

LURING TERNS

How do you convince thousands of seabirds that they're in the wrong place? That's the task confronting Nanette Seto, the Portland-based biologist who runs Fish & Wildlife's Caspian tern management program.

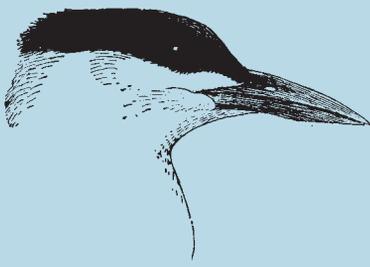
Caspians, North America's largest tern, once nested in interior wetlands like the Klamath Basin marshes. With these habitats lost, they shifted coastward. By 1991, most of the western population of Caspian terns had regrouped on Rice Island near the mouth of the Columbia River, where they took a heavy toll on hatchery-bred salmon and steelhead smolts heading out to sea. The birds were encouraged to relocate to East Sand Island, closer to the ocean, and salmonids dropped to 17% of their diet by 2004. But that's still 3.5 million fish, more than NOAA Fisheries considers acceptable. So most of the terns will be moving again: by reducing nesting habitat, wildlife managers intend to force 13,000 of the 18,000 Caspians to breed elsewhere.

Plans call for the Army Corps of Engineers to create or enhance alternative breeding habitat in Washington, Oregon, and Northern California. In the Bay Area, target sites are Brooks Island, where encroaching vegetation will be cleared, Hayward Regional Shoreline, which already has suitable dredge-spoil islands, and the Don Edwards S.F. Bay National Wildlife Refuge, where a new island may be constructed in one of the salt ponds. Caspians are no strangers to the area—S.F. Bay used to house large colonies of the birds at Bair Island and Alameda; now there are about 1,000 pairs already nesting at Brooks Island and 50 at the Refuge.

Fish & Wildlife will use decoys and recorded calls to attract terns to the new sites. Seto hopes Caspians that winter in Mexico and Southern California will stop to nest in S.F. Bay rather than continuing on to the Columbia. The impact on other Bay waterbirds is expected to be minimal; the big Caspian terns and the smaller, endangered least terns feed on fish of different sizes.

A final environmental impact statement on the project awaits interagency consultation. Funding is problematic: The \$400,000 price tag for the Bay component could be higher if erosion at Brooks Island is addressed, and post-hurricane reconstruction in the Gulf of Mexico has stretched the Army Corps' budget.

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FrankenDelta

The plethora of problems plaguing the Delta—a crashing ecosystem, crumbling levees, and politicians and a public who don't understand the landscape—have visions of a different, more sustainable Delta dancing in some scientists' heads. A large, open body of water resembling Chesapeake Bay. A Delta that is fresher in the spring and sometimes in the winter, and saltier in the fall. A Delta re-connected with flows from both of its rivers; one not treated as an isolated system but as the linchpin of a 60,000-square-mile watershed. Yet any discussion of a different Delta seems to lead to a discussion of a Delta circumvented by pipes, carrying freshwater flows around it.

If we decide to try to maintain some of the natural ecosystem while still providing water for urban and ag users, does that inevitably mean building the peripheral canal (dreaded by many enviros) or a version of the peripheral canal? Not necessarily, says UC Davis' Jeff Mount, one of the scientists sounding the loudest warning calls about the Delta. But, he says, if we intentionally breach some levees (ones likely to fail anyway) and let the Delta become more brackish, we would have to desalinate the water we're pumping south. How difficult would that be? The California Bay-Delta Authority's Joe Grindstaff, who has been involved in building brackish desal plants, says the cost is about \$500 per acre-foot (vs. as much as \$1,200 per acre-foot for ocean saltwater). "For urban Southern California, they would hate that, but it is not beyond the pale," says Grindstaff. "But for the farmers in the eastern part of the Delta and the Central Valley, that would kill farming. You could not do ag in this state at that price." Yet compared to the cost of continual levee reinforcement,

desalination might be a bargain in the long run, says the Bay Institute's Marc Holmes. Grindstaff says there are other issues to be considered with desal—such as where the plant would be sited and the energy use that would be required. "It may be that we do want to do it, but it may be that there are other ways to control water quality in the Delta or to supply water when it is

brackish. There may be ways around some of the challenges; we haven't looked at it enough."

One "other way" might be "dual conveyance," says Grindstaff, in which we continue to use the Delta for some pumping, but also use pipes to carry a certain baseline amount of water around the Delta. "It gives you some reliability in case of a massive earthquake, and it also improves water quality and keeps exporters interested in the Delta. I don't think a peripheral canal as originally envisioned is probably feasible—there's been a lot of

development in the areas where it was intended to be built." The Central Delta Water Agency's Tom Zuckerman thinks any new pipes or canals are a bad idea. "Those 'dual conveyance' pipes are designed to carry about 4,000 cfs—it doesn't sound like a lot, but it's equivalent to about 75% of the Sacramento River's flow in dry years. It would be a huge increase in deliveries out of the Delta. Any isolated facility around the Delta would ensure [the Delta's] destruction over time."

Zuckerman thinks that instead of breaching levees in the western Delta, we should strengthen them to protect water quality and find ways to take less water out of the Delta. "As the saying goes, 'It's the water, stupid.' The more people want to increase exports, the less feasible it is to have a healthy Delta. We've proven that. We need to think about how to decrease exports to the point where the Delta can sustain itself." But the San Luis & Delta-Mendota Water Authority's Tupper Hull says

"Any isolated facility around the Delta would ensure [the Delta's] destruction over time."

