ESTUARY

YOUR BAY-DELTA NEWS CLEARINGHOUSE

PESTY BUGS OR PRECIOUS RODENTS?

What at first seemed a stand off between mosquito haters and mouse lovers turned into a happily ever after this spring when six agencies finally settled on a restoration plan for the South Bay's Ora Loma marsh.

Though the six banded together to save the parcel adjacent to Hayward Shoreline wetlands from suburban sprawl in the 1980s, it's taken years for them to decide what to do with it.

The recently finalized restoration plan, developed with seed money from U.S. Fish & Wildlife's S.F. Bay program, will create a tidal marsh and brackish pond and wipe out prime skeeter breeding grounds by reintroducing water circulation and drainage instead of by disking what is also sensitive mouse habitat.

Two things distinguish this restoration, to be executed by Levine Fricke, from others: the reintroduction of tidal influence in phases and the recreation of a brackish tidal pond characteristic of historic San Francisco baylands.

Due to subsidence caused by years behind levees, immediate tidal flooding would drown out harvest mouse habitat. The phased restoration will flood half the marsh and then wait for mouse-friendly vegetation to develop there before flooding the other half.

The brackish tidal pond — a natural feature in the transition between marsh and uplands that serves as a secure food source and roosting area for shorebirds — is nearly absent from the present day Bay-Delta landscape. As opposed to seasonal marshes which tend not to fill up until the roosting season is underway, a brackish tidal pond is consistently flooded throughout the season. In order to create the brackish tidal pond, the restoration team must put a hardened control structure, called a weir, in place that allows water in without letting it completely drain back out.

Ora Loma flooding is scheduled to begin at the end of the year once the final regulatory hurdles are cleared.
Contact: Joe DiDonato, East Bay Regional Parks (510)635-0135 *MB*

Sierra Headwaters:
Water Banks or Home Sites?

Kathleen Garr, a rancher who is now in her 90s, remembers walking across Indian Creek, in Plumas County not far from Taylorsville, when she was a girl. She followed a path made of logs that spanned the shallow creek, which meandered through two valleys and a steep canyon before flowing into the Feather River.

Today Indian Creek is a study in erosion. The Army Corps of Engineers has dredged it. Logging, grazing, and mining have all taken their toll. Instead of the stream lined by meadowgrass and sedges that Garr remembers as 60 feet wide and only six feet deep, Indian Creek is a downcut, straightened channel hundreds of feet wide and 20 feet deep. The sandy loam from its exposed banks melts down into the riverbed, making Indian Creek one of the major sediment-producing reaches of the Bay-Delta's upper watershed.

Restoration of Indian Creek was on the drawing board three years ago, according to Jim Wilcox of the Plumas Corporation. "We thought it was all set in 1993," he says. "We had landowner support. We had a strong expectation of federal support. PG&E was supporting it for sediment reduction; their dams were full with our soil."

The first to go was direct federal funding. With that money out of the picture, landowners began to lose interest. Then PG & E withdrew its cash, because of a scheme that allowed them to pass sediment further down the watershed. After that, the U.S. Forest Service, which was going to provide rock to restore the creek, told Wilcox that their office had run so low on money it couldn't open a quarry.

The restoration of Indian Creek is only one of many environmental projects that has languished due to federal and state funding cuts over the past two years. Increasingly, policy makers and environmentalists are looking to innovative methods to protect and restore land — both private and public.

Today, Garr and other local landowners are supporting efforts by the Plumas Corporation, an economic development agency, to restore Bay-Delta headwaters using non-traditional funding mechanisms that borrow from the latest in environmental thinking. In his groundbreaking 1989 book, *For the Common Good*, former World Bank economist Herman Daly came up with the idea that conventional economics fails to account for the real costs of environmental degradation. Since then, other economists have proposed an "environmental GNP" to address the problem.

These abstract-sounding ideas are being brought down to earth by the Plumas Corporation and the Regional Council of Rural Counties in a gutsy proposal that may not win them many friends in the state water wars. The 24 northern counties recently proposed to the State Water Board that if it wants them to give up water and restore habitat for fish in the Bay-Delta's upper watershed, then southern water users picking up the surplus flows downstream for free should help pay the price.

"For some reason, water users don't consider it a cost of doing business to maintain the natural water collection areas above the dams," says Leah Wills of the Plumas Corporation. "They're used to maintaining the man-made parts of the state's water delivery system but not the God-given parts."

