

FLATS THREATENED

It is spring again, and the tidal mudflats of the Bay are packed with migrant shorebirds. Many have molted into the bright colors and crisp patterns of the plumage they'll wear in their northern breeding grounds. Avocets sport cinnamon head and neck feathers; dunlins are no longer dun; ruddy turnstones and black-bellied plovers live up to their names. For these long-haul travelers, the Bay's mudflats and marshes are a crucial refueling stop, a smorgasbord of small crustaceans, mollusks, and worms.

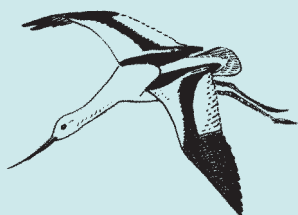
But global climate change could jeopardize this annual spectacle. The rising sea levels projected to result from anthropogenic warming trends could flood the flats and their fringing tidal marshes. A recent study by ecologist Hector Galbraith and his associates prepared for a National Science Foundation-sponsored report translates this danger into specific terms for the Bay and other key migrant stopovers.

Galbraith's team looked at San Francisco Bay and four other major shorebird staging areas: Willapa and Humboldt bays on the Pacific coast, Delaware Bay on the Atlantic coast, and Bolivar Flats on the Texas Gulf. They found that even using the most conservative estimate of global warming—a 2 degrees Celsius increase within the next century, assigned a 50% probability by U.S. EPA—the seas would claim significant habitat at half these locations, jeopardizing their ability to support the traveling flocks.

The forecast for South San Francisco Bay is especially gloomy: Galbraith's computer models predict the loss of 70% of the current intertidal habitat by 2100, rising to 96% by 2200. Land subsidence, possibly due to aquifer depletion, is already causing sea level in the South Bay to rise faster than that in the North Bay. But by the turn of the 23rd century, Galbraith's research suggests, the North Bay will have sustained an 89% loss of its intertidal areas as well.

Galbraith's report concludes that even under a conservative scenario, "it is difficult to imagine how [South San Francisco Bay and Delaware Bay] could continue to support shorebird populations that are even a fraction of their current sizes." And the loss of intertidal habitat would likely be replicated in estuaries up and down the Pacific Flyway, from Patagonia to the high Arctic.

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**Worries Over Waterworks**

Fearing that a little-publicized plan that would dramatically increase the amount of water that could be moved through the Delta—and ultimately exported south—could jeopardize the tenuous recovery of endangered Delta fish, the Environmental Water Caucus is poised for battle.

"We will vigorously oppose this project unless we have guarantees that there will be no net increase in Delta exports and no additional fish kills at the pumps," says Eric Wesselman of the Sierra Club, a member of the Caucus. The brewing storm centers on CALFED's innocuously named South Delta Improvement Plan (SDIP), which is meant to facilitate the transfer of water from north to south through the Delta using existing channels and sloughs, while simultaneously reducing the number of fish killed at the pumps. The ambitious plan, which was identified in the CALFED Record of Decision, calls for the development of new operational rules that would allow exports to increase from the current rate of 6,680 cubic feet per second to 8,500 cfs. It also calls for new, permanent flow control barriers at Middle River and Old River, dredging in South Delta channels, and a new barrier at the confluence of Old River and the San Joaquin River to help migrating fish. The plan originally called for a subsequent increase in pumping to 10,300 cfs, along with a "state-of-the-art" fish screen facility. However, these plans have been shelved indefinitely, according to Kathy Kelly of the Department of Water Resources, who says the projected \$1 billion price tag of the new screening facility and "uncertainty about its

relative benefits to fish has prompted a closer look at the method defined in the ROD." In the meantime, a new South Delta Fish Facilities Forum "is providing guidance and will establish priorities to be used in developing alternatives for fish protection facilities."

Enviros are worried that analysis of the environmental effects of the plan will not be broad enough to provide adequate protection for fish and that there is still the possibility of a later increase in pumping. "That kind of an increase in pumping has potentially huge consequences for a number of ecosystem processes," says the Bay Institute's Tina Swanson. "There is more and more evidence that pumping has much broader impacts than just on hydrology and fish take at the pumps." For example, says Wesselman, increased pumping could reduce the "residence time" of water in the system, affecting the food web's ability to provide enough food for species recovery. Wesselman

and Swanson say they are also concerned about the possible effects of dredging.