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TECHNOFIX

ClO₂ TO THE RESCUE

In the upper atmosphere, ozone blocks ultraviolet radiation while in the lower layers, it contributes to smog and greenhouse gases. Closer to earth, this versatile gas is now being widely used to purify drinking water as a substitute for chlorine and chloramines (see "Chlorinated Clues", p.3). Ozone is the primary disinfectant at the Contra Costa Water District's Bollman Water Treatment Plant near Oakley. But there is a catch: when applied to Delta water, which contains bromine, ozone produces bromate, an unwanted byproduct with a U.S. EPA allowable contaminant level of 10 parts per billion (ppb).

While investigating treatment alternatives with funding from the American Water Works Association Research Foundation and the California Energy Commission, the District hit on a new approach: adding chlorine dioxide before ozone. "We found that when we added chlorine dioxide ahead of ozone, we needed much less ozone, and bromate production dropped a lot," the District's Tom Linville explains. Bromate levels dropped from 5 ppb to below the detection threshold of 2 ppb, and the reduced use of ozone cut energy requirements by 30%. Chlorine dioxide forms fewer regulated byproducts than pure chlorine and is shorter-lived than chlorine or chloramine.

Linville recalls that the key insight came from Dale Newkirk, then the District's manager of water quality. "He looked at the numbers and said 'Aha, there's something going on here.' He was able to spend more time and isolate it out."

Working with the funding agencies and Black & Veatch, an engineering firm also involved in the research, the District obtained a patent for the chlorine dioxide treatment that keeps it in the public domain. "It made sense for us because of the way it was funded," Linville says. "A lot of for-profit individuals would patent a process—using ultraviolet light as a disinfectant, for example—and collect royalties for its use." This way, other water treatment operations can use the process free of charge. Final publication of the patent is expected early this year.

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HOW I SEE IT

THE DELTA FISH DECLINE: WHAT DOES IT MEAN FOR PUBLIC POLICY?



Mike Connor

Delta pelagic fish populations have been crashing for several decades. Since the millennium, that decline may have taken a turn for the worse, though there is some disagreement among statisticians as to whether the pace of the recent decline is truly worse, or simply statistical noise in the long-term decline of the Delta smelt, striped bass, and longfin smelt. Op-ed commentators have responded to the decline by criticizing CALFED for not being able to resolve this problem after spending untold millions of dollars on research and monitoring, while failing to develop any public agreement on indicators of Delta health and attainable goals that all parties can accept.

This fall has seen two important scientific summaries of the problem: an analysis and work plan developed by the Interagency Ecological Program and a review of that analysis and plan by outside reviewers brought together by the CALFED Science Program. The perspective of the outside reviewers was refreshing—in essence, they were puzzled over why there was such a focus on the trends of the last five years when the system has been declining since the beginning of good data records. This debate about whether the Delta fish crash is getting worse points to an important public policy failing—we do not have a generally understood agreement for what level of Delta fish abundance is attainable, desirable, and acceptable to all parties.

The second important finding of the internal analysis and external review is the extent to

which fairly obvious losses of fish—getting stuck on the debris screens (impingement), being collected and transported to other parts of the Delta (salvage), or being sucked into the water supply system (entrainment)—are not well quantified. While the complex biological factors that influence the health of Delta fish populations may never be well understood, the costs of understanding and remediating the effects of fish impingement, salvage, and entrainment seem small compared to the consequences of the multi-billion-dollar water conveyance decisions we are making.

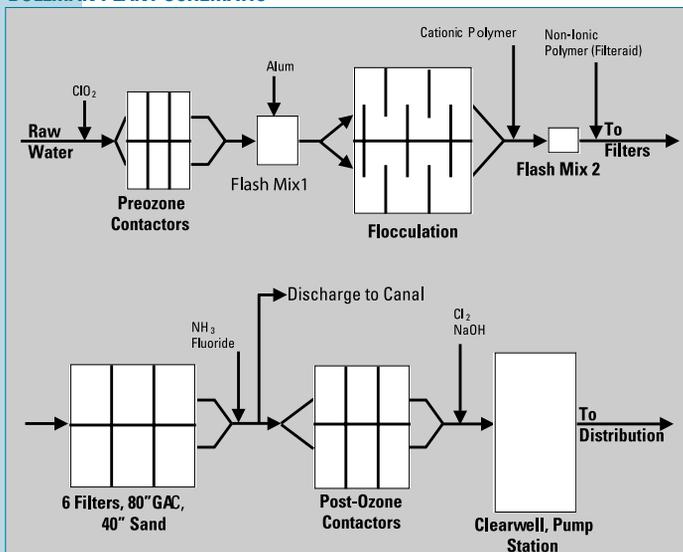
Surprisingly, the analysis found that we don't have very good information about the impingement and entrainment effects of other large Delta water pumping projects, such as the use of cooling water for Bay-Delta power plants. Section 316 of the Clean Water Act requires that cooling water withdrawals and discharges must be protective of local fish populations. In other parts of the country, power plants have been required to use evaporative, air-cooled, and hybrid cooling towers to reduce cooling water use by 95% or more, and fine wedge wire intake screening and/or aquatic filter barriers to prevent fish impingement and to minimize the entrainment of early life stages of fish. These issues have received much less public discussion in the Bay Area. The effects of impingement and entrainment should be relatively easy to understand, quantify, and extrapolate as to their effects on Delta fish populations compared to all of the other subtle ecological threats (e.g., contaminants, nutrients, invasive species) to the Bay. It's time for these assessments to be made, peer-reviewed, and presented to the general public.

