



**BREEDING LIKE RABBITS** — The riparian brush rabbit, added to the federal Endangered Species list in March, will get a boost from a captive breeding program sponsored by the U.S. Fish and Wildlife Service and the Endangered Species Recovery Program at Cal State Stanislaus. The rabbit, with a population of less than 100, is largely restricted to riparian habitat along the Stanislaus River in Caswell Memorial State Park and to a spot of private land along the San Joaquin River near Stockton. Wildlife biologists plan to capture some rabbits this fall, with the hope of releasing them in a year or so, and with the ultimate goal of creating three separate populations numbering at least 1,200 rabbits.

**BAY ODYSSEY 2020?** — PG&E's plans to set a five-story, turbine-topped, gas-belching barge the size of a football field adrift in the Bay have run aground. Prompted by a one-day heat wave in June that caused rolling brownouts around the Bay, PG&E sought to circumvent required environmental studies in order to have the barge operational by mid-August. According to the company's preliminary application to the state Energy Commission, the four turbines could release 1,560 to 3,600 pounds of nitrogen oxides over a 24-hour period, over 20 times that released by a modern natural gas-fired plant. After strong objections from the S.F. Bay Conservation and Development Commission and environmental groups — not to mention the Davis Administration's failure to declare an "energy emergency" as PG&E had requested — the plan has been abandoned. The barge is moored in Texas, awaiting another assignment.

**ESTUARY EDITOR TAKES LEAVE** — Ariel Rubissow Okamoto will be in Boston for the next nine months, where her husband will be enjoying a Loeb Fellowship at Harvard's Graduate School of Design. Though she will be writing regular stories and helping manage the newsletter from afar, day-to-day responsibility for ESTUARY will now rest with Senior Editor Cariad Hayes. Please contact Cariad with story ideas and newsletter feedback at [cariad@dnai.com](mailto:cariad@dnai.com). Keep in touch with Ariel at [bayariel@earthlink.net](mailto:bayariel@earthlink.net).

## Budgeting Water for Fish and Flows

The next time endangered fish swim too close to Delta export pumps, environmental managers will have a new way to save them. It's not a cutting-edge technology, but rather the Environmental Water Account developed by CALFED architects, who hope it will prove to be the holy grail of water management — a means of achieving species recovery without reducing water deliveries to farms and cities.

"This is the first time water will be acquired and set aside specifically for environmental use," says the Department of Water Resources' Leo Winternitz. As described in CALFED's recently unveiled *Framework for Action* (see p.5), the account will be authorized to purchase approximately 385,000 acre-feet per year, which will be stored underground and in existing State Water Project and federal Central Valley Project facilities, and managed by U.S. Fish & Wildlife, Cal Fish & Game and the National Marine Fisheries Service. The projects will operate within a regulatory baseline consisting of the biological opinions on Delta smelt and winter-run chinook, the 1995 Delta Water Quality Control Plan and the Central Valley Project Improvement Act, which requires that 800,000 acre feet of CVP yield be dedicated to species recovery. If the fishery agencies determine that the baseline is not sufficient to protect fish, they can require that the pumping be slowed or halted, and deliver EWA water to users instead. They can also release water upstream to augment instream flows. "The basic concept is that we give the environment a share of the acquired water and let the environmental managers manage it as they see fit," says Winternitz. "The account will provide protection for species and flexibility for project operations, and could also

result in increased Delta outflow."

At press time, negotiators were still hammering out the operational details of the account, which were to be included in CALFED's Record of Decision (scheduled for release on August 25). For example, the account will be authorized to borrow water, but how much and under what circumstances were still being decided. "We're still figuring out how we're going to make this work," says CALFED's Ron Ott. According to Ott, one big question is what priority EWA water will have when it comes to the use of state and federal facilities: "What happens if there is no room to store the water and no capacity in the canals to move it?"



Another question is how much, if any, of the EWA's \$50 million annual budget will have to be used to cover increased pumping costs — estimated to be between \$5 million and \$25 million per year — that may result from changing pumping times. "Most pumping happens in the spring, when there is a lot of water and electricity is cheapest," says Ott, "but with the EWA we see pumping shifting to the late summer and fall when there are fewer fish around. But that's when power is most expensive. So who is going to pay the added cost?"

