YOUR INDEPENDENT SOURCE FOR BAY-DELTA NEWS & VIEWS

ESTUARY

ONE IF BY LAND

Lisa Krieshok

The Bush Administration dealt a major blow to the control of aquatic invasive species when it announced last September that the U.S. Environmental Protection Agency would no longer regulate ballast-water discharges from ships, instead leaving this duty to the U.S. Coast Guard. Meanwhile, California's budget woes are weakening protection against other paths of invasion.

Agricultural check stations—a major front in the battle against aquatic invasive species arriving by land—are for the most part limiting their inspections to large, commercial vehicles as a result of the state's fiscal troubles.

To help slash roughly half its annual budget, the California Department of Food and Agriculture, which runs the check stations, will no longer inspect on a regular basis private cars towing boats used for recreation. "We reserve the right at any time to inspect passenger vehicles, but the shift of emphasis is to commercial vehicles, moving vans, and RVs," says Food and Agriculture's Steve Lyle.

The move could threaten the efforts of the Golden State to keep out the most feared invasive species, the zebra mussel. Native to the Caspian and Black seas, zebra mussels were first found in California in 1993 attached to a trailered boat inspected at the agricultural check station in Needles. In 1995, five more private boats turned up at agricultural check stations in Needles, Yermo, and Truckee with zebra mussels in tow. All six boats had traveled more than 1,000 miles from the Great Lakes with the invasive hitchhikers aboard. Lyle says the current inspection system should catch the mussels because they "are confined to yacht-sized vessels that are towed on commercial-sized vehicles."

A 1994 study by U.S. Fish & Wildlife found that recreational boating activity is the primary means by which zebra mussels—on hulls, motors, and in motor compartments—are crossing the Continental Divide.

The mussels leave huge economic and ecological damage in their wake, colonizing and plugging water intakes at power and water treatment plants. Cleaning these facilities is expensive—Pew Oceans Commission estimates put the cost to remove zebra mussels from the Great Lakes region, where they first appeared in the United States, at between $750 million and $1 billion for the years 1989-2000. **KC**

Napa Deal Demystified

A proposal that would revamp California's state and federal water projects has environmentalists spitting mad, while proponents say the plan does nothing more than advance CALFED's established goals for improving water supply reliability.

The deal, known unofficially as the "Napa Proposition," was negotiated in July during a week-long series of closed-door meetings between BurRec, the Department of Water Resources, and several large water contractors, including Westlands Water District and the Metropolitan Water District of Southern California. It calls for increasing pumping at the Banks Pumping Plant to 8,500 cfs and coordinating the operations of the federal Central Valley Project and the State Water Project to allow them to share pumping and storage capacities, including construction of an intertie between the two systems, among other measures.

"This is the biggest, baddest diversion from CALFED yet."

"The big contractors are just cherry-picking the parts of CALFED that they like," says the Sierra Club's Eric Wesselman, referring to the state-federal effort to improve the reliability of the state's water supply while restoring the Delta ecosystem and improving water quality. "Napa shows a disregard for the standards and obligations outlined in the CALFED Record of Decision (ROD) and its regulatory underpinnings. This is the biggest, baddest diversion from CALFED yet."

Wesselman and other enviros say the proposal allows as much as a million acre-feet of water to flow south each year, and insist it is unconscionable to talk about taking more water out of the Delta system while major environmental commitments have not been met. They point in particular to the Environmental Water Account—established by CALFED to mitigate for the effect of pumping on fish populations—which, in the three years of its existence, has never yet received the money or water prescribed in the ROD. They also point out that CALFED's Environmental Water Program has yet to be implemented, and that neither take limits established by the Endangered Species Act nor the Central Valley Improvement Act's requirement that anadramous fish populations in the Delta be doubled have yet been met.

Proponents of the proposal vehemently reject the charge that it amounts to an end run around CALFED. "This proposal is entirely within the spirit of CALFED," says MWD's Tim Quinn, who disputes the million acre-feet figure. He maintains that the plan advances CALFED's "balanced agenda" of improving water supply reliability and water quality while protecting the environment. "How you achieve reliability is much more important to the health of the fisheries than whether or not you do it," he says, pointing out that by improving the efficiency of the two existing water projects, the proposal will enhance reliability through water markets, transfers, and banking rather than through the traditional approach of building dams and reservoirs. He notes that MWD has supported every aspect of CALFED's environmental restoration program, and points out that the proposal specifically calls for the expansion and funding of EWA. Quinn also denies that there was anything sinister about the private meetings that led to the proposal. "This was a legitimate caucus meeting—the environmental caucus holds meetings all the time that we are not invited to."

Enviros are not the only ones with concerns about the proposal. Delta water agencies, which were not invited to participate in

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CONFERENCE

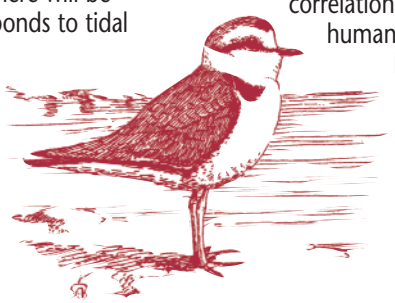
BEDEVILED BY CHOICES

Though the words "changes and challenges" dominated the banners and brochures of October's State of the Estuary conference, another "C" word kept springing to the lips of its speakers: choices. The 800-plus crowd gathered at the Henry J. Kaiser Convention Center in Oakland heard experts talk about difficult choices ahead, as we try to reach ambitious restoration goals for huge areas of our watershed without bringing on more pollution, mosquitoes, invasions, or clashes over which city or island or bird or fish gets what water. "We are entering an era of choices, and they won't be easy ones," announced one of the first speakers, CALFED's Sam Luoma.