The California Bay-Delta Authority is charged with determining by 2007 whether the re-routing of water through the Delta is working or whether other solutions are necessary. For such a significant decision, it is surprising how little is known about the framework for making the

decision. What ecological functions must be maintained in order for through-Delta transport to be considered a success by all the stakeholders? Are there other criteria for success? What data will be used? What is the process for conducting and reviewing the analysis? It's time for the different CALFED parties to state what their expectations are. Most good decision making requires that the decision criteria be developed before the decision is made. Otherwise, there will naturally be suspicion that the decision was made first, and the criteria adjusted to fit the politics.

Mike Connor is Executive Director of S.F. Estuary Institute.

BOLLMAN PLANT SCHEMATIC



ENVIRONMENT

CHLORINATED CLUES

Dead fish in Strawberry Creek, a broken water line, and elevated chlorine levels made for a real-world version of the game Clue last summer. Although neither Colonel Mustard nor Mrs. Peacock was a suspect, the solution to this ecological whodunit provides a cautionary tale about protecting creeks and streams.

The mystery began when a west Berkeley resident called the Urban Creeks Council with news of dead fish in his yard. The Council's Steven Donnelly followed the resident back to his property to find about 30 fish—identified as Sacramento suckers—belly up in the creek. Donnelly took a fish and some water as samples and notified state and local authorities.

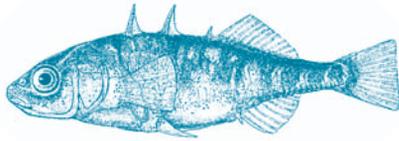
Environmental scientist Karl Hans of U.C. Berkeley received a call, too, and walked out to check the creek on campus upstream. Things looked good, so Hans hopped on his bike to check out the creek segment where the dead fish were found. A quick test revealed that the water was fully chlorinated. The possible source: a broken water main sending the city's drinking water—disinfected with chloramines (chlorine and ammonia)—into Strawberry Creek. Ammonia is highly toxic to fish.

"We're hypothesizing that it's chloramines [that killed the fish]," explains Hans.

Berkeley's Toxic Management Division found a broken water pipe—part of the East Bay Municipal Utilities District system—in the vicinity of the west Berkeley neighborhood where the fish kill took place. Water was flowing at an estimated rate of five gallons per minute. EBMUD fixed the break a day after Berkeley Toxics called the agency. That left potable water running into the creek for at least one day, producing some drastic results. Says Donnelly, "Who would have thought that the water we drink would be so toxic to fish?"

Chloramines have become the preferred disinfectant because chlorine—in the levels it was being used in water—was not effective against *Cryptosporidium*, and it generated chemical byproducts, such as chloroform, that are known to cause cancer. But two reports—one in 1996 by the World Health Organization and another in 2002 by the Natural Resources Defense Council—found that chloramines only modestly reduce carcinogen levels, and do nothing to reduce risks from *Cryptosporidium*. The WHO report also recommended that people with suppressed immune systems—those with HIV, AIDS, or who are on chemotherapy—boil their chloraminated water for 10 minutes before drinking it.

In the Bay Area, chloramines are proving to be a double-edged sword, notes EBMUD's David



Richardson. "The advantage of chloramines is that they're long-lasting and persistent, and the

disadvantage is that they're long-lasting and persistent," he says.

Because chloramines have such staying power in water, EBMUD, San Francisco, and other water districts warned customers who might be on kidney dialysis or have aquariums of the need to remove the chloramines in the water before using it. "[EBMUD] has done a pretty good job of getting the information out for dialysis and aquariums, but you don't see much about the environmental impacts of releases," observes Berkeley's Hans.

Hans, Donnelly, and many creek activists see those impacts when water lines break—something that's quite common in the EBMUD service area and other water districts around the Bay. According to EBMUD files, the system has experienced an average of 99 breaks per month over the last 40 months. EBMUD's Richardson says many of these breaks are in a 30-year-old housing development in Contra Costa County and result from defective pipes. Nonetheless, Richardson concedes the EBMUD system is vast (serving 1.3 million customers), old in many places, and subject to the whims of the Hayward Fault or slide areas.

But harm to fish and other aquatic organisms will persist if chloramines aren't neutralized, and breaks aren't fixed earlier. A faster reaction to water line breaks is something El Cerrito resident George McRae would like to see. He notes that last May, a water line near Baxter Creek broke, sending gallons of water into the street and ultimately into the storm drain. The leak went unabated for at least six hours. "This sort of thing happens all the time," says McRae.

Meanwhile, California is spending millions of dollars to restore watersheds. The Urban Creeks Council just received a grant to help steelhead native to Cordornices Creek migrate past major barriers. "A big spill on Cordornices could wipe out the whole reason we're working on the creek," Donnelly says.

Richardson wants to help. He's part of a task force that is looking into such issues as EBMUD response times to line breaks. An early December meeting with city officials and the general public brought up what the S.F. Regional Board's Ann Riley believes is a key problem: a discrepancy between EBMUD's published protocols and its in-the-field practices. One of the steps in EBMUD's slide presentation about its response to line breaks was placing mats over storm drains to stop drinking water from entering them. Audience members said

WEED WARS

HABITAT FOR HABITAT

It wasn't a perfect weapon, but the herbicide glyphosate—trade name Aquamaster, an aquatic version of Roundup—used to be the best one in the Invasive Spartina Project's arsenal. But glyphosate had serious limitations in treating infestations of Atlantic cordgrass (*Spartina alterniflora*). According to the ISP's Erik Grijalva, the herbicide easily binds to sediment in a marsh and becomes inactive. Effective treatment requires coating the entire plant (rarely possible) and a 6- to 12-hour post-application period without tidal inundation.