According to Wills, there's a notion in the headwater counties — where there's a lot of federal land but few people and where the economy has always been based on natural resources — that they would like to be

- continued on page 6

Willet

BULLETIN BOARD

LESS RUNOFF OF DORMANT SPRAYS USED TO CONTROL PESTS IN CENTRAL VALLEY ORCHARDS is the hoped for result of a lawsuit settlement between the Sacramento Valley Toxics Campaign and state regulators this February. The settlement requires California's Department of Pesticide Regulation to more carefully monitor waterways for diazinon, chlorpyrifos and other sprays, to use its authority to reduce orchard discharges of these sprays, to determine what spray levels adversely effect aquatic organisms, and to measure the success of any new runoff reduction efforts. "We're confident that some real focused efforts to keep these chemicals on site aren't going to cause economic hardship to growers," says the Department's Paul Gosselin. Though the settlement concerns ag runoff, it begs a question as to whether a similar clamp-down should be made on other diazinon sources such as urban runoff. Gosselin says his agency is already working with sanitation districts and the S.F. Regional Board to address this question, and in the interim, encouraging industry BMPs and homeowner education about diazinon in household products. (916)445-3984

TRACKING FLOWS AND FISH MOVEMENTS in the water in order to minimize fish loss from spring pumping began on April Fools this year. This "real-time monitoring" expands a 1995 Inter-agency Ecological Program pilot effort, extending the monitoring period from two to three months and adding new sampling sites at Old River, False River and the Turner and Columbia Cuts. "We've tried to make a ring of sites including all the major waterways fish travel toward the pumps," says Cal Fish & Game's Chuck Armor. This year's program also has a more flexible design, he says, so sampling locations can be shifted if fish barriers are added as proposed. Armor says the real time, up-to-the-minute, data flow to pump managers will be even more important this season as endangered Delta smelt have been found much further upstream in the Estuary. (209)948-7800

AN 835-ACRE PURCHASE OF OLD SALT PONDS AND UPLANDS, approved this February by the Wildlife Conservation Board, will augment S.F. Bay's tidal marsh habitat by up to 10%. Hayward's Baumberg Tract was purchased from Cargill through a complex and expensive transaction that some observers fear will drive up the price of other such acquisitions. But the wildlife values of the tract, among them the largest snowy plover nesting habitat on the Central Coast, "far surpass" that of any other areas acquired, says the Audubon Society's Arthur Feinstein.

CALIFORNIA COTTON FARMED ORGANICALLY GREW FROM 100 TO 15,000 ACRES between 1989 and 1994, according to the Sustainable Cotton Project. Such eco-friendly cultivation practices, while they reduce chemical runoff into the Estuary, also result in cotton that costs 15-20% more than the nonorganic variety. But the price difference has halved over the past two years as practices become more efficient, banks become more supportive, and the market grows, says the Project's Will Allen. (209)862-0860

BURNING ISSUE

SLUDGE BAN FOR DELTA?

Sewage sludge isn't likely to produce an enthusiastic response from common folk, whatever its demonstrated value as a farm fertilizer. The negative public perception is just one of many factors — including the state of sludge science and existing laws governing its use — that is influencing debate over a new regulation proposed by the Delta Protection Commission. The regulation would preclude construction of new sewage treatment facilities and the placement of sewage effluent or sludge on 500,000 acres in the heart of the Delta.

The way the 19-member Commission sees it, the Delta's primary zone is so unique in terms of its biological, agricultural and drinking water riches and their susceptibility to flooding due to land subsidence below sea level, potential levee failures, poor drainage and the closeness of groundwater to the surface — that sewage facilities and byproducts shouldn't be allowed there. The theory is that any flooding might release heavy metals, salts, bacteria, pathogens and other undesirables into the zone.

"Our commissioners all agree with the concept of putting sewage sludge to good use on the right site, but not in the Delta's primary zone," says the Commission's Margit Aramburu.

"If it's done right it can help agriculture but if it's not it can kill us," says David Guy of the California Farm Bureau, which supports the Commission's stand. "One wrong move could affect the water quality of the entire state."

But the sludge industry thinks existing EPA and Central Valley Regional Board regulations already more than adequately protect water quality and sensitive areas of the Delta. According to Bio Grow's Linda Novick, current regs limit how, where and under what conditions her company can spread "bio-solids" on farmland. "We don't think this is a good policy precedent," says Novick. "It's a policy based on public perception not science. And it takes useful fertilization options away from Delta farmers."

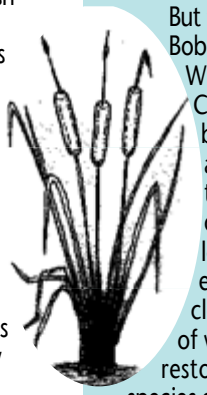
Aramburu is quick to argue, however, that the Delta is unique enough that state and federal regs don't fully cover it. The current Central Valley Board regs take the form of a general order that doesn't provide for site specific public review and allows industry to monitor itself. As this issue went to press, State Water Board staff were recommending that this general order be remanded back to its Central Valley arm for full EIR review. Aramburu says such a review could answer a lot of the remaining scientific questions about sludge impacts but that it will take money the regional board doesn't have. In the meantime, she's confident her commission will err on the side of caution and public perception.

