

CROAKLESS SPRING



As lily pad vacancies continue to skyrocket, scientists are scrambling to understand where all the hoppy creatures have gone. Under an NSF grant, University of Pittsburgh biologist Rick Relyea is looking at one possible clue, examining how the world's most popular herbicide—Roundup—affects tadpoles.

He's found that it not only "rounds up" weeds, it also kills off amphibians faster than you can say "jumping frog of Calaveras County." Published this fall in the *Journal of Ecological Applications*, Relyea's results show that in his simulated ponds—300-gallon containers filled with insects, leaves, and mucky water—Roundup wiped out three out of five frog species in just one day. The lethal substance is not the active herbicide ingredient, glyphosate; it's the surfactant, an inert substance that allows the glyphosate to penetrate plants' leaves—and possibly tadpoles' delicate skin.

"The question is, did Relyea study realistic concentrations of Roundup—those likely to be found in the field?" says Washington University's community ecologist Jon Chase. "And did he apply Roundup the way it's actually applied in the field?"

No to both questions, says Joy Honnegger of Monsanto, Roundup's St. Louis-based manufacturer. "Relyea's studies aren't reasonable because according to the label, Roundup is for terrestrial use only, and Relyea sprayed it into water." But Relyea says there is overwhelming evidence that Roundup gets into aquatic habitats, even when applied correctly. Sprayers can avoid large lakes and ponds, he says, but not all of the shallow, muddy puddles that appear suddenly after heavy spring rains dry up a few weeks later. These small, temporary wetlands can harbor thousands of tadpoles and are the sole breeding grounds for some amphibians.

Relyea says that he used realistic maximum concentrations in some studies, the amount you'd expect to find in a wetland that was accidentally oversprayed, and amounts well below the realistic maximum in others. He notes that scientists have predicted that Roundup concentrations in a wetland could range as high as 1.4 mg a.e./L to 7.6 mg a.e./L (milligrams of acid equivalents per liter). But with a Roundup concentration of only 1.0 mg a.e./L., well below the predicted maximums, Relyea observed a 71% tadpole mortality rate.

There are other areas of contention. Honnegger says Relyea's simulated ponds aren't realistic because they don't contain soil, which appears to absorb Roundup before it can be taken in by amphibians. Relyea claims he did use soil in one study, and it didn't reduce the mortality rate at all.

The problem is that there aren't many studies about herbicides and amphibians because U.S. EPA doesn't require them, Relyea explains. To register a herbicide or

continued page 2



Silver Pellets

A small, starchy, white pellet may not be the magic silver bullet that solves the murky morass of issues facing the Delta—subsidence, natural disasters, habitat and farmland loss, and variable water quality—but it could be a piece of the puzzle scientists, water managers, and others are trying to piece together in starting to think about a more sustainable Delta landscape.

While levees are usually intended to keep water off farmland, in a seemingly counterintuitive move, researchers in a new study are flooding the Delta's peat soils to grow rice—an act that could help stop subsidence. Parts of the Delta are now 20 feet below sea level, which puts pressure on the levees, making it necessary to keep building bigger ones (see "Suisun Rising," ESTUARY, August 2004). "We don't have the data for the subsidence mitigation potential of rice, but USGS data for similar water management practices for wetlands on Delta peat soils show promise," says Steve Deverel with Hydrofocus, which is partnering with USGS, Ducks Unlimited, U.C. Davis and U.C. Davis Coop Extension, Bachand Associates, and the Contra Costa Water District on the study. "The USGS data indicate that keeping the soil saturated for most of the summer stops the carbon loss that is the primary mechanism for soil loss. If you can stop the soil loss, then when you do break a levee, the initial

big gulp that goes onto the island is going to be less. Plus if the land is less subsided, the levees haven't got as much hydraulic force on them."

Although growing rice could help arrest subsidence, the CALFED-funded study was conceived of with other goals in mind—including creating wildlife habitat and possibly

improving water quality. The study designers wanted to know if growing rice under flooded conditions could reduce the amount of organic carbon getting into the Delta—and into the water taken in by the Contra Costa Water District and other water suppliers that have intake pipes near agricultural drainage outlets.

The researchers theorize that by growing rice under flooded conditions, less organic carbon will end up in the tailwater that flows into the Delta (and ultimately drinking water) than when surface irrigation is

used on corn, for example, or other crops traditionally grown in the Delta. "With rice, you can keep water on the field and minimize water coming off the field," explains Deverel. "There is some drainage, but you can control it in a much better way than you can with a typical crop like corn." Deverel explains that unlike rice, which likes having its feet wet, most crops need to have their root zones aerated to avoid becoming waterlogged. That means irrigating, allowing the root zone to dry out, and then irrigating again, a process that releases dissolved organic carbon from the peat soils and into the Delta water supply.

continued page 3



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CROAKLESS CONTINUED

pesticide, the EPA requires testing on some, but not all, classes of animals, including fish, mammals, birds, and zooplankton. "So it wasn't until an Australian study in 1999, after Roundup had been used for 25 years, that anyone looked at how it might affect amphibians," says Relyea. That study showed that four species of Australian amphibians were moderately sensitive to Roundup, so an herbicide was developed for Australia that uses a less harmful surfactant. North American frogs are up to 10 times more sensitive than Australian frogs, but the alternative variety of Roundup hasn't been approved for the United States.

