

## SEWER OF DREAMS

In the wake of a mid-May U.S. Supreme Court announcement, some environmentalists and fish biologists are allowing themselves to imagine a scenario that for half a century has been virtually unimaginable: native salmon returning to the upper reaches of the San Joaquin river. The ruling is just one of a string of current developments and initiatives that could help improve flows, habitat and water quality in the much-abused San Joaquin.

The high court let stand a 1998 appeals court decision requiring the Bureau of Reclamation to operate Friant Dam in compliance with California environmental protection laws, and invalidating 14 long-term federal contracts for water diverted to irrigators through the Friant-Kern and Madera canals. The contracts must now be renegotiated subject to a full review under state and federal environmental protection laws, says Hal Candee of the Natural Resources Defense Council (NRDC), which first sued BurRec in 1988.

If water is eventually released from Friant Dam it could mean a virtual rebirth for a river that is often described as little better than an open sewer. The San Joaquin was identified in 1997 as one of the most threatened rivers in the nation by the organization American Rivers due to low flows, pollution and encroaching urbanization. Farmers who rely on the San Joaquin's water feel equally threatened, however, fearing that they may be forced to retire thousands of acres of productive farmland for lack of irrigation.

One of California's two main riparian arteries, the San Joaquin runs nearly 200 miles from its headwaters east of Fresno to the Delta. When the BurRec built Friant Dam — part of the federal Central Valley Project — in 1941, the intention was to divert virtually the entire flow of the river into canals to irrigate southern farmland. Some water was left in the river for the 35 miles between Friant Dam and Gravelly Ford to appease existing riparian water rights holders. However, water project managers opted not to continue allowing river water to flow over the porous riverbed at Gravelly Ford, where much of it would percolate into the groundwater and be "lost." As a result, for a 20-mile stretch from Gravelly Ford to Mendota Pool the river is bone dry, except in flood years. And that, says John Cain of the Natural Heritage Institute, is the primary reason why salmon cannot get to their spawning grounds in the upper San Joaquin. There is still water in the river for the 35 miles above Gravelly Ford that could provide spawning habitat, he adds.

Conditions aren't great below Mendota Pool, either. In 1951, water engineers built the Delta Mendota Canal to bring water from the Delta to Mendota Pool. From there, the water flows into irrigation canals and the river itself. Rights holders below Mendota Pool, the San Joaquin

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## The Game's Up

Strategists holed up in an environmental war room since October have been staring up at four big flickering screens, moving watery troops this way and that through California's trenches, across battlegrounds mined with smelt and salmon, and around Delta obstacles. Their mission: to save a kingdom of fish long under siege.

The opposing forces are formidable — droughts, floods, pumps, and battalions of thirsty people. The challengers — biologists, engineers and water managers — lack a commander and instead must collectively negotiate each advance and retreat. Their secret weapon is CALFED's proposed environmental water account.

This "gaming," as insiders call it, explores what can be accomplished when you give the environment its own allocation of water or resources to use or lend in California's water markets. The gaming is sponsored by CALFED, the cooperative federal-state program established to resolve California's war waters and balance the needs of fish, farms, cities and the environment in the long term.

Each "game" takes a period in history and punches information on the conditions that occurred in that period into the models, maps and minds of the assembled strategists. In one game period, fish are few, flows large, and water quality good, so the pumps go full bore. In another game period, export conditions are not so favorable.

"The account gives ecosystem advocates the collateral they need to say 'stop pumping temporarily to avoid grinding up fish and we'll give you our water which we have previously stored over here to make up for it,'" says game

player Dave Briggs of the Contra Costa Water District. "This is the only tool we have in CALFED that addresses the interface between water project operations and ecosystem restoration."

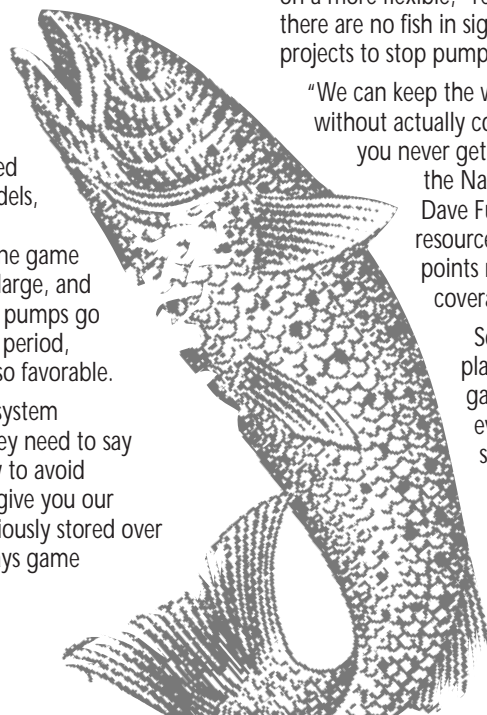
The collective realization this March that the gaming was CALFED's only real forum for deciding how to better manage the water projects to achieve environmental and water quality benefits leant considerable heat to the effort, according to EPA's Bruce Herbold, a fisheries biologist. Environmentalists have long said they won't vote for any new reservoirs or canals until CALFED has done its best to optimize use of existing water and infrastructure, which is exactly what the gaming is designed to do.

More heat came from the realization that the account is CALFED's main tool for environmental protection in the short term, aside from the restoration program. "This represents a significant shift in the way environmental protection may be promulgated in the future," says Briggs. "Before, it was prescriptive standards — provide these flows, at these times, regardless. The new way is to look at things on a more flexible, "real-time," daily basis. If there are no fish in sight, why force the projects to stop pumping?"

