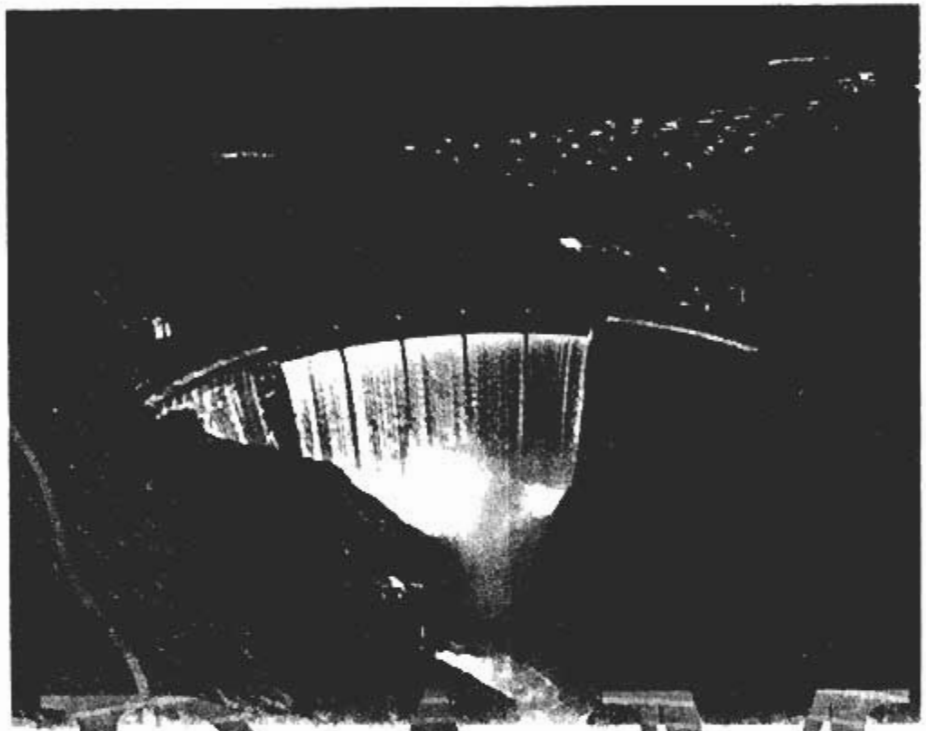
SCIENCE&TECHNOLOGY

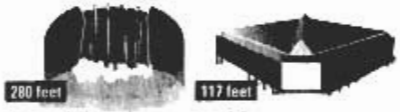
INSIDE

Classified
■ Buy it, sell it, find it fast with a Mercury News Classified Ad./**5F**



ARMY CORPS OF ENGINEERS

For salmon and other fish making their way upstream, Englebright Dam, on the Yuba River about 40 miles north of Sacramento, is an insurmountable barrier blocking their path to spawning grounds



◀ The Englebright is a concrete dam . . .