To support its claim that Roundup couldn't hurt a frog, Monsanto points to a large-scale field study that took place in Canada in 2004. Experimenters sprayed Roundup aerially over a large forested area dotted with small ponds, then compared tadpole mortality rates for directly sprayed ponds with those of indirectly sprayed ponds and control ponds. They found no statistically significant difference, so concluded that Roundup was not responsible for the deaths.

"But their results are hard to interpret," says Relyea. "About 36% of the tadpoles in the directly sprayed ponds died, and about 26% in the control ponds died. When there is high, unexplained mortality in the control population, it's difficult to draw strong conclusions. Yet this is the one study that Monsanto always cites."

No one disputes that amphibians are dying. About one-third of amphibian species are threatened worldwide, compared to only 20% of mammals and 12% of birds, according to a recent survey by the Union for the Conservation of Nature and Natural Resources.

"Amphibians are the wimps of the animal world," says Chase. "They're like the canaries in the coal mine—the first to respond to changes in the environment. They're susceptible because they absorb their surroundings through their permeable skins. Lots of things seem to harm them: UV radiation, temperature changes, acid rain, new diseases. But habitat loss is probably the main thing. Herbicides may not be good for them either, but we have no idea if herbicides are contributing to the global decline."

Relyea has a host of follow-up studies underway. He's testing how long it takes soil to absorb Roundup, and he's looking at varieties of Roundup that use different surfactants.

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PEOPLE

THE REAL TERMINATOR

Mark Mahre may not think of himself as an object of desire, but he is every environmentalist's—and environmental regulator's—dream come true. For the past 14 years, Mahre has worked full-time for the Santa Rosa police department, investigating environmental crimes, often alongside the North Coast Regional Water Quality Control Board, Cal Fish & Game, and the Department of Toxic Substances Control; sometimes all three at the same time. Paid for by the Santa Rosa sewage treatment plant and the city's Department of Public Works stormwater program, Mahre investigates everything from individuals or businesses illegally dumping hazardous wastes into storm drains, landfills, streams, or the ground, to auto-body shops dry sanding outside (where paint flecks land on the ground and get washed into streams) to construction sites failing to use proper erosion control. Mahre has the authority to issue citations or arrest anyone violating Fish & Game codes and other environmental regulations.

One of his most satisfying accomplishments is that he's starting to see fewer violations at construction sites. "About four or five years ago, I started looking at some of the construction sites in town, riding around with building inspectors and North Coast Regional Water Board regulators," says Mahre. "I showed up at one site to talk to the job foreman in a Chevy Suburban environmental crime unit with the star on the door. I started talking to him about what would happen if there was a discharge coming off the site and told him that we could issue a citation or I could arrest him." (Within a few hours, Mahre says, the foreman was in the city manager's office complaining that he was being harassed.) That year,

recalls Mahre, the D. A. took action on five or six erosion-control violation cases. "The following year, I didn't have a single case, so something's working," says Mahre.

The majority of his cases involve illegal disposal of hazardous waste. He recently arrested a long-time owner of a plating shop who he discovered was dumping hexavalent chromium into a floor drain that connected to the sewer system. How does he prove such a case? Mahre kept track of the company's hazardous waste site manifests. After a while, the manifests dropped off while water use increased, offering him a clue that something was wrong. He then did some discreet sewer sampling by isolating the shop's lateral line, and found inordinately high levels of hexavalent chromium. Then he got a search warrant and found the evidence he was looking for inside the shop. Sometimes he snoops around in garbage bins, he admits, or just looks around on the ground behind a business. Other times, he receives tips, usually from disgruntled former employees.

The penalties? Most of the time, people are fined, says Mahre. But he thinks a better disincentive is arresting the responsible person—if he can show that the person knowingly participated or directed others to participate in the act. "A lot of times when businesses illegally discharge, it's a lack of knowledge or education," says Mahre. "The auto sanders working outside—sometimes they just need to be educated."

So how do you change behavior? "You can have all the brochures in the world, and some people will read them and do the right thing. But then there are businesses that routinely build in as a cost of doing business the cost of getting caught," says Mahre. And, he adds, there will always be people who willingly break the law. Anyone who falls into that category—at least in Santa Rosa—might want to think twice. **LOV**



PELLETS CONTINUED

In most of the Delta, large releases of organic carbon occur during the winter after the peat oxidizes—or cooks—all summer. To grow rice, the soil is flooded all summer and again during the winter. Over the long term, the wetter conditions provide less opportunity for soil oxidation and organic carbon release, says Deverel. When certain kinds of organic carbon combine with free chlorine at water treatment plants, trihalomethanes (“THMs”), which are suspected carcinogens, can form. “The rice study is part of a holistic approach we’re taking,” says the Contra Costa Water District’s Dave Briggs. “We’re trying to improve our treatment plant and distribution system, as well as relocate one of our intakes and improve source water quality.” And that is where rice comes in.

Growing rice also offers a way to keep farmland in production while providing wildlife habitat. “The Delta Protection Commission has let it be known that they don’t want to turn these islands back into wetlands,” says Deverel. “This might be a way to keep farming alive in the Delta.”