"We can keep the water dancing around without actually consuming it, a benefit you never get with standards," says the Natural Heritage Institute's Dave Fullerton. "It's targeting resources at the highest payoff points rather than just blanket coverage."

So what lessons have the players learned in the games so far? First, everyone seemed surprised to find that contrary to popular perception, wet years are often harder to

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## BULLETIN BOARD

**MURKY, NOT CLEAN, WATERS** is the title of a report released this May by Public Employees for Environmental Responsibility which says that there's little reliable data to support official claims that the nation's rivers and streams have gotten cleaner over the last 20 years. This insiders account written by U.S. EPA specialists suggests that pollution reductions are more fiction than fact — fiction created by data manipulation, bad science, politics and bureaucratic torpor on the part of EPA and its state partners. *Murky Waters* details numerous inconsistencies in waterway monitoring and measurement of impairment, points the finger at EPA for weak oversight, and recommends changes in the water quality reporting system. [www.peer.org/murky.html](http://www.peer.org/murky.html)

**WHAT MAKES A PERFECT WETLAND** is the question behind MIT researcher Heidi Nepf's latest study. Nepf has built a model wetland in her lab, according to a May 3 article posted by the *Environmental News Network*, which consists of a 66-foot-long flume (like a big fish tank) filled with artificial plants (wooden dowels armed with plastic strips) and awash in up to 1,500 gallons of water. Nepf wants to learn more about how water moves around different kinds of plants, and how such movements influence a wetland's capacity to filter nutrients and contaminants. The turbulence and stillness of the water around aquatic plants, and even the little wakes rippling around them, are all significant to such functions, and the focus of Nepf's experiments. [HMNepf@mit.edu](mailto:HMNepf@mit.edu)

**STORMWATER POLLUTION REDUCTION WORKS**, according to a report published by the National Resources Defense Council this spring. *Stormwater*

*Strategies* details more than 150 examples of successful runoff pollution prevention programs run by communities, including a few from the Bay Area. "The report shows that when motivated, local governments are able to develop strong programs to fight this problem," says BayKeeper's Mike Lozeau. More motivation promises to come this October, when U.S. EPA issues a new rule extending a requirement that big cities and counties develop stormwater management plans to communities with populations below 100,000 and a density greater than 1,000 people per square mile. Such communities will likely need some of the strategies detailed in the report, among them educating the public, controlling construction site runoff, eliminating improper discharges, and undertaking prevention in municipal operations. (See *Now in Print*.)

## GAMING CONTINUED

manage than dry. Though there's lots more water around, there's also fish all over the place and in the way, whereas in dry years with less livable conditions fish distribution is often more limited. In wet years, cutting down exports to save fish is very costly since the pumps are going full tilt to make the most of spring's bounty. In dry years, pumping rates are already very low so cutbacks cost little. Despite the challenges, gaming through wet year conditions in 1993 and 1995 suggests that managers could make very drastic cuts in export rates without bankrupting the environmental water account, according to Fullerton.

Another lesson learned concerns where water for the account is banked. "Having islands available for flooding in the Delta is going to be important for storage," says CALFED's Wendy Halversen Martin, referring to the proposed Delta Wetlands Project which would store water on two islands and restore two others. "We need local sources of water, with no delivery time, to help fish. Water from Shasta takes 22 hours to get here."

Similarly, players have found that while banking relatively inaccessible groundwater may not help with immediate crises, water contractors do seem to see it as an acceptable form of collateral. Indeed the gaming suggests that any water held above or below ground south of the Delta may help account managers.

"Then we can say 'hey water contractors, we'll swap our 100,000 acre feet in the San Luis Reservoir for your 100,000 in Shasta,'" says CALFED's Ron Ott. "The users like that kind of swap because then they don't have to get their water across the Delta with all its restrictions and endangered species." With the Shasta water in their account, environmental water managers then get to enhance upstream river flows, where the fish are in need, and maybe even recapture the water downstream.

Though doing a better job of helping endangered fish was the original intent of the gaming, managing for water quality was soon added to the ticket. Water districts think water can be managed better to reduce bromides, largely from seawater intrusion, and total organic carbon (TOC, largely from soils and agricultural nutrients), in their water. The former can produce suspected carcinogenic disinfection by-products, and both can compromise drinking water quality.

"From the urban water agency perspective, we want to move down a path where water quality continuously improves, and where the health risk of disinfection by-products decreases," says Contra Costa's Briggs.

Putting water in the right places to achieve these reductions is a different task than helping fish survive Delta obstacles. Briggs says the bromide problem occurs largely in summer and fall when outflow is low and saltwater creeps upstream, so pumping should be reduced at that time. In terms of TOC, water management actions might include not pumping during

February and March when farmers release all their agricultural drainage and cause a TOC spike. Downstream districts like his are concerned that using Delta islands to store account water will produce more TOC, as the water sits atop highly organic peat soils.

The trade off between water quality and quantity is still unclear in the game, adds Herbold. "The Metropolitan Water District has said that if water quality falls below a certain point they will need more water. Is the reverse true? If we can deliver them higher quality water, do they need less?"

Though juggling water quality and fish needs in one water account may be possible, some enviros would prefer separate accounts. "We must be careful not saddle the account with multiple and sometimes conflicting objectives. We've got fisheries agencies and export water users both setting the bar very high on both sides. Let the account be for fish, and develop other mechanisms for water quality," says Fullerton.