In the 2005-2006 treatment season, the ISP switched to imazapyr (Habitat), recently registered for use in California. A recent report from Leson and Associates that summarizes laboratory and field studies describes imazapyr as both more effective and less hazardous than glyphosate. Among the report's findings: imazapyr degrades rapidly in water and inundated soil, leaving no detectable residue after two months; maximum planned application rates are not toxic to mammals, birds, or bottom-dwelling organisms; and exposure risks to workers applying the herbicide and to the general public are minimal.

The downside: accidental spraying of non-target plants carries a higher likelihood of damage than with glyphosate. Laboratory tests also indicated a slight risk to fish at highest concentrations. But Grijalva considers it "extremely unlikely that there is a risk to fish based on the rates that will be used in an actual application."

Fact sheets from the Pesticide Action Network of North America note adverse effects to laboratory animals from imazapyr, including an increased incidence of cancer in rats that the U.S. Environmental Protection Agency considers statistically insignificant. It therefore considers the herbicide noncarcinogenic.

Despite imazapyr's promise, cordgrass may still be a tough adversary. Some weed species, including perennial ryegrass and rigid ryegrass, have evolved resistance to the terrestrial version of the chemical, marketed as Arsenal and Chopper.

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CITYBEAT

ECO-CITY SAN FRANCISCO



Few San Francisco residents realize that 12 species of native berries still grow on the north slope of Mount Davidson, that the first bright yellow wildflower to bloom in the city in the spring is aptly called “footsteps of spring,” or that great horned

owls still hoot from high in the Presidio’s eucalyptus or Monterey pine trees. Fewer still know that yerba buena (the “good herb,” San Francisco’s original namesake), a native mint, still survives in some backyards and wild areas—it is also used to make mojitos!), or that 13 species of bats dart through the city eating mosquitoes. Peter Brastow, founder of the new group Nature in the City, hopes to reverse that lack of knowledge and reconnect urban residents with their landscape.

“How can you be sustainable unless you connect with nature where you live, if you don’t value what’s special where you live?” he asks. He explains that the goal of his group, under the umbrella of the larger Earth Island Institute, is to “restore a positive relationship between people and nature, to teach people that cities and communities can foster biodiversity and live harmoniously with nature even in a city.” Getting people to appreciate nearby nature is also a way to improve their quality of life, especially for those who don’t have access to regional parks or the Sierra.

Building an ecological identity in San Francisco is not without challenges: With urbanization has come habitat fragmentation on a grand scale, says Brastow, and—possibly the biggest challenge—the city is covered with invasives like French broom, pampas grass, cape ivy, and eucalyptus. But Brastow thinks it’s not too late. In places like Glen Park, Cole Valley, Bernal Hill, Mount Davidson, and the Presidio—to name just a few—native species are hanging on; some even thriving. Brastow is encouraged by Mayor Gavin Newsom’s public interest in the environment—and he plans to expand upon it.

“I want to make local and urban nature conservation part of all decision making in the city.”

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LAND USE

MARSH (OR HOMES) IMMINENT

The fight to save one of the last stretches of privately owned salt marsh along San Pablo Bay may finally be coming to an end. The East Bay Regional Park District has offered to buy the land that has been at the center of a longstanding struggle between the District, local residents, and environmental groups, who want to preserve the property as open space, and the owners, who want to develop it.

The 240-acre parcel—known as Breuner Marsh after its previous owner, Gerald Breuner of the furniture chain—is connected on its north side to Pt. Pinole Regional Park in North Richmond. On the south side, the land is bordered by Rheem Creek. The entire property—recommended in the *Habitat Goals Report* as a prime restoration site—is home to many wildlife species, including the endangered California clapper rail, black rail, and salt marsh harvest mouse.

The marsh is also a retreat for residents of Parchester Village and others in North Richmond, says Whitney Dotson, a longtime resident of the community and founder of the North Richmond Shoreline Open Space Alliance. Dotson’s father, a minister, helped recruit church members to buy homes in Parchester Village, which was built in the 1940s and was the first place in the Bay Area where African Americans could own their own homes. He says residents were promised that the land would one day be dedicated as a park.

Instead, residents have been fighting proposals to build everything from an airport to a technology park on the land since the 1970s. The most recent proposal—a roughly 1,050-unit housing community that would be built on 45 acres—has prompted renewed efforts to permanently preserve the property.

Since the development plan was first floated nearly two years ago, opponents have held community outreach meetings, spoken at city council meetings, and even sponsored an open space festival with a barbecue and live music. “We’re basically just making sure that through some direct efforts, people are aware of what’s going on and know how critical this is,” says Dotson. “Almost everybody that I’ve talked to ... wants this whole area to remain exactly how it is. All of the development that’s happened all

around—enough is enough. So basically what we’re doing is drawing a line in the sand.”

Their efforts seem to be paying off. The East Bay Regional Park District, which offered to buy the land in May 2005, began publicly considering whether to exercise its power of eminent domain after the owners rejected the offer a few months later. At that time, the District’s Nancy Wenninger said, “It was time to save this property while it was still possible to do so.”