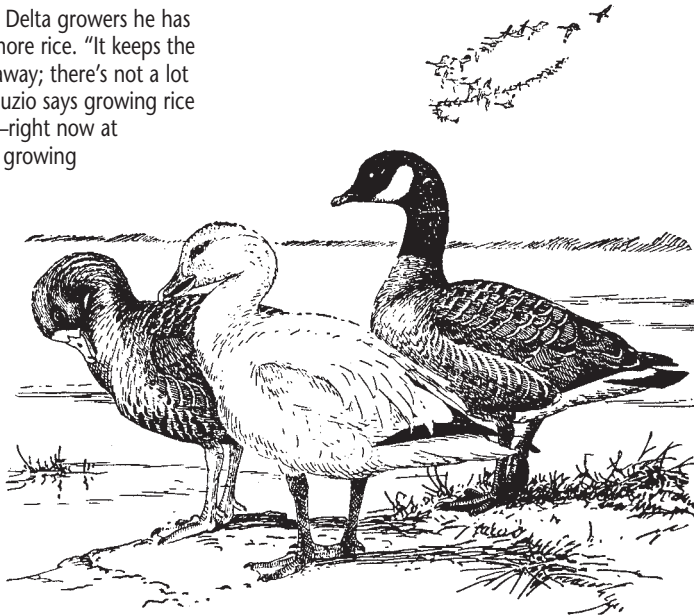
Without wetlands, rice fields may be the next best thing for wildlife. Gene Muzio, who farms about 1,800 acres on the Wright-Elmwood Tract, says he’s seeing more ducks and geese than he ever has on the 600 acres he planted with rice as part of the study. “I thought they had all disappeared, and now they’re back,” he says.

Muzio, like lots of other Delta growers he has talked to, wants to plant more rice. “It keeps the peat wet; it doesn’t blow away; there’s not a lot of dust. I like the crop.” Muzio says growing rice is less labor intensive and—right now at least—more lucrative than growing corn, which barely allows him to recoup his costs. Another grower is trying rice to see if flooding his fields will help destroy the soil nematodes and diseases that ruin his potato crop. “We’re looking at how rice might fit into crop rotation in the Delta for disease, nematode, and weed mitigation,” says the Coop Extension’s Mick Canevari, one of the study’s sponsors. Although the Delta wasn’t traditionally as favorable for growing rice as the Sacramento Valley, explains Canevari, new varieties have been developed that are flourishing here.

How much rice could be planted in the Delta? No one seems to want to hazard a guess

at this point, but as more Sacramento Valley rice farmers sell water south—or land to developers—Delta growers could fill a niche while solving several problems. Briggs says additional management and logistical questions need to be answered if rice is to be grown on a larger scale in the Delta. And other factors come into play too. “Economics drives the success of certain crops,” says Canevari. “Is rice going to be the silver bullet? I don’t know that, but there’s enough interest and enough pluses that I think we need to invest more effort into finding out the benefits and how to make it work in the Delta.”

Lots of rice in the Delta might not sit well with some folks, even with all its seeming pluses. “We’ve got the watchful eyes of the California Rice Commission on us,” says Briggs. “They haven’t said they’re for or against this project—they know it’s just a study—but whenever you’re talking about putting land into production for rice, they’re going to want to know about it.” Muzio says the Rice Commission shouldn’t worry. “What we’re growing down here is a pea in the pod compared to what they’ve got planted.” With 470,000 acres of rice being grown statewide—only 2,500 of which is in the Delta—he has a point. Philip Bachand, the lead investigator on the study, says to “stay tuned. Ultimately, it may be one of the only sustainable crops in the Delta, at least for areas with peaty soils.”



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HOW I SEE IT



Mike Connor

LEVEES SHOULD TOP EVERYONE'S AGENDA

The small leap from levee failure due to hurricanes in New Orleans to levee failure from earthquakes in the Bay Area has proven to be an

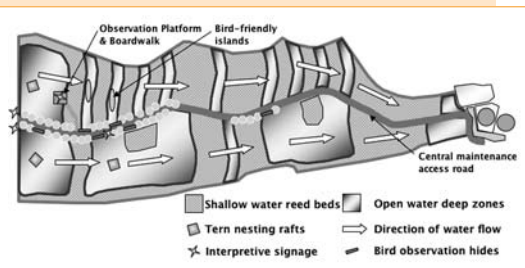
easy one for news analysts and commentators to make. In both instances, scientists have predicted both the likelihood and consequences of catastrophic levee failure. In both instances, the issue has eluded clear public policy solutions, and development policies have made the problem worse. New Orleans has shown us that the risks of inaction are immense—it will take years to recover from a catastrophic levee failure. And the consequences of catastrophic levee failure during an earthquake will have even more serious and long-lasting effects than the damage Katrina caused. A major earthquake or flood could easily destroy tens of miles of the 1,100 miles of levee, immediately flooding thousands of acres of farmland as well as the highways and railroads that cross the Delta. When a levee breaks in the Delta, water rushes into the subsided land (sometimes as much as 20 feet below the level of the adjoining river), sucking in salty water from Suisun Bay that can be carried to the South Delta and contaminate the fresh water being pumped to Southern California.

Mobilizing resources for disaster while the sun shines is so difficult we have fables about it—witness the ant and the grasshopper. We been unable to implement a strategy to respond to the Delta levee risk. There’s a high probability that this disaster will happen before we can shore up the levees. We need a two-pronged strategy that addresses: 1) what to do to prevent the disaster, and 2) how to respond if the disaster occurs in the short-term and long-term.