Beyond the operational issues, there are still big unknowns about how the account will work in practice. A team of biologists, engineers and water managers have spent more than a year modeling and manipulating different historical conditions to try and determine how the account should best be used to protect endangered fish. However, the so-called "gaming" has some significant limitations, says the Bay Institute's Christina Swanson. "The more you manipulate the historical data on which you based your models, the more problematic your results become and the greater the probability that your pre-

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## SPECIESSPOT

## WHALE BLOW OUT

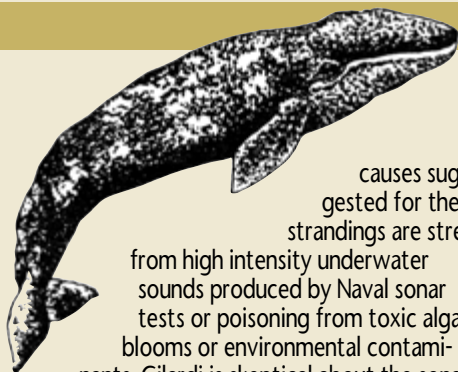
Ferry passengers have become whale-watchers over the past few months, jolted from their morning doldrums by the sight of gray whales swimming alongside their boats. This year's number of sightings, between Pier 7 in San Francisco and San Pablo Bay, has reached a record at 85. Although some of the sightings may be of the same whales, even if that number were reduced by half, says the Oceanic Society's James Gilardi, it is still much higher than the normal number of sightings, about five per year. The high numbers have scientists scratching their heads over possible causes.

While European explorers in the late 1700s/early 1800s often reported seeing whales spouting in the Bay, by the early 1900s, over-hunting had caused gray whale numbers to plummet. In the 1970s, gray whales and most large whales were added to the Endangered Species list. Since they have been protected from hunting (with the exception of yearly quotas set for indigenous peoples in Alaska and Siberia), grays along the Pacific coast have recovered to an estimated 26,000 whales. In 1994, they were delisted.

The recent increase in sightings could have positive or negative implications for their recovery, says Gilardi — or both. In addition to the live whales, 19 whales have been found stranded (washed ashore, sometimes dead) along Bay shores this year, part of a state-wide total of 57 strandings, up from an average of 15 per year. On the positive side, the frequent sightings may mean that gray whales are recovering to their pre-whaling levels and may be exploring new foraging opportunities: the Bay's soft mucky bottom is perfect habitat for grays, which feed by sucking up large quantities of mud and using their baleen to sieve out bottom-dwelling worms and shrimp-like creatures.

But the apparent increase in whales in the Bay (dead and alive) might also be a sign that something is wrong with their foraging grounds off the coast (grays migrate along the California coast as part of their 6,000-mile journey between Mexico and Alaska) or in the Bay itself. "We could be seeing both recovery and a problem occurring at the same time," says Gilardi.

Some scientists think grays may have reached the ecosystem's carrying capacity: in other words, too many whales, not enough food. But studies have shown that the whales are only using a small portion of their best feeding grounds, says Gilardi, which doesn't support the carrying capacity theory. Other



causes suggested for the strandings are stress from high intensity underwater sounds produced by Naval sonar tests or poisoning from toxic algal blooms or environmental contaminants. Gilardi is skeptical about the sonar and algae theories — in part because their impacts would likely be more localized whereas the strandings have occurred all along the coast — but he is more reluctant to rule out possible effects of exposure to contaminants, in the Bay or elsewhere. "They could be eating something, accumulating a biotoxin, or it may even be a disease problem; we just don't know," says Gilardi. "It would be a shame for them to be returning to the Bay only to be contaminated by our historic abuse of the Bay."

Joe Cordaro of the National Marine Fisheries Service also theorizes that the increase in whales in the Bay may not be related to poor feeding conditions in the ocean since the majority of the stranded whales in the Bay are full-bodied — not emaciated — adults. The Service is examining the theory that boat collisions may have caused some of the Bay strandings, but so far they've only been able to attribute one or two deaths to boats. Like Gilardi, Cordaro remains puzzled by the increase in whale sightings and strandings in the Bay. "Right now, it's all speculation," he says of the various explanations. "We really need to look at what's happening over a five-year period." In April, the Oceanic Society began a five-year study that will use photo identification, boat surveys, behavioral observations, bottom sampling, and prey analysis to try to piece together the mystery of the gray whales in the Bay.

Spotters of live whales in the Bay are asked to call (415)409-GRAY and to report stranded or dead whales to the Marine Mammal Center at (415)289-SEAL. Contacts: Joe Cordaro (562)980-4017 or James Gilardi (415)441-1159

LOV

## EWA - CONTINUED

dictions of how the system functions will be far from reality," she says. "The models can't take into account all the impacts of your actions." Swanson says the only way to determine how the EWA will work is to test it using the real system. "Decisions will have to be based on lots and lots of information: where the fish are, what the outflows are, what's ratio of inflow to export is, how much water you have upstream left over and whether you need to hold that back to have water available for temperature control later. It's very, very complex."

The account's managers will also have to figure out how to allocate EWA water among different species. "Are we going to use all the water for salmon or Delta smelt?" asks the EPA's Bruce Herbold. "Are we going to use some of it to protect other species? How are we going to decide?"

