

LETTERS

DEAR ESTUARY,

In your February article on the proposed listing of steelhead trout, you mentioned that biologists consider the steelhead to be an "umbrella species", providing, through its listing, protection for other species which inhabit the same streams. I would like to concur with that designation and provide one example from the South Bay.

Historically, steelhead migrated up several streams and the Guadalupe River in great numbers providing sustenance for local Native Americans and early Spanish settlers. Flourishing within these same waterbodies were substantial numbers of other fish, reptile and amphibian species. One species in particular, the California red-legged frog was as prevalent in South Bay streams as the steelhead. But as the Santa Clara Valley became more populated, dams were built and streams were straightened and lined with concrete to provide flood control protection. Non-native species such as bullfrogs, bass, and perch competed with red-legged frogs for dwindling riparian resources. Just as steelhead populations have suffered from the destruction or alteration of rivers and streams, so too have its neighbors such as the red-legged frog.

Although the red-legged frog received protection under the Endangered Species Act as a threatened species last year, the added listing of the magnificent steelhead will undoubtedly provide supplemental habitat protection measures for red-legged frogs as well as for the myriad other species which depend upon wetland and riparian habitat. Additionally, resource managers would for the first time have broader regulatory support for watershed-based planning efforts.

It's just a shame that we have to wait until these species are on the brink of extinction before we recognize the tragedy of their loss.

MICHAEL RIGNEY
COYOTE CREEK RIPARIAN STATION

EDITORS NOTE: *Please send your thoughts, comments and opinions on Bay-Delta water issues and ESTUARY stories to ESTUARY, P.O. Box 791, Oakland, CA 94604.*



Unnatural Predators, Uneasy Controls

For the past 15 years, biologist Leora Feeney has monitored endangered California least terns, trapped their predators, and tried to keep one of their habitats — approximately 60 acres at the Oakland Airport — free of invasive vegetation. ("I tell my husband I'm going to go weed the airport," jokes Feeney.)

Although young terns have not fledged at the airport since 1989, they do use the site for courtship and resting on soft sand. Feeney believes the airport is crucial for the endangered terns as an additional site to the Alameda Naval Air Station, where the terns have successfully bred for over ten years and predators are carefully managed. "It's really important when you have an endangered species to have more than one site, especially if predators get really focused on one of them," says Feeney. In 1982 for example, feral cats became focused on the Naval Air Station, and the following year, when the Station had only three nests, the airport had over 80.

What Feeney likes least about her job is "predator management" — keeping non-native, predatory animals like feral cats and red foxes from decimating terns. But Feeney's predator control options are limited: when Animal Damage Control (part of the U.S. Department of Agriculture) shot foxes at the colony after least terns were confirmed nesting there, fox and cat-lovers protested so much that shooting is now prohibited and predator management limited to trapping the animals for later euthanasia. Feeney wishes fox and cat supporters would realize

that being trapped and confined in a small space for several hours is more stressful to the animals than being shot. Although when instructed to accompany the sharpshooters, Feeney found herself dreading the experience, she says she now believes that, if the shooting is done properly, the animals literally don't know what hits them. "It was like turning the lights out," she says.

Just one cat or red fox can do an incredible amount of damage, according to Laura Collins, biologist at the Naval Air Station. Both are focused predators that will return

again and again to an area where they have found abundant food. The red fox also displaces native predators like the grey fox, which tends to be less likely to forage in open areas. Red foxes have even been known to follow the scent of biologists to nesting sites.

Trapping and relocating the cats and red foxes is not an option, since the problem will be relocated right along with the animals. Although an effort was made a few years back to relocate red foxes, wildlife officials in other states decided not to accept them, fearing

diseases and parasites. Feeney says the red fox has been the tragic victim in California from the start, introduced for hunting, fur farming, and even as pets — and now caught between animal rights activists and those charged with protecting endangered species. Despite a firm belief in the need to control foxes and cats, Feeney also has great empathy for them. "Some of these animals take a while to trap," she says. "They're incredibly intelligent and wily — they've got nerve endings too; you develop a relationship with them."