In the past, my attitude toward levee planning has been, “I know it’s important, but I’ll let other people worry about it because I’m interested in other ecological protection and restoration issues.” New Orleans makes clear that my attitude must change. Besides the humanitarian reasons, New Orleans has brought home a very practical reality. The costs of the economic dislocation from Katrina and rebuilding are so large—estimates begin at \$200 billion and go up from there—that they will crowd

(NON)TECHNOFIX**REED WORK**

Stockton's wastewater plant has 360,000 new hires hard at work in its newly created treatment wetland. The employees—tules and cattails—are busy reducing particulates, biochemical oxygen demand (BOD), and turbidity in the wastewater while providing habitat for waterfowl and other birds. The plants have replaced the old flocculators that used lots of electricity and didn't clean as well as Mother Nature.



"The wetland is part of the facility," explains Tony Stanbridge of OMI-Thames, the company operating the treatment plant. "It's between the ponds, which use algae to control BOD, and the nitrifying towers, which reduce ammonia, then pass the wastewater on to filters, chlorinators, dechlorinators, and finally the San Joaquin River." The wetland is one of the largest such projects in the United States and will help the plant meet strict standards that take effect in 2006 for water discharged into the river, says Stanbridge.

The key is to work with Mother Nature, he says. "We planted 360,000 [tules and cattails] in 12 bands or strips of shallow water separated by open-water deep zones. As the wastewater flows across the bands, it is evenly dispersed and it slows. The reeds then absorb dissolved nutrients and capture solids, such as algae, like sieves. When the algae die and break down, the reeds feed on them."

Birders are excited because the reed bands, with secluded muddy islands built into them, will provide habitat. Birders will be able to enjoy the sights from the wetland's new mile-long causeway and observation platforms.

Says Thames' Peter Spillet, "The nature reserve should get the community thinking about wastewater treatment, and that's not easy to do," he says.

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HABITAT**DECIPHERING DUCKS' NEEDS**

As hunters, birders, and wildlife biologists know, there's no such thing as "duck habitat." On their breeding and wintering grounds, different species have different needs and preferences—and pose different challenges for restoration. Case in point: the migratory canvasbacks and northern pintails wintering in the Estuary.

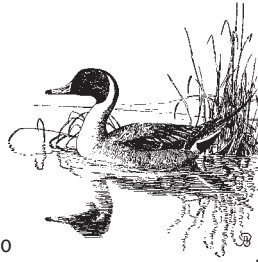
Canvasback numbers mirror water levels in prairie pothole country—the Dakotas and up into Manitoba and Saskatchewan—where they breed. "They're one of the most variable populations of all," says biologist John Takekawa of the U.S. Geological Survey's Western Ecological Research Center. Low water exposes their nests to mammalian predators like raccoons and mink. They took a hit during the dry 1970s; since then, they've been "all over the map" and remain a highlighted species for wildlife managers.

These diving ducks, feeding on clams in winter, found the North Bay salt ponds to their liking. A decade ago, up to 59% of the Estuary's canvasbacks settled here; San Pablo Bay National Wildlife Refuge was established primarily for this species. When Cargill ended salt production in 1993, water levels dropped—and so did the canvasback census. The ponds housed 8,000 in 1990; only 2,500 in 1999. Overall, North Bay canvasbacks have declined from 25,000 in the mid-1980s to 5,000 to 10,000 last year. Changing resources are also implicated; the invasive Asian clam *Potamocorbula amurensis* may not be as reliable a winter-long food item as the mollusk species it displaced.

Where have the canvasbacks gone? If those nesting at Nevada's Ruby Lakes National Wildlife Refuge are typical, they've shifted from the North Bay to restored Central Valley wetlands: mostly to the San Joaquin, and some to the Yolo Basin, other Sacramento Valley areas, and the Delta. Between 1969 and 2001, recoveries of canvasbacks banded at Ruby Lakes increased elsewhere but plummeted to zero in S.F. Bay.

The plan for restoring the former salt ponds involves maintaining Pond 2 as deepwater habitat for diving ducks. But Takekawa cautions that it's hard to construct levees that will hold water deep enough to attract canvasbacks and provide suitable food: "It will take a little bit of thought and cost."

Managing for northern pintails raises different issues. These elegant ducks breed as far north as Alaska, with small numbers nesting in the North Bay, Suisun Marsh, and elsewhere in California. But most come from the Canadian prairies. Unlike other prairie ducks, pintails haven't fully recovered from the last drought. Besides conversion of prairie to cropland, the problem is their



preference for dry nest sites. "They love stubble fields," says Mike Miller of USGS. "They get well into nesting and then it's time to cultivate and plant spring wheat." With nests destroyed by farm operations, the prairies have become an ecological sink.

Groups like Ducks Unlimited Canada are promoting conversion to fall crops and a Conservation Reserve Program to take nesting habitat out of farm production.

Suisun Marsh used to be a magnet for wintering pintails. But changes in the wetlands and surrounding farmlands have reduced its attraction, and midwinter counts in the Bay fell from 200,000 in the 1950s to 20,000 in the 90s, with most of the decline in Suisun. "Pintails are nervous ducks," says Greg Green of Ducks Unlimited. "They like wide open spaces and low vegetation." The Suisun marshes, managed for mallards and other species, are now too thickly vegetated for their taste.