Despite the possible conflicts, the gamed shifts in pumping patterns for fish have frequently proved good for water quality. "We're getting more multiple benefits that we anticipated," says CALFED's Ott. "It's the synergistic effect of doing it all at once, getting all the parties to think at the same time in the same way."

"It's been immensely educational for everyone," says Herbold.

Educational and exhausting. According to Ott, "It's like playing three-dimensional chess all day long. When we get out of the gaming room we're all brain dead." But the work that follows the game is even more important. "For every eight hours of gaming, it takes another 12 hours to figure out if you did any good. Did we do better than a standard? Did we make more water? Did we use it more efficiently? How many fish did we lose?"

**"We can keep the water dancing around without actually consuming it, a benefit you never get with standards."**

# RESTORATION



## LIVELY LAGOON

This April a long-legged, chestnut-colored bird stopped off in a lagoon near Davis to rest. But this was no ordinary bird, nor ordinary lagoon. The bird, a white-faced ibis, is a state Species of Special Concern and the lagoon treats wastewater from the Davis Water Pollution Control Plant.

Each day, up to 7.5 million gallons of near tertiary-treated wastewater is pumped 1.5 miles from the city of Davis' plant to the new lagoon, which has been fully operational since this January. The water from the wastewater lagoon and stormwater from a second lagoon then flow by gravity into a pond where they mix together. The combined waters then flow on through seven more tracts or ponds, in which suspended solids and organics settle out or are absorbed by plants and microorganisms. The entire cycle takes around 90 days, according to Mike Conner, wildlife resource specialist with the Department of Public Works.

Once the water has circulated in the final pond, it is either discharged into the Yolo Bypass or recirculated for further oxygenation. The city hopes to eventually send the water on to farmers and ranchers in the area for re-use. In the meantime, Conner is keeping close tabs on the water quality gains of the project. The project's permit requires him to regularly monitor benthic and water column invertebrates and duck and shorebird eggs for selenium (a concern since elevated levels have been found in the area's groundwater), as well as test sediments for metals.

The \$6.9 million for the project came out of two pockets. The city spent \$2.2 million, most of it on acquiring the property, known as the Conaway Ranch. The Army Corps picked up the tab for the remaining 75% (\$4.7 million), as part of its new mandate to provide more environmentally-sound

flood control and as mitigation for wetlands lost during construction of the Yolo Bypass.

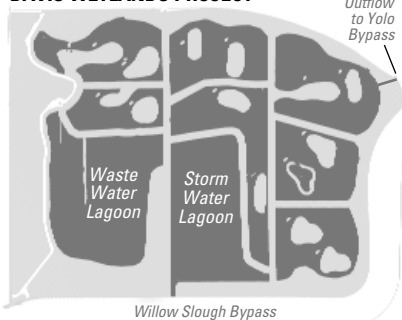
The project also reflects Davis' efforts to offset increasing impacts from urban growth by preserving more open space and natural floodplain, and by filtering more stormwater through wetlands, according to Dave Pelz, Director of Public Works. To this end, Davis has also required developers to create several smaller "stormwater" wetlands throughout the area, some water from which can also be conveyed to the city's own wetlands.

Davis is not the first city to treat wastewater with wetlands. Arcata began using wastewater ponds in the early 1970s, and several other sanitary districts around the state, including Las Gallinas in Marin, and Sacramento, use wastewater ponds (the latter is an experiment in removing heavy metals). But the Davis project is the largest constructed wetland with treatment capacity in the United States and unique in that it was designed specifically for wildlife.

The primary wildlife features are islands. Each pond contains four of these: two larger islands planted with native grasses to offer nesting habitat for waterfowl, and two smaller "loafing" islands free of vegetation, where shorebirds and waterfowl can see predators sneaking up. Shorebirds also use the loafing islands for nesting. Tract 3 was designed explicitly for shorebirds: water levels are drawn down — or water is piped around the tract — to allow the ponds to become mudflats during peak migrations. In addition, the northern border of the wetlands, planted with 8,000 native trees and shrubs, provides critical riparian woodland habitat, says Conner.

Conner is thrilled that the project has attracted such diverse wildlife. "We've already broken county records for several species of birds," he says. The white-faced ibis was only one of several unusual birds — including a ruddy turnstone (more of a coastal bird) and a semi-palmated sandpiper (ordinarily an East Coast migrant) — seen enjoying the ponds. Other "regulars" include white pelicans and a peregrine falcon, not to mention 85 other avian species (later this year, the wetland will open for birdwatching). With the birds safe on their predator-proof islands, the coyotes, foxes and skunks now being spotted in the area are welcome too. "It's very dynamic," says Conner. "We wanted to simulate a natural system as much as possible, and it seems to be doing just that." Contacts: Mike Conner or Dave Pelz (530)757-5686 **LOV**

## DAVIS WETLANDS PROJECT



■ Permanent Wetlands  
■ Other Habitat

## PEOPLEPLACE



**WATERWOMAN**  
**JEAN AUER**

As the first woman appointed to the State Water Resources Control Board and the first woman mayor of Hillsborough, Jean Auer has blazed a lot of trails. Now she's working to help more women and minorities leave their own marks on California water policy.

"Women have made enormous strides in areas such as law, medicine and science, but at the policy level they haven't come quite as far, although that is changing," says Auer, pointing to new Resources Secretary Mary Nichols as an example of the shift.