Feeney also empathizes with the fox rescuers and cat-colony feeders, people who

"...it may be time for everyone to think twice about what is being saved and what is being lost and about the prospect of managing predators in perpetuity."

continued back page

BULLETIN BOARD

HIGH SELENIUM IN BAY — New research by the U.S. Geological Survey found levels of the naturally occurring trace element selenium — associated with the front-page waterfowl deformities at Kesterson wildlife refuge in the 1980s — are not only higher in Suisun Bay than previously thought, but also could be strongly influenced by river inflows. According to a paper in the Regional Monitoring Program 1995 annual report, high inflows in May 1995, for example, coincided with the lowest concentrations of selenium in resident clams while subsiding flows in October 1995 increased selenium concentrations. Thus the amount of freshwater flow appears to influence the bioavailability of selenium to clams, and the sturgeon, birds and other life that feed on them. "Our findings could have implications for Delta water management and agreements," says the Survey's Sam Luoma. Also influencing selenium's creep up the food chain is the invasion of the Asian clam (*Potamocorbula amurensis*), shown to concentrate 2-3 times as much selenium as other residents in 1984-86. Luoma and others are now working to answer a new spate of research questions including which types of selenium are producing the high readings in Suisun Bay and from what sources — the Asian clam, Central Valley drainage (see p. 5), or nearby oil refineries? (415)329-4481

WETLAND DEBITS AND CREDITS — Building seawalls, riprap shores and boat docks are just some of the small Bay fill projects that over decades have claimed acres of Bay wetlands. Many such projects are too small to justify eye-for-an-eye mitigation in terms of protection or restoration of equivalent wetland resources. However, the new S.F. Bay Wetland Mitigation System proposed by the staff of the S.F. Bay Commission might for the first time offer a process and currency for dealing with small wetland debits and credits, as well as a field test for revamping mitigation approaches for larger ones. The proposal, now in its fourth draft, received its first public hearing at BCDC on April 17 and could be implemented early as 1998. (415)557-8775.

ECOSYSTEM RE-HAB — CALFED, a cooperative federal and state effort to develop a long-term solution to Bay-Delta water conflicts, released a 68-page executive summary of its ecosystem restoration plan at a public workshop early this April. The summary is short on prose and long on detailed action lists but basically embraces the following systemwide targets: restore 75,000-120,000 acres of freshwater and brackish tidal marsh, and shallow water habitat, as well as 100-200 miles of riparian woodland and shaded riverine areas; provide 300,000-500,000 acre feet of increased critical period flows to restore physical processes and ecological functions; replace 40-100 tons of river and streambed gravel annually to enhance anadromous fish spawning; provide new or improved fish passage aids and fish screens at selected diversions; develop floodways on the San Joaquin and Cosumnes Rivers; manage undesirable and interfering introduced species; and manage water quality problems that degrade ecosystem health. The full-fledged plan will debut this May. (916)657-2666

STORMDRAIN RETROFITS — Technology can do its part to help clean stormwater racing down the drain with its pollutant payload of heavy metals, oil, grease and sediments. Several enterprising companies have, for example, developed filters to attach to drains. According to EPA's *Nonpoint Source News Notes*, the "Enviro-Drain" filters runoff through three trays — the first stalls sediment and debris; the second removes oil, and the third neutralizes fertilizers and pesticides (cost \$400 to install and \$3-10 to replace filters monthly). KriStar's "Fossil Filter" captures contaminants in a metal trough (installation \$500-600, plus trough cleaning costs every six months). A more permanent solution is a "Stormceptor" — a precast concrete system fitted underground which traps petroleum and suspended solids. Although it costs a lot more than the filters to install (\$7,600-\$33,500), the once-yearly maintenance via vacuum trucks is easier on manpower and the pocketbook. (None of the costs above include disposal.) Enviro-Drain (206)820-8364; KriStar (800)579-8819; Stormceptor (800)762-4703.

WATERSHED SCIENCE BLUEPRINT — "A holistic approach to watershed management" is how the Coyote Creek Riparian Station's Mike Rigney describes the S.F. Estuary Institute's new *Bay Area Watersheds Science Plan*, released in draft this January. The plan sets forth a three-phase program for developing comprehensive scientific information on local watersheds, and then using that information to set goals for watershed health and to monitor progress. The plan calls for extensive research and field reconnaissance, including developing a Geographic Information System map of the watershed, habitat surveys and data collection on topics such as soil types, vegetation, rainfall and stream flow. Because water quality is a top priority of watershed management, the plan emphasizes the need for detailed inventories of pollution sources and potential controls. The plan also calls for the participation of trained volunteers. Rigney says that although numerous state and federal programs acknowledge the importance of watershed health and management, until now there have been no guidelines on how to inventory, assess and monitor watershed functions. (510)231-9539

CHANNEL ISLAND COORDINATION — About 800 often-overlooked fragments cut off from larger Delta islands by dredging are the subject of a "Coordination of Efforts" currently being circulated by the S.F. Estuary Project. The non-binding document — drafted by the Project's Delta In-Channel Islands Workgroup — stipulates a commitment to protecting the islands, which are home to fish, wildlife, wetland and riparian plants, and numerous special status species. As a step toward coordination, the workgroup is now part of CALFED's Levee and Channel Technical Team. Project staff hope to get at least 50 signatures on the coordination document from interest groups, landowners and agencies. To see or sign, contact (510)286-0924



CALFED

CLOUDY OUTLOOK FOR DRINKING WATER?