The move exacerbated the already-tense relationship between the District and the city of Richmond, which has not approved or rejected the proposed development but could see an increase in property tax revenues if it is built. At the time the use of eminent domain was proposed, the Richmond city council held a meeting during which many council members said they were insulted by the District’s move, which they considered to be a presumptuous exercise of authority over land in the city’s jurisdiction.



Whitney Dotson

The District postponed a meeting to discuss acquiring the land last September after owners of the marsh, Bay Area Wetlands, LLC—a wetlands bank developer—and Don Carr, complained that they were not given enough notice of the meeting to properly prepare a response. Since then, the District has reopened negotiations with the owners and, through a series of meetings, patched up its relationship with the city of Richmond, Wenninger says. The meetings led to another offer from the District—only this time, it is offering to buy only the portion of the property that was deemed undevelopable by the 1993 North Richmond Shoreline Specific Plan. Much of the community participated in the Plan’s zoning process, which protected a majority of the site as open space but zoned about 20 acres of upland area as light industrial. According to Wenninger, the District submitted the offer in late January, and the owners have until mid- to late February to respond.

In the meantime, the owners are moving forward with the development plan, and the city of Richmond is holding a public scoping meeting to get community input on what issues it should look at in its environmental impact report on the project. Wenninger could not say whether the District would pursue eminent domain if its offer is rejected, but said the District is committed to acquiring the sensitive portions of the site. If the District’s board of directors does choose to use

RESTORATION

URBAN RIVERS 101

"Nature bats last if she doesn't come first," said Ann Riley, S.F. Regional Board, emphasizing the lesson policymakers must learn from the repeated failures of conventional engineering practices on the nation's beleaguered urban waterways. "Recent natural disasters and environmentally devastated rivers illustrate the failures," explained Riley in her keynote address at the "City Rivers—The Urban Bankside Restored" symposium held at the Golden Gate University School of Law in November 2005. "We now have successful examples of ecologically functioning streams restored from concrete and channels that serve as models for returning healthy waterways to densely developed cities," said Riley. The key, she said, is that the public needs to get involved and insist on having a living river—one that supports even the most endangered species—over parking lots and warehouses.

Throughout the day, speakers echoed the theme that a new and long-overdue era of understanding has finally arrived in which ecologically sensitive principles are being developed and applied to resuscitate urban rivers. Yet the mindset of the Army Corps has been a major obstacle, said American Rivers' Melissa Samet. "The very symbol of the pork barrel, the Corps has a bias toward huge, over-designed projects with enormous price tags that have been selected for political reasons and don't take the environment into account." Successful restoration projects require that the community harness and manage the Corps, she said, and outlined a strategy for doing so. Communities must bring projects to the Corps rather than letting the Corps start projects, and they must keep state and federal agencies actively involved, as they can deny projects. Experts should be enlisted to examine the Corps' excessively long feasibility studies and, as a last resort, the community should complain to Congress and get the press involved.

Whatever the funding source, investing in urban rivers is critical for myriad reasons, said James Lyons, Casey Trees Endowment Fund, who noted that the Clinton administration understood this, while the current one doesn't seem to. "Nearly 90% of Americans reside in metropolitan areas," he said, "so restored rivers and riparian habitats in cities can bring communities in touch with nature, expanding the public's awareness of the value of natural resources and building the base of support



Kite photo of newly-restored Codornices Creek by Cris Benton.

needed to sustain natural resource programs and budgets for wildland as well as urban areas." He emphasized that investments in rivers can save taxpayers money by reducing stormwater runoff, for example, which improves water quality and eliminates some water treatment costs.

Ellison Folk, an attorney with Shute, Mihaly & Weinberger, discussed how setback ordinances, which limit development within a certain distance of a resource, are one of the most commonly used tools to protect riparian habitats and waterways. "While

these ordinances are controversial because people don't like being told what they can and can't do with their land, they serve many important purposes," she noted. The ordinances tend to pass if the purpose is clearly understood and where they do not substantially reduce property values.

The symposium's focus then shifted to case studies of rivers at various stages in the rebirth process. "The Anacostia Waterfront Initiative," explained Uwe Steven Brandes, Anacostia Waterfront Corporation, "is a federal-local partnership, and a planning process that has produced a development plan for the ecological, economic, social, and cultural rebirth of the Anacostia River." Unprecedented in the history of urban planning in Washington, D.C., due to its inclusion of neighborhoods on both sides of the river, the plan envisions a greensward that will link parks, maritime activities, and communities, as well as restoring water quality and stimulating economic development.

Things are looking up even for the Los Angeles River. "The river is now the subject of intense re-examination," said Robert Gottlieb, Occidental College. "The strategy for bringing the river to life has been to bring people down to the river to envision the possibilities." Friends of the L.A. River has organized poetry readings by the river, art shows, and annual bicycle rides, he said, and now a rail yard adjacent to the Metro stop at Chinatown has been transformed into a temporary art project, an actual cornfield, which was just harvested. Like other urban rivers, the L.A. River may take years to restore. Yet the take away message, says conference organizer Paul Kibel, was positive. "There are ecologically-sound flood control approaches that are more compatible with emerging bankside uses than traditional armoring. Federal, state, and local agencies are coming to realize this, but only after much prodding by communities who want living streams rather than concrete gulleys." **SPW**

WATERQUALITY

PESTICIDE NO PANACEA

Pyrethroids—a family of synthetic substances derived from toxins found in chrysanthemums—have won the lion's share of the residential insecticide market since more hazardous chemicals like diazinon and chlorpyrifos (Dursban) were phased out. But there's a catch: A recent study in Placer County suggests collateral damage to urban creek ecosystems. The apparent victims are tiny bottom-dwelling amphipod crustaceans called scuds (*Hyaella azteca*), a favored prey of small fish, tadpoles, newts, and aquatic insects.