"This issue isn't going to go away and it isn't just about the Delta," she says. "It's about finding the best use for a material and deciding on public goals concerning what some people see as a waste and a threat and others as a resource." Contact: Margit Aramburu (916)776-2290 or Linda Novick (714)476-4080 *ARO*

INSIDE THE AGENCIES

TEN WAYS TO FIX THE DELTA

A splash of freshwater here, a flooded island there.... A new canal, a rebuilt levee, a big reservoir, a small diversion... Wider river meanders, broader Delta channels, shadier streamsides.... Less water wasted and polluted, more water for cities, fish and farms... This is the stuff, in various shapes, sizes and combos, of CALFED's list of ten ways to fix the Delta.



CALFED — a collaborative effort among ten government agencies and myriad stakeholders aimed at solving the Bay-Delta's water supply and environmental problems in the long-term — proposed 20 alternative fixes in March and recently whittled the list down to 10. Three of these alternatives emphasize development of major new "conveyances" to reroute water from upstream supplies to downstream users and around the sensitive Delta. Such conveyances, combined with new diversion points, could greatly reduce fish entrainment due to water exports and increase supply reliability. But they could also significantly alter an already heavily-tinkered-with estuarine ecosystem, and they harken back to past proposals for a Peripheral Canal.

Four other alternatives emphasize a combination of new water conveyance, diversion and storage facilities with improvements in management and/or the capacity of the current system. One matches a small conveyance capable of moving 5,000-7,000 cubic feet of water per second along the Delta's east side with improvements to existing Delta channels to speed through-flow, for example. Another develops new storage facilities up and downstream of the Delta which would in turn enhance flexibility in timing diversions so that fish loss at the pumps is minimized.

The three remaining alternatives stress improving management and facilitates in the existing system. The first focuses on aggressive "demand management" — reducing the demand for diversions via methods such restructuring water pricing, conserving urban and agricultural water, reclaiming urban wastewater, and retiring farmland from production. The second would improve through-Delta water conveyance and downstream storage to increase water delivery flexibility. The third mixes major habitat restoration efforts with a new in-Delta facility to store water for environmental purposes — based on the premise that healthier, happier fish and other aquatic organisms will be less vulnerable to diversions.

Beyond the basic emphasis of each alternative is a carefully balanced diversity of other measures ranging from fish screens and wetland restoration to levee upgrades and pollution prevention. CALFED says it's carefully put these kinds of measures together so that each alternative offers a comprehensive, ecosystem-level approach to solving the Delta's problems. The diversity of alternatives presented seems testimony to CALFED's effort to keep all options on the table. But now comes the hard part — shrinking the ten down to 3-5 alternatives by the end of June. To review and or comment on today's ten, request a copy of CALFED's *Phase I Progress Report* from (916)657-2666.
ARO

ENVIRO-CLIP

A BIOLOGICAL BOTTOM LINE

CALFED has set ambitious and broad goals for Bay-Delta restoration but Gary Bobker thinks they need to get more specific. "Without specific restoration objectives, any improvement to the environment could be viewed as acceptable," says the Bay Institute activist.

But "any" improvement isn't what Bobker and others in the Environmental Water Caucus are after. Now that CALFED has 10 alternatives for balancing Bay-Delta water supply and environmental concerns on the table (see opposite), many in the caucus are finding themselves at a loss to evaluate their respective environmental value. "Without a clear vision and measurable targets of where we want to go in terms of restoration, in terms of reversing species declines or reaching some level of ecosystem health as opposed to merely maintaining the patient on life-support, how can we proceed?" says Bobker.

CALFED's Dick Daniel says many of the specifics Bobker is after are covered in a newly released and much more detailed description of the program's 10 alternatives. But he acknowledges that there are still gaps in the science, in historical accounts of past resources, and in CALFED's ability to conclude that some specific degree of restoration would represent a functional ecosystem. "We're still open on how to set goals and measure performance in achieving them," says Daniels.

This leaves the environmental caucus' technical staffs burning the midnight oil to generate what Bobker calls a "framework for an ecosystem restoration plan." This framework, as he envisions it, might create two tiers of quantifiable restoration targets. The first tier would consist of short-term, fairly specific targets aimed at restoring natural processes (such as flow and habitat) to the extent necessary to meet established recovery criteria for species of concern. Such targets might identify minimum amounts of acreage to be restored of certain types of fish habitats, for example, or set threshold flow levels necessary to transport endangered fish during sensitive periods. The second tier would focus on longer-term and larger scale ecosystem level targets that might focus, for example, on establishing partial or full equivalency to conditions at some less ecologically-disturbed time in past.