The EWA is based on the assumption that together with the baseline conditions, EWA actions will satisfy Endangered Species Act requirements regarding take limits at the pumps. Indeed, CALFED is providing water users with "assurances" that for the first four years of the program no additional water will be required to meet protection requirements for ESA listed species. However, says Swanson, an analysis of the gaming reveals that when the projects export more water than they historically have, take limits are exceeded even when the EWA is used. At best, she says "the EWA does not benefit fish but only mitigates for increased pumping." She gets no argument from Ott: "She's right. If demand increases a lot we'll have to make the EWA a lot bigger," he says.

Whatever it's limitations, says Winternitz, "when the EWA starts working it will totally change business as usual." Contact: Leo Winternitz (916)653-0758, Christina Swanson (415)721-7680, Ron Ott (916)657-2486 CH

## BUSINESS

### EBMUD EYES PG&E DAMS

Ever since energy deregulation got under way in California, private companies have been salivating over the prospect of getting a piece of the action. One of the big prizes has been PG&E's vast hydropower network — 174 dams, 99 reservoirs, dozens of power plants, thousands of acres of watershed lands and hundreds of miles of pipelines and aqueducts — worth up to four billion dollars. East Bay MUD says that it wants to acquire part of PG&E's holdings, not to make money from escalating electricity prices, but instead to protect the quality of its Mokelumne River water supply. EBMUD has formed a coalition with agencies in Alpine, Amador and Calaveras counties, all of which are along the Mokelumne. This Upper Mokelumne River Watershed Authority has set its sights on PG&E's Project 137, which consists of two reservoirs, along with several dams and their associated infrastructure. It has an estimated value of about \$50 million. Under deregulation, electricity prices are extremely volatile, often changing from hour to hour as consumer usage peaks and then drops. One reason hydropower facilities are so valuable is that they can adjust almost instantly to consumer demand, simply by changing the flow of water through the turbines.

That dramatically alters the downstream flow of the river, however, and EBMUD worries that sudden changes would increase turbidity of the water flowing into its Pardee Reservoir. This, in turn, could be detrimental to water quality and increase treatment costs. "Our greatest fear is that some big company will begin using the river to maximize their profit," says EBMUD board member Katie Foulkes.

Environmentalists are generally favorable, but cautious, about the proposal. "Drinking water quality dovetails nicely with environmental quality," says Steve Wald of the California Hydropower Reform Coalition. He supports a provision that would set aside 30% of the project's surplus operating revenues for watershed improvements, and notes that most of the profits would stay in local counties, rather than going to corporate stockholders. But he adds that EBMUD has a "mixed" environmental record, and he's skeptical about the agreement allowing local counties to increase their surface water storage. "That does raise our eyebrows."

"We're still a million miles away from anything happening," Foulkes says. The future of PG&E's hydropower facilities is still very uncertain, and the issue is now before the state's Public Utility Commission. The com-

pany may auction its dams off piecemeal, but it reportedly favors transferring them wholesale to an unregulated affiliate. State Assemblymember Dion Aroner is sponsoring legislation that would make it easier for public agencies, like EBMUD, to purchase PG&E properties.

The PUC is currently conducting a massive environmental impact report about the sell off of the PG&E hydro system. Wald

hopes that the commission uses that information to reach its decision, rather than reaching a back room deal with the company or other potential buyers. "At this stage we don't have any preconceived notion of who should be the owners," he says. "What matters most is how they operate the dams." Contact: EBMUD (510) 835-3000 or California Hydropower Reform Coalition (510) 644-2900 ext.105 **OB**

## DETOX

### CLEANING ALAMEDA WITH STEAM AND BUGS

A team of environmental engineers from UC Berkeley just completed a multi-year study of contamination at the Alameda Naval Air Station, tackling three problem areas: an underground plume of solvents and waste oils that had leaked from a storage tank, an underground plume of aviation gas, and a lagoon that the Navy had used for landing seaplanes, berthing ships, and repairing aircraft. Their results demonstrate how science can help assess and address contaminant problems, using both nature and human ingenuity.

The first problem area, the seaplane lagoon, had trapped all kinds of wastes that the Navy had poured into its storm drain system — thinking they would flow out into a diluting bay — before the Clean Water Act prohibited such actions. When the multi-year study kicked off, the Navy knew the lagoon was contaminated, but wanted to know more about what was down in the mud and when it settled in. Rather than performing a traditional sediment analysis, which includes taking a chunk of sediment and homogenizing it, Berkeley researcher Jim Hunt created a "vertical profile" of the lagoon's bottom. First, a seismologist from Lawrence Berkeley National Laboratory sent sound waves down into the lagoon, revealing that four to six feet of material had been deposited since the lagoon was dredged down to the Merritt sand in the 1930s. The question for the Navy was whether that material was its responsibility or had been deposited by natural processes.

Hunt took sediment cores near an outfall in the lagoon, where he thought contamination might be high. Using radioisotopes found in the samples, he was able to determine more precisely when the sediments



had been

contaminated. He found Cesium 137, for example, introduced into the atmosphere in 1963 during nuclear weapons testing about 30 centimeters down. "The cesium spread around the globe, accumulated on particles that landed in the Bay, and got buried in the sediments," says Hunt. Hunt knew then that the contaminated sediments beneath the cesium—which "resembled the color and texture of black mayonnaise"—had to have been deposited prior to 1963.