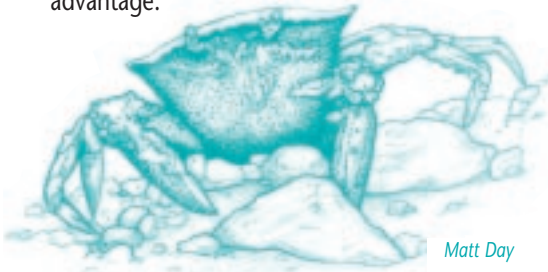
Enviros aren't the only ones worried about the possible impacts of the SDIP, although both farmers and urban water agencies that rely on Delta water seem more or less confident that their concerns will be addressed by the EIR/EIS for the project, expected to be released in September. "They have an obligation to do these exports in such a way that they do not affect water quality, depth, or flow," says the South Delta Water Agency's Alex Hildebrand, who represented farmers during stakeholder meetings on the SDIP. The new flow control barriers, which can be opened on the flood tide and closed on the ebb, are a critical part of the plan as far as farmers are concerned. Currently, temporary barriers are installed every year. "We

"That kind of an increase in pumping has potentially huge consequences for a number of ecosystem processes..."

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BULLETIN BOARD

INVASIVE SPECIES LIKE THE EUROPEAN GREEN CRAB leave most of their parasites at home, according to a study in the Feb. 6 issue of the journal *Nature*. Researchers from the Western Ecological Research Center, U.C. at Santa Barbara, and Princeton found that many animals have an average of 16 parasites in their native habitats, but bring fewer than three with them when colonizing new areas. In Europe, a parasitic barnacle castrates many green crabs, keeping them small and rare and preventing them from reproducing successfully. But in the Bay, where the barnacle does not occur, the crab thrives. Meanwhile, Bay natives are busy battling parasites of their own, giving the invaders a competitive advantage.



Matt Day

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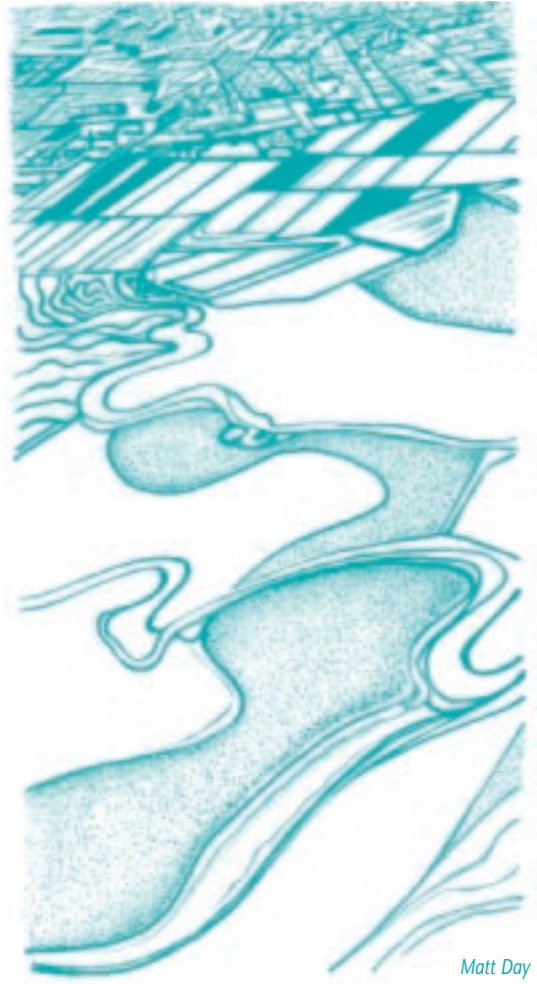
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CALIFORNIA COULD RECEIVE UP TO \$1,740,000 in grant monies under a new federal Landowner Incentive Program designed to help private property owners conserve and restore endangered species and their habitat. The grants require a 25% match from a non-federal source. <http://grants.fws.gov/>

IN FEBRUARY, THE WILDLIFE CONSERVATION BOARD unanimously approved the sale of 16,500 acres of Cargill salt ponds and other lands to the state. The sale had been delayed until purchase terms and documents assessing the site were released to the public. The \$100 million price tag will be split among the state, which will pay \$72 million, the federal government, at \$8 million, and the Packard, Hewlett, Moore, and Goldman foundations, which will collectively contribute \$20 million. See www.southbayrestoration.org.