Miller also notes pintails' preference for new water after heavy rains. "One of the problems in San Francisco Bay is the loss of areas that can flood," he says. The wheat and barley fields that once provided flooded upland habitat are gone. His prescription: "To keep maximum pintails, you need shallowly flooded freshwater areas in conjunction with brackish and salt."

Instead of Suisun, more of the 800,000 to 2 million pintails that migrate to California stop in the Sacramento Valley, in restored wetlands and winter-flooded rice fields. Miller says that by January, three-quarters of the pintails that began the season in Suisun Marsh and the San Joaquin have moved north to the Sacramento.

Thanks to a high-tech tracking study, Miller now knows that 75% to 85% of California-wintering pintails stage in the Klamath Basin in early spring—another claimant for contested water resources. From there, data gathered by satellite from backpack-harness transmitters shows that some pintails move east to the Great Salt Lake, then north to the prairies; others make a beeline for the prairies; still others go directly to Alaska and even beyond—Subject 17553 was traced from the Central Valley to the Kanchalan River in Siberia, where she spent the summer.

Pintails have also used the Napa-Sonoma salt ponds, although in lower numbers than Suisun's managed seasonal wetlands. While it's only one part of the annual cycle, winter habitat with enough seeds for pintails and clams for canvasbacks—to be converted into fat reserves—may be a key to productivity on the nesting grounds. Providing that quality imposes yet another balancing act for wetland restoration.

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BUREAUCRACY

CRITIQUING CALFED

Cynthia Koehler was only a few sentences into her testimony before the Little Hoover Commission on CALFED governance when the Commission's vice-chair, Stanley Zax, flipped on his microphone, leaned in, and said, "I'd like to talk about the science."

Koehler, the former legal director for Save the Bay, said she had not come to the hearing to criticize the science program. After all, science was not supposed to be the focus of this hearing; "governance" was.

The September 23 hearing was the second in a series of three public meetings scheduled between August and October in response to Governor Schwarzenegger's June 22 request that the Commission "undertake an examination of governance issues related to the CALFED Bay-Delta program and the proper role of the California Bay-Delta Authority," and issue findings and recommendations. The Little Hoover Commission is comprised of up to five members appointed by the governor, four appointed by the state legislature, two sitting senators, and two sitting assembly members. The state legislators on the Commission were not present at the hearing.

Zax did not let Koehler finish her testimony—the first of the morning—but went on to describe the multi-billion-dollar CALFED program as "a polite luncheon club" for state and federal agencies and to ask pointed questions about the quality of the program's science.

In response, Zeke Grader, with the Pacific Coast Federation of Fisherman's Associations and on the first panel of witnesses with Koehler, told the Commission that CALFED "ignored the science."

Grader said good science was available in the late 1980s when studies showed that the Delta lacked 1.6 million acre-feet of water annually, and in 1991 when Congress recognized this lack in the Central Valley Project Improvement Act. "It shouldn't take a rocket scientist to figure out that we have a Delta collapsing," he said.

Returning to the topic at hand—governance and the right role for CALFED—the enviros and water agency representatives who testified agreed that the Bay-Delta Authority lacks any true authority. They questioned whether or not it should have any authority, and if so, with what scope.

"Part of the problem with the governance of CALFED is that the fisheries agencies don't have the authority to implement their programs," said Mindy McIntyre, a water policy specialist with the Planning and Conservation League, after the hearing. McIntyre noted that the Department of Water Resources and BurRec have representatives on the CALFED Delta working group, which gives them the power to vote on

whether to take action against their own programs—i.e., Delta exports. "This makes it impossible for agencies to make decisions based on what's best for the fish."

Randy Kanouse, a lobbyist with EBMUD, told the Commission that the State Water Resources Control Board represents a better governance structure for restoring and protecting the Delta. When making water rights decisions, he said, the Board takes testimony from state and federal agencies, as well as from water rights applicants and stakeholders. The Board makes decisions that are binding on all parties, "and it does so based on evidence; it does so on the record; and anyone has the chance to participate."

Timothy Quinn, with the Metropolitan Water District of Southern California, presented the commissioners with a very different picture of how the Authority should operate. "The Authority's job is to facilitate, not decide," he said. "The Authority needs to be the United Nations of California water in the Delta."

Steve Hall, with the Association of California Water Agencies, said that the nature of the problems facing the Delta has changed since CALFED was formed, listing the fish crash in the Delta, "climate change," and earthquakes. As a result, he said, CALFED should refocus on the Delta, with leadership from state and federal agencies, and on a science program whose sole purpose is to feed policy decisions."

"We've bowed too deeply to the god of consensus," Hall said, "and what we have sacrificed on that altar are results."

Some of the results that Hall called for are increased pumping capacity out of the Delta and more surface water storage, adding that both can be done in environmentally friendly ways. "You can build surface storage in a way that helps the environment," he said. Hall's testimony contrasted sharply with Grader's, who said it wasn't possible to restore the Delta and get more water out of it at the same time.

During the panel on environmental justice, Gary Mulcahy, the governmental liaison for the Winnemem Wintu Tribe, testified that even though the CALFED ROD established a commitment to environmental justice that was to cut across all programs, "the environmental justice element of CALFED is pretty much lip service."