At approximately 67 centimeters, the sediments held another clue, traces of radium. "During World War II, the Navy used luminescent paints (made from radium) on ship dials, railings, and other parts of ships," says Hunt. The radium-containing sediments had been contaminated about 50 years ago, but have remained quite immobile since then.

One of the proposed re-uses for the lagoon is as a marina. But small boats with anchors could bring up buried contaminants, so Hunt recommends that if a marina is decided upon, additional studies be performed to address the mobility of the sediments. Possible solutions, he says, are to remove the contaminated sediments or build barriers to isolate them from the water column. In any case, his results show the Navy is clearly responsible for the tainted deposits.

At the site of the second problem area, the aviation gas spill, Lisa Alvarez-Cohen found that microbes had been cleaning up contamination on their own, in effect by eating the hydrocarbons—at least where there was plenty of oxygen. The section of the site covered with grass had very little

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## DETOX CONTINUED

contamination left. But the portion that lay beneath asphalt was biodegrading much more slowly. "A very active microbial community is degrading the aviation gas to methane," says Alvarez-Cohen. But the methane is building up beneath the asphalt, creating a potential hazard and slowing the rate at which bioremediation takes place. Alvarez-Cohen recommended that the Navy remove the asphalt and plant the site with grass, which would allow the bugs to finish the job.

Steam, not bugs, was the tool used to deal with the third problem area, the underground plume of solvents and waste oils that had leaked from a storage tank years ago. After installing steam-injection wells around the perimeter of the spill and an extraction well in the center, project coordinator Kent Udell heated the soil to boiling point, vaporizing the underground pollutants. Pollutants included TCE and PCE (unlike the hydrocarbons in the aviation gas spill, these compounds would have taken years to degrade on their own, says Udell, and would have degraded to highly dangerous vinyl chloride). "After 70 days, we had recovered 600 gallons of oil and solvents and removed 99.9 percent of the chlorinated solvents," says Udell.

Before the steam-cleaning, Alvarez-Cohen had found 1,000 million microbes per gram of soil. Afterwards, that number dropped by a factor of 10, says Udell. But just four days later, the number of microbes was climbing back up again. The bugs will clean up any remnant pollution, he says. "They tend to deal better with contaminants at low concentrations. Now the site is conditioned to be a wonderful bioreactor."

Clearly, the Berkeley team has helped the Navy navigate its clean up morass. "I think we brought a lot of good will and competence into this process between the Navy, the regulators, and the public groups. We didn't take sides—we just focused on the science behind the problem."

Contacts: Jim Hunt (hunt@ce.berkeley.edu) or Kent Udell (udell@newton.berkeley.edu) **LOV**

## RESTORATION

## SPRING TRAINING

Autumn may be approaching, but the folks in the Bay Area Wetlands Planning Group (BAWPG) are getting ready for a "spring training" of sorts. Instead of working on changeups and base stealing techniques, they'll be trying to figure out how to help wetland restorers plan their projects and, hopefully, ease their way through the maze of agencies and regulations governing them.

Formed in 1995, BAWPG is an ad hoc, inter-agency effort chaired by the California Resources Agency. In the last six months, it has worked to develop a supportive structure for implementing the 1999 *Habitat Goals* report recommendations for the region's baylands. At a June 20 public forum in Oakland, the Group outlined its objectives and first steps — a "very flexible vision —" as EPA's Mike Monroe told the audience.

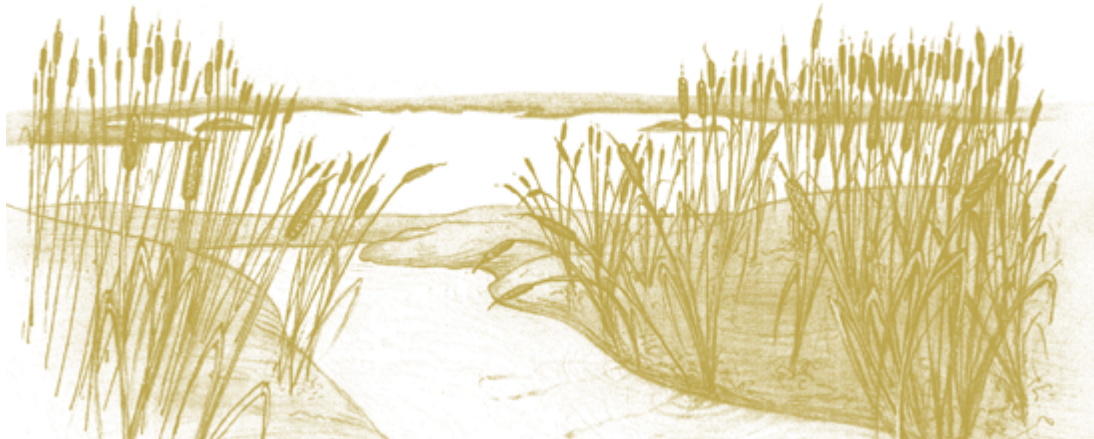
The Wetlands Recovery Project, as it is currently called, is aimed at helping wetlands project planners, both public and private, to design better projects and navigate the permitting process. It will put together a committee of technical experts, including biologists, ecologists, engineers, and so on. The project proponent could bring their preliminary plan to this committee, which would review it to see if it meets with the objectives of the *Habitat Goals*, suggest improvements in the design, scope out potential technical and regulatory problems, and provide guidance for monitoring. A committee of high-level agency decisionmakers will be formed to review and try to resolve policy issues and interagency conflicts.