Auer established and supervises the Water Education Foundation's Water Leaders Class, which focuses on teaching a new generation of diverse leaders about California water issues and preparing them to serve on water policy bodies. "As California's demographics change, it's important to make sure that the people who represent the state be ready to serve on these boards and commissions," says Auer.

Auer herself has put in plenty of time on such bodies over the past thirty years, beginning when she chaired a study of national and local water issues for the League of Women Voters in Santa Barbara County, where she then lived. That led to an appointment to the Central Coast Regional Water Quality Control Board, and following a move to the Bay Area, a transfer to the S.F. Regional Board, where she served for a year.

Auer's interest in water stems from childhood summers spent on Lake Erie. "The deteriorating quality of the Great Lakes was the impetus for a lot of the changes in the way we manage water resources," she says. "When I got the chance to work on water issues I jumped at it."

Upon returning from a Hawaiian vacation in 1972, Auer received a message that the governor's office had called to offer her a State Board appointment. Although she was the only woman on the Board, Auer says her colleagues never treated her any differently. "There was one witness who addressed us as 'members of the Board and Mrs. Auer,' though," she laughs.

Five years later Auer left the Board when she and her husband decided to take their sons out of school and travel around the world for a year. On her return, Auer re-entered the water world, serving on a variety of committees and panels. Among her



PEOPLE PLACE CONT

positions were chair of the Bay Area Water Reuse Study, and vice-chair of the San Joaquin Valley Drainage Program. Of the latter she says "we made great steps forward towards identifying solutions, although there have been some efforts to undo our recommendations." Auer acknowledges that "nothing much has come of it," largely because the program didn't form a governance organization and relied on a very loose memorandum of understanding for implementation. "I'm afraid the same thing might happen to CALFED," she adds.

Auer's colleagues say that her deep understanding of California water issues and warm personal style make her an extremely valuable participant in consensus-based processes. "She's independent and has credibility with a very diverse group of people," says Marcia Brockbank of the S.F. Estuary Project, in which Auer has participated since its founding. "Plus she has a wonderful sense of humor."

Auer believes that educating political leaders about water issues is crucial. "In the past a lot of consensus efforts have ignored the legislature, which is a mistake because a lot of the solutions will have to come from there," she says "Water is a very complex subject and I think that is incumbent upon everyone to educate the legislature, particularly now that we have term limits and people are there for a briefer period of time."

The water leaders program is one way Auer hopes to achieve this. "The program would not exist if it were not for Jean," says the Water Education Foundation's Rita Sudman. "It takes a lot of hand-holding and patience to bring it all together, and she does it all." Auer is particularly thrilled that a member of the first class now serves in the legislature.

Auer says she herself has learned a lot from her experiences with consensus-based processes. "You have to keep at it and you have to be forthright and honest," she says. "You get as much consensus as you can, avoid the toughest issues until they're inevitable, and then you hope that you have accumulated enough good will among stakeholders that you'll be able to overcome what might have seemed to be an insurmountable difference. It doesn't always happen, but that's the approach you have to take." CH

## SAN JOAQUIN CONTINUED

Exchange Contractors, essentially traded river water for Delta water. Downstream from Mendota Pool, the river consists primarily of irrigation return flows. Because of the poor conditions, a fish barrier at the San Joaquin's confluence with the Merced River diverts salmon up that tributary to protect them.

NRDC's case now goes back to the district court in Sacramento, where a judge will decide how much, if any, water must be released from Friant Dam to protect salmon. Behind the scenes, however, NRDC and the Friant Water Users Authority are continuing confidential settlement negotiations begun last fall. "We have explained to the court that we are exploring ways to restore flows below Friant Dam and associated public trust values on a mutually acceptable basis," says Candee.

In the meantime, the Natural Heritage Institute has put forward a proposal for rewatering the San Joaquin that combines a water-swap scheme that has been around for decades with a groundwater banking plan. The proposal involves sending some of the Delta water now used by the Exchange Contractors to Friant water users through the California Aqueduct. In exchange, water would be released from Friant Dam into the San Joaquin. "As the river flows its natural course, it would recharge the aquifer, which could be tapped in dry years to meet the Exchange Contractors needs," explains Cain. The idea is getting an enthusiastic response from some stakeholders. "We have been proposing large scale recharge using wet year water for years," says Ed Steffani of Stockton East Water District. "We have a huge underground reservoir here — more than 3 million acre-feet—just waiting for water."

Back to the NRDC's case, it's unclear what effect, if any, the outcome might have on CALFED and other ongoing negotiations. "We would be happy to amend the Ecosystem Restoration Program Plan if the courts restore flows to the San Joaquin," says CALFED's Dick Daniel. "But to start making those plans now would be premature."

The legal drama is playing out against the backdrop of ongoing State Board hearings to determine which Valley water rights holders will be required to give up how much water to provide flows through the Delta in compliance with the Bay-Delta Accord. Those hearings are expected to last for at least another year. In the meantime, some of the major players have been negotiating among themselves and have devised a couple of plans that could improve conditions for salmon and other San Joaquin species. Under the Vernalis Adaptive Management Program (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 fish mortality, flows at Vernalis (downstream of the confluence with the Stanislaus River) would be set at specific levels during the spring fish migration period, depending on the type of water year. The experiment is predicated on obtaining the necessary flows through the San Joaquin River Agreement, under which 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 VAMP experiment. The agreement is to be financed through a combination of state and federal funds, including if necessary the Central Valley Project Improvement Act Restoration Fund.

