program would have to tailor it to the Bay Area's topography and agency jurisdictions, which differ significantly from those of Los Angeles.

T.R.E.E.S. enthusiasts warn that any similar Bay Area effort has a long road ahead of it. "Those interested in promoting a multi-agency approach fostering T.R.E.E.S. project concepts should educate their decision makers," says Wallace, "and bring together those stakeholders with complementary missions for the purpose of pursuing joint projects."

Contact : Andy Lipkis (818)623-4848; Jovita Pajarillo (415)744-2011; <http://www.treepople.org/trees/index.htm>. CH

## SCIENCE

## BREATH-taking SHIP CHANNEL STUMPS SCIENTISTS

Anyone with an ounce of salmon savvy can tell you that the biggest obstacles lurking in the migration path of anadromous fish are high dams and hard-sucking water pumps. But there's one major obstacle on their San Joaquin River route that's less obvious to the naked eye: a 15-mile stretch of dark deep water off Stockton just short enough of oxygen to make fall-run salmon turn tail.

"CALFED's worried because they're spending millions laying salmon spawning gravels upstream, but what if the moms can't get to the maternity ward," says the Central Valley Regional Water Quality Control Board's Chris Foe. In years past, dissolved oxygen levels as low as 1.5-2 milligrams per liter have been measured in the Stockton Deepwater Ship Channel, much lower than the Board's water quality objectives of 5-6 milligrams per liter (the objective varies with the month).

The culprit, in this dissolved oxygen-deficiency-mystery, isn't a nasty sewage outfall or irrigation pipe, nor a by-product of human tinkering with river flows and depths, nor nature out of synch, it's all of the above and more — or at least that's what scientists think. In the next year a team of 15 technical experts, each hired by different stakeholder interests, will be managing an \$866,000 CALFED-funded investigation of the causes of the problem to help stakeholders and regulators decide who should ultimately be held accountable, and what can be done to reoxygenate the ship channel.

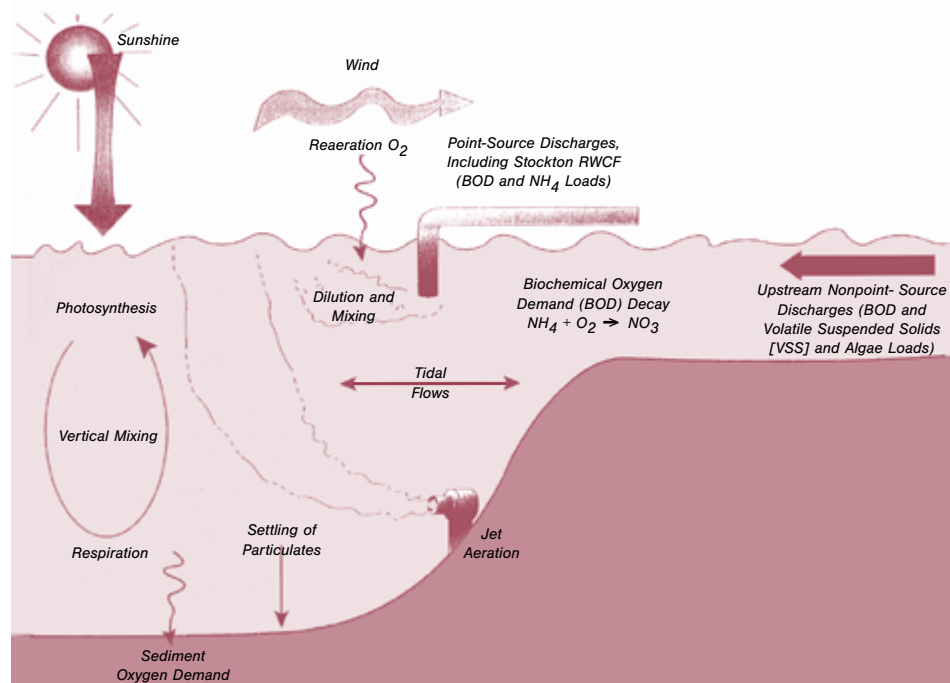
"There's no one problem, no smoking gun," says BurRec's Doug Ball, who sits on the technical committee.

The scientific basics are these: under normal river depths algae and phytoplankton move around in the water column enough to get enough sunlight to photosynthesize, and thus produce oxygen. The amount of algae and phytoplankton in the San Joaquin River, meanwhile, is fairly high due to the quantity of nutrients flowing into the river upstream from cities and farms — nutrients fuel algae growth.

When the 10-foot-deep river suddenly hits the 35-foot-deep dredged ship channel, the water slows down and less mixing occurs. Algae and other organic material sits around in the deeper darker water and down in the bottom sediments much longer, and without light only consume but don't produce oxygen. More oxygen is consumed by organisms in the sediments and other channel bottom processes, meanwhile (see chart). All this oxygen demand is exacerbated by the low (or even reverse) flow conditions that often occur due to the way water exports are managed — the Old River cutoff to the export pumps is only 10 miles upstream of Stockton.