Water diverted from the Delta may not be able to meet forthcoming new national drinking water standards using currently accepted advanced treatment technologies, according to a draft study commissioned by the California Urban Water Agencies.

The study frames source water quality characteristics in the context of total organic carbon and bromide concentrations, both of which may be affected by different Delta management strategies. CUWA's Byron Buck says the study's purpose was to provide CALFED with suggested criteria related to source water to help in selecting a long-term Bay-Delta solution.

Buck says the Delta presents unique challenges to drinking water suppliers due to high levels of organic carbon in runoff and to the intrusion of bromide-containing seawater. Among the primary health concerns for Delta water are pathogens, such as *Giardia* and *Cryptosporidium*, and disinfection by-products such as bromate. One reason for the push for new standards is concern over *Cryptosporidium*, which is relatively harmless to healthy people but can be deadly for those with impaired immune systems. According to Bruce Macler of U.S. EPA, the agency charged with developing the new standards, *Cryptosporidium* is the agency's new indicator species. "It is extremely difficult to kill. If you are killing that, you can be pretty sure you are killing everything else." Ozone disinfection is required to kill *Cryptosporidium*; however, ozone reacts with bromide to produce bromate, a carcinogen that may also cause birth defects.

The CUWA study used "reasonable, conservative assumptions" to project what the new EPA regulations will be, says Buck. The scenario includes a limit on disinfection by-products of 40 µg per liter for total trihalomethanes, 30 µg per liter for the sum of five haloacetic acids, and 5 µg per liter of bromate. The panel evaluated the source water quality characteristics necessary to meet these requirements using standard treatment, and concluded that source water would have to contain less than 3 mg per liter of total organic carbon and less than 50 µg per liter of bromide.

The report concludes that "based on the historic concentrations of these constituents [in Delta water] it is unlikely that the criteria for bromide could be met under existing conditions, even in wet years." The report goes on to call on CALFED to examine a variety of actions aimed at enhancing source water quality, including in-Delta hydraulic modifications to limit seawater intrusion, pollutant source control programs for organic carbons and pathogens, water storage and management, increased outflow and isolated facilities (the PC euphemism for new canals and water conveyances).

In the absence of better source water quality, says Buck, "water providers would have to look at microfiltration and reverse osmosis, both of which are very expensive and also cost water—perhaps increasing water demand by as much as 15% to 25%." In addition, these technologies have never been tried on the scale that would be required by agencies relying on water from the Delta.

CALFED's Rick Woodard says that it's hard to guess what the impact of the report on CALFED — whose current approach on source water is much more general — will ultimately be. Nevertheless, he says, "we are certainly very interested in knowing what the EPA's reaction is." But Macler warns against placing too much emphasis on either the study or EPA response to it. "Water quality will be substantially improved by whatever alternative comes out of the Bay-Delta process," he says.

CUWA is calling on the EPA to provide some guidance to CALFED while the new drinking water standards are in the works (a two phase process, with the first phase expected at the end of 1998 and the second in 2002). Macler notes that new regulations will be an incremental change to a system that is already very protective of human health. They will also be the result of a negotiated process that includes all stakeholders and will be at least partly based on feasibility.

"It would be disingenuous to use the study's conclusions to make an argument for a specific CALFED decision," says Macler. "My concern is that projected water quality requirements for utilities will drive decision making to the detriment of other Delta interests, such as the environment."

Contact: Byron Buck (916) 552-2929 or Bruce Macler (415)744-1884 CH

CAPITAL BEAT

OLD FLOOD MONEY FOR NEW METHODS

A bill that would help restore urban and rural waterways—with no new federal funding—will be introduced to Congress this spring by Oregon Representative Elizabeth Furse. Known as the Waterways Restoration Bill, the act would use existing funds from the Natural Resources Conservation Service's Small Watershed Program, to finance projects that would use innovative, environmentally-healthy methods to restore streams and other waterways. The act also favors projects offering environmental and job-training benefits to low-income and minority communities.

The Program was created by Public Law 566 in the 1950s to reduce flooding and erosion and to improve water quality. "Some good erosion control projects were done under this old program, but there were also a lot of environmentally-destructive small dams and channelization projects," says Ann Riley of the Coalition to Restore Urban Waterways.