◀ Over two times as tall as the San Jose Arena

DAM busters

To help save fish, officials consider razing some dams

BY KAREN LEVY
Special to the Mercury News

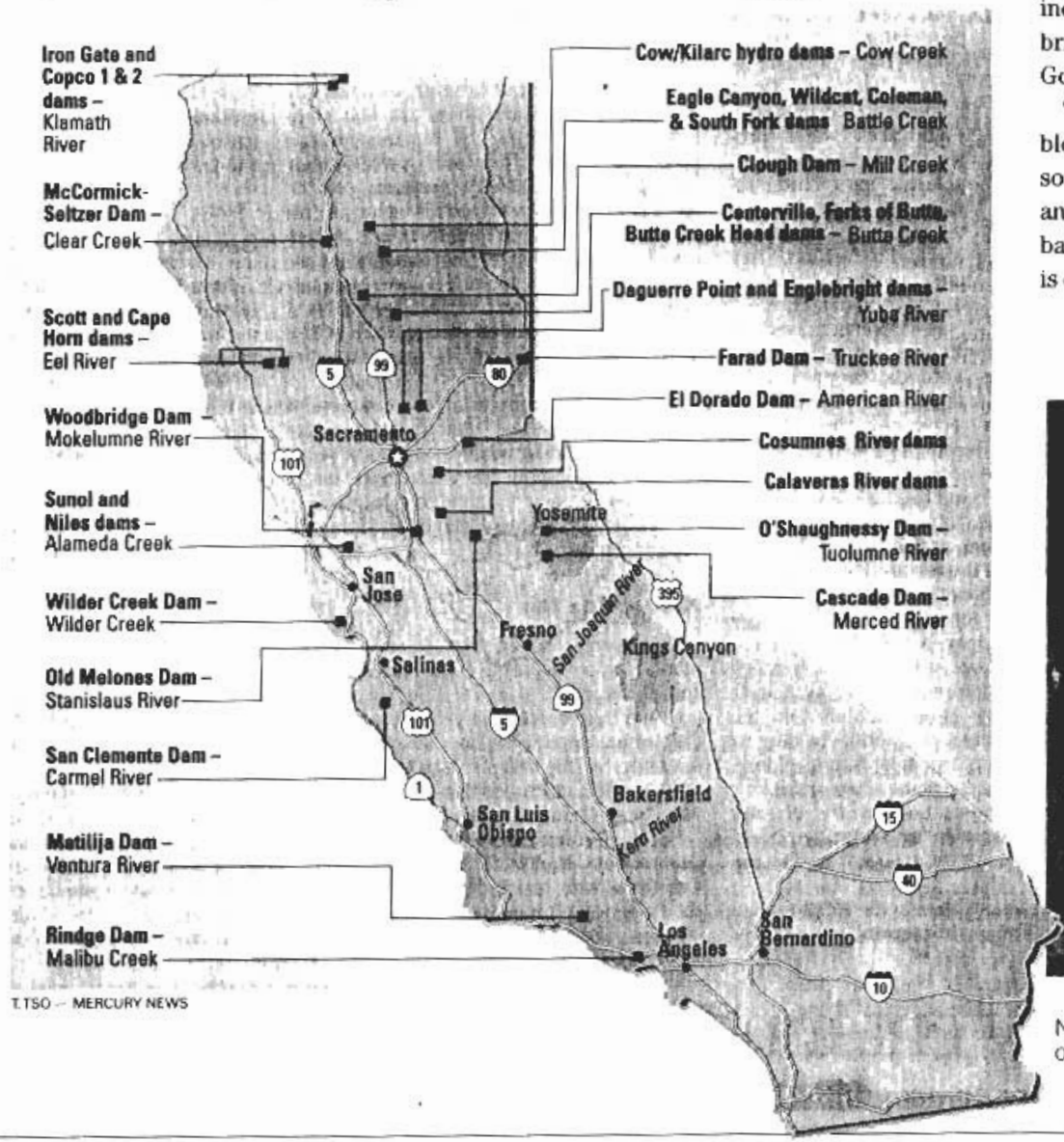
NESTLED into the Sierra foothills 40 miles north of Sacramento, massive Englebright Dam has generated hydroelectric power and provided flood protection for Marysville and Yuba City since 1941.

The 280-foot-tall concrete dam on the Yuba River created a peaceful mountain lake that every year attracts thousands of visitors who ply its serene waters in houseboats.

But for salmon and other fish making their way upstream, Englebright Dam — more than twice the height of the San Jose Arena — is an insur-

Hydro hit list

More than two dozen dams in California are possible candidates for removal to restore salmon runs. Some are controversial; others are silted up or abandoned, and are being studied by state and federal officials as potential targets for demolition.



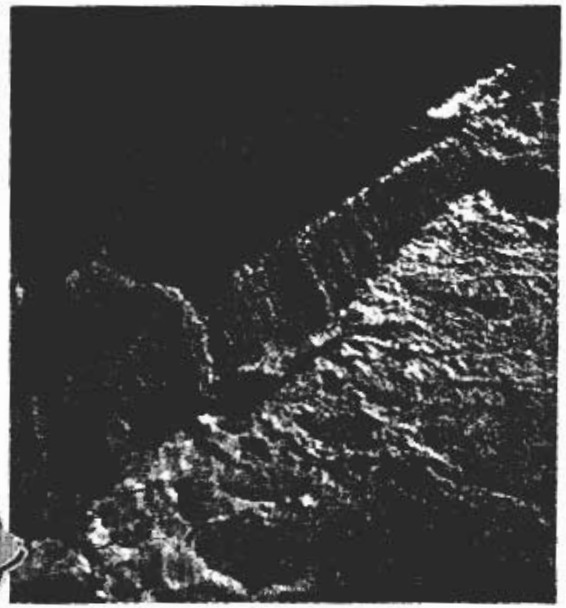
T. TSO — MERCURY NEWS

mountable barrier blocking their path to spawning grounds.