Tackling tough choices will require science, education, and especially leadership, according to keynote speaker Leon Panetta. Too often it is not these things, but a crisis that drives environmental policy said the 16-year congressman from Monterey, who served as White House Chief of Staff from 1995 to 1997. Panetta pointed to the collapse of Monterey Bay's valuable sardine fishery as an example of shortsighted stewardship and called for a national commitment to protecting our oceans and estuaries on the order of Roosevelt's early commitment to our national parks. "We need to decide what kind of quality of life we want to pass on to the next generation," he said.

Many of the decisions that loom ahead involve birds. The last few generations of Bay shorebirds have greatly benefited from the large constellation of salt ponds in the South Bay, but they may need to make way for other avians unless careful choices are made about what the U.S. Environmental Protection Agency's Mike Monroe called the largest single habitat restoration project ever envisioned for the Estuary. We must decide how and where to maximize habitat potential for the many different species of birds that currently use the ponds, continued the Point Reyes Bird Observatory's Nils Warnock. There will be tradeoffs in transforming the ponds to tidal marsh, with dabbling ducks benefiting the most, he said.

Tidal marsh restoration could displace the threatened snowy plovers that nest in and around the salt ponds and levees in the South Bay and that need to be handled with kid gloves. According to U.S. Fish & Wildlife's Joy Albertson, the Bay supports 100-150 breeding plovers, about 10% of the entire U.S. population. The birds nest in shallow scrapes on salt pond levees or flat open areas within 100 meters of water, lining their nests with pebbles and salt crystals. But California gulls—which also roost on dry salt ponds and levees—prey on plover nests and chicks. Like gulls, ravens and crows are thriving as the Bay Area continues to urbanize. They "hang out" in the landfills built next to the wetlands years ago, and also eat plover eggs and chicks. Choosing where to locate and restore salt pans and ponds will be critical to the plover's future, said Albertson, along with deciding how to manage water levels, salinities, and predators.



Ravens and crows are not the only interlopers on sensitive bird turf. The hum of mountain bikes or the drum of hiking boots can also disrupt shoreline birds and mammals, but regulators and scientists are still trying to figure out just how much is too much. The S.F. Bay Commission's Caitlin Sweeney told the crowd that two field studies along the Bay Trail show differing results—one that humans have an adverse effect; the other that there is no correlation between bird use and human use of trails. "We still have a lot to learn about the relationship between frequency and intensity of human use and effects on wildlife," admitted Sweeney.

Because the South Bay ponds are located in such a heavily populated urban area, said the Coastal Conservancy's Amy Hutzel, resource managers will need to decide how to balance many competing interests, among them endangered species, birds, flood management, and wildlife-oriented public access and recreation. Planners are applying what has been learned about restoring salt ponds in the North Bay, but the South Bay is a different animal, said Hutzel, who explained that the Conservancy and its partners are working on a phase-out and stewardship plan that will deal with such issues as formulating a long-term water circulation plan for the ponds, and minimizing mercury methylation, introduced species, and mosquitoes. Said Hutzel, "We hope to compress the 10 years of work done in the North Bay to five years in the South Bay."

SCORECARD
STATE OF THE ESTUARY ACCORDING TO THE BAY INSTITUTE

D+ Score = 32	**Habitat** Bay habitat loss is slowly being reversed, but it could take nearly 200 years to reach the tidal marsh restoration goal.	long-term ↓	short-term ↑
D Score = 29	**Freshwater Inflow** Reduced inflows are still degrading the Bay ecosystem, and recent gains from wetter years and new standards are being eroded	long-term ↓	short-term ↓
C Score = 55	**Water Quality** Open waters are cleaner, but standards are not met in parts of the Bay. Toxic sediments and storm runoff are a major problem.	long-term ↑	short-term ↔
F Score = 10	**Food Web** Plankton levels in the upper Bay have crashed, reducing food sources for fish and birds. Alien species are locally dominant.	long-term ↓	short-term ↔
B- Score = 63	**Shellfish** Crab and shrimp numbers are increasing, but commercial harvest is still down from previous high levels.	long-term ↓	short-term ↑
C- Score = 39	**Fish** After a long decline, fish populations are stable at low levels, but some species are still endangered.	long-term ↓	short-term ↔
D+ Score = 31	**Fishable-Swimmable-Drinkable** Fish are harder to catch, and unsafe to eat. Beach closures are up, drinking water violations are down.	long-term ↓	short-term ↔
C- Score = 43	**Stewardship** Water conservation, pollution limits, monitoring, and restoration efforts are finally underway, but progress is slow.	long-term ↓	short-term ↔

But how will we pay for long-term maintenance and operations of the restored South Bay ponds? That was the question posed by the Bay Institute's Marc Holmes in his talk the second day. The Bay lacks a distinctive identity 3,000 miles away in Washington, D.C., said Holmes, which makes it challenging to get federal funding. It doesn't have the poetic "River of Grass" image of the Everglades, or the strong, multi-state constituency of Chesapeake Bay, said Holmes, and "historic diked baylands" don't necessarily inspire East Coast politicians. "When people think of San Francisco Bay, they think about the Golden Gate Bridge and the Transamerica Pyramid building," he said. The Bay needs not only a strong identity that will resonate in Washington (Holmes suggested John Hart and David Sanger's "Hollow Lands"), but also a planned funding strategy to finance restoration, operations, and maintenance—not merely acquisition.