Progress toward both types of targets could be evaluated based on a set of ecological indicators of ecosystem health, says Rod Fujita of the Environmental Defense Fund. Over a hundred such indicators have already been put on paper as a result of scientific workshops co-organized by the Fund and the Institute (March 1996 draft report now available).

"Setting a biological bottom line seems to be a challenging task no one wants to start," says Bobker."We think CALFED can't come up with a defensible product until they've got it, and we're trying to take the first step." Contact: Gary Bobker (415)721-7680
ARO

DREDGE SCOOP

A TALE OF THREE HARBORS

Those in the nation's inner dredging circles have long extolled the Army Corps' "PSSDA" program in Washington's Puget Sound as the shining star of public-private cooperation in solving dredging problems and balancing environmental and shipping concerns. Conversely, those writing the front pages of Eastern newspapers describe New York harbor as "choking in mud....and locked in debate with beachfront communities, fishermen and environmental groups who oppose any further disposal of tainted silt in the ocean." As San Francisco Bay begins to to nail down a regional solution to its own dredged material disposal problems (see insert), a comparison with the two other ports reveals the terra firma ahead and the quicksand behind.

"New York's stuck where Puget and San Francisco started out," says the Bay Commission's Steve Goldbeck. Back to the 1980s, the two Pacific ports experienced sudden shut downs of primary dredged material disposal sites due to fishery and environmental concerns. More recently, New York's Mud Dump, the region's disposal mainstay, became off limits to over two thirds of the New York area's dredged material due to new and tougher EPA toxicity tests for ocean dumping.

While the origins of this "mudlock" in the three ports may be similar, the politics, timing and disposal demand have all been different. Puget Sound began is mudbreak back in 1985 in a liberal and "environmentally interested era," according to the Seattle Army Corps' Stephanie Stirling. By the time San Francisco began its effort in earnest in 1990 the era had a more economic flavor. Important fisheries and major port upgrades were at stake and warring interests had become entrenched. But "once everyone realized we were all holding guns to each others heads we started to negotiate," says Goldbeck.

New York, according to its Port Authority's Tom Wakeman, doesn't have the multi-interest "desire" for consensus that San Francisco has. "For us it's more a matter of political will, of looking for the biggest voting coalition, of allaying public fears about dredged material ending up on their beaches." In addition, Wakeman says no one in the two-state New York/New Jersey port seems to be willing to be responsible for disposal of anyones' dredged mud but their own. He says New York is just barely beginning to consider the kind of "regional" strategy for dredged material management that Puget has and San Francisco's hatching.

Other key differences between the three ports have influenced the relative success of their dredging programs. Puget may be a shining star, but it also has the cleanest mud on average, the naturally deepest channels and the least amount of material to dredge. Puget dredges around 700,000 cubic yards per year, New York around four million and San Francisco around six. Puget's about as clean as any urban harbor region gets while San Francisco's contaminant levels are middling and New York's more often than not off the charts. "There was a heavy concentration of people, industry and sewage outfalls here for a hundred years before San Francisco came of age," says Wakeman.

"What we hear is that our dirty sites are New York's clean reference sites," says Goldbeck, "that their mud is black mayonnaise."

PACIFIC VS. ATLANTIC PORTS OF CALL

The degree of sediment contamination, and the heavily developed nature of the greater New York area, narrow the region's disposal options. There are no nearby diked baylands perfect for politically-correct wetland restoration reusing clean dredged material as in San Francisco Bay. Engineering fill for a parking lot is more along the reuse lines for New York. For the rest, Wakeman is looking at constructing containment islands and/or underwater pits where contaminated material could be capped. But none of these options are up and running yet. Indeed New York's recently had to send 150,000 cubic yards of contaminated dredged material all the way to a Utah dump — pricetag $18 million (or $118 per cubic yard, as compared to Mud Dump's $5 bucks a yard).

By way of rough comparison (cost estimates vary wildly in their assumptions), "chemically-challenged" Oakland mud from a recent harbor deepening went to a local golf course site for $22 a cubic yard while cleaner material went to the ocean at around $8 and into a wetland restoration at around $10. Puget's average disposal costs per cubic yard are $3-5.