"Generally during the fall there's little or no net flushing in the channel, and the water is just getting sloshed back and forth with the tides," says the U.S. Geological Survey's Rick Oltmann. "We need to better understand how the depth and geography of the channel contribute to negative oxygen production," says state Water Resources' Peggy Lehman, who is heading up the investigation.

*continued page 7*



Source: Jones & Stokes Associates, Inc.

# PLACES TO GO & THINGS TO DO



## WORKSHOPS & SEMINARS

MAR

### LEGISLATIVE WORKSHOP

TUES, WEDS  
21  
22

**Topics:** The changing face of California; smart growth; election year analysis; the future of CALFED.  
**Sponsor:** ACWA  
**Location:** Sacramento (916)441-4545 or [www.acwanet.com](http://www.acwanet.com)

APR

### ECOLOGY OF WETLANDS

WEDS - FRI  
12  
THRU  
14

**Topics:** Course covers the structure and function of the six main types of wetlands.  
**Sponsor:** U.C. Berkeley Extension  
**Location:** Berkeley (510)642-4111 or [www.unex.berkeley.edu/enroll](http://www.unex.berkeley.edu/enroll)

APR

### ENVIRONMENTAL FILM FESTIVAL & LECTURES

WEDS & TUES  
12  
18

**Topic:** San Francisco Bay Greenbelt and efforts to restore the Bay and Delta  
**Location:** S.F. Main Library (415)437-4852

APR

### NATIONAL MONITORING CONFERENCE 2000

WEDS - FRI  
25  
THRU  
27

**Topic:** Monitoring for the Millennium  
**Sponsor:** National Water Quality Monitoring Council  
**Location:** Austin, TX (405)516-4972 or <http://nwqmc.site.net>

APR

### NATIONAL VOLUNTEER MONITORING CONFERENCE

WEDS - SAT  
26  
THRU  
29

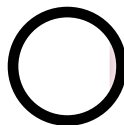
**Topic:** Moving into the Mainstream. Includes building partnerships, developing and using quality assurance/quality control plans, managing data, working with schools and youth groups.  
**Sponsor:** National Water Quality Monitoring Council  
**Location:** Austin, TX (703)385-6007 or [www.epa.gov/owow/monitoring/vol.html](http://www.epa.gov/owow/monitoring/vol.html)

MAY

### COURSE: NEGOTIATING EFFECTIVE ENVIRONMENTAL AGREEMENTS

THURS - FRI  
4  
5

**Sponsor:** CONCUR  
**Location:** Berkeley  
**Cost:** \$500  
(510)649-8008 or [www.concurinc.com](http://www.concurinc.com)



## MEETINGS & HEARINGS

MAR

### REGIONAL MONITORING PROGRAM FOR TRACE SUBSTANCES

MON  
13

**Sponsor:** SF Estuary Institute  
**Location:** TBA  
(510)231-5713 or [gabriele@sfei.org](mailto:gabriele@sfei.org)

MAR

### CALFED POLICY GROUP

WED  
15

**Location:** Sacramento  
9:00 AM — 4:30 PM  
(916)657-2486

MAR

### FRIENDS OF SAUSAL CREEK

WED  
15

**Topic:** Spring events, Earth Day  
**Sponsor:** Aquatic Outreach Institute  
**Location:** Dimond Library, Oakland  
7:00 PM — 9:00 PM  
(510) 231-9566

APR

WED  
19

MAY

### CCMP IMPLEMENTATION COMMITTEE

FRI  
5

**Sponsor:** S.F. Estuary Project  
**Location:** Oakland  
(510)622-2321



## HANDS ON

MAR

### WATCHING OUR WATERSHEDS — ALAMEDA COUNTY

SATURDAYS  
18  
AND  
25

**Topics:** Environmental activities for students, including raising Pacific chorus frogs, monitoring creeks, reducing hazardous household waste and creating wildlife habitat. Open to K-12 educators working in Alameda County.  
**Sponsor:** Aquatic Outreach Institute  
**Location:** Castro Valley  
9:00 AM — 4:30 PM  
(510)231-5784

MAR

### RESTORATION WORKDAY

SATURDAYS  
18  
&  
APRIL  
22

**Sponsor:** Aquatic Outreach Institute  
**Location:** Dimond Park Recreation Center, Oakland  
9:00 AM - noon  
(510)231-9566

MAY

### FREMONT STEELHEAD FESTIVAL

SAT  
13

**Topic:** Watershed Awareness Fair, 10K run  
**Sponsor:** Alameda Creek Alliance  
**Location:** Niles Community Park, Fremont.  
9:00 AM — 3:00 PM  
(510)845-4675

## STOCKTON CONTINUED

Investigators clearly have their work cut out for them. The system is so full of different kinds of algae, other organic matter and growth-spurring nutrients, all deriving from diverse municipal, agricultural and natural sources up and down the river, that it's difficult to pinpoint exactly which algae goes where and does what — in terms of consuming or producing oxygen — in the river. "The key is trying to identify the ultimate source of the material creating the problem," says Lehman.