Once we have the money we need for restoration (and ongoing maintenance), we will need to decide where we will get the best return on investment, to use the banking-based terminology common in several talks. We tend to put restoration money into highly visible projects, like tidal wetlands and urban streams, said Jeff Haltiner of Phil Williams & Associates, but we also need to develop stewardship around mudflats, upper watersheds, and grazing lands—to take a broader look at the Bay. And in doing restoration, we need to better train the next generation. We are practicing by "learning on the patient," said Haltiner, who also pointed out that while we have regional goals for wetland restoration, we have nothing comparable for fluvial systems.

In fact, riparian restoration is the "poor cousin" of marsh restoration, according to the S.F. Regional Board's Ann Riley, despite enormous citizen interest and the fact that riparian restoration has evolved from city-block-long-sized projects to mile-long projects, an evolution due in part to opportunities to rehab old flood-control projects. One of the myths about restoring urban streams, said Riley, is that you cannot have a healthy ecological system in a city. If project designers get the length and width of the active channel right, she said, a fully functional channel is possible. Working with nature is a part of the new restoration paradigm, she added. "The era of planting streams with container stock from nurseries—to 'pretty up' an ugly engineering project—is over. Plants are our new engineering materials." Soil bioengineering techniques similar to those used in urban stream restoration—creating willow fascines and bundles to trap sediment—are also being used in the Delta, said Lauren Hastings in her overview of Delta restoration projects, the idea being to work with nature instead of trying to control it with hard structures. Working with nature—the tides—was also the U.S. Geological Survey's Jon Burau's focus, who described recent experiments at Frank's Tract. By synchronizing water project operations with tidal ebbs and flows, said Burau, we can control salinity and improve water quality.

Riparian restoration may not receive the attention marsh restoration does, but new science indicates that it should. Lester McKee pointed out that recent research by the S.F. Estuary Institute on sediment loads from small tributaries shows that they may be having a greater impact on the Bay than the larger rivers that flow to the Estuary. Why? Because there is proportionately more sediment in less volume of water, explained McKee, and particles are more likely to be deposited along channel banks and bottoms. These same small waterways are also large contributors of mercury and PCBs—at least equal to inputs from Central Valley rivers, according to McKee. Part of the problem is that many of these small tributaries historically entered the Bay in sloughs or seasonal wetlands, but now discharge their water—and contaminants—directly into the Bay in flood-control channels or pipes without first being filtered by wetlands.

Restoring the mouths of creeks is one choice we could make to see multiple benefits from our restoration dollars, as such projects would help filter sediment and pollutants while creating habitat. Meanwhile, other pollutants lurking at the bottom of the Bay will be harder to get rid of, said several speakers. For some pollutants, our only choice may be to do nothing—or try to reduce their loads, which is not always possible. The Estuary Institute's Mike Conner mentioned mercury, PCBs, DDT, dieldrin, and chlordane as problem pollutants in the Bay, which he christened "the Big Muddy" because sediments—and contaminants from the bottom—become resuspended with every tide. Conner's colleague, Jay Davis, described the efforts the Institute has undertaken over the past few years as part of the Regional Monitoring Program (RMP) to model the long-term fate of persistent organic pollutants in the Bay. The degree of contamination is most severe for PCBs, said Davis, which continue to "load" the Bay as bottom sediments are resuspended and recirculated, and contaminated sediments are eroded from the watershed. According to the Institute's model, if all these loads could be eliminated, we could reduce PCBs in the Bay by 90%, but it would take about 70 years. PAHs are another problem, and are at the threshold for concern, said Davis. When it comes to a relatively new pollutant, the flame retardant PBDEs, we don't know enough about the threshold for concern, said Davis. We do know that concentrations of PBDEs are increasing exponentially and that we are "loading up our sediments." The partial ban on PBDEs signed by former Governor Davis will help address the problem, but overall, the Bay is slow to respond to a decrease in loadings of persistent chemicals,

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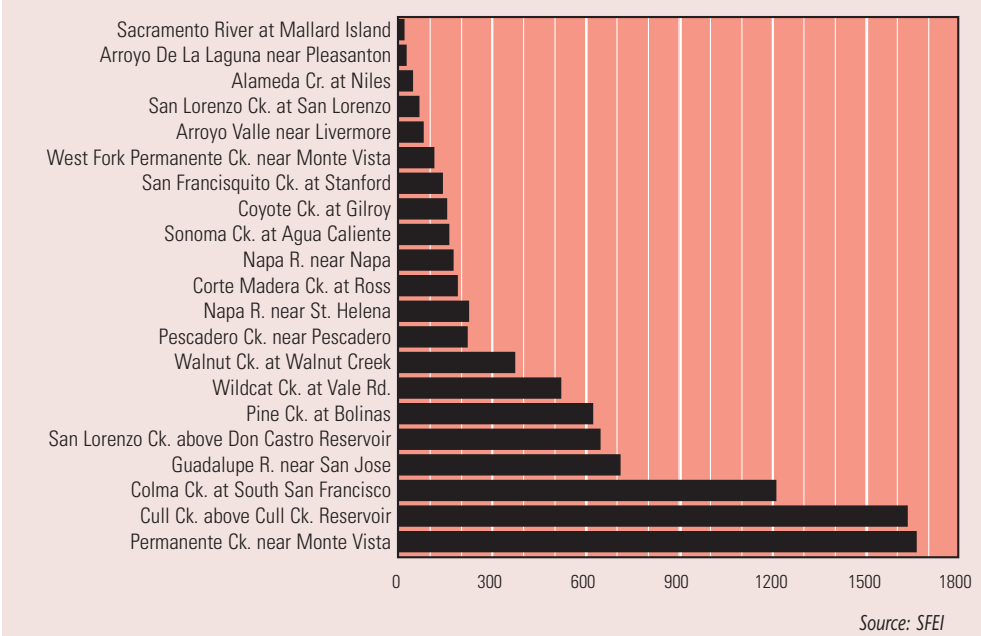
SEDIMENT EXPORT TONS PER SQUARE KILOMETER PER YEAR