While New York remains in mudlock, San Francisco is moving toward regional consensus on a blend of beneficial reuse and Bay and ocean disposal, and the Puget Sound is happily humming along with the eight aquatic disposal sites it established under its regional program in 1988 and 1989. But all three regions, at whatever stage, are basically finding the same thing, according to Wakeman. "It's not the environment or the economy, it's the environment *and* the economy," he says. "Favoring either one is a disaster for both in the long run."

"What really makes things work is accountability," says Sterling, whose federal agency takes the lead on dredging programs across the nation and has at times been perceived as irreverent of Nature. But the Corps' eleven-year-old model Puget program reports to the public on its activities at an annual review meeting every year. Sterling says the environmental groups don't even show up at these meetings anymore. "Trust is something you earn," she says.

As Goldbeck sees it, San Francisco's already been in New York's muddy boots and doesn't want to go back. "We're nearing a solution," he says. "I hope we achieve the acceptance and satisfaction in both the environmental and economic camps that Puget's program has earned." *ARO*

SPECIES SPOT

HATCHING SALMON NATURE'S WAY

A report issued by the National Research Council last fall concluded that the widespread use of fish hatcheries has not only failed to slow the decline of anadromous fish runs, but actually contributed to this drop-off. Despite such criticisms, the four fall-run chinook salmon hatcheries in the Sacramento basin continue to produce millions of smolts every year. A proposed $30 million dollar hatchery on the Tuolumne River, however, hopes to show how improved hatchery production can help rather than hinder the beleaguered species.

The NRC's report argued that some hatcheries are producing fish in quantities that overwhelm wild salmon populations and, in turn, weaken the overall species. Hatchery-produced salmon — which tend to possess a relatively narrow range of genetic variation — may lack the ability to adapt to environmental stresses and changes. Once these less-adaptable, artificially-sustained populations dominate, disease or changing stream conditions can cause catastrophic loss and threaten to wipe out an entire run — or specific population — of salmon.

Cal Fish & Game's Bill Loudermilk, however, insists that fisheries cannot be restored to historic levels without hatcheries. Loudermilk wants to develop a new and different kind of hatchery on the Tuolumne which he calls a "supplementation" hatchery as opposed to the traditional large "production" hatchery. Whereas production hatcheries generally have large numeric goals to meet each year, a supplementation hatchery could vary and limit its production to dovetail with fluctuations in natural run numbers, says Loudermilk.

Other innovations focus on representing the full diversity of natural genes in the hatchery population. In the past, it was common to mix sperm from more than one male with each female's eggs to optimize fertilization rates. At Tuolumne, they hope to use only sperm from one male per female so that the genes from each parent have an equal opportunity of being expressed in the hatchery population (the previous system favored males with speedier sperm). Another technique along these lines would extend the egg fertilization process from a one shot deal to the entire spawning period of a particular run.

"New techniques can help fish managers avoid the problems of the past," says Loudermilk.

Peter Moyle, a fish specialist at UC Davis, is skeptical of the proposed Tuolumne hatchery. While he concedes that "they're thinking along the right lines," he is wary of constructing another hatchery. He explains that Loudermilk's innovative hatchery will be expensive and staff-intensive to operate. In his opinion, it will only work if there is secure funding down the road — otherwise, budget cuts will eliminate all the monitoring and staff time, leaving just the hatchery. "Once the hatchery is in place the temptation will be to use it as a production hatchery," says Moyle.

Moyle has written a letter to U.S. Fish & Wildlife expressing his opposition to the hatchery. He sees the Tuolumne river as an opportunity to implement and closely monitor natural restoration efforts. These efforts are being emphasized in such documents as U.S. Fish & Wildlife's draft restoration plan for anadromous fish — now being finalized — which was developed to meet the population doubling requirements of the 1992 Central Valley Project Improvement Act.

Moyle worries that Cal Fish & Game, which has already acquired the property for the hatchery, will go ahead with its plans without proper review. But he seems willing to be convinced that the new hatchery is a good idea. Without hatcheries, he concedes, salmon fisheries are unlikely to be maintained. Contact: Bill Loudermilk (209)445-5415 *MB*

HARD SCIENCE

NOT SO EASY EZ

A new study of the EZ — otherwise known as the entrapment zone where ocean tides and river outflows overlap and support copious life at the base of the estuarine food chain — suggests that the zone isn't where or what scientists once thought it was. According to the Romberg Tiburon Center's Wim Kimmerer, who headed up the multi-scientist Interagency Ecological Program research effort, "Tidal flows are more important than we suspected."

For years, scientists have thought "gravitational circulation" — two layer circulation in which heavier, salty tidal water moves upstream along the estuary bottom and lighter, fresh river water moves downstream on the surface — occurred in and enhanced the riches of Suisun Bay. But research by the U.S. Geological Survey's Jon Burau found this type of circulation rare in Suisun Bay. "Some other mechanism must be responsible for the aggregation of organisms in the bay, and it's probably tidal migration," says Kimmerer.