The goal of the new bill is to support community-designed, non-structural projects while satisfying the Small Watershed Program's original goals. Such projects might include creating riparian greenways and floodplain zones, revegetating and bio-stabilizing eroding banks, removing channels and culverts, restoring streams, organizing local watershed councils, and training participants in restoration.

"There's no new money in Washington," says Ann Riley. "The only way to do something like this is to take old programs and re-work them. But we need legislative authority to spend the money in a good way." Contact: Ann Riley (510) 848-2211

LOV

ENVIROCLIP

ROCK LOPPING

Harding. Shag. Arch. Blossom. The names of these underwater rocks scattered across San Francisco Bay might suggest a certain nautical charm, but the possibility of one of them piercing the hull of an out-of-control tanker certainly doesn't.

That's why U.S. Representative George Miller (D-Martinez) has introduced legislation to shear the tops off the rocks, which are dangerously close to the Bay's busiest shipping channels. Because some of the rocks are less than 35 feet below the surface at low tide, they present a hazard to modern supertankers, which draw up to 50 feet and hold 18 million gallons of oil.

Miller's bill, based on recommendations made by the Harbor Safety Committee, authorizes the Army Corps to conduct feasibility studies. Ultimately, some or all of the rocks could be altered, giving a minimum of 55 feet of clearance. The Corps will consider various methods of removing the tops, including using dynamite or dredging equipment to scrape them off.

Cal Fish & Game's Bob Tasto says that the rocks provide habitat for several species, including ling cod, rockfish, and anchovies. They are also popular spots for recreational fishing, because the rocks provide fairly shallow water for catching strippers.

Because of the devastating damage from a large oil spill, the bill has drawn cautious support from environmentalists, including the Center for Marine Conservation and Save the Bay. The Pacific Coast Federation of Fisherman's Associations also favors it. The Federation's Zeke Grader notes that the legislation includes provisions for replacing damaged fish habitat, which he says would be a relatively easy task.

But United Anglers of California's John Beuttler says that even if the rocks are lowered, there's still a "plethora of places where these ships can run aground." He thinks alternatives, like requiring tractor tugs to guide all incoming tankers through the Bay, might be less disruptive. "Anytime you have to destroy the environment to protect it, maybe you're not looking at things the right way." Contact: Miller's Office (510)602-1880 or United Anglers (510)525-2474. *CH*

LEGISLATION

CUTTING RED TAPE TO TRANSFER WATER

Legislation that would smooth voluntary transfers of water supplies between the haves and the have nots took a baby step toward the governor's desk on March 18, when State Senator Jim Costa held hearings on a Model Water Transfers Act.

California has a long history of water transfers, and new types of transfers promise to figure prominently in today's search for a way to balance environmental, farm and urban demands on California's scarce supplies of freshwater. But the new legislation's purpose is primarily to overhaul, streamline and clarify existing transfer law.

"Water transfers are governed by at least four different statutes, enacted over the course of 30 or 40 years, with different standards from one statute to another," says East Bay MUD lobbyist Randy Kanouse. "The Model Act would consolidate the standards into one clear set for short-term transfers and another for long-term transfers." Sponsors of the Act include the California Business Roundtable, the California Chamber of Commerce, the California Farm Bureau and the California Manufacturers Association.

The Act would give end users, such as farmers, more power to transfer water. Under existing law only water right holders can transfer water. The Act also sets forth specific guidelines relating to water wheeling—the use of publicly owned water supply systems to transport water. According to Kanouse, the current rules for wheeling are too general. The most contentious issue relates to the fees that agencies may charge for the use of their systems.

Although there is widespread agreement about the need to clarify water transfer law, certain provisions of the Model Act worry some environmentalists and members of the agricultural community. The Act would expand the definition of a short-term transfer from one year to two years, and establish an expedited process for short-term transfers, including exempting them from CEQA environmental review. The Farm Bureau's David Guy contends that these provisions encourage short-term transfers over long-term ones.



However, Santos Gomez of the Pacific Institute's Water Transfers Project says that the Act's wording would allow a series of short-term transfers, although not to the same party consecutively. "You could essentially have a long-term transfer to two parties without CEQA review," he says.

The Act includes a provision that for every acre foot of transferred water a \$5 security deposit must be made to the State Board, against which third parties injured by the expedited transfer could file claims. Gomez and others worry that this provision amounts to a cap on the compensation third parties could receive, and question the Act's underlying assumption that market processes are the best way to allocate the state's water supplies. "Should we let an agency's ability to pay for water be the only criteria, or should we consider other factors, such as need?" asks Gomez.