Martha Guzman, with the California Rural Legal Assistance Foundation, was a member of the CALFED Bay-Delta Public Advisory Committee for three years, representing the United Farm Workers. Guzman testified that initially environmental justice advocates saw CALFED as an opportunity for change and as a way to involve rural communities in water policy decision making. Early participation was encouraging, she said, but projects were put on hold until the Authority found a coordinator for the

OUTREACH

CALFED REGROUPS

Faced with the widespread perception that CALFED is all but dead in the water, the program's new head honcho, Joe Grindstaff, paid a visit to the Bay Area Water Forum on September 25 to lay out resuscitation plans.

After recapping some of the ambitious state-federal program's early successes, Grindstaff turned to the challenges CALFED faces as it goes forward. Chief among these, of course, are the mammoth state and federal budget deficits that have developed since 2000 and absorbed much of the money that was expected to be available to carry out the program's initiatives.

Other issues cited by Grindstaff include the need to sustain momentum for the program now that initial conflicts have been resolved and the Record of Decision adopted; maintaining public interest and managing expectations and shareholder fatigue over the course of a 30-year program; meshing agency cultures; and creating sustained leadership for the program.

These and other issues will be addressed by the plan Governor Schwarzenegger announced in May, which calls for an independent review of CALFED by a team composed of the state Department of Finance, which will review CALFED's expenditures to date; the Little Hoover Commission, which will review governance issues (see "CRITIQUING CALFED"); and KPMG, an independent management consultant, which will explore the business practices and performance of CALFED and The Bay-Delta Authority. The recommendations of this team will help CALFED refocus its practices and priorities.

Between now and the end of the year, Grindstaff said, the Bay-Delta Authority will undertake a series of concrete steps towards this goal. After narrowing down its options and refining cost estimates for them, the authority will select and revise a preferred option for a refocused CALFED, and identify funding needs and mechanisms. In November, the authority will consider the recommendations of the independent review team, recommend final options for a refocused CALFED, and draft a financing and capital improvements plan. In December, recommendations on program improvements, governance, and financing will be forwarded to the governor for inclusion in next year's budget. CH

continued page 8

WATER QUALITY

SWITCH TO FISH

When the Bush administration proposed a new water quality standard for selenium last December, federal officials with the California offices of U.S. Fish & Wildlife and U.S. EPA knew there would be work to do. That work—just now getting underway—is to fill gaps in the draft standard to make it relevant to California's fauna.

The proposed national standard—still under review—has met with great criticism. That's because it increases the concentration of the toxic metal deemed safe from 5 ppb to 7.9 ppb. But the new standard measures the selenium in fish flesh instead of water, which some scientists think is more appropriate.

Kesterson demonstrated that selenium bioaccumulates in the tissues of fish and aquatic life—through breathing, contact with skin, and eating—and is passed up the food chain to the waterfowl and other animals that feed on them.

The fact that the proposed standard measures selenium only in fish and aquatic life makes it a tough sell for Kesterson-educated Californians. "The national standard doesn't address wildlife and doesn't specifically address federally listed species like the California clapper rail," says Tom Maurer of U.S. Fish & Wildlife.

Maurer will spend the next few years developing a wildlife standard for selenium with California officials from U.S. EPA and the U.S. Geological Survey. USGS has developed a model that will be among the tools used to assess the risk to wildlife posed by the presence of the toxic metal in the Estuary.

As a California-specific wildlife standard for selenium is developed, it's possible that the proposed "safe" level of 7.9 ppb will be shown to be unsafe (a finding that would have to be reflected in the national standard). Former Fish & Wildlife scientist Felix Smith thinks 7.9 ppb will be proven dangerous. "It shouldn't take any earth-shaking science to find this out—we've known for a long time that this stuff bioaccumulates," Smith says.

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FLOWS

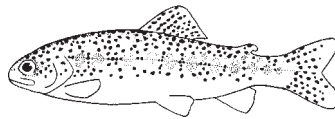
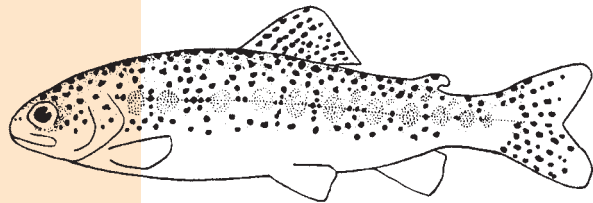
ROSIER RIFFLES

Life on the American River was downright rosy last summer, as far as Cal Fish & Game biologists were concerned. That's rosy—not as in sanguine—but as in the red tissue they saw hanging out of the afts of the young steelhead they were counting. When steelhead with red blobs on their bellies first turned up in nets in August 2004, Rob Titus and his team didn't know what they were looking at, but they noted that about 10% of the fish had the condition.

"It was worrisome," Titus recalls. "It was an indication of some form of stress in the fish."

That stress increased. Last September's surveys showed that 19% of sampled fish had the condition. And then in October, nearly half of all steelhead sampled had it. Titus and other members of his team explored further. Pathology tests indicated the young steelhead were suffering from rosy anus—a bacterial infection that causes the fish's intestines to poke out through its anal vent.

State pathologists had never seen a fish from the wild with rosy anus. They had seen it in the hatcheries, where large populations of trout are crowded into water in which the temperature sometimes rises above 60 degrees Fahrenheit. Titus says the steelhead's immune system is most effective in fighting bacteria in water that is at 60 degrees.



"Those fish had been exposed to temperatures well above that for a few months by the time we saw it on the American," Titus notes.