Just how organisms use the tides to move around the EZ and Suisun Bay was a major question for the two-year, high-tech field study which examined the relationships between the positions of organisms — in terms of their height in the water column and their location upstream or downstream of the EZ — and physical parameters like tidal flow, river flow and time of day.

Reseachers found that most organisms ride the higher velocity flood tides upstream, then drop down to the lower velocity layers on the ebb. In this way, minute specks of life that any casual observer would assume just drift around and go with the flow are actually behaving in a way that maintains their position within range of the EZ.

The study also showed how strong an influence the burgeoning exotic Asian clam *Potamocorbula amurensis* — which is consuming the EZ food supply — has had on the abundance of life in the zone. "Abundance peaks are not in the same place, nor nearly as pronounced, nor as year round as they was before the clam's arrival," he says. "There's been an upstream shift in

continued back page

CCMP BRIEF

DELTA DERELICTS

The Delta channel islands — California's "most ignored piece of real estate" by one biologist's estimation — were the subject of a one-day workshop this February in Stockton. The workshop, organized by the S.F. Estuary Project through its Delta CCMP subcommittee, brought together Delta stakeholders to discuss the present state of this waterbound real estate and the prospects for restoration.

The channel islands number about 800, according to the Army Corps. Also known as derelict islands, they were amputated from larger Delta islands during dredging for agricultural levees and deepwater shipping channels. But the channel islands, unlike their parent islands, have never been farmed or inhabited by humans. According to Sonoma State's Chris Kjeldsen, they are all that remains of a vast biological heritage, a "library of information that is in danger of being lost."

The main danger to the islands is erosion. Workshop presenters theorize that upstream dams have eliminated the Delta's sediment input which would otherwise counter this natural geomorphic process. Erosion is exacerbated by recreational boat wake, wind fetch, and other causes, they say.

At the conference, Cal Fish & Game's Frank Gray reported on a restoration team's attempt to lay down rip rap and dredge spoil along the shoreline of three islands in 1994. Gray says problems plagued their efforts, ranging from permitting hassles to engineering difficulties. The foremost permitting obstacles centered around impacts to endangered Mason's lilaeopsis and delta mudwort. These plants can be destroyed when island banks are reinforced. Though advocates of restoration concede that such problems must be resolved before justifying additional projects, they suggest that anything may be better than allowing the islands to simply wash away.

Conference facilitator Paul Schwarz acknowledges the importance of these ecological debates, but wants to see more focus on the politics of island restoration. "Folks who use the Delta will ultimately be responsible for the implementation and maintenance of these projects," he says. "Involving them in developing solutions is key to our success or failure." Contact: Ron Sokolov (510)286-0924 *MB*

SIERRA, FROM PAGE 1

watershed stewards. "But there's no economic framework for this stewardship," she says. "Our resources are eroding and counties going broke. People are fighting the fish. Maybe if we were being paid for preserving water for the fish, then we'd have an incentive."

The counties went into what Wills call "defense mode" when the State Board gave notice earlier this year that it was preparing a draft EIR on the impacts of a water rights reallocation necessary to implement its 1995 Bay-Delta Water Quality Control Plan. The third alternative in the EIR notice seeks to "balance the public trust and reasonable use" by shaving northern water rights, according to Wills.

"You can't define the trust as taking water from the north for free and giving it to the south," she says. "This is the tragedy of the commons. This is the biggest takings issue of the century. All the notion of reinvestment is downstream." The counties will present their own proposal for "balancing the trust" to the State Board soon.

Steve Macaulay of the State Water Contractors, a nonprofit representing 27 water districts, says that the needs of northern counties like Plumas are definitely on the radar screen these days. This wasn't always the case, both Macaulay and Wills agree. She says the first time she showed up a Bay-Delta meeting everyone thought she'd gotten the wrong room. "We've encouraged Plumas and other counties who have not been engaged up until now to get involved in the CALFED Bay-Delta planning process," Macaulay says.

This process goes further than the State Board reallocation and serves to balance Bay-Delta water needs and restoration in the long-term (see page 3). Whatever final solution CALFED settles on, it might take from 5-15 years and cost $5-10 billion to implement, says Macaulay.

Long-term funding is likely to come from about a dozen sources, including water users up and down the state and a $500 million bond issue (SB900-Costa) proposed for the November ballot. One possibly contentious issue is whether restoration funds will be used north of the state and federal water projects or downstream. Northern counties are pushing for reinvestment in both areas. "You're not doing ecosystem management if you cut the ecosystem off at the dams," says Wills.