Preparatory research done last year provided two leads, suggesting that upstream sources may be more important than anyone anticipated, and that sediment oxygen demand may be less so — a conclusion that surprised many members of the technical committee. About 60,000-70,00 pounds of BOD (biological oxygen demand)-causing constituents flow into the deepwater channel from upstream each day, as opposed to an estimated 6,000 pounds coming from channel sediments, according to consultant Fred Lee, who is compiling the preliminary data in an issue paper.

Delving deeper into the upstream contribution will require a look at all inputs above the ship channel, including Stockton's wastewater treatment plant two miles up, cities and towns farther upriver, and the 7,300 square-mile watershed, with its large areas of irrigated agriculture, beyond.

Some info already exists. In a review of historical data on nutrient and suspended sediment inputs to the San Joaquin River upstream of Vernalis between 1972-1990, researcher Charlie Kratzer of the U.S. Geological Survey found increasing concentrations of nitrate since the 1950s and decreasing concentrations of ammonia during the 1980s (bacteria in the water convert ammonia into a nitrate, and in the process guzzle more oxygen). What this means, says Kratzer, is that inputs from dairies (ammonia) have gone down with better on-farm management while inputs from irrigated agriculture have gone up (not surprising given widespread tile drain installation in the 1960s and 1970s).

Kratzer's analysis suggests that at least 81% of the nitrogen and 68% of the phosphorous in the river at Vernalis come from nonpoint sources. He thinks any future monitoring of nutrient types and sources should look at "tracers" such as human pharmaceuticals or growth hormones (used in milk production). "Nutrients aren't labeled as coming

## STOCKTON CONTINUED

from land or fertilizers or municipal wastewater, but if you find caffeine you know its coming from a treatment plant not a dairy," he says.

Some of the other big questions the research needs to answer, according to the Central Valley Board's Tom King, include what's going on in the 16-mile stretch of river between Mossdale and the ship channel where some dissolved oxygen is clearly lost. Another big question is which are the things most limiting to algal growth (and thus most worthy of control efforts). Is light the most limiting factor? In a system swamped with more nutrients than algae can use, is nitrogen or phosphorous more important to curb?

Recent estimates suggest that phosphorous inputs, for example, would have to be reduced by 100 fold to make a difference, according to Fred Lee. "Nobody's ever done that before on ag land. Even in Chesapeake Bay, with its similar problems, their goal is only a 40% cut."

Likewise, though less ammonia is coming from dairies upstream, ammonia coming from the Stockton sewage plant during low flow periods last fall exceeded levels recommended for the protection of aquatic life, says Lee.

Solving this and other wastewater related problems, by investing in a tertiary treatment, will be very costly.

Who will take responsibility for which part of the dissolved oxygen problem is a task slated to be completed by a Steering Committee of stakeholders by 2002. The divvying up — to be achieved via a Regional Board-approved "TMDL" or total maximum daily allowable load for the river — also allocates responsibility for paying for any solutions to the problem.

Insiders think the "solutions" will combine BMPs (best management practices) for agriculture, some tertiary treatment for sewage, installation of some aeration devices in the channel depths; and changes in how and when flows are directed through the offending stretch of river (via reoperation of the South Delta tide gates and barriers). When the Grant Line barrier was opened last fall (sucking water away from the river), flows to the deepwater channel dropped from 800 to 100 cubic feet per second, dissolved oxygen levels halved, and residence time leaped from 10 to 30 days, according to Lee.

Water management aside, environmentalists are worried that even with the TMDL in hand, growth in the San Joaquin Valley's burgeoning

cities, and its associated swells in wastewater loads, may just cancel out any progress.

With so many factors to consider and so many who may soon be held accountable, it's no wonder that recent meetings of the steering and technical committees have been somewhat "nervy," say observers. Discussions of how the CALFED workplan should be tweaked to reflect the preliminary data have also been heady. Lehman sounds a little world weary when talking about the committee process. "It's a technical nightmare for scientists to have over 50 people engaged in internal reviews every step of the way," she says.

But stakeholders such as Bob Murdoch of the City of Stockton are encouraged that so many interests have been meeting every month, and that new faces are appearing at the table as more people understand that this may affect them. "First you have to spend the time to understand the problem, so that when you spend the money to fix it, you know it'll be fixed," he says. Contact: Peggy Lehman (916)227-7551, Tom King (916)255-3105, Fred Lee (530)753-9630 or Charlie Kratzer (916)278-3076 **ARO**



FEBRUARY 2000 VOLUME 9, NO. 1

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

Estuary Web site at

[www.abag.ca.gov/bayarea/sfep/news/newsletter/index.html](http://www.abag.ca.gov/bayarea/sfep/news/newsletter/index.html)

Subscription Q&A: (510)622-2321

STAFF

Managing Editor: Ariel Rubissow  
Okamoto  
Senior Editor: Cariad Hayes  
Graphic Design: Darren Campeau  
Contributing: Bill O'Brien

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.

CHANGE SERVICE REQUESTED

PRESORTED  
FIRST-CLASS  
MAIL U.S. Postage  
**PAID**  
Oakland, CA  
Permit No. 832