Now state and federal officials are considering a proposal that a generation ago would have been inconceivable — whether to tear down Englebright, one of the 1,400 dams spread across the Golden State.

"With 95 percent of salmon and steelhead blocked by dams, it's going to take removing some dams to restore the habitat," said Steve Evans, conservation director of the Sacramento-based advocacy group Friends of the River, which is championing dam removal in California.

*See **DAMS**, Page 2F*



RICK E. MARTIN — MERCURY NEWS

Niles Dam on Alameda Creek near Fremont is one of the small dams being considered for removal.

Efforts to aid fish by razing dams spawns debate

■ DAMS

from Page 1F

"Englebright is one of the few opportunities to restore a salmon run in the Sierra Nevada, and that's important," he said.

Increasingly, California is finding itself caught up in a movement to reconsider the need for some of the 75,000 dams more than six feet high in the United States. Across the country, hundreds of dams are on the chopping block, and some already have been taken down.

In the West, the primary motivation, spurred by the Endangered Species Act, is the decline of salmon runs.

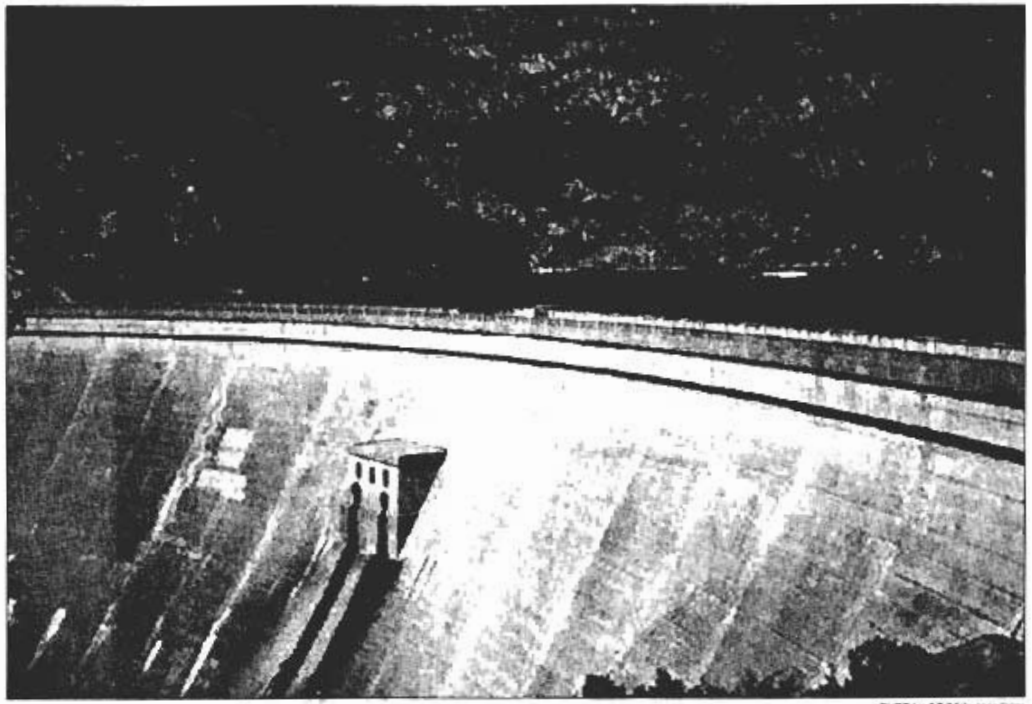
"The real point with Englebright or with any of these dams is this: We are losing our wild salmon populations," said Marc Reisner, author of "Cadillac Desert," a history of water in the American West. "The Endangered Species Act isn't something that the American public seems to want to get rid of," he said.

The issue sparks fierce discussion that often borders on theological debate.

Opponents say dams provide good reservoirs for boating, and in many cases are needed for flood control and water storage.

"It would just be a heartbreaking loss of a beautiful area and a waste of taxpayer money," said Doni Hubbard, who owns property above the reservoir and is co-founder of Citizens Allied Against Lake Englebright Destruction.

"I have friends in Friends of the River," Hubbard said. "We're just not friendly about this issue."