The Regional Board's Peggy Olofson says that the first preliminary meetings of the technical committee will take place in late August. These will be the "spring training" phase, she says. Committee members will pick one or two projects in order to get a feel for how things will work. After a few of these practice runs, it

will report to a committee of agency decision-makers, hopefully in October or November, and gradually refine the process as it broadens its scope to work on more projects. After a year, the Recovery Project will conduct a more formal review of what was, and wasn't, accomplished.

Certainly, there are more questions than answers right now. At the public hearing, representatives from various agencies and organizations raised a number of concerns and shared their very different perspectives. Most were quite supportive of the concept and overall goals. One audience member opined that the process could ensure that, "the right (type of) wetland goes in the right place." But others worried that the review would bring another layer of bureaucracy and slow down, rather than speed up the process, and wondered how much a review would cost. Another big question was whether or not mitigation projects would be eligible for the reviews. Some people were concerned that the process could actually speed up some controversial waterfront projects — developers might try to use the review process to move their mitigation proposals more quickly. Several participants urged BAWPG to be careful to include public input and participation at all stages of the process.

Olofson stresses that the Recovery Project planners will listen and learn. "We haven't cut off any options yet," she says. "There are lots of different issues on lots of different projects. We're taking very much an adaptive approach." Contact: Peggy Olofson (510) 622-2402 **OB**



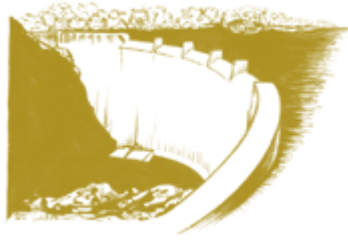
## RIVERS

### SLOW GOING ON THE YUBA

Gold miners extracted more loot from the Yuba River Basin than any other basin in the Central Valley, but they didn't do it with pickaxes and gold pans. Instead, they used huge hydraulic mining operations, which clogged the river with hundreds of thousands of tons of debris. At times, the riverbed was higher than the streets of Marysville and flooding was common. By trapping the debris, Englebright and Daguerre Point dams alleviated much of the flood danger, but in doing so hindered salmon and steelhead from reaching miles of prime upstream habitat. Today, two separate studies are examining the feasibility of improving fish access to all or some of this habitat, while continuing to protect downstream communities.

Progress on CALFED's Upper Yuba River Studies Program, which is exploring the feasibility of introducing salmon and steelhead to the Yuba River watershed above Englebright Dam, slowed this spring when funding was delayed. Located below the confluence of the north, middle and south forks of the river, the 260-foot tall, 1,142-foot long dam completely blocks fish access to the upper watershed — removal and reoperation are among the strategies being considered to permit fish passage.

Despite the funding delay, Mills says he expects most project scopes of work to be complete by year's end, including assessments of upstream and downstream habitat, flood control issues, water supply, sediment and water quality — the last two issues are of particular concern due to the possibility that sediment held back by the dam may be heavily contaminated with mercury, which was used in mining operations. Mills says the program will develop a separate process for evaluating the economic and social impacts of dam modification, which will depend to some extent



on the results of the previous studies.

Downstream of Englebright, the Army Corps of Engineers is completing a very limited analysis of alternatives for improving fish passage at Daguerre Point Dam, under a contract from U.S. Fish & Wildlife. However, according to the Corps' Shana Kaplan, the study will do little more than lay out preliminary cost/benefit information for two options: dam removal and fish ladder improvements. "There is very little data out there," she says. "They need more technical studies, including a fish passage study, and once they document the problems, they need to do a full feasibility study with a range of alternatives."

Meanwhile, upriver, 39 miles of the Yuba's south fork was granted wild and scenic river status late last year, protecting it from the threat of new dams. If the fish ever get that far, the habitat will be waiting for them. Contact: Terry Mills (916)651-6478 **CH**

### STEEP YOURSELF IN SCIENCE!

CALFED's Science Conference 2000, on October 3-5, offers over 100 sessions for the broad community of scientists, engineers and managers working on CALFED issues.