The latter provision irks some environmentalists, who don't like the idea of restoration funds being used to pay for water that they say the districts are legally required to release anyway under the Clean Water Act. However, since resolving this question would almost certainly entail years of legal wrangling, others feel it's a compromise worth making. Besides, as Natural Heritage's David Fullerton notes, "part of the agreement is that all parties will make a good faith effort to find alternative funding sources so that we don't have to dip into restoration money."

## SAN JOAQUIN VALLEY



Others have different doubts about the plan. "While we support the intent of the VAMP studies, we're not convinced that any new or useful information will be generated," says Tim Ramirez of the Tuolumne River Preservation Trust, which is involved in a major restoration effort on the San Joaquin's largest tributary. "In addition, the way the VAMP flow requirements are met is to manipulate flows on the tributaries, which potentially compromises similar studies evaluating smolt survival on the Tuolumne." Ramirez adds that because the VAMP experiment requires large numbers of hatchery fish, he believes it increases pressure to establish a hatchery on the Tuolumne, a project he and others oppose. "We are trying to restore a river and a wild salmon population, not manage an aquarium."

The agreement has also encountered opposition from some Delta interests, who fear that the VAMP's spring pulse flows may reduce the amount of fresh water released into the river in late summer, when low flows, discharges and contaminated agricultural drainage already create severe water quality problems in the lower part of the river. Nevertheless, VAMP has the support of both the City of Stockton and the Stockton East

Water District, according to the District's Ed Steffani, who says studies to determine the agreement's effect on water quality are being conducted. "There has been a very good cooperative effort to make this thing work so that no one gets hurt," he says. Natural Heritage's Fullerton adds that in the continuing negotiations over the final form of the agreement, "efforts are being made to give assurances that flows won't be reduced in the summer."

The poor quality of San Joaquin water is almost legendary, and is the focus of two new Central Valley Regional Water Quality Control Board initiatives. In January the Board launched a steering committee to guide the development of total maximum daily loads allowable for the river (TMDLs) of the constituents that contribute to low dissolved oxygen in the water column. These biochemical oxygen demanding substances (BODs) are organic substances found in both municipal waste water and agricultural runoff, according to the Board's Tom King. The Board is currently seeking funding for the necessary studies, which it hopes to begin in December.

Perhaps none of the San Joaquin's water quality problems has been as confounding as the poor drainage and mineral laden soils that leach salt, selenium, boron and other contaminants into the river with agricultural runoff. Salt concentrations in the lower part of the river exceed water quality objectives approximately 50% of the time during the spring and summer, according to the Regional Board's Rudy Schnagl. As Stockton East's Steffani explains it, "We pump salty water from the Delta to the westside, where they irrigate salty land with it. The runoff goes to the river and then into the Delta and we turn around and pump it back again. The salt problem gets worse almost exponentially."

This spring, the Board held a series of public workshops on a proposed Basin Plan Amendment for salt and boron in the stretch of the river from Vernalis to Mendota Pool, a move that has been greeted with enthusiasm by water users in the lower part of the river. "The Board's stated objectives to set water quality objectives above Vernalis by the end of the year is a giant first step," says Steffani. "We've been trying to get them to do that for literally 30 years."

According to Schnagl, the Board is focusing on the types of in-Valley solutions identified by the San Joaquin Valley Drainage Program in a 1990 management plan, such as irrigation improvements and drainage reuse. However, some observers believe that these measures will ultimately be fruitless.

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## LEGAL BRIEF

### B(2) WATER IN THE DOCK

Almost seven years after Congress passed the Central Valley Project Improvement Act (CVPIA), the legal battle between environmentalists, the Dept. of the Interior and agricultural users of CVP water over implementation of one of the law's central provisions is headed for a July 20th trial date.

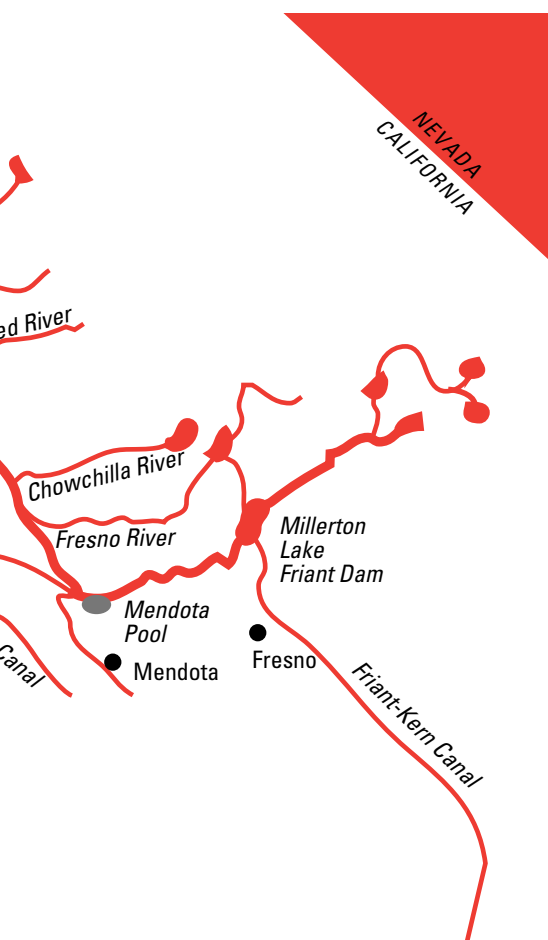
The trial is supposed to resolve the dispute over the accounting system used to measure Central Valley Project water released for environmental restoration under the CVPIA (so-called "b(2)" water). The statute dedicates 800,000 acre feet of CVP yield annually to the environment, but nowhere near that amount has ever been released, according to Save the Bay's Cynthia Koehler. In fact, Interior has argued that it did not need to measure the water precisely, so long as it implemented certain environmental restoration measures.