BUREAU OF RECLAMATION

In 1987, Interior Secretary Donald Hodel proposed studying the removal of 312-foot-high O'Shaughnessy Dam in Yosemite National Park — the dam environmentalists love to hate — but the idea faded after a flurry of media coverage and public outrage.

The larger issues

But dam removal advocates say many dams are silted up, damaged or abandoned. Two small dams on Alameda Creek near Fremont, the 6-foot Niles Dam and 12-foot Sunol Dam, fall into this category. The San Francisco Public Utilities Commission, which owns them, is studying whether to tear them out to help restore struggling steelhead runs.

Last month, state Sen. Byron Sher, D-Redwood City, introduced a bill that would require the California Resources Agency to

been spent since 1980 on restoration projects such as building ladders on dams so migrating fish can get upstream, installing screens on diversion pipes and canals so fish don't get pumped out of the river, and even barging fish around dams. Still, fish populations are faltering.

"Basically the fishery is about as bad off as it was 20 years ago," said Reisner, the author.

Three weeks ago, Oregon Gov. John Kitz-

old-growth forests and the endangered spotted owl, is in the center of this eco-dispute.

The Interior Department is studying the removal of the Elwha and Glines Canyon dams on the Elwha River in Washington. In 1996, the Bureau of Reclamation recommended removal of Savage Rapids Dam on Oregon's Rogue River. And the proposal to decommission the four large federal dams on the Snake River is one of the hottest issues in Idaho.

of Chico. CalFed contributed $5.7 million toward the $9.5 million project.

In 1999, 20,000 salmon returned to Butte Creek, up from just hundreds the year before. Although the increased numbers of salmon cannot be conclusively linked with removal of the dam, officials consider the results promising.

CalFed also agreed to help fund half of a $50 million effort to restore 42 miles of salmon habitat on Battle Creek, a tributary

dams. The project, which CalFed helped fund, created a more efficient irrigation system for the Western Canal Water District, and the users didn't lose any water.

Environmentalists contend that removing these small dams offers false hopes while giving water users more leverage in making demands.

"Five dams being removed from Battle Creek sounds wonderful until you realize that three of those dams are the size of an office desk," said Evans, of Friends of the River.

CalFed's Daniel acknowledged that "the program will be limited to smaller dams that serve limited functions on smaller streams." But demolishing any structure that fish cannot pass over will boost their survival chances, he said. "All the streams we're talking about have endangered species of fish."

Demolition opponents criticize CalFed's use of taxpayer money for such projects, but for different reasons.

According to the Yuba County Water Agency, it would cost $457 million to remove Englebright Dam, including $5 million to breach the structure and $80 million to remove sediment behind it. The big costs would be $278 million lost in future power generation revenues and $94.5 million in recreational losses.

Based on increasing the salmon population by 15,000 a year, the cost would be $1,680 per fish annually, the water agency said.

'Expensive fish'

"I know that the goal is to save the fish," said Englebright Dam advocate Hubbard. "But that's a pretty expensive fish."

CalFed disputes that cost estimate. "We don't even know what the project is yet, so I don't see how they could put a cost estimate on it," said Terry Mills, a fisheries biologist and resource adviser for the agency.

There are other downsides to dam removal, including hydropower losses, reduced water supply reliability, increased flood risks, loss of reservoir recreation and consequences for community identity and livelihood.

There are a variety of ways to tear down a

quire the California Resources Agency to draw up a list of dams by Jan. 1, 2002, that could be demolished to help the recovery of endangered salmon and steelhead trout.

The bill exempts any of the major dams that are part of the crucial State Water Project and Central Valley Project. Sher said his aim is to draw attention, and future funding, to removing mostly small dams that are silted up, abandoned or in disrepair, and where there is little or no opposition to removal.

Government agencies, fisheries biologists, angler organizations and environmental groups have proposed or are considering as many as 50 dams, large and small, for removal in California, according to surveys by Friends of the River.

The Englebright removal is being considered by the CalFed Bay-Delta program, a consortium of state and federal agencies devising a long-term plan for California's primary source of drinking water, the Sacramento-San Joaquin River Delta.

The CalFed program is financed by a combination of federal, state and user funds. It was formed to restore the state's endangered species and troubled ecosystems while at the same time satisfying the water reliability needs of the state's $27 billion per year agricultural industry and rapidly growing population.