U.C. Berkeley environmental toxicologist Donald Weston looked at pyrethroid levels and *Hyaella* populations in suburban Roseville's Kaseberg and Pleasant Grove creeks. The pyrethroids, primarily bifenthrin, cyfluthrin, and cypermethrin, in creek bed sediments killed scuds in laboratory tests. No living *Hyaella* were found in Kaseberg and the south branch of Pleasant Grove, the creeks with the highest pyrethroid levels. The scuds were only present in areas with the least residential influence.

"We are so used to thinking of pollution as coming from 'them,'" Weston told the *Sacramento Bee*. "But this is not the petrochemical plant. It's basic suburban pesticide use. The source is 'us,' not 'them.'" Pyrethroids are widely used in termite control, which often involves injecting the chemical underground. While underground injection is unlikely to be a problem for creeks, surface applications are washed from around buildings, lawns, and gardens into watersheds, where they bind with sediments.

"Diazinon and Dursban were causing widespread toxicity in water in urban creeks, and now we are getting widespread toxicity in sediment," says water-quality consultant Kelly Moran. "We really are not getting anywhere."

Pyrethroids have long been known to be highly toxic to fish, including coho salmon and rainbow trout. Trapped in creek sediments, the chemicals won't impact fish directly. But if they kill scuds and other benthic organisms, there's reason for concern about cascading effects through aquatic food webs.

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MARSH CONTINUED

that power, the process will go rather quickly, Wenninger says. Once the District files its eminent domain action, the District is given possession of the land, although the actual title wouldn't change hands until the District buys the land. If the parties can't agree on a purchase price, the case would have to be brought before a jury within a year of the filing.

Dotson and his alliance of community members and environmental groups are looking to the District to not only stop development on the land but also to connect the Bay Trail through the property to Pt. Pinole and work with the Natural Heritage Institute to restore Rheem Creek. The Institute has worked with the community all along the creek—which starts in El Sobrante and empties into San Pablo Bay at Breuner Marsh—to develop a restoration plan to increase residents' access to the water and improve the viability of the stream for salmon, steelhead, and birdlife, says the Institute's Rich Walking. The plan would also allow the creek to meander across the property as it did before a flood control project in the 1960s redirected it.

Although there is no set date for the District's acquisition of the property—through a willing sale or the possible exercise of eminent domain—Dotson says the campaign is a successful example of community members, environmental groups, and the government working to protect the shoreline “for people and for wildlife—to save the ecosystem.”

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FRANKENDELTA CONTINUED

recent science doesn't support Zuckerman's contention. “I think it's now becoming clear that the Delta ecosystem is very complex, and that the role of water exports appears to be relatively minor—if not nonexistent—in terms of impacting fish species and the like.” And he doesn't think desal is the answer either. “We can make it more difficult and more costly to grow food in California. But we are not doing anything for the fish.” Hull says his agency is trying to stay out of the intensively political debate about a new peripheral canal, but he does think a conversation about the canal would be more constructive than discussing exports.

For now, the pipe/canal plan may be moot. Mount points out that the CALFED Record of Decision has effectively kept everyone from discussing anything but the option of running water through the Delta. The ROD is scheduled to be reevaluated in 2007, but he thinks it is not too soon to start putting all ideas on the table. Assuming that such thorny, politically charged issues as new pipes and water treatment could be worked out—and that all stakeholders would agree that the Delta needs ecological rescue—what kind of restoration could be done? “People cling to some obscure and obsolete notion of the Delta,” says Mount. “One hundred and fifty years ago, it was a 700,000-acre freshwater tidal marsh. Today it is something completely different. We don't even have a name for the kind of system it is today.” There are no systems for us to really compare it to, he adds. But the Delta as we know it is “dead and gone, and there is no turning back. Now we are managing for something other than the Delta, whatever that is. Our problem is that we can't seem to figure out what we want it to be. ‘Frankendelta?’” Mount and U.C. Davis' Peter Moyle have suggested trying to head off the next earthquake or flood at the pass by breaching some of the levees north and east of Antioch, which could result in a large body of open brackish water—a Chesapeake Bay-like scenario.

The Bay Institute's Tina Swanson agrees with Moyle that “no matter what we do, we can never get back the natural historic Delta.” But Swanson says S.F. Bay isn't Chesapeake Bay—and that there are lots of uncertainties as to how the Delta would react ecologically or hydrologically to attempts to make it resemble its East Coast sister. “We have a long history of physically manipulating the Delta, trying to make it better. But that doesn't work,” warns Swanson. “We need to be very careful. On the other hand, it is absolutely clear that maintaining the status quo is positively unsustainable if our objective is going to be to balance the needs of the ecosystem with farming and water quality and supply.” The levee-breaching idea makes Zuckerman nervous, too. “It's an unproven sort of concept.

Once you start creating these open areas where there is lots of fetch and wind action, you can begin to lose islands successively. Why run the risk of losing the entire Delta?”

What should be done? Swanson says we need to regroup, reevaluate, and remember that two rivers drain into the Delta. By withdrawing less water from the beleaguered San Joaquin River—and thereby improving water quality—we could significantly improve Delta habitat, says Swanson. The goal, she explains, is to better manage the Delta for native species, a principle most scientists think leads to a more sustainable ecosystem.