Source: SFEI

THE MONITOR

CRUISE CRAPOLA

Floating cities with the amenities of world-class resorts—spas, pools, ballrooms, shopping malls, and restaurants—will soon dock at a new cruise ship terminal at San Francisco's Piers 30–32. On Nov. 6, the S.F. Bay Commission blessed San Francisco Cruise Terminal's project, which will include two cruise ship berths, public promenades along the Bay, and retail and office space. The Port of San Francisco touts the project as a boon to the local economy and is confident about the permit's water and air quality protections. The environmental community, however, is not convinced.

"San Francisco has better environmental regulations than any port in the country," says Peter Dailey, the Port's Maritime Director. BCDC's permit prohibits dumping of any treated or untreated wastewater, he notes. The Port's regulatory program requires cruise ship companies to sign berthing contracts that prohibit dumping. The Port's advisory committees, with membership rosters that read like who's who directories for the maritime industry and environmental community, will address water and air pollution issues.

"That's not enough," says Bluewater Network's Teri Shore. "There's no effluent monitoring. The Coast Guard monitors for safety. Cruise ship calls could increase 300% within 10 years after the terminal opens, and cruise ship companies can't be trusted."

Monumental polluters, cruise ships – about 250 worldwide – generate 50 tons of trash, 210,000 gallons of sewage, 35,000 gallons of oil-contaminated water, and a million gallons of gray water from sinks, showers, and laundries each week, says Shore, who adds that between 1993 and 1998, cruise ships were charged with 104 cases of illegal discharges into U.S. waters. In 1999, Royal Caribbean Cruises pled guilty to 21 counts of illegal discharges. Ironically, cruise ships are sometimes caught dumping by passengers with video cameras.

The solution is vigilance, says Shore, whose agency heads a coalition of environmental groups that advocate strict new monitoring regulations for cruise ships. "We'll follow the Port's air quality advisory committee closely as it develops mitigations, such as clean-burning fuels and shore-side power."

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CONFERENCE CONTINUED

said Davis. "Even small loads of persistent chemicals can have significant consequences, and contamination of the watershed will prolong recovery."

Emerging pollutants—PBDEs and endocrine disruptors—were the focus of a trio of speakers during the first day's afternoon session. Tom McDonald with the Office of Environmental Health Hazard Assessment described health concerns related to PBDEs, which are now ubiquitous in our environment: Even house dust may be a pathway into the human body. Kim Hooper characterized humans as the proverbial canaries in a coalmine, making the case for measuring body burdens of contaminants like PBDEs. We measure chemicals in air, soil, water, and animals, said Hooper, but not in people. Yet body burden data—particularly from human breast milk—is very useful for analyzing risks associated with neurodevelopment, said Hooper. The bottom line is that persistent organic pollutants are "not a good idea." PBDE levels in humans and biota in the Bay are now among the highest in the world. One concern about PBDEs is that they may be endocrine disruptors, the focus of NOAA Fisheries' Tracy Collier's talk. Endocrine disruptors mimic or block hormones or alter hormonal balance in humans and other creatures, such as fish, explained Collier, who has studied the effects of PAHs (another problem Bay pollutant and endocrine disruptor) on zebra fish and found that the fish suffer from arrhythmia and loss of cardiovascular function.

So what can be done? Some solutions are simple, said the S.F. Regional Board's Keith Lichten, who described how post-construction stormwater management measures, such as swales, ponds, wetlands, media filters, green roofs, and even something as simple as narrower streets, can filter and improve what runs off to the Bay. Those measures can have other benefits too, like controlling floods and giving people a sense of place. "As people see runoff flow across the landscape, they better understand their connection to the Bay and how their actions affect it," said Lichten. "The Bay becomes more than something they just drive over." Another regulatory approach to cleaning up the Bay is through TMDLs, or standards that limit the maximum amount allowable from all dischargers on a daily basis. Lichten's colleague Dyan Whyte explained that regulators are continuing to define and refine water quality standards for the Bay. Whyte told the audience to "stay tuned" for a TMDL for PCBs in the Bay, an urban creek pesticide toxicity TMDL, a report on Napa River sediment and pathogens, sediment reports for San Francisquito and Sonoma creeks, and an amendment to the S.F. Basin Plan for mercury, which remains one of the Bay's most problematic contaminants and was one of the conference's most popular topics.

Mercury—in the form of methyl mercury, which bioaccumulates in birds and their eggs—was chronicled by Steve Schwarzbach of the U.S. Geological Survey, who found that clapper rails are particularly vulnerable due to their tidal wetland foraging patterns in and along the edges of primary sloughs, and their endangered status. Schwarzbach found that slough channel order influences methyl mercury concentrations, with greater methylation taking place in primary—or smaller, more dendritic—channels. One of the most timely questions that needs to be addressed, said Schwarzbach, is whether wetland restoration will increase or decrease mercury levels—and whether the benefits of restoration outweigh any associated problems.