One of CalFed's studies is how to make spawning areas above Englebright Dam accessible to threatened steelhead trout and endangered spring-run chinook salmon. After early opposition from some local business leaders and residents, CalFed officials convened an advisory group of 52 people — scientists, business owners, environmentalists and others — to draw up a detailed feasibility study of costs and potential benefits and drawbacks. That study, expected to begin this summer, has an 18-month time frame.

The idea of demolishing dams has been gaining momentum in recent years as other methods for restoring collapsing salmon runs have failed.

In the Pacific Northwest, $4 billion has

Steelhead trout

- **Description:** Gunmetal gray on top with silvery stripe on the side and white underbelly. Breeding males begin to show a pink side stripe.
- **Size:** Adults average 3 to 9 pounds.
- **Range:** From Malibu to Canadian border. In Bay Area, commonly found in Guadalupe River, San Lorenzo River and small creeks in Alameda, Santa Cruz, San Mateo and Marin counties.
- **Declining numbers:** Statewide, down 75 percent in past 50 years. Caused primarily by siltation from logging, dam building and development.

Source: Annie Kook, the Natural World

MERCURY NEWS

Three weeks ago, Oregon Gov. John Kitzhaber called for breaching of four lower Snake River dams, shocking fellow western governors who have resisted the idea.

Kitzhaber said Columbia Basin salmon are doomed to extinction unless action is taken "decisively and soon." The announcement received a standing ovation from hundreds of scientists at the Oregon Chapter of the American Fisheries Society who voted unanimously for a resolution stating that dam breaching is "necessary to help restore healthy wild salmon runs on the river."

Such proposals once would have seemed almost sacrilegious because dams, especially in the West, stand as a tribute to engineering prowess.

The electrical power production of Grand Coulee Dam on Washington's Columbia River helped win World War II. California's water projects turned a desert into a fertile agricultural region. Dams provide water, electricity, flood control and recreation. They are a symbol of human domination of nature.

Environmentalists have long abhorred dams and the obstruction of wild rivers, but today they're not the only ones who talk about removing dams.

Besides river ecosystem restoration, dams are being decommissioned for safety reasons; because of the high cost of repair and maintenance; and because federal regulators that license dams increasingly require costly retrofits such as fish ladders. In some cases, the cost of the required work exceeds the economic value of the dam.

"My parents' generation gloried in the construction of dams across America's rivers. My generation saw how those rivers were changed, deformed, killed by dams," Interior Secretary Bruce Babbitt told the Ecological Society of America in August 1998. "Your generation must help decide if, how and where those dams stand or fall."

Babbitt has been traveling the country with a sledgehammer, symbolically presiding over dam removal events from Oregon to Maine.

Not surprisingly, the Pacific Northwest, a focal point for environmental debate over on the Snake River is one of the hottest issues in Idaho.

In California in November, Friends of the River released a hit list of two dozen dams that it, and in many cases government agencies, proposes to demolish. Many are less than 20 feet high and have been abandoned.

Atop the list of dams that environmentalists love to hate is 312-foot-high O'Shaughnessy Dam on the Tuolumne River in Yosemite National Park. When its floodgates closed in 1923, the dam drowned Sierra Club founder John Muir's beloved Hetch Hetchy Valley. The reservoir provides drinking water for San Francisco and a number of other Bay Area cities.

In 1987, Interior Secretary Donald Hodel proposed studying the removal of O'Shaughnessy Dam, but the idea faded after a flurry of media coverage and public outrage.

Other proposals

Other dam-busting proposals are less controversial, targeting obsolete structures such as 100-foot Rindge Dam on Malibu Creek, now filled with sediment, and Matilija Dam, a 190-foot-tall structure that has silted up on the Ventura River. The U.S. Geological Survey and the U.S. Bureau of Reclamation are studying how to remove Matilija.

Dick Daniel, CalFed's assistant ecosystem planning director, said his agency's project and changes in public opinion have opened a window to remove obsolete dams.

"The dams we're looking at have been targets of opportunity for decades," Daniel said. "Now that CalFed exists, more of the dreams of these biologists are being fulfilled."

The restoration program, one component of the grand CalFed plan to restore the health of the delta while providing a more stable water supply for California's farms and cities, is being hammered out in policy circles in Sacramento with advice from citizens and scientists.