Swanson points out that historically, the Delta was fresher in the spring and periodically in the winter (because there were less upstream dams capturing flows, and because less water was diverted from the Delta itself), and saltier in the fall. “One of the things we've done is increase flows through the summer and fall. The way we operate it now, we've significantly reduced within-year variability.” That disruption of the natural hydrograph, says Swanson, is one of the factors she thinks has enabled non-natives to thrive and possibly decimate native fish and pelagic organisms. “Natives can tolerate episodic, disruptive events—they evolved in those conditions,” she says. But non-natives are happier with the current, more static situation. Says Swanson, “It is becoming scientifically clear that the best thing you can do for aquatic ecosystems is to preserve key portions of the hydrograph—such as a snowmelt pulse and low flows [in water-scarce months].”

U.S. EPA's Bruce Herbold echoes Swanson's views about trying to restore a more natural hydrograph. He envisions “a future where salt-water comes in every summer and drives out introduced species, enabling native and long-established Estuary fish like striped bass to thrive.

Before we started tampering with the Delta, says Herbold, it was very much an “inland sea” that drained through a narrow gap in the Montezuma Hills. “It was like a bathtub with a small hole; it stayed fresh for a good part of the year,” he explains. But Herbold recognizes that we aren't going to get back to that. “We're not going to move the city of Stockton; we're not going to change some of that infrastructure. But we need to decide how much is protectable and what to do with the rest. There's a lot of creative thinking out there that hasn't gone into planning yet.” What he doesn't want to see, says Herbold, is islands lost to levee failures, the result being a bunch of semi-isolated deep ponds that “sit there and percolate, ruin water quality, and trap salt.”

Maybe it's time for a Delta design charette, in which scientists and resource managers ponder all the questions facing the Delta. Says Herbold,

continued page 8

PLACES TO GO & THINGS TO DO



WORKSHOPS & CONFERENCES

FEB
TUESDAY
14

VALENTINE'S OPEN HOUSE

TOPIC: A meet-and-greet at the Water Education Foundation.
LOCATION: Sacramento
SPONSOR: Water Education Foundation
<http://www.water-ed.org/whatsnew.asp>

FEB
TUESDAYS
14 &

CALIFORNIA COLLOQUIUM ON WATER

TOPIC: Hell & High Water in the Delta: The Fate of California's Water Supply Hub (February); The Invaded Estuary: Exotic Species in S.F. Bay (March).
LOCATION: Berkeley
SPONSOR: U.C. Berkeley
<http://www.lib.berkeley.edu/WRCA/ccow.html>

MAR
14

24th ANNUAL SALMONID RESTORATION CONFERENCE

TOPICS: Rediscovering urban creeks and creating healthy watersheds: dam removal, floodplain management, salmonid education, project monitoring for watershed management; soil bioengineering workshops.
LOCATION: Santa Barbara
SPONSOR: Salmonid Restoration Federation
[Srf@calsalmon.org](http://www.calsalmon.org/conference/2006/index.htm)
<http://www.calsalmon.org/conference/2006/index.htm>

FEB
WEDS-SAT
22-25

AERS SPRING MEETING

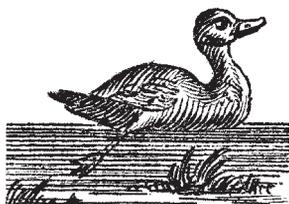
TOPIC: The Delaware Estuary: Much improved water quality, but ...
LOCATION: Philadelphia, Penn.
SPONSOR: Atlantic Estuarine Research Society
<http://www.aers.info>

MAR
THURS-SAT
9-11

RE-ENVISIONING THE DELTA

TOPIC: Implications of ongoing urbanization of the Delta; exploration of alternative futures for the Delta; lessons learned from New Orleans.
LOCATION: Berkeley
SPONSOR: U.C. BERKELEY, Dept. of Landscape Architecture and Environmental Planning
<http://www.laep.ced.berkeley.edu/laep/delta>

MAR
THURS-FRI
16-17



HANDS ON

MAR
TUESDAY
14

INTERNATIONAL DAY OF ACTION AGAINST DAMS

TOPIC: Protest & act against destructive river development and celebrate successes over the past year.
SPONSOR: International Rivers Network
LOCATION: Various
www.irn.org/dayofaction

CALL FOR ABSTRACTS

DEADLINE: WEDNESDAY, FEB. 15

Researchers are invited to submit abstracts for the spring 2006 meeting of the Southeastern Estuarine Research Society (March 30-April 1, Ponte Vedra Beach, Fla.). The meeting will feature a special session on the impacts of hurricanes on water quality and quantity, biota, and coastal ecosystems and processes. Those with research interests in this area are especially encouraged to submit an abstract. Email abstracts to Paul Pennington (paul.pennington@noaa.gov).

For more information:
<http://links.baruch.sc.edu/seers/meetings.htm>

JOB OPPORTUNITY

OPEN UNTIL FILLED

Cal Fish & Game's Central Valley Bay-Delta Branch's Suisun Marsh Program is accepting applications for one Scientific Aid to assist with wildlife surveys in the Grizzly Island Wildlife Area, Suisun Marsh, and the Delta. This position requires variable work hours, driving on levee roads, and working independently. Qualified applicants should have strong communication, writing, and computer skills. Experience with radio telemetry and bird surveys is preferred but not necessary.