Another potential risk associated with wetland restoration is West Nile Virus, which is headed for the Bay Area in 2004, according to the Contra Costa Mosquito and Vector Control District's Karl Malamud-Roam. Some wetlands will present more trouble than others, said Malamud-Roam. High-risk wetlands include seasonal wetlands, wetlands with dense vegetation (in which mosquitoes can hide from fish), wetlands with no plumbing or operations and maintenance budget, and small, dispersed wetlands (for which it is harder to track down landowners about maintenance concerns). Good tidal flushing helps prevent mosquitoes, explained Malamud-Roam, because most juvenile mosquitoes need three-plus days of standing water in order to breed. "Wetland restoration is possible and compatible with mosquito control, but it has to be done right," Malamud-Roam concluded.

Regardless of fears about West Nile Virus, wetlands restoration efforts continue to burgeon around the Bay. Wetlands and Water Resources' Stuart Siegel gave a bird's eye tour of planned and in-progress projects, while Keith Merkel of Merkel & Associates showed us where the few remaining eelgrass beds are located and described the efforts being undertaken to map them, in order to better understand where to try to restore them. Currently, only 0.1% of the Bay's bottom supports eelgrass, compared to 11% in San Diego Bay and 55% in Mission Bay, for example, although there is more eelgrass in the Bay now than in the late 1980s. What is thriving in and around the Bay are weeds, such as invasive spartina, pepperweed, and other troublemakers, according to coastal plant ecologist Peter Baye. Restoration will affect the

spread of all plants, including invasive species, warned Baye, who suggested that Heron's Head Marsh in San Francisco could be used as a model for other tidal marsh restoration projects. There, Atlantic cordgrass was removed prior to restoration and nearby colonies controlled to minimize reinfestation.

Phil Williams took the long-range view in discussing wetlands restoration, attempting to predict the future of Bay habitats. "We need to recognize that the Estuary as a geomorphic system is dynamic and evolving whether or not humans are on its periphery," said Williams. He cautioned that the time to do restoration is sooner rather than later. "The Estuary is still a drowning river valley that has not achieved equilibrium between sediment deposition and erosion yet," said Williams. Because we are faced with a diminishing sediment supply in the Estuary and accelerated sea level rise, we will get a vegetated marsh more quickly in restoring subsided sites now than if we wait until later, he explained. Phyllis Faber, of Phyllis M. Faber & Associates, has monitored several wetland restoration projects over the years, comparing Warm Springs in the South Bay, and Muzzi Marsh and Sonoma Baylands in the North Bay, to China Camp, a "control" site. Plants will establish themselves naturally where elevations and soil conditions are appropriate, said Faber. But a mature pickleweed marsh can take 30 to 40 years to develop, and she stressed that restorationists need to cultivate patience. Visiting scientist Denise Reed from the University of New Orleans echoed Faber, suggesting that we shouldn't "mess with stuff" too much, but rely on nature and time instead. We also need to consider how the Bay's wetlands are influenced by water management decisions, said Reed.

Such considerations were the focus of the conference's third day. The Resources Agency's Tim Ramirez kicked things off by reminding us that Southern California is tied to the Klamath, and the Bay to the Colorado River by virtue of our plumbing and political systems. CALFED's Patrick Wright agreed, emphasizing that our old approach to meeting water needs—by expanding existing projects—is "out the door," and suggesting that new approaches need to be regionally and partnership-based. "It's not an accident that in an area like the Klamath, conflict is more prevalent than in areas where we have a process," said Wright. The S.F. Regional Board's Loretta Barsamian stressed the importance her agency has placed on building partnerships with businesses, environmental groups, and dischargers in resolving Bay-related conflicts. Analyzing conflicts on the Klamath River was also the focus of U.C. Davis' Jeff Mount, who shared his perspective as a member of the National Research Council team convened to investigate last year's fish kill. The Council concluded that while the primary cause of the die-off was disease, resource managers in the Klamath Basin are not taking full advantage of the tools available to them under the Endangered Species Act. "The Klamath Basin lacks an ecosystem-based approach," said Mount, who felt that an important lesson to apply to the Bay-Delta is that single-species management is "destined to fail."

Managing for multiple species is part of what we need to do in figuring out whether we can pump more water south and still protect the Estuary, the hot topic of the third day's late morning session. If you are a small fish near the pumps, said Cal Fish & Game's Diana Jacobs, you will be drawn into the central and south Delta. "Will flow changes add to cumulative impacts or be barely perceptible?" asked Jacobs. "The stakes are high for people and ecosystems." The Metropolitan Water District's Tim Quinn presented Southern California's perspective, Kern County Water Agency's Brent Walthall described ag's point of view, and Steve McAuley covered that of the California Urban Water Agencies. Environmental Defense's Spreck Rosekrans offered his critique of the Environmental Water Account (EWA) (for more on this issue, see "Napa Deal", page 1). The Department of Water Resources's Jerry Johns said that the EWA is working, calling it the "glue that put CALFED together," guaranteeing water supply reliability and fish recovery. "There have been two dry years and one above-normal water year," said Johns. "And no big fights. The fish have benefited, and the water supply is stable." But DWR's Kamyar Guivetchi predicted that by 2030, California will have "half as many new people as today," and pointed out that "because California agriculture is producing 50% more today than 20 years ago, we cannot afford to keep taking water away from ag to meet our urban water