Categories of topics covered include: organic carbon and lower trophic level processes; levee system integrity; species of special concern; climate variability; salmonids; drinking water quality; contaminant effects; fluvial processes; invasive species effects; hydrodynamics; fish facilities and screening; and tidal wetland processes.

Specific presentations range in subject matter from tree-ring reconstruction of S.F. Bay salinity and seasonal feeding habits of steelhead trout in the lower Mokelumne River to floodplain restoration, levee modification, selenium assimilation in striped bass, channel migration in the Sacramento River, and biodiversity in soil seed banks in salt marshes.

To see a complete program, visit <http://www.iep.water.ca.gov/calfed/sciconf/>

## PAPERWORK

### BLUEPRINT NEEDS GREEN

After six years, and countless hours of negotiation among dozens of stakeholder groups, this summer saw the release of the CALFED Bay-Delta Program's *Framework for Action* to improve the supply and quality of California's water while restoring the ecological health of the Estuary (see *Now in Print*). But while acknowledging that the Framework represents an impressive achievement, some observers say the monumental effort will be dwarfed by what lies ahead.

"The biggest challenges for CALFED are still to come," says the Nature Conservancy's Leslie Friedman Johnson. "It's going to take tremendous political leadership to move forward from this point."

The biggest obstacle to implementing the plan is likely to be money. The Framework calls for spending at least \$8 billion in federal, state and local funds over 30 years on dozens of initiatives. Among the plans provisions are roughly a million acre-feet of new water storage, an environmental water account of approximately 380,000 acre feet, dam removal and wetland restoration, new rules for water transfers, new efforts to reduce pollution from farms, cities and abandoned mines, and a variety of new water conservation and efficiency measures. According to the program's implementation plan, the state and federal governments are each to provide about one third of the necessary funding, with the final third coming from a combination of local funds and users fees.

Although some funding has already been provided by measures such as 1999's Proposition 13, the overwhelming majority of it still requires state and federal legislation, and is therefore vulnerable to shifting political winds. Indeed, at press time there was no money at all for CALFED in the 2001 federal budget, although members of California's congressional delegation were working on an authorization package for the program.

Johnson worries that the release of the plan itself may jeopardize the momentum needed to keep it going. "By definition the package is a compromise, which means that many interest groups are less than enthusiastic, which could translate into a lack of motivation," she says. "We've got to remember that we've all invested in this and it's up to us to make it work." Contact: <http://calfed.ca.gov> **CH**

## SCIENCE

## ORCHESTRATING INTEGRITY

"The moral authority of science" is the high-falutin phrase water czar Steve Ritchie uses to describe what CALFED hopes to gain from its emerging science program. The program — barely on paper yet but energized by the August hire of a chief scientist — faces the daunting task of making sure those managing the state's water supplies and trying to protect its endangered fish have solid science, or at least darn good guesses, to inform their decisionmaking.

"If this is going to work, the science has to be isolated from environmental politics," says the Bay Institute's Anitra Pawley, who has worked on several aspects of the new program.

Of all the tools available, perhaps only science can budge veteran players of all stripes from their long-held positions in the water wars, and provide those investing billions of public and private dollars in what is purported to be the most ambitious water management and ecosystem restoration program ever undertaken with some way to measure success.

Most daunting among the new program's objectives, perhaps, will be creating connectivity between CALFED's myriad programs, getting entrenched research efforts to march behind a new drummer, and assuring stakeholders that the best possible science will always be available and never be ignored.

"It will provide CALFED with public transparency and accountability, so we don't get bogged down in these annual circuses over who gets what water and why," says Tim Ramirez from the office of the State's Secretary for Resources.

A tall order, even for science. But the program's interim lead chief scientist, hired to jumpstart the program over the next 18 months, is optimistic. "Science lives by rules and by debate, and we can bring those rules to the process," says Sam Luoma of the U.S. Geological Survey, a hydrologist who has worked in Bay-Delta research for over 30 years. "Science will help us move the debate continually forward, and help eliminate the train wrecks."

Luoma sees five kinds of challenges for his new program: narrowing the uncertainties about how some ecosystem processes work; "learning as we go" through adaptive management (science aimed at discovering how specific actions, such as adding a Delta cross channel, actually affect flows or fish, for example); creating regional and ecosys-

tem scale monitoring programs to assess restoration progress; interfacing with regulators and providing them with peer review ("We'll use expert panels to target critical regulatory questions," he says); and communicating research results to the public, water managers, stakeholders, legislators and other scientists.

"We have to build a science program that's broad based enough so that when surprises come we meet them with some talent, some study and some knowledge, so we don't have to start from zero every time," says Luoma.