Kanouse and Guy both acknowledge that the Model Act represents only a first step toward new water transfer legislation. Any formal bill will be the result of extensive dialogue and negotiation among all the stakeholders. In addition, many of those close to the issue say that significant action on water transfers is unlikely until CALFED chooses its preferred alternative for the Bay-Delta. "Stakeholders all agree that a transfer bill should not disrupt the CALFED process," says Kanouse. In the meantime, Senator Costa has introduced a so-called "spot bill," a placeholder allowing him to introduce water transfer legislation later this session. Contact: David Guy (916) 924-4037 *CH*

POLLUTION

SILVER CREEK SELENIUM SURGE

Too much water coming too fast is the reason given for a controversial commingling of selenium-laced flood flows and agricultural irrigation drainage in San Joaquin Valley channels often used to serve wildlife refuges this January.

The event originated in the Silver-Panoche Creeks watershed where high runoff forced San Joaquin drainers to route both storm flows and their drainage through refuge channels instead of a bypass — largely due to the limited capacity of a newly built connector to the bypass in the San Luis Drain. The event stepped over the limit lines of a hard-won 1996 drainage management agreement for the selenium-plagued region in two ways. Under the agreement, agricultural drainage cannot be discharged into Salt Slough and other channels serving local wetland and wildlife refuges, and certain selenium load restrictions must be met. Load restrictions were exceeded by 10% and a 2 ppb state selenium standard for Salt Slough and other channels was also exceeded.

Drainers argue that a 10% stretch is a considerable achievement given such record rains, and point out that during the preceding first four months of the agreement, they succeeded in reducing selenium loads.

"They're claiming an 'act of God' and saying they aren't responsible for any of this, when we've watched Silver Creek overflow year after year," says the Environmental Defense Fund's Terry Young. "It's bad planning on their part. They built that connecting channel too small."

But drainers say the connector was sized to carry problem agricultural drainage not to solve "solve all the flood control problems on the West side of the valley," according to Dan Nelson of the San Luis & Delta-Mendota Water Authority. Nelson says the agreement even cites Silver Creek as an example of an "unforeseen circumstance" beyond the control of drainers.

"Now we need to have a discussion about how Silver Creek and stormwater fit into the discharge accounting in the agreement," says Nelson, who recently

made an informal proposal to BurRec that rainfall-induced drainage not be counted in the load restrictions. (BurRec owns the San Luis Drain, a section of which the agreement allows San Joaquin drainers to use as a bypass).

Young describes herself as "ballistic" about the proposal. "After five years of negotiation on the agreement and just four months of implementation, the drainers are angling to change the deal. It's a bad faith effort in my book," she says. But BurRec's Penny Howard sees the fact that the drainers haven't made any more formal proposals as a willingness on the part of the farming community to learn from experience and explore other drainage management options.

At the very least, Young thinks drainers should have more aggressively tried to minimize the drainage flows through the sloughs, which row crop farmer David Cory insists that they did. Cory says drainers carefully coordinated with the downstream water district and refuge managers to uphold the environmental commitments of the agreement. "No water deliveries to the refuges were taking place when the overflow went through," he says.

What the actual environmental impacts of the discharge were won't be known for a couple of months, when all the monitoring data has been analyzed. Preliminary results show no short-term toxicity to aquatic organisms, perhaps due to dilution by high flows, according to Howard. Any reevaluation of the project is premature until all the data is in, says Howard, adding that the first part of the agreement only lasts for two years, during which time a long-term plan must be developed.

"We're in learning mode, and this is in effect a field laboratory with certain controls," she says. "As long as we honor the process, and learn lessons, the agreement can still succeed."

Contact: Penny Howard (916)979-2476 ARO

THE MONITOR

AIR WATER TRADE-OFF?

Does cleaner air mean dirtier water? A key ingredient of California's reformulated gasoline has begun showing up in surface and groundwater around the state.

Methyl tert-butyl ether, or MTBE, an oxygenate meant to reduce vehicle emissions, has been used in small quantities for years, but comprises approximately 11 percent by volume of the reformulated fuel mandated by the State of California last year. The additive travels quickly, does not degrade naturally and resists ordinary treatment. It has been found at low levels in groundwater and reservoirs throughout the Bay Area, including Anderson, Coyote and San Pablo Reservoirs. Suspected sources include leaking underground fuel tanks and pipelines, watercraft, and aerial deposition.

Although the U.S. EPA considers MTBE a possible carcinogen, little is known about the effects of the chemical on humans or the Estuary. "MTBE's presence is new and there are a lot of unknowns about it," says Sandy Oblonsky of the Santa Clara Valley Water District. The District recently began an MTBE monitoring program for wells, reservoirs and percolation ponds, and is planning another for stormwater.