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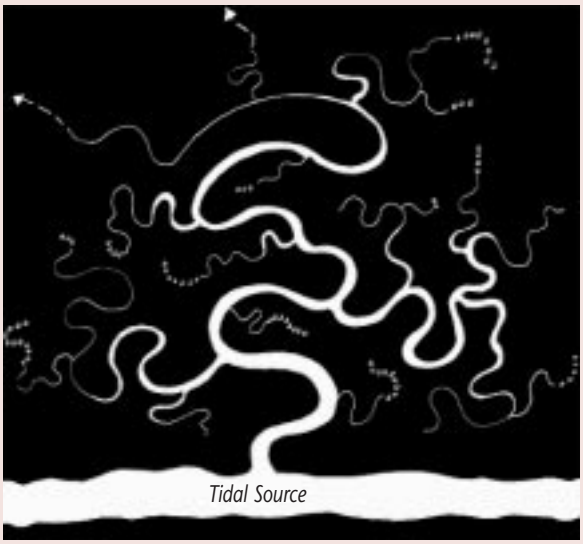
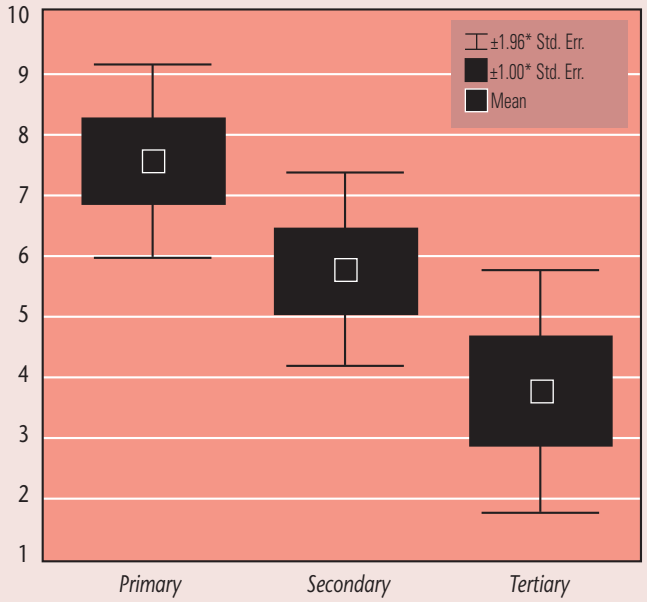
INTERTIDAL MARSH STRUCTURE
PRIMARY SLOUGHS ARE SMALLEST



MERCURY IN SLOUGHS
METHYL MERCURY IN SURFICIAL SEDIMENT (ng/g dw MHg)



Source: Schrawzbach, 2003

CONFERENCE CONTINUED

needs." He suggested that perhaps cotton and rice should be phased out. "We need to subsidize crops that can be used to promote things that will have statewide benefits."

In the afternoon, Senator Mike Machado said that while we have the tools to manage our water, we need to better choose how to use them. Assemblymember Joe Canciamilla agreed, but went one step further, saying that the state "is at a pivotal point in resolving water issues, all of which have a direct and indirect effect on the Bay-Delta." The challenge to public agencies, said Canciamilla, is "whether the CALFED ROD will be followed. What's being proposed now is 'trust me.'" We can consider increased pumping, said Canciamilla, but we need to take care of the Delta in the process (see "Napa Deal", page 1).

One way to make sure we have enough water to meet multiple needs is to increase our use of recycled water. DWR's Fawzi Karajeh said his agency sees possibilities for using more recycled water in agriculture and landscape irrigation. At the top of the list of the state's recycled water task force are public safety and the environment, said Karajeh. If we can assure the public that recycled water is safe, 1.5 MAF of it could contribute 1.2 MAF of "new" water supply. Gary Wolff, of the Pacific Institute for Studies in Development, Environment, and Security, told the audience that California's economy can continue to grow without taking more water from the environment. Cost-effective conservation techniques for homes and businesses are available now, said Wolff, who summarized some findings from the Institute's new publication, *Waste Not, Want Not* (see "Now in Print", page 7).

Water saved by urban users could benefit both human quality of life and fish, said Wolff. But flows may not be all fish need, according to the University of Washington's Jim Anderson, who has found that temperature is more important, at least to fish in the Columbia River. U.C. Davis' Bill Bennett wondered if we can truly separate human impacts from natural influences on fish populations, concluding that the issue needs to be researched further. Human and natural influences may be co-occurring and interacting in complex ways, causing population declines, said Bennett. "It's not just pumps and pollution, but effects at local and regional scales. We can measure these things." Another human impact that remains a puzzle is the genotoxic effects of agricultural runoff in the San Joaquin River, said Susan Anderson, also from U.C. Davis. While Anderson saw elevated DNA strand breaks in fish exposed to the San Joaquin River, it wasn't clear which pesticides might be causing the problem. In the future, said Anderson, genotoxins, such as captan, ziram, carbaryl, malathion, methyl bromide, and trifluralin, should be studied.

With all these chemicals in our waters, can we ever hope to restore our fisheries? Gordon Becker from the Center for Ecosystem Management and Restoration added water supply issues, flood control, and fish migration and land use barriers to the list of challenges facing steelhead in Bay tributaries. While historical abundance will never be attained, said Becker, we should focus on improving passage and flows and on habitat improvements based on natural channel processes. "Restoration should focus on priority watersheds," said Becker, who believes that too few resources are being expended to restore Bay Area streams. "We should integrate steelhead restoration into watershed management efforts underway." Becker concluded on an optimistic note, citing great public support for restoring fish in Walnut, Alameda, and Coyote creeks, among other Bay Area streams.