Though the current flurry of paperwork and meetings to launch the science program is a "positive first step" says Pawley, it's been too long coming. Proposals for the program, and for its essential arm called the CALFED Comprehensive Monitoring, Assessment and Research Program CMARP, have been the subject of countless committee meetings for years already. (Implementation of CMARP, designed to provide info needed for adaptive management, is now under the umbrella of the new science program). Pawley hopes the science program will help prioritize the long list of concepts languishing in the appendices of CMARP plans, not to mention intensify the effort to define indicators of CALFED success.

One thing the program is sure to do is coordinate with the many existing state and federal, public and private, research efforts and help them jive with CALFED's actions. As a result, some government scientists at least, may have renewed mandates, some may have to break out of their sandboxes, some may find their data used by incoming CALFED brainpower with more time and money to do analysis.

Despite the potential threat of federal oversight in the form of a federal scientist at the helm, state scientists are more hopeful than fearful. "We'll change and evolve," says Cal Fish & Game's Perry Herrgesell, also a lead manager in the decades-old Interagency Ecological Program (IEP), which has always done the lion's share of the research on flows and fish for the state and federal water projects. "We already have an impressive infrastructure, with lots of boats and lots of scientists. We have to be part of the game." Six months ago, observers say IEP wanted little to do with CALFED science management.

"Nobody wants the CALFED science program to be doing field work," says Pawley. "We just want them to help prioritize and coordinate."

HOT OFF  
THE PRESSRESTORATION  
BETWEEN COVERS

The ink is dry on the new *State of the Estuary Report 2000, a Restoration Primer for the San Francisco Bay Sacramento-San Joaquin River Delta Estuary*.

This bright green and blue 76-page report, published by the S.F. Estuary Project, summarizes restoration and rehabilitation recommendations drawn from the 29 presentations and 99 posters of the 1999 State of the Estuary Conference and on related research.

The report mixes general rehab advice for creeks, rivers and baylands with specifics on new scientific findings related to restoration and descriptions of actual on-the-ground restoration projects. It's packed with how-to information, maps, diagrams, data and designs. Readers can learn about everything from pickleweed propagation techniques and riverbed reconstruction to common reed control, mercury hotspots in the Delta and the pros and cons of breached levee restoration projects for native fish. The report also gives examples of ways to model impacts and measure success in restoration projects, including ecological indicators, performance criteria and GIS maps. Dozens of leading scientists, engineers and planners contributed to the report, among them Bill Jordan, Matt Kondolf, Luna Leopold, Sam Luoma, Scott McBain, Peter Moyle, Jefferey Mount, Lynne Trulio, Charles Simenstad, Phil Williams and Joy Zedler.

To order a copy, send \$5 for shipping and handling to: State of the Estuary 2000, S.F. Estuary Project, 1515 Clay Street, # 1400, Oakland, CA 94612 or email questions to Heather Bowman at hb@rb2.swrcb.ca.gov.

Having centralized scientific oversight — CALFED is even considering a brand new one-stop science center — is bound to create some ripples, and Luoma seems the man for the job. The word on the street is that he's both a good listener and a man of action. "I took this job because I've always felt there wasn't enough good science incorporated in ecosystem restoration," he says. "I took this job because it looks to me as if CALFED is serious about providing the funding and opportunities to give us this science." Contact: Sam Luoma

# PLACES TO GO & THINGS TO DO



## WORKSHOPS & SEMINARS

**SEPT 11-12**  
MON - TUES  
**ENDANGERED SPECIES CONFERENCE**  
**Topic:** Water Resources and Coordinated Compliance  
8:30 AM—4:30 PM  
**Sponsor:** UC Davis Extension  
**Location:** Sacramento  
**Cost:** \$270  
(800)752-0881

**SEPT 14-15**  
THURS - FRI  
**CALIFORNIA WETLANDS**  
**Topic:** 7th annual conference on current wetland issues including regulatory compliance, permitting, partnering, mitigation banking and case law.  
**Sponsor:** CLE International  
**Location:** San Francisco  
**Cost:** \$595  
(800)873-7130

**SEPT 19**  
TUES  
**SAN FRANCISCO BAY DECISIONMAKERS CONFERENCE**  
**Topic:** Elements of a Successful Environmental Permit Process  
8:15 AM—3:45 PM  
**Sponsor:** Bay Planning Coalition  
**Location:** San Francisco  
**Cost:** \$200—\$300  
(650)994-8080  
www.bayplanningcoalition.org

**SEPT 20**  
WEDS  
**MARKETING AND STORAGE: THE NEXT GENERATION OF WATER SOLUTIONS**  
**Topic:** Status report on options for expanding California's water supplies, including water marketing, surface storage and new conjunctive use projects.  
**Sponsor:** ACWA  
**Location:** Chico  
(916)441-4545

**OCT 3-5**  
TUE - THURS  
**SCIENCE CONFERENCE 2000**  
**Topic:** Scientific information and ideas relevant to CALFED's goals and objectives pertaining to ecosystem restoration, levee system integrity and water quality.  
**Sponsor:** CALFED  
**Location:** Sacramento  
(510)622-2465 or www.iep.water.ca.gov/calfed/sciconf