The Plumas Corporation already has a coherent, ecologically sound restoration plan in which 25% of any new funds would go to counties and 75% to restoration including forest health, road rehabilitation, erosion control and riparian enhancement.

Wills and others hope that new jobs that are created by reinvestment will help shape the county's future. Like other resource-dependent rural areas in the West, Plumas County has been encouraging housing development to stem the economic decline caused by timber market globalization and forest degradation. But Wills thinks the highest and best use of the headwaters is as watershed not subdivision, and that an economy based on land and water stewardship could help Plumas retain its rural character. "Why urbanize the state's water banks so they then withdraw water from the rest of the state?" she says.

Wills is looking now at how a stewardship approach would "lay out in the land." One proposed sustainable development project is a facility to make ethanol fuel out of the small trees, mostly white fir, that grow in forests where fire has been suppressed. In contrast to the clearcutting of 1,000-year-

continued back page

WHO REINVESTS IN THE RESOURCES?
ECONOMICS OF NATURAL RESOURCE ALTERING ACTIVITIES IN THE SIERRA

ACTIVITY	GROSS REVENUE	ESTIMATED SURPLUS VALUE MINUS COST	COMMUNITY/ECOSYSTEM REINVESTMENT % OF PROFITS
Developed Recreation	$ 1,500M	$ 150M	0-10%
Timber	600M	100M	50%
Hydroelectric Gener. H_20	612M	500M	negligible/unquantified
Water Diversions	400M	1,083M	negligible/unquantified
New Residential Development	1,000M	70M	negligible/unquantified
Grazing	50M	5M	negligible/unquantified

Adapted by Plumas Corporation from Wm. C. Stewart of the Pacific Institute's work on Sierra Nevada Ecosystem Project

PLACES TO GO & THINGS TO DO

WORKSHOPS & SEMINARS

The History of California's Marine Ecosystem (lecture)

THURS·5/2·7 PM

Sponsor: Berkeley Natural History Museum
2050 Valley Life Sciences Building, Berkeley
(510)642-7541

Steering the Water Agenda Through Turbulent Times: ACWA Spring Conference

WED-FRI·5/8-10·All day
Topics: Discuss issues critical to the water community, including key legislation and policy developments at the state and federal levels.
Sponsor: Assoc. of California Water Agencies
Monterey Conference Center, Monterey
Cost: $395 (916)441-4545

Central Valley Riparian Habitats

THURS·5/9-10·All day
Topics: The critical role of riparian habitats in the Central Valley and their relationship to agricultural lands and other habitats.
Sponsor: UC Davis Extension
Call for exact location
Cost: $235 (800)752-0881

Negotiating Effective Environmental Agreements

THURS-FRI·5/9-10·All day
Topic: How face-to-face negotiation can augment traditional environmental policy making with creative agreements that are better informed and more stable.
Sponsor: CONCUR
Clark Kerr Campus
2601 Warring Street, Berkeley
Cost: $400 (510)649-8008

Creating Partnerships: 3rd Annual Bay Area Volunteer Monitoring Conference

FRI·5/10·All day
Topics: Discussion of volunteer monitoring issues, including setting goals, sustaining activities and building partnerships, plus workshops on how to start a volunteer program and data management. Field trips to various locations are available 5/11-12.
Sponsors: SF Estuary Institute; State Water Bd; Rivers, Trails and Conservation Assistance Program; and Urban Creeks Council
Conference Room – San Leandro Main Library, 300 Estudillo Avenue, San Leandro
Cost: $15; Additional $15 per field trip
(510)231-9539 or joelle@sfei.org

Land Use Planning for Environmental Professionals

TUES-THURS·5/14-16·All day
Topics: Local government structure and priorities, principles of local land-use planning and state agency and local government partnerships to implement state resource conservation policies.
Sponsor: UC Davis Extension
Sutter Square Galleria
2901 K Street, Sacramento
Cost: $385 (800)752-0881

Central California Water Tour

WED-FRI·5/15-17·All day
Topics: Discussions of surface and ground water use, including visits to the State Water Project and the Central Valley Project, plus visits to wildlife refuges and dams.
Sponsor: Water Education Foundation
(916)444-6240

Bay-Delta Water Tour

WED-FRI·6/19-21·All day
Topic: Educational travel through the Delta and the Bay Area, with tours of Delta waterways and wildlife refuges.
Sponsor: Water Education Foundation
(916)444-6240

HANDS ON

4th Annual Mother's Day Barbeque and Silent Auction

SUN·5/12·12PM-2PM
Activity: Gather for a barbeque luncheon, then visit Audubon Canyon Ranch to view nesting egrets and great blue herons.
Sponsor: Marin Audubon Society
Volunteer Canyon north of Stinson Beach; call for exact location
Cost: $12 (benefits Audubon Canyon Ranch and Marin Audubon)
(415)453-4715

MEETINGS & HEARINGS

Bay Commission

THUR·5/16·1 PM
Topics: Public hearing on consistency determination for Concord Weapons Station project.
Call for location
(415)557-3686

NOW ON LINE

HOME PAGE PICKS

To help you sift the sites as you surf the Web, ESTUARY's put together a short list of informative home pages. We can't possibly include everything out there, so let us know your favorites, and we'll publish them in a future issue.