In March a federal judge ruled that the law requires Interior to provide the full 800,000 acre feet of CVP yield — no more and no less — to the environment and gave the Department 180 days to come up with an accounting system for the water. In May the same judge issued an injunction ordering the Department to obey the law and shaving two months off the accounting system deadline.

Environmentalists argue that the accounting system should measure water in terms of reduced deliveries to CVP water users. "Because the CVP is fully — if not over — allocated, it's a zero sum game," says Koehler. "If it's CVP water, its got to come from CVP users."

The water users dispute this interpretation. "Since the CVPIA was signed there have been other measures, such as the Bay-Delta Accord, that impose restrictions on the CVP," says attorney Tom Birmingham, arguing that implementation of these measures already requires CVP users to give up more than 800,000 acre feet for the environment.

As a result of the legal wrangling, scheduled April export reductions to help fish did not occur. Koehler maintains that the judge's order requires Interior to make up for the lost water. "We need to think about banking it, or about other types of fish measures. Either way, Interior can't avoid their obligation. The full 800,000 acre feet has to be provided." Contact: Cynthia Koehler (510) 452-9261 or Tom Birmingham (916) 321-4500 CH



**SAN JOAQUIN CONTINUED**

"The only way we are going to solve the San Joaquin and Delta water quality problem and still farm as many acres as we do is with an ag drain" to carry contaminated water out of the valley altogether, says Steffani. "The farmers can't really solve the problem themselves because we're supplying them with salty water." The mere mention of a drain has caused political fireworks for decades, as it harkens back to the San Luis Drain closed by the Kesterson wildlife refuge environmental disaster years ago. Steffani acknowledges that draining to the Delta, the Sacramento River or Monterey Bay would be politically and environmentally unfeasible. Instead he advocates biting the financial bullet and constructing a drain that would carry waste water far out into the deep ocean.

Although recent developments seem to offer glimmers of hope for the San Joaquin, some fear that urbanization along the river's banks may erase any gains. "If we can't preserve a river corridor, hopes for restoration will be lost," says Natural Heritage's John Cain, pointing to new developments such as Gold Rush City as an example of the creeping threat. Indeed, the idea of restrictions on land use is so politically sensitive that until recently, few dared even whisper the thought. But that may be changing, thanks to the floods of 1997. The Army Corps of Engineers is conducting a comprehensive study of the San Joaquin and Sacramento Basins and developing a plan to improve both flood management and ecosystem restoration. The plan is likely to include measures such as dam reoperation and flood plain restoration, as well as possible restrictions — or at least disincentives — on development in the flood plain, according to the Corps' Steve Yaeger. Any such restrictions would have to be approved by both the state and federal governments. Nevertheless, says Yaeger, "we think we can put together a pretty compelling package that combines flood plain management, flood damage reduction and ecosystem restoration."

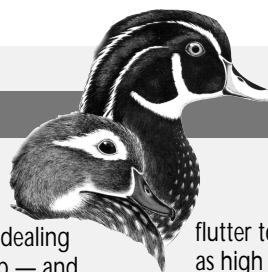
Other improvements to the river's habitat for fish and wildlife may be accomplished by the San Joaquin River Riparian Habitat Restoration Program, a program launched by those already negotiating on the flows issues. Joining forces in the program are NRDC, the Water Users Authority and the Pacific Coast Federation of Fishermen's Associations. "We decided that we should see if we could find opportunities to work together to help the river," says the Authority's Dan Fults.

The program's objective is to develop a restoration plan for a continuous riparian corridor in the reach of the river between Friant Dam and the Merced. "If fish ever get up there

they will need riparian habitat to supply food and shading," says the program's Paula Landis. "But right now we're not talking about fish. We're just talking about habitat that can provide important benefits to all kinds of species, including endangered species like the yellow-billed cuckoo and the riparian brush rabbit," of which fewer than a hundred remain in the state.

The program launched in 1997, has identified 15-20 specific projects and begun implementing several of them. But participants say it has also had a less tangible benefit. "Working together on this has helped to build trust among the parties," says Fults.

If flows are regained, habitat restored and water quality improved, would salmon return to the San Joaquin? You bet, says U.C. Davis biologist Peter Moyle, who says a certain number of migrating salmon naturally stray into new habitat every year. "If you give them the water, they'll come," he says, adding "five years ago this conversation would have been a pipe dream. It's amazing that we are even able to talk about it." Contact: John Cain (415)788-0550, Paula Landis (559)487-5103 or Ed Steffani (209)948-0333 CH

**SPECIES SPOT****BED AND BOX?**

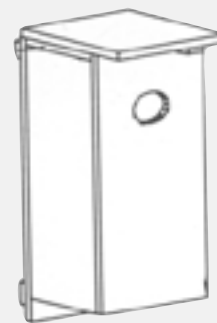
Lisa Woo Shanks was tired of dealing with horse poop but it was poop — and the flies that come with it — that led to her latest, more elegant project. While trying to help ranchers reduce flies in an environmentally-friendly way, Shanks, with the Bay Area Council of Resource Conservation Districts, came up with the idea of installing nest boxes to attract bug-eating birds. Instead of the more common garden variety bug-eaters like bluebirds, swallows and ash-throated flycatchers, she settled on wood ducks, whom she heard about from ornithologist Rich Stallcup. Not only do the ducks favor nest boxes for shelter and bugs for fodder, they also offered, in Shanks' view, an ideal way to involve landowners in watershed stewardship: "It's okay to like ducks," she explains.