Submit Standard State Application Form 678 (available at: <http://www.spb.ca.gov/Employment/stateapp.htm>) via email or standard mail to Ms. Laurie Briden, Central Valley Bay-Delta Branch, 4001 N. Wilson Way, Stockton, CA 95205, lbriden@delta.dfg.ca.gov.

For more information: Laureen Barthman-Thompson (209)948-7706.

NOW IN PRINT & ON LINE

Biodiversity Values of Geographically Isolated Wetlands in the United States. December 2005. P. Corner et al. *NatureServe*. www.natureserve.org

Discussion Paper on Pharmaceutical Disposal to Sewer Systems. February 2005. Emerging Contaminants Workgroup, Santa Clara Basin Watershed Management Initiative. Karin.north@cityofpaloalto.org

Effects of Urbanization on Stream Ecosystems December 2005. American Fisheries Society. www.fisheries.org ("bookstore")

Environmental Literacy in America: What Ten Years of NEETF/Roper Research & Related Studies Say About Environmental Literacy in the U.S. September 2005. Kevin Coyle. National Environmental Education & Training Foundation. www.neetf.org

The Handbook for Developing Watershed Plans to Restore & Protect Our Waters. October 2005. U.S. EPA. http://www.epa.gov/owow/nps/watershed_handbook/

CHLORINATED CLUES, continued

when they've seen EMBUD field personnel responding to a break, the mats don't cover the drains, and the water simply goes around them—and heads for the nearest creek.

Among the solutions proposed at the meeting was for EBMUD to be more proactive and place a neutralizing agent at the storm drain that could be there year-round. "That interests me because there are real limitations to merely reacting to emergencies," says Riley.

Next on the agenda will be the Board's request for a meeting with EBMUD to design new protocols and practices and to discuss worker training. The goal would be to reduce EBMUD's reaction time to line breaks and implement some "enforcement tool" to stem the flow of chloraminated water into streams and creeks. Riley stresses that EBMUD would become a pilot agency that could serve as a model for others that are dealing with chloramines and water line breaks.

Not only would EBMUD serve as a model for other agencies, but it could also train creek groups to be part of a volunteer task force that would be the first to respond to water line breaks. "I think East Bay MUD is proud of its environmental record and wants to do the right thing, and so that's why it's a good agency to do a pilot," notes Riley.

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FRANKENDELTA CONTINUED

"We need to get 30 people in a room for a week and have a serious conversation, identify goals and problems, and solve them. So far we haven't done that because people think they have the answer, or that someone else has the answer, and they don't like that answer." Yet with the governor allocating \$16-\$18 million in the general fund this year to prop up ailing Delta levees—and proposing a \$900 million bond for fixing Delta levees over the next 10 years—we may only have a tiny window of opportunity in which to tackle the Delta's problems in an intelligent, non-knee-jerk way, says Holmes. But Grindstaff says some of that levee money could be used to implement a new vision for the Delta.

A common vision, he says, is needed before any design charrette can take place. "We have to find a way to involve the local communities and lots of stakeholders to come to an agreement on what we want to see in the Delta. We're going to try to foster [such a process]." Grindstaff's vision for the visioning process is to have a science panel available for policymakers to consult with as they discuss what to do about the Delta. Holmes thinks

scientists should come up with the vision, with politicians locked out of the room. Hull says people would have to come with an "open mind," and let go of their orthodoxy that "less exports is the solution," which he likens to turning a knob that no longer works.

One key point on which most folks seem to agree, however, is that in any discussion or visioning process we also need to tackle the state's overall water use issues, particularly with the Central Valley's population predicted to increase by 131% by 2050. How do you get all of those new residents to understand they are living in a water-challenged state? "No one wants to tell people how to live, but if you tell people they can't have unlimited water in an arid state, they get it; they try," says Holmes. "Right now, there's a complete lack of leadership from the government in educating people about this." Says Grindstaff, "We need to find the right mixture of incentives—positive and negative—to get water agencies and the public in general to change their [water use] ways. Clearly, we have to do everything we can to reduce demand. The state as a whole has to get that ethic and that's something the state—CALFED, DWR—has to push." Says Swanson, "There are

places where we could increase reliance on integrated regional supplies instead of imported supply [from the Delta]. There are huge opportunities for water conservation by both urban and agricultural areas, including land retirement."

Can the kaleidoscope of ideas ever coalesce into a coherent vision? U.C. Berkeley is holding one visioning process in March (see calendar). Probably the only point on which everyone seems to agree right now is that we need to keep talking about the Delta and start dealing with its future, unless we want nature to do it for us, New Orleans style. Says Herbold, "We cannot bring all of those levees up to the federal standards needed to protect us from earthquakes and climate change. We should be asking 'What are the sustainable resources in the Delta?' Otherwise, we're just sitting on the tracks in a stupor as the train heads straight toward us."

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YOUR INDEPENDENT SOURCE FOR BAY-DELTA NEWS & VIEWS



FEB 2006

VOLUME 15, NO. 1

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ESTUARY is a bimonthly publication dedicated to providing an independent news source on Bay-Delta water issues, estuarine restoration efforts and implementation of the S.F. Estuary Project's *Comprehensive Conservation and Management Plan* (CCMP). It seeks to represent the many voices and viewpoints that contributed to the CCMP's development. ESTUARY is funded by individual and organizational subscriptions and by grants from diverse state and federal government agencies and local interest groups. Administrative services are provided by the S.F. Estuary Project and Friends of the S.F. Estuary, a nonprofit corporation. Views expressed may not necessarily reflect those of staff, advisors or committee members.

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