Access USGS San Francisco Bay and Delta: Links to extensive information on the Bay and Delta, including water flow, wetlands, water quality, hazards, urbanization and digital maps. http://sfbay.wr.usgs.gov/

The California Department of Water Resources: Links to current information on weather, water and snow; the California Water Plan; and the State Water Project. http://www.dwr.water.ca.gov/

California Government Agency & Commission List: A jumping off point for access to government agencies via the World Wide Web. http://www.ganymede.org/agencies.html

CERES: (California Environmental Resources Evaluation System) A huge data and information base on natural resources, plus extensive links to other sites. http://ceres.ca.gov

The Regis Home Page: (Research Program in Environmental Planning and Geographic Information Systems) GIS tools applied to environmental planning, management, research and teaching. http://www.regis.berkeley.edu/

San Francisco Bay Area Progressive Directory: A collection of about 1000 organizations in the San Francisco Bay Area of interest to the progressive activist community, including extensive environmental links.
http://www.emf.net/~cheetham/dir.html

San Francisco Bay National Wildlife Refuge: Information on Refuge activities and programs, how to volunteer, environmental education program and links to other environmental organizations. http://www.r1.fws.gov/sfbnwr/sfbnwr.html

San Francisco Bay-Sacramento/San Joaquin Delta Geographic Information System: Over 100 digital data layers (maps and associated statistics) on urban growth forecasts, existing land use, historic Bay margins, streams and watersheds (part of REGIS). http://www.regis.berkeley.edu/baydelta.html

SINBAD — The Scientific Information Network for the Bay and Delta will soon be accessible through the San Francisco Estuary Institute's Web site. SINBAD contains the Estuarine Data Index, the Bay-Delta Bibliography and Bay-Delta Hearing Testimony and Exhibits. http://www.sfei.org/data_man.htm

Finally, **ESTUARY** newsletter, your Bay-Delta news clearinghouse, is now available (back issues only) on the Web at http://www.abag.ca.gov/bayarea/sfep/index.html

SIERRA HEADWATERS CONT'D

old trees now going on under the auspices of the controversial timber salvage rider, the county's plan is to find a use for the smaller trees that must be taken out if the forest is to approach pre-settlement conditions, says Wills. She points out that an ethanol facility would not only protect northern watersheds for the dry and smoggy southern state, but also improve air quality down the road.

If it works, economic conversion in Plumas County could provide a model for other resource dependent communities, according to EPA's Tim Vendlinski. The region also has the Quincy Library group, a nationally recognized consensus coalition of citizen activists, timber industry officials, U.S. Forest Service staff and local government officials, which has been working to solve the region's timber problems.

"There are these disaffected people, loggers and miners out of work, and ranchers concerned with regulation. The resources have been plundered and a Wise Use ethic is emerging," says Vendlinski. "Then there's the Quincy Library Group and the Plumas Corporation saying the government is not necessarily our enemy, here's what we can do together."
Contact: Leah Wills (916)283-3739
SZ

EZ CONTINUED

abundance peaks from the 2 parts per thousand isohaline in Suisun Bay to 1 ppt or less." (An isohaline refers to a line in the estuary with a specific amount of salt in the water). This shift corresponds with the area outside the clam's reach.

In addition, work by the Romberg Center's Tim Hollibaugh indicated that many bacteria in the EZ are associated with particles of organic matter in the water, rather than free-living. This suggests, says Kimmerer, that organisms such as copepods and filter feeders which are too big to eat free-living bacteria could be feeding on the particle-bound brand, and that the latter may be a larger contributor to the estuarine food chain than once thought. The final report on the study is due out around June.
Contact: Wim Kimmerer (510)525-9073
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ESTUARY
YOUR BAY-DELTA NEWS CLEARINGHOUSE

APRIL 1996 VOLUME 5, NO. 2

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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.* ***For a free trial subscription*** *(three issues), mail your name and address to Liz Blair of ESTUARY at the address above. Views expressed may not necessarily reflect those of staff, advisors or committee members. Printed on recycled paper with soy-based inks by Alonzo Printing Co.*

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