Other speakers, too, were optimistic, despite the challenges and choices ahead. As a result of the RMP, the S.F. Bay-Delta is unique among U.S. estuaries in the accuracy and amount of temporal data collected, said Russ Flegal of U.C. Santa Cruz, making it possible to quantify current metal contaminants in the Bay. Other reasons for hope include increased public awareness about the Bay. Save the Bay's David Lewis pointed out that, under supervision of his organization alone, over 12,000 people have removed 20,000 pounds of invasive species and planted more than 20,000 native plants on several sites around the Bay. John Wise (retired, EPA), said he is optimistic about public engagement in Bay issues, citing a "continuous agenda of public involvement" as the driving force behind public policy over the past 40 years. We will need to continue making an effort to involve the public, said Wise, and the public is eager for a way to measure the success of

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SPECIESSPOT

MEDUSA MADNESS

How much trouble could an eyeless, brainless, gelatinous blob cause? Plenty, according to University of Washington marine biologist Claudia Mills. Mills and others have been tracking two species of jellyfish—more properly, hydromedusae—native to the Black Sea that were discovered in the Bay Area in 1992. They most likely arrived in ships' ballast water. Although their role in local ecosystems is unclear, they have the potential to disrupt estuarine food webs.

Maeotias marginata and *Blackfordia virginica*—neither has a common name—are small creatures, up to an inch or so in diameter. They thrive in brackish waters, like the downstream reaches of the Napa and Petaluma rivers where they first turned up, and Suisun Slough. *Maeotias*, at least, can reproduce asexually, by budding; the all-male Petaluma population has gone through periodic blooms, with thousands filling the river.

The stinging tentacles of these tiny floating predators capture tinier crustaceans—copepods, larval crabs, and barnacles—which are also important prey for the young fish that frequent estuaries. Out-of-control jellies could be serious competitors. Mills says exotic jellyfish in the Sea of Azov "so devastated the population of two fishes (anchovy and Azov kilka) that these commercial fisheries have ended." Ironically, one of the culprits reached this arm of the Black Sea via a ship from an American port.

The Black Sea jellyfish, along with better-known interlopers like the Chinese mitten crab and the Amur clam, are among at least 234 exotic species now established in the S.F. Bay and Delta, "the most invaded estuary and possibly the most invaded aquatic ecosystem in the world," according to the S.F. Estuary Institute's Andrew Cohen.

Without adequate control of ballast-water discharges, more exotics will be joining their ranks. "Invasive species are like chemical pollutants that mate," says the Ocean Conservancy's Linda Sheehan, commenting on the U.S. Environmental Protection Agency's recent decision to forego a regulatory role (Estuary, October 2003). "Once they are here, they are here to stay. They cost hundreds of millions of dollars a year to keep in check, and … push threatened and endangered species over the edge."Contact: Claudia Mills cemills@u.washington.edu **JE**

PLACES TO GO & THINGS TO DO

WORKSHOPS & SEMINARS

DEC THURS 18

WATERSHED COUNCIL WORKGROUP MEETINGS

TOPICS: Education, outreach & capacity building; economics & funding.
LOCATION: Sacramento
SPONSORS: Cal EPA &Cal Resources Agency
http://cwp.resources.ca.gov/calendar2

JAN SUN 31

6TH ANNUAL BAY AREA CONSERVATION BIOLOGY SYMPOSIUM

TOPIC: Student-organized forum to showcase & provide feedback on graduate student research in conservation biology.
LOCATION: U.C. Davis
SPONSOR: Society for Conservation Biology
http://scb.ucdavis.edu/BACBS/BACBS2004/SCBsymposium.htm

FEB TUESDAYS 3 THRU MAR 16

INTRODUCTION TO WATERSHED ASSESSMENT

ALSO SATURDAYS FEBRUARY 21, 28, AND MARCH 6; AND SUNDAY FEBRUARY 29, 2004
TOPIC: Review functions & processes in watersheds; integrate physical & biological sciences to see how a creek works & what elements must be assessed to restore & sustain habitats. Field trips to Sausal Creek & Redwood Creek watersheds.
LOCATION: Merritt College
SPONSOR: Merritt College
(510)832-3101

MAR THURSDAYS 4 THRU APR 22

WETLAND RESTORATION

ALSO SATURDAYS AND SUNDAYS, MARCH 13, 14, 20, AND 21, 2004
TOPIC: Review the ecology of California wetlands. Field trips to local wetland restoration projects.
LOCATION: Merritt College
SPONSOR: Merritt College
(510)832-3101

HANDS ON

DEC SAT 13

WETLANDS & HABITAT RESTORATION

TOPIC: Restore East Bay wetlands.
LOCATION: East Bay
SPONSOR: Save the Bay
(510)452-9261
www.savesfbay.org/getinvolved/restorewetland/index.cfm

DEC SATURDAYS 13 AND 20

MARSH RESTORATION

TOPIC: Plant native wetland plants along the eastern shore of McNabney Marsh.
LOCATION: Martinez
SPONSORS: Save the Bay, Watershed Nursery & Mt. View Sanitary District
(510)548-4714
www.savesfbay.org/calendar/index.cfm

JAN SAT 10

RESTORATION KAYAK

TOPIC: Paddle to the Marin Islands to restore native habitat.
LOCATION: North Bay
SPONSORS: Save the Bay & U.S. Fish & Wildlife
(510)452-9261
www.savesfbay.org/calendar/index.cfm