As of February, all water suppliers are required to monitor for MTBE. The EPA currently has a health advisory for MTBE of 20 to 200 parts per billion in drinking water, while the California Department of Health Services has established an action level of 35 parts per billion. So far, MTBE levels found in Bay Area water have been well below these limits.

In the meantime, some environmentalists suggest that an alternative oxygenate, such as ethanol, should be substituted immediately. Ironically, says Julia May of Communities for a Better Environment, a recent study in Denver found that MTBE was not effective at reducing carbon monoxide. "It's toxic and it doesn't do what it's supposed to do," she says. According to the California Air Resources Board's Allan Hirsch, however, MTBE in gasoline was found to reduce carbon monoxide by approximately 10 percent in studies conducted in the winter of 1992-1993. CH

RECYCLING

SAN JOSE STANCHES FRESH FLOWS

Up to 21 million gallons of treated wastewater now being discharged into the South Bay each day — wastewater that is rapidly converting salt marsh habitat for endangered species into freshwater marsh — will be diverted to industries for reuse, and onto golf courses and parks for irrigation by the close of 1997.

To help accomplish this feat, San Jose and other South Bay cities are now completing over \$140 million worth of new pipes, pumps and other wastewater recycling facilities. This infrastructure will divert the 21 mgd of tertiary-treated effluent to over 300 private and public agency recycled-water customers in San Jose, Milpitas, and Santa Clara. It starts with a new pumping station near the treatment plant and connecting 108-inch-diameter pipe. From there, 60 miles of newly-

laid pipeline will take the recycled water in three branches along flood control and railroad rights-of-way and beneath surface streets to the three cities. In San Jose, two new pumping stations will add pressure and equalize the flow, so the water can be carried up into the hills. At the last pumping station, the city will build a small reservoir for temporary storage. A retrofit grant program will help recycled-water customers finance the on-site improvements needed to keep recycled and potable water separate. As an incentive to encourage its use, rates for the recycled water will be considerably lower than those for potable water.

The recycle-bound wastewater will come from the San Jose/Santa Clara Water Pollution Control Plant, which treats water from all or portions of 8 South Bay cities and in 1996 discharged an average of 132 million gallons into the Bay per day, 12 million gallons in excess of the 120 mgd maximum imposed by the S.F. Regional Board in 1991. Part of the problem for the San Jose plant is that it's a

shallow bay discharger, which means its effluent must be more dilute than that of deep-bay dischargers like East Bay MUD. A bigger problem is the Silicon Valley and South Bay economic boom, and its spiraling increases in wastewater loads.

The new recycling facilities are just one part of a \$258 million, three-part action plan — first approved in 1991 and now being implemented — for reducing discharges. The second part expands a 1980s water conservation/education program to emphasize rebates for homeowners and commercial property owners who install ultra-low-flush toilets. The third part — purchase and some restoration of two tracts of salt marsh totaling 404 acres — mitigates for 380 acres of salt marsh converted to freshwater marsh between 1970 and 1985 as a result of plant discharges.

Once the 21mgd begins coursing through the recycling pipeline, it should help the South Bay get back down to the 120 mgd limit in its discharge permit. A revised plan for how to keep this lid on in the years ahead goes to the Board in May, with a public hearing scheduled for June 18.

"Just putting more pipes in the ground could break our residents' backs, in terms of costs we have to pass on," says the city's Lindsey Wolf. "We're looking at a whole range of measures for maintaining the 120 mgd while continuing to grow. No one wants a moratorium on growth."

Some scientists and environmentalists question whether the program, however ambitious, will succeed in stopping further salt marsh conversion. "My guess is that at 120 mgd, the conversion would continue," says Howard Shellhammer, a San Jose State University salt marsh harvest mouse expert. Shellhammer and other biologists have noticed less of the endangered mice in the South Bay. As Cal Fish & Game's Deborah Johnston explains, "People are just now starting to realize the extent of the change that has occurred." Shellhammer predicts that as water demands continue to grow, the city's options for reducing discharges could become cost-prohibitive and unsustainable.

Greg Karras, with Communities for a Better Environment, points out that discharges in excess of 120 mgd are partially due to industrial wastewater, and claims that many companies have already proved they can recycle more water inside their plants cost-effectively. "There's every indication we can solve this problem," he says. "The only issue is whether the cities and industries can start reducing the flows now, before more salt marsh is converted to fresh."

Contact: Lindsey Wolf (408)277-5533 LOV

SCHOOLYARD

WET AND WILD EDUCATION

Each spring since 1995 the freshwater marsh at Big Break in Oakley has been invaded by hordes of small creatures sporting brightly colored plumage and emitting shrill cries. They are not exotic birds or bugs; they're first graders from Vintage Parkway Elementary School participating in the school's Wet 'N Wild program, which teaches students and their families about the Delta and the marsh.