**OCT 14**  
SATURDAYS  
**THRU**  
**NOV 11**  
**CREEKS, WETLANDS & WATERSHEDS**  
**Topic:** A series of five weekend institutes for educators and the general public covering native plant propagation, bugs, water quality monitoring, school gardens, canoes in sloughs, nature art, restoration and other topics.  
**Sponsor:** Aquatic Outreach Institute  
(510)231-5778

**NOV 7**  
TUE  
**ACWA PRE-CONFERENCE WORKSHOP**  
**Topic:** CALFED's Groundwater Management Plan  
**Sponsor:** ACWA  
**Location:** Anaheim  
(916)441-4545 or www.acwanet.com



## MEETINGS & HEARINGS

**SEPT 26-27**  
TUE - WED  
**INVASIVE SPECIES CONFERENCE**  
**Topic:** Annual Meeting of the Western Regional Panel of the Aquatic Nuisance Species Task Force.  
**Location:** Oakland  
(510)622-2321

**NOV 8-10**  
WEDS - FRI  
**ACWA 200 FALL CONFERENCE**  
**Topic:** ACWA — Proud or Its Past, Poised for the Future. Includes session on land use planning and water supply, Water quality issues, local government and LAFCO issues, analysis of election results, urban and agricultural water management plans, ESA issues.  
**Sponsor:** ACWA  
**Location:** Anaheim  
(916)441-4545 or www.acwanet.com



## HANDS ON

**SEPT 16**  
SAT  
**CALIFORNIA COASTAL CLEANUP DAY**  
**Topic:** Cleanups along California's bays, creeks, rivers, highways, coast.  
**Sponsor:** California Coastal Commission  
**Location:** Various  
(800)COAST-4U or  
www.coastal.ca.gov/publiced/ccd/ccd2.html

**SEPT 16**  
SAT  
**BIRD-A-THON 2000**  
**Topic:** A day of birding that supports PRBO research, conservation and education  
**Sponsor:** Point Reyes Bird Observatory  
**Location:** Point Reyes (415)868-1221, x10

**OCT 4-6**  
WEDS - FRI  
**FISHERIES AND FACILITIES TOUR**  
**Topic:** Three-day, two-night tour travels the length of the Sacramento Valley and includes visits to Oroville Dam, the beginning of the State Water Project, and Shasta Dam, keystone of the federal Central Valley Project. Other highlights are visits to the Feather River Fish Hatchery, Red Bluff Diversion Dam, Spring Creek Debris Dam and ecosystem restoration projects.  
**Sponsor:** Water Education Foundation  
**Location:** Various (916)444-6240

## NOW IN PRINT & ON LINE

*Biotic Invasions: Causes, Epidemiology, Global Consequences and Control*  
Issues in Ecology, Series 5, Spring 2000 <http://esa.sdsc.edu/issues5.htm>

*California's Water Future: A Framework for Action*  
CALFED  
Copies from <http://calfed.ca.gov>

*Exploring the Estuary, (Public Education Computer Software for PCs & Macs.)*  
Aquatic Outreach Institute Copies (\$35) from (510)231-5655

*Final Programmatic EIS/EIR*  
CALFED Bay-Delta Program  
Copies from (800)900-3587 or <http://calfed.ca.gov>

*Mono Basin Clearinghouse*  
[www.monobasinresearch.org](http://www.monobasinresearch.org)

*National Ballast Water Information Clearinghouse*  
[www.serc.edu/invasions/ballast](http://www.serc.edu/invasions/ballast)

*Protecting Drinking Water: A Workbook for Tribes*  
Water Education Foundation (916)444-6240

*Tracy Fish Facility Draft Environmental Assessment & Initial Study*  
Bureau of Reclamation <http://www.mp.usbr.gov/tffdir.html>

*Volunteer Estuary Monitoring: A Methods Manual (2nd Edition)*  
EPA National Estuary Program [www.epa.gov/owow/estuary/nep.html](http://www.epa.gov/owow/estuary/nep.html)

*Volunteer Wetland Monitoring: An Introduction and Resource Guide*  
EPA Office of Wetlands, Oceans and Watersheds  
Copies from (800)832-7828 or [www.epa.gov/owow/wetlands](http://www.epa.gov/owow/wetlands)

*West Coast Ballast Outreach Project*  
<http://ballast-outreach-uscgep.ucdavis.edu>

**OCT 6**  
FRI  
**BAY INTERPRETIVE DOCENT TRAINING PROGRAM**  
**Topic:** Ongoing training sessions (Thursday and Friday mornings) train volunteers to assist naturalists in teaching the Bay's ecology to children.  
**Sponsor:** City of Berkeley  
**Location:** Berkeley  
(510)644-8623

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