Hefty price tag

The overall CalFed plan, whose environmental impact report is set to be released in June, is expected to cost $6 billion to $10 billion and take at least 30 years to carry out. CalFed has already begun restoration work, paid for by the federal Bay-Delta Act of 1994, California Proposition 204 of 1996 and water user contributions.

So far, CalFed has spent $254 million on 240 projects. In July 1998, Babbitt came to California with his sledgehammer to strike the inaugural blow — the destruction of two small diversion dams on Butte Creek south $60 million effort to restore 42 miles of salmon habitat on Battle Creek, a tributary to the Sacramento River. The agreement between CalFed and Pacific Gas & Electric Co., which owns the hydroelectric facilities on Battle Creek, includes destruction of five dams and installation of fish ladders and screens on several others.

CalFed also has paid for fish ladders, screens and other restoration measures on many other streams in the Central Valley, and plans to fund more of these projects. But it's too early to determine whether such efforts will be successful.

"Biologists unanimously agree that removing obstacles to migration is far superior to fish ladders," Daniel said. Englebright Dam is the largest demolition on CalFed's drawing board.

However, environmentalists argue that dam operators, not taxpayers, should pay to restore fish habitat.

"It's like saying, 'Gee, your car doesn't meet smog standards. Here, we'll give you $500 to help you pass,'" said Evans, of Friends of the River. "We have to be careful that we're not taking the public for a ride and getting less out of it than we would with a regulatory approach. In a lot of cases I see private interests using the dam removal thing for profit. Certainly, PG&E has done that."

Benefit seen

Jean Oscamou, PG&E supervising engineer for hydropower generation, says tearing out the Battle Creek dams will result in a net benefit for the environment.

"We were able to develop a more extensive restoration plan than would have occurred through FERC relicensing," he said.

FERC — the Federal Energy Regulatory Commission — must consider environmental and recreational issues when renewing licenses for dam owners. By demolishing the Battle Creek dams, Pacific Gas & Electric will not earn an estimated $20.5 million from electricity that could be produced until 2026, when its license comes up for renewal.

David Yardas, a water resources analyst for the Environmental Defense Fund in Oakland, questions PG&E's claims of altruism.

"Why did PG&E 'donate' $21 million in foregone energy for flow improvements?" he asked. "I think it's safe to say that they face uncertainties and potential liabilities with obligations under things like the Endangered Species Act."

Dam removals are "often a business decision," Daniel conceded. In Butte Creek, rice farmers proposed demolishing the diversion

[illegible] community identity and overhood.

There are a variety of ways to tear down a dam, depending on its size. Cutting a notch in small earthen dams allows river water to flow through and erode the structure. But demolishing large concrete structures is more difficult.

"It's not a matter of buying a case of dynamite and going out there on a Saturday afternoon and blowing it up," said CalFed's Daniel.

"One of the biggest technical issues ... is the sediment in the reservoir," said Philip Williams, who runs a hydrology consulting firm in Corte Madera.

What do you do with the sediments trapped behind the dam, and where do you dump the massive amount of rubble from a concrete structure?

The mercury problem

In California, the sediment issue is exacerbated by the large amounts of mercury buried in the silt, a legacy of California's gold rush days. Mercury was used in a chemical reaction to extract gold from mined ore. But it seeped into Central Valley rivers from the Coast Range, where approximately 30 abandoned mercury mines remain, as well as from the Sierra Nevada, where it was used in the mining process.

"There's not an easy way to neutralize the mercury," said Tom Suchanek, a University of California-Davis ecologist.

As some people argue that dams trap and stabilize the mercury, others claim the toxic metal in the sediments will enter the food chain and affect fish and wildlife behind the dams. CalFed has initiated a $3.8 million study of the problem.

"Mercury ... could be a real show-stopper," said Mills of CalFed.

Williams, the Corte Madera hydrologist, said there are ways to deal with the sediment.

"Dams have been removed that were completely filled with sediment. You can pretty much predict from modeling how much of the sediment would be eroded as the river down-cuts," he explained. "You can make provisions as the dam is lowered to stabilize a large portion of the sediment that's accumulated in the reservoir."

Williams is philosophical about tearing down dams. "This is a new battleground ... of ideas how we should manage rivers," he said. "It becomes a question of controlling nature."

Rivers pull at the heartstrings of others in the debate. "I'm not ashamed to say that reclaiming a river excites me," Daniel said. "It brings me to tears."