"For a few weeks we pretty much eat, drink and breathe the wetlands," says teacher Nancy Huffaker, who heads the program this year. Through activities that include collecting plant and animal specimens, monitoring animal tracks and debris, and writing stories about the Delta, students learn about the water cycle, water quality, and marsh wildlife. In past years students have stenciled storm drains, conducted marsh clean-ups and created a book entitled *Down the Drain* about the effects of stormwater pollution.

Two Vintage Parkway teachers launched the Wet 'N Wild program after attending an October 1994 Kids in Creeks workshop. Kids in Creeks' sponsor, the Contra Costa Clean Water Program, provided funding through its

Teacher Action Grants program, which awards grants of up to \$1,500 for innovative classroom-based environmental awareness and restoration projects. The grants are administered by the Aquatic Outreach Institute (formerly the S.F. Estuary Institute's Education Program), which also runs Kids in Creeks. More than 700 teachers have participated in Kids in Creeks workshops since the program was launched in 1992. The workshops, which use local urban creeks to teach watershed protection, are offered on a county-wide basis and provide teachers with resources specific to their counties.

Antioch High School science teacher Jim Hybarger has received several Teacher Action Grants, as well as funding from the City of Antioch and DuPont Chemical, for his 10th grade science curriculum incorporating restoration, monitoring and other West Antioch Creek activities. In 1996, Hybarger's students replaced non native vegetation at the creek with native California big leaf maples and valley oaks. This spring, Hybarger and his students are planting a demonstration vegetable garden which will use integrated pest management techniques. "I'm hoping that we'll be able to show the vegetables at the county fair in July," he says.

Contact: Kathy Kramer
(510) 231-9507 CH



PLACES TO GO
& THINGS TO DO

WORKSHOPS & SEMINARS

APRIL
SATU
26

KIDS IN CREEKS

Workshops prepare educators to teach about creek ecology and restoration. Workshop will also be held on May 3.

Sponsor: Aquatic Outreach Institute
Alameda County locations
(510) 231-5783

MAY
THUR • FRID
1
2SYMPOSIUM: WATERSHEDS,
WETLANDS AND COASTAL
RESOURCES

New Approaches to Comprehensive Coastal Policy for the 21st Century

Sponsor: U.C. Santa Barbara
Location: Corwin Pavillion,
U.C. Santa Barbara
(805) 893-2968

MAY
TUES
6ACWA GROUNDWATER
WORKSHOP

Managing Groundwater into the 21st Century

Location: Caesar's, S. Lake Tahoe
(916) 441-4545

MAY
WEDS
7DIOXIN AND FURAN
WORKSHOP

Human health effects, effects on wildlife and the aquatic environment, sources and exposure pathways.

Sponsor: S.F. Regional Board
Location: 800 Madison Street, Oakland
9:00 AM—3:00 PM
(510) 286-0533

MAY
WEDS • THUR
7
8ACWA SPRING
CONFERENCE

Feast or Famine: Managing California's Fickle Water Resources

Location: Caesar's, S. Lake Tahoe
(916) 441-4545

MAY
THUR • FRID
8
9NEGOTIATING EFFECTIVE
ENVIRONMENTAL
AGREEMENTS

Training course teaching how face-to-face negotiation can augment traditional policy making with creative arguments that are better informed and more stable. Participants will learn the elements of mutual gains bargaining and apply them in simulated disputes.

Sponsor: CONCUR
Location: UC Berkeley, Kerr Campus
9:00 AM—5:00 PM
(510) 649-8008



MEETINGS & HEARINGS

MAY
FRID
2S.F. ESTUARY PROJECT
IMPLEMENTATION COMMIT.

Regulatory overview on reducing pesticides entering the Bay; CALFED's Ecosystem Restoration Plan.

Location: 2101 Webster, Oakland,
Rm.4BC
10:00 AM—12:30 PM
(510) 286-0924

MAY
WEDS
21

S.F. ESTUARY PROJECT

North Bay Geographic Subcommittee: Bay Commission North Bay Protection Plan; Property Values in North Bay.

Location: Mare Island, Bldg 755, Rm 221
9:30 AM—12:00 PM
(510) 286-0924



HANDS ON

APRIL
WEDS • THUR • FRI
23
24
25THE CENTRAL CALIFORNIA
WATER TOUR: THE SAN
JOAQUIN VALLEY

Three-day tour focusing on San Joaquin Valley, the SWP and the Central Valley Project. Includes discussions of CVPIA, groundwater use, water transfers, agricultural drainage and water conservation measures.