Wood ducks had been hunted almost to extinction by the early 1900s, and their nesting habitat — mature riparian trees old enough to have cavities — disappeared as it was cleared for agriculture. Although wood ducks were a candidate for listing as a state Species of Special Concern as late as the 1980s, their numbers are recovering, with help from the many nest box projects around the state, including the volunteer-based California Wood Duck Program sponsored by the California Waterfowl Association, which has hatched over 145,000 ducklings since 1991. As they fly along waterways, wood ducks will spot and readily adopt nest boxes that are placed facing creeks and rivers. Within just 24 hours of hatching, the young ducklings

flutter to the ground — sometimes from as high as 50 feet — and follow their mothers to water.

To make the boxes, Shanks got financial help from Ducks Unlimited and the National Fish and Wildlife Foundation and woodworking expertise from Davidson Middle School in San Rafael. Fifty boxes have since been built by Peter Roodhuyzen's eighth-grade advanced woodworking class. The boxes sport a 4-inch diameter hole just large enough for the ducks to squeeze in and out of, and scratched facades so help the clawed

ducklings get a grip on the



Source: California Waterfowl Association

way out. The boxes will soon be installed along Sonoma Creek and the Petaluma River, with help from ranchers, farmers, grape growers and the local Resource Conservation District.

At first the woodworking students weren't too happy about having to give away their class projects, since

they usually keep their jewelry boxes, toys, bowls, and other craft, says Roodhuyzen. But ultimately they felt a sense of satisfaction in doing something to help the environment, he says, and after a presentation by a naturalist, "really got into the bird itself and leaned about something most of them knew nothing about before." Contact: Lisa Woo Shanks (707) 794-8692, ext.121 **LOV**



# PLACES TO GO & THINGS TO DO



## WORKSHOPS & SEMINARS

JUNE  
17  
THRU  
AUG  
12  
SEVEN WORKSHOPS

### START AT THE SOURCE INTERACTIVE WORKSHOPS

Topic: Seven workshops exploring site planning and design techniques for commercial, industrial and residential development which improve stormwater quality, based on revised 1999 *Start at the Source* manual.

Sponsor: BASMAA

Locations: Belmont, San Ramon, Fremont, Marin, San Francisco, Vallejo, Campell

8:00 am—1:00 pm

(650)328-5976

[www.tomrichman.com](http://www.tomrichman.com)

JUNE  
23  
WED

### TUOLUMNE RIVER TECHNICAL ADVISORY COMMITTEE

Topic: Restoration plan for the river corridor.

7:00 PM

Location: Modesto

(415)292-3531

JULY  
15  
THURS & FRI  
16

### WATER LAW AND POLICY BRIEFING

Topic: Leading policymakers address the latest in Western water law and policy including California's Colorado River 4.4 plan, the Mojave River Adjudication and more.

Sponsor: Water Education Foundation

Location: San Diego

(916)444-6240

SEPT  
1  
WEDS

### LAND USE AND NATURAL RESOURCES PLANNING CONFERENCE

Topic: Regional Habitat Conservation Planning: Successes and Lessons Learned. Emphasizes issues related to implementation of habitat conservation plans and new approaches to HCP development.

8:30 AM—5:00 PM

Sponsor: UC Davis Extension

Location: Sacramento

Cost: \$225

(800)752-0881

SEPT  
23  
THURS

### SAN FRANCISCO BAY DECISIONMAKERS CONFERENCE

Topic: Does the Environmental Regulatory Process Serve the Public Interest? Focus on Bay Area ferries, airports and harbors

8:00 AM—5:00 PM

Sponsor: Bay Planning Coalition

Location: San Francisco

(415)397-2293

JULY  
23  
THRU  
25  
THURS THRU SAT

### SOCIETY FOR ECOLOGICAL RESTORATION 11TH ANNUAL CONFERENCE

Topic: Reweaving the World

Sponsors: SER, CALFED, National Park Service, more.

Location: San Francisco

(608)262-9547

[www.ser.org/ser99.htm](http://www.ser.org/ser99.htm)



## MEETINGS & HEARINGS

JUNE  
23  
WED

### DELTA CHANNEL ISLAND COMMITTEE

Topic: Demonstration projects to restore channel islands

2:00 PM—4:00 PM

Sponsor: SF Estuary Project

Location: Sacramento

(510)622-2325

JULY  
19  
MON

### REGIONAL MONITORING PROGRAM STEERING COMMITTEE

9:30 AM—Noon

Sponsor: SF Estuary Institute

Location: Richmond

SF Estuary Institute

(510)231-5713

JUNE  
22  
THRU  
JULY  
15  
FIVE MEETINGS

### SFO RUNWAY RECONFIGURATION: FIVE COMMUNITY MEETINGS

Topic: Status report on SFO airport runway reconfiguration program (which could include major changes to the bayshore) and public input on community concerns and issues to be considered in the environmental review process.