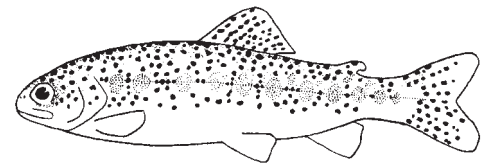
At the same time, scientists were looking at the flow levels of the American River for August through October. What they found was that BurRec had reduced flows from Folsom Dam in late September from 1,500 cfs to 1,000 cfs.

This created the perfect environment for spreading a bacterial infection. That's because steelhead—just like salmon—prefer the high points—or riffles—of the streambed to nest and spawn in. Because these riffles are high in the riverbed, they are more exposed in lower flows, forcing the steelhead to crowd together and making them more vulnerable to disease transmission. Lower flows and higher temperatures also reduced the number of insects and other invertebrates in the trout's food web.

Rosy anus was a turning point in getting higher flows for the American River, a process that has dragged on since the early 1980s. "They finally realized that if that's happening in the river at 1,000 cfs, you clearly can't incorporate that flow standard—it's not protective of resources," explains Leo Winternitz of the Water Forum, who has worked for the past four years to bring local, state, and federal officials together with farmers, environmentalists, and business interests to hash out a way to make the American River work for everyone—including fish. The revised flow standard will establish a minimum flow of between 1,250 cfs and 1,750 cfs.

BurRec's Mike Finnegan knows that supporting a new flow standard makes his agency's juggling act—providing water for agriculture and urban use while meeting water quality standards for the Delta—that much harder. The moment BurRec upped the flows in the face of the spread of rosy anus, Finnegan says he "heard about it" from south-of-Delta CVP contractors.

Nonetheless, the process of getting to a new minimum flow on the American has clued in all parties to each other's requirements. "We have less flexibility, but we're looking forward to that challenge," Finnegan says.



This year, good rain and snow pack have left Folsom Dam with an abundance of cool water to meet the American River's needs, and Titus reports that his team has yet to find a single case of rosy anus in 328 observations in the river.

Contact: Leo Winternitz (916)264-1998; Rob Titus (916)227-6390 **KC**





WORKSHOPS & CONFERENCES

OCT
12-13
WEDS-THURS

CALFED SCIENCE PROGRAM WORKSHOP

TOPIC: Review of the underlying science of the NOAA Fisheries biological opinion of October 2004 on the long-term operation of the Central Valley Project and the State Water Project.
LOCATION: Davis
SPONSOR: CALFED Science Program Randy Brown (916)961-5449 or brown.randall@comcast.net http://science.calwater.ca.gov/workshop/workshop_ocap.shtml

OCT
18
TUESDAY

PEOPLE SAVING RIVERS CONFERENCE

TOPIC: Watershed protection through citizen monitoring.
LOCATION: Nevada City
SPONSORS: South Yuba River Citizens League & State Water Resources Control Board Kayle Martin (530)265-5961, ext. 201 <http://www.syrcl.org/news/news.asp?id=87>

NOV
2-4
WEDS-FRI

SELENIUM SUMMIT

TOPICS: Problems and solutions in the West posed by selenium.
LOCATION: Costa Mesa
SPONSORS: Water Education Foundation, Department of Water Resources, U.S. Geological Survey, U.S. Fish & Wildlife & BurRec Rita Schmidt Sudman (916)444-6240 http://www.watereducation.org/whatsnew.asp#item_2

NOV
3
THURSDAY

ELKHORN SLOUGH COASTAL TRAINING PROGRAM WORKSHOP

TOPIC: Riparian restoration on California's coast.
LOCATION: Carmel Valley
SPONSOR: Elkhorn Slough Natural Estuarine Research Reserve Cynthia Ficenec (831)757-7470 or cynthia@wildwork.org; Jonny Nesmith (831)274-8700 or jonny@elkhornslough.org http://www.elkhornsloughctp.org/training/show_train_detail.php?TRAIN_ID=RipZ9RL1

NOV
7-9
MON-WEDS

THIRD BIENNIAL NPS POLLUTION CONFERENCE

TOPIC: Measuring water quality improvement.
LOCATION: Sacramento
SPONSORS: State Water Resources Control Board, Regional Water Quality Control Boards, California Coastal Commission & U.S. EPA (703)385-6000, ext. 381 <http://www.waterboards.ca.gov/nps/fall2005.html>

OCT
11
TUESDAYS
NOV
8
DEC
6

CALIFORNIA COLLOQUIUM ON WATER

TOPICS: Global perspective on investments in municipal water and sanitation and infrastructure; glaciers and the California waterscape; California's water infrastructure and future climate change.
LOCATION: Berkeley
SPONSOR: Water Resources Center Archives (510)642-2666, waterarc@library.berkeley.edu, <http://www.lib.berkeley.edu/WRCA/cow.html>

NOV
18
FRIDAY

LAW & POLICY SYMPOSIUM

TOPIC: City Rivers: The Urban Bankside Restored.
LOCATION: San Francisco
SPONSOR: Golden Gate University School of Law Paul Kibel (510)499-1649 or psk@policywest.net

NOV
29
TUESDAY

WATER RESOURCES MANAGEMENT & GROWTH WORKSHOP

TOPIC: California at a crossroads.
LOCATION: San Diego
SPONSORS: Association of California Water Agencies, American Planning Association, League of California Cities, Groundwater Resources Association of California (916)441-4545 <http://www.acwa.com/events/FC05/precon.asp>



RECOGNITION

2006 NATIONAL WETLANDS AWARDS PROGRAM DEADLINE: THURSDAY, DEC. 15, 2005

The National Wetlands Awards Program honors individuals from across the country who have demonstrated extraordinary effort, innovation, and excellence through programs or projects at the regional, state, or local level. The 2006 Awards will be given in six categories: Education and Outreach; Science Research; Conservation and Restoration; Landowner Stewardship; State, Tribal, and Local Program Development; and Wetland Community Leader.