DEC MON 15

RECOGNITION

DEADLINE: DECEMBER 15, 2003 (POSTMARK)
The National Wetlands Awards Program is taking nominations for deserving wetland leaders who have demonstrated extraordinary effort, innovation, and excellence through programs or projects at the regional, state, or local level. The 2004 Awards will be given in six new categories: Education and Outreach; Science Research; Conservation and Restoration; Landowner Stewardship; State, Tribal, and Local Program Development; and Wetland Community Leader.
(202)939-3822
wetlandsawards@eli.org
www.eli.org/nwa/nwaprogram.htm

NOW IN PRINT & ONLINE

Alhambra Creek Watershed Map and Historical Timeline.
Contra Costa Resource Conservation District. 2003. www.ccrcd.org/home.html

The Bay Institute Ecological Scorecard: San Francisco Bay Index, 2003.
The Bay Institute of San Francisco. October 2003. www.bay.org/ecological_scorecard.htm

Hidden Treasures of San Francisco Bay: Photographs by Dennis E. Anderson.
Dennis Anderson Photography & Heyday Books. 2004. www.bluewaterpictures.com

Historical Distribution and Current Status of Steelhead, Coho Salmon, and Chinook Salmon in Streams of the San Francisco Estuary, California.
Center for Ecosystem Management & Restoration. October 2003. www.cemar.org

The King of California: J.G. Boswell and the Making of a Secret American Empire.
Mark Arax & Rick Wartzman. Public Affairs Books. October 2003. www.publicaffairsbooks.com/books/kin.html

San Francisco Bay: Portrait of an Estuary
By John Hart and David Sanger. U.C. Press, 2003.

San Francisco Bay Estuary Invasive Spartina Project: Final Programmatic Environmental Impact Statement.
S.F. Estuary Invasive Spartina Project. September 2003. www.spartina.org/project_documents/eis_final.htm

San Francisco Estuary and Watershed Science.
San Francisco Bay-Delta Science Consortium & John Muir Institute of the Environment. October 2003. http://repositories.cdlib.org/jmie/sfews

South Bay Salt Pond Restoration Project.
Coastal Conservancy. November 2003. www.southbayrestoration.org

Water Recycling 2030: Recommendations of California's Recycled Water Task Force [Final Report].
California Department of Water Resources. June 2003. www.owue.water.ca.gov/recycle/docs/TaskForceReport.htm

Where Rivers Are Born: The Scientific Imperative for Defending Small Streams and Wetlands.
American Rivers & Sierra Club. September 2003. www.sierraclub.org/cleanwater/reports_factsheets/

Waste Not/Want Not

Pacific Institute for Studies in Development, Environment, and Security. October 2003. *www.pacinst.org/reports/urban_usage/waste_not_want_not_full_report.pdf*

The path to a water-sustainable future in California leads to the local hardware store for low-flow toilets and other water-efficient technology, according to this new publication from the Pacific Institute. After three years of studying California urban water use, the Institute paints an unflattering picture of consumption habits: Urban dwellers send the biggest and most environmentally sound source of water down drains and sewer pipes.

By switching to water-efficient technologies in their homes and gardens, urban users have the potential to save about one-third of their current usage level—more than 2.3 million acre-feet per year—for the future. The Institute advocates conservation and education, along with more and better data collection among urban agencies to give water officials more accurate information upon which to base policy and price.

Conservation is a touchy subject in the tussle over water allocation. The Institute acknowledges the acrimonious relationship between urban areas and the state's biggest water customer—agriculture. The Institute doesn't mention agriculture further, except to call for continued study of ag's water use, so the report doesn't quite offer the full picture. But by making one of the first attempts to quantify urban water use, the Institute hopes to break the ice for more discussions about urban conservation.

NAPA DEAL CONTINUED

the meetings, worry that increased pumping will increase existing problems with water levels, circulation, salinity, and dissolved oxygen, according to Alex Hildebrand of the South Delta Water Agency. Hildebrand and others are negotiating with proponents of the Napa Proposition to include engineering fixes to mitigate for these problems, including new, permanent flow-control barriers.

At least one interested party believes that much of the brouhaha over the Napa Proposition is misplaced, or at least premature. "They didn't do anything new in Napa with regard to export levels," says CALFED's Patrick Wright, noting that the 8,500 cfs pumping rate is consistent with the ROD. "What is new is the proposal for coordinating the state and federal projects." Furthermore, he says, there is no "it" there yet. "This is not a decision document." Wright says CALFED will incorporate elements of the proposal, including SVP/CVP integration, into a comprehensive Delta improvement package that also includes an expanded EWA and water quality actions. "Everything will flow through an EIS/EIR that will be subject to full public review."

Be that as it may, says Wesselman, "The bottom line is that taking more water out of the system will make it more difficult to meet environmental quality objectives under CALFED."

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CONFERENCE CONTINUED

restoration and adaptive management. "What gets measured gets done," said Wise. The Bay Institute's Report Card is one important step in that direction. The S.F. Estuary Institute's Bruce Thompson and the Bay Institute's Anitra Pawley presented the results of the S.F. Bay Index published in October 2003 (see pg. 2). Several speakers mentioned that the only way the public will fully support restoration is through good science. "Science has never been more important," said CALFED's Sam Luoma. "The Bay is a constantly changing place, and we are still learning better ways of operating our existing systems and how to work with Mother Nature." But most importantly, said Luoma, the public needs to understand that we are living in an era of choice. "We need to examine the gravity of the changes we've wrought as we've made ourselves comfortable and prosperous living along the Bay." **LOV**

A State of the Estuary report summarizing conference proceedings will be published in fall 2004. For other conference-related topics, see Napa Deal, p. 1, and Now in Print).

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