7:00 pm—9:00 pm

Sponsor: S.F. International Airport

Locations: Oakland, San Mateo, San Rafael, S.F., Palo Alto

(650)794-4001



## HANDS ON

AUG  
6  
FRI

### CCMP IMPLEMENTATION COMMITTEE

Topic: Upcoming water rights conference

10:00 AM—12:30 PM

Sponsor: SF Estuary Project

Location: Oakland

(510)622-2325

JULY  
13  
THRU  
16  
TUE THRU FRI

### MARINE SCIENCE TEACHER INSTITUTE

Topic: From the Sierras to the Pacific. Workshop highlights aquatic habitats including San Francisco Bay and Estuary, marshes and mudflats, open ocean and Pacific Coast rocky intertidal.

9:00 AM—4:00 PM

Sponsor: Marine Science Institute

Location: Various

(650)364-2760

[www.sfbaymsi.org](http://www.sfbaymsi.org)

## NOW IN PRINT & ON LINE

### *A Water-Wise Garden Map*

Water Education Foundation  
(916)444-6240

### *Bay Area Regional Water Recycling Program Master Plan*

BARWRP (available in early July)

(925)299-6733 or [www.recyclewater.com](http://www.recyclewater.com)

### *California Water Charge Survey*

Black & Veatch

Copies from (949)788-4229 or [budiantoa@bv.com](mailto:budiantoa@bv.com)

### *Contaminant Concentrations in Fish from San Francisco Bay 1997*

SF Estuary Institute

Copies from (510)231-5713

### *Directory of Water Interests*

Water Education Foundation

(916)444-6240

### *Fish Habitat: Essential Fish Habitat and Restoration*

American Fisheries Society

Copies from (412)741-5700

### *Non-Indigenous Fishes Introduced into Inland Waters of the United States*

American Fisheries Society

Copies from (412)741-5700

### *Regional Monitoring Program Annual Report 1997*

SF Estuary Institute

Copies from (510) 231-5713

### *Setting a Course for the California Bay-Delta (video, revised)*

Water Education Foundation

(916)444-6240

### *Stewardship Plan for San Pablo Baylands*

Save the Bay

Copies from (510)452-9261

### *Stormwater Runoff Water Quality Science/Engineering Newsletter*

Drs. Fred G. Lee and Anne Jones-Lee

Copies from [gfredlee@aol.com](mailto:gfredlee@aol.com) or (530)753-9630

### *Stormwater Strategies:*

#### *Community Responses to Runoff Pollution*

Natural Resources Defense Council

Copies from (212)727-4413

[www.nrdc.org](http://www.nrdc.org)

### *The Water Fact Book:*

#### *Agriculture and Its Use of Water*

California Farm Water Coalition

(916)441-7723

### *Water Quality in the San Joaquin-Tulare Basins*

USGS Information Services

Copies from Box 25286, Federal Center, Denver CO 80225 or [water.wr.usgs.gov/sanj\\_nawqa](http://water.wr.usgs.gov/sanj_nawqa)

## GAMING CONTINUED

Other questions arising from games are: how accurate are the assumptions plugged into the models (water demand greatly affects management of fish water); how realistic are the assumed assets (water and money to buy it) in the account; how strong is the link between project operations and species recovery; and how should management of the account best be set up to keep it able to make fast decisions but protect it from politics.

In terms of the assumptions, Herbold is concerned that water demand projected by the Department of Water Resources model used in the games does not always square with reality. The model, for example, assumes demand for water from the Central Valley Water Project is constant in all years, but it isn't. When it rains a lot, farmers don't need as much water. If demand is really lower, game players may be "greatly exaggerating" the work the environmental water account might have to do in deluge, says Herbold.

In terms of the assets, different players have different views. Herbold calls the assets assumed in the games to date "aggressive"

because they include up to 400,000 acre feet of water and up to \$30-40 million per year to pay for it, as well access to water stored in Delta Wetlands, which is still only a paper project. Such big assets may not be available in a drought year or with a change in politics, which is why others say the assets assumed are not nearly powerful enough. It's not like having a water right or a million acre feet of environmental water sitting in storage in your own reservoir, says Briggs, adding that assumed water purchases are "nothing" compared to water generated for the environment by Bay-Delta Accord standards and the Central Valley Project Improvement Act's b(2) water (see p.5).

"We need to make sure the resources available to the account are adequate and firm," says Fullerton. "We need a diversified portfolio."

The account also needs a home, and a strong legal and institutional framework. Such a framework could work with centralized management, modeled perhaps on Fish & Wildlife's and BurRec's joint management of CVPIA environmental water. Management could also be decentralized, suggests Fullerton, with fish and water quality

each having their own independent resources and then interacting with each other and suppliers.

"By definition, the account is a model of decentralization. It is empowering the environment (via a trustee) to provide for its own welfare, without the need for consensus from the water users," he says. Some suppliers might see the latter as a recipe for chaos. They're also worried that the new account throwing its weight around may drive up water prices and absorb all the current water transfer capacity of the system.

Some of these problems and particulars may be worked out by Christmas, when Ott hopes to provide more detail on the account in CALFED's final programmatic EIS/EIR.

"People's expectations of gains to be made may be more than this tool can deliver," cautions Briggs. "But the approach is novel. If we continue to work through this, we may be able to achieve more."

Contact: Dave Briggs (925)688-8073 or Ron Ott (916)657-3319 ARO

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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.

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