Jared Thompson (202)939-3247 or wetlandsawards@eli.org <http://www2.eli.org/nwa/nwaprogram.htm>

NOW PRINT & ONLINE

Bay Institute Ecological Scorecard. S.F. Bay Index 2005. www.bay.org

Birding the San Francisco Bay Trail. 2005. S.F. Bay Bird Observatory, S.F. Bay Trail & California Coastal Conservancy. http://www.sfbbo.org/brochure_info.htm

CA 2025: It's Your Choice. June 2005. Public Policy Institute of California. <http://www.ppic.org/main/publication.asp?i=600>

California Water 2030: An Efficient Future. September 2005. Pacific Institute. http://www.pacinst.org/reports/california_water_2030/

Healthy Growth Calculator: Using the Calculator to Build Healthy Communities. September 2005. Sierra Club Building Healthy Communities Campaign. <http://www.sierraclub.org/sprawl/density/>

Historical Distribution & Current Status of Steelhead/Rainbow Trout (Oncorhynchus mykiss) in Streams of the San Francisco Estuary, California. 2005. Leidy, R.A., G.S. Becker & B.N. Harvey. Center for Ecosystem Management & Restoration. <http://www.cemmar.org/estuarystreamsreport/homepage.html>

San Francisco Estuary & Watershed Archive. 2005. California Bay-Delta Authority Science Program & John Muir Institute of the Environment. <http://www.estuaryarchive.org/archive/>

Soaking Uncle Sam: Why Westland's Water District's New Contract Is All Wet. September 2005. Environmental Working Group. <http://www.ewg.org/reports/westlands/>

Thirsty for Justice: A People's Blueprint for California Water. August 2005. The Environmental Justice Coalition for Water. http://www.ejcw.org/our_work/blueprint.html

Wetlands, Oceans & Watersheds Discussion Forum. Summer 2005. U.S. Environmental Protection Agency Office of Water. <http://www.epa.gov/owow/watershed/forum/forum.html>

JOB OPPORTUNITY

LEAD SCIENTIST, CALFED Bay-Delta Program

The California Bay-Delta Authority (CBDA), the implementing agency for the CALFED Bay-Delta Program (CALFED), seeks an established, experienced research scientist to direct the efforts of the Science Program. This position requires a Ph.D. or equivalent experience in natural science; evidence of stature in the broad scientific community; experience advising top managers and policy makers; evidence of ability to work and communicate well with people from different professional backgrounds; and experience working with and advising on complex issues that integrate multiple disciplines.

Stuart (916)263-1901; resumes@cps.ca.gov http://www.cps.ca.gov/ExecutiveSearch/Recruitments/Brochures/LS_CBDA.pdf

HOW I SEE IT CONTINUED

out almost every other large capital program in the region. These cost consequences far overwhelm the few billion dollars we need to upgrade Delta levees. Katrina has also shown us that costs are not limited to economic costs. Besides dollars, disaster response wreaks havoc on good planning—environmental requirements, public involvement in decision-making, and normal procurement policies have all been swept aside in the response to Hurricanes Katrina and Rita. These elements are crucial in developing a political consensus for the Delta levees, and we must not allow disaster response in the future to replace sound planning now.

So let's move ahead with a Delta levee plan as quickly as possible. For those of us who care about the future of the Bay, it's time to make a sensible plan for the Delta our top priority.

CALFED CONTINUED

Environmental Justice Subcommittee. Hope turned to frustration, she said, when the coordinator came on. "Basically, they hired a facilitator...and, politely speaking, we've been facilitating for four or five years."

Guzman said that while rural communities in the Central Valley suffer from problems with water access and quality without funding assistance, CALFED spent millions of dollars on irrigation canal improvements in the Valley as part of the "solution area."

After four panels of witness testimony, Michael Alpert, chair of the Commission, opened the hearing to public comment. Alisha Deen, with the Environmental Justice Coalition for Water, said, "It seems like there wasn't much interest in a response [to testimony on] environmental justice. This has been our experience with CALFED itself. Environmental justice has been this buzzword without any real action."

The Little Hoover Commission holds its next hearing—on "Alternatives and Alignment"—on Thursday, October 27, at 9 a.m. in the State Capitol.

Contact: Little Hoover Commission (916)445-2125; Alisha Deen (510)286-8400; Zeke Grader (415)561-5080; Martha Guzman (916)446-7901; Steve Hall (916)441-4545. JG

What one thing would you like to see more of in ESTUARY?



Email lowensvi@earthlink.net

Editor's note: Due to a printing error in our August issue, some of the colors in the Dutch Slough map on page 4 were reversed. Apologies to PWA.

YOUR INDEPENDENT SOURCE FOR BAY-DELTA NEWS & VIEWS



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