Sponsor: Water Education Foundation
(916) 444-6240

MAY
SATU
10SAN PABLO BAYLANDS
AGRICULTURAL DAY

Naturalist-led tours of vineyards and former dairylands, other activities.

Sponsor: Partnership for San Pablo Baylands
Location: Cabral Dairy, Carneros
9:00 AM—1:00 PM
(707) 557-9816

MAY
SATU
10

KIDS IN CREEKS FAIR

Celebration of Kids in Creeks teachers and students. workshops, activities and project ideas.

Sponsor: Aquatic Outreach Institute
Location: Oakland Museum
9:30 AM—12:00 PM
(510) 231-5783

MAY
SUND
1142ND ANNUAL
MOTHER'S DAY BBQ

Benefit for Marin Audubon wetland and marsh restoration and Audubon Canyon Ranch. Reservations due May 7th.

Sponsor: Marin Audubon Society
Location: Volunteer Canyon, Bolinas
11:00 AM—2:00 PM
(415) 453-4715

NOW IN PRINT

Adult Salmon Migration Monitoring, Suisun Marsh Salinity Control Gates, September-November 1994

Interagency Ecological Program
Copies from (916) 227-7541

An Assessment of the Likely Mechanisms Underlying the "Fish-X2" Relationships

Interagency Ecological Program
Copies from (916) 227-7541

California Coastal Access Guide

California Coastal Commission Cost: \$17.95
(510) 643-7127

California Wildlife Viewing Guide

by Jeanne L. Clark (revised and expanded) \$12.95
(800)582-2665

Clean Boating Guides

(updated February 1997 Bay or Delta versions with maps of pump-outs etc.)

S.F. Estuary Project & California Department of Boating & Waterways (510)286-0924

Clean Marinas—Clear Value

U.S. EPA
Copies from (513) 891-6561

Ecosystem Restoration Plan Executive Summary

CALFED (Complete plan due in May)
(916) 657-2666

Erosion and Sediment Control Field Manual

(for construction projects)
S.F. Regional Board, \$25 inc. shipping
(510)286-0924

The Future of Irrigated Agriculture

National Research Council
Copies from (202) 334-3422

Otolith Aging of Larval and Juvenile Striped Bass in California

Interagency Ecological Program
Copies from (916) 227-7541

A Telemetry Study of Striped Bass Emigration from Clifton Court Forebay: Implications for Predator Enumeration and Control

Interagency Ecological Program
Copies from (916) 227-7541

NOW ONLINE

Watershed Information Technical System

(data for watershed planning, management, restoration and monitoring)
c/o California Environmental Resources Evaluation System at <http://ceres.ca.gov>

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Please put ESTUARY on your mailing list for upcoming events and publications related to the Bay and Delta! Announcements of calendar items, publications and on-line information can be sent to Carlad Hayes, ESTUARY, P.O. Box 791, Oakland, CA 94604 or faxed to (510)547-6287.

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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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PREDATORS CONTINUED

have spat on her and threatened her life. "If I didn't understand so clearly the dynamics of the damage these animals are doing, I'd probably be right there with them," she says. But she wishes they could realize that "terns are wonderful animals too," and that the quality of life for these foxes and cats is not very healthy, with too many predators in one area and not enough food or shelter. Once a cat colony has been established at a site, people frequently dump unwanted cats there, which just adds to the problem.

At the Alameda Naval Air Station, the biggest predator problem is feral cats, which are primarily controlled by trapping and euthanasia. Native predators, such as birds of prey, which can also become a problem in small patches of habitat, are trapped and relocated. The cost to the Station ranges from \$7,000-\$15,000 a year, according to the Navy's Doug Pomeroy. At the S.F. Bay National Wildlife Refuge, the endangered clapper rail population doubled after a program to control foxes and feral cats was implemented in 1991. The Refuge shares two full-time animal control officers (and their salaries) with a number of other South Bay agencies.

As human development continues to encroach on the Bay's last natural areas and wildlife are relegated to patches of habitat that attract unnaturally high concentrations of predators, it may be time for everyone to think twice about what is being saved and what is being lost and about the prospect of managing predators in perpetuity.

"Pets belong in the home, they don't belong in parks, wetlands and endangered species habitats, no matter how cute and cuddly," says the Audubon Society's Arthur Feinstein, a self-professed cat lover. "Seeing cats or introduced foxes as 'natural' and 'wild' in these contexts borders on ecological ignorance."

"I think when the public goes out into our last remaining open spaces, they want to see and enjoy other living things besides domestic cats," says Feeney.

Contact: Leora Feeney (510)522-8525
or Laura Collins (510)843-3263 LOV



ESTUARY

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