AFTER IT INCREASED FLOWS FROM FOLSOM DAM to the American River in February to meet water-quality standards in the Delta, BurRec then cut them back to save water for summer fish migrations and drinking water supplies. This stranded thousands of baby salmon and exposed the egg nests—or redds—of steelhead trout, causing some biologists and enviros to call for a new look at Delta flows and water quality standards. BurRec says the problem reflects the challenge of simultaneously managing Folsom Lake for drinking water, hydroelectric power, recreation, fish, and water quality.

OLD PLANS FOR A BIGGER DAM ON THE SOUTH FORK STANISLAUS have been dusted off by the Stockton East Water District and Tuolumne Utilities District. An expanded Lyons Dam—upstream of the New Melones Reservoir—would produce up to 47,500 acre-feet of water per year, according to Stockton East. Enviros worry that the river doesn't have much water to spare, and claim that an expanded dam would flood more than three miles of riparian habitat used by rare amphibians. They are also concerned that more water would encourage more housing developments in Stockton and would ruin the rural character of Tuolumne County. The water districts say that expanding an existing dam is less environmentally damaging than building a new one.



Matt Day

IN MARCH, A FEDERAL JUDGE IN SAN DIEGO restored the Colorado River water that had been cut off to Imperial Valley farmers on New Year's Day. The decision, by Federal District Court Judge Thomas Whelan, was seen as a slap in the face of the U.S. Department of the Interior, which had ordered the flow of water to California stopped when negotiations over water exchanges among the Imperial Valley Irrigation District, the San Diego County Water Authority, the Coachella Valley Water District, and the Metropolitan Water District failed. Under a proposed deal, Imperial was to sell 200,000 acre-feet of water to San Diego and permanently fallow as much as 25% of its farmland. After the Department of the Interior cut off 11% of Imperial's water supply, the irrigation district sued the department, stating it had no authority to take Imperial's water. Under Judge Whelan's decision, the restored water is to continue flowing until Imperial's lawsuit can be heard.

FEEDBACK

GRADING THE BAY

Scientists, resource managers, and agency officials have long furrowed their brows in frustration, trying to find a way to evaluate the health of the Estuary. Recent efforts include CALFED's newly launched Performance Indicators program, which will track how CALFED's restoration projects of different scales are affecting the Bay and Delta, and the S.F. Estuary Project's Bay-Delta Environmental Report Card, which evaluates overall progress in implementing the 1993 Comprehensive Conservation and Management Plan for the Bay-Delta Estuary.

After nearly 10 years of involvement in various efforts to identify indicators of Bay-Delta ecological health, the non-profit Bay Institute has come up with its own approach: the Bay-Delta Ecological Scorecard. The Ecological Scorecard uses a series of indexes, or environmental topic areas, to evaluate how well the Bay and Delta are functioning, says the Institute's Anitra Pawley, who has also worked on indicator efforts at CALFED and participated in the state's Environmental Protection Indicators for California project. For now, the Ecological Scorecard's indexes include habitat extent, fish, birds, invertebrates, flows, water quality, stewardship, and human uses (how fishable, swimmable, and drinkable is the water?). The Institute hopes to add other indexes, such as aquatic production, amphibians, or invasive species, in later phases of the project.

Within each index, several indicators—species richness, abundance, percent of native species, and numbers of species that are tolerant of human impacts (in the bird and fish indexes), for example—are evaluated to come up with a grade, score, and trend. In addition to describing the indicators, each index also lists key findings, methods and data sources, and ecological and management implications.

Pawley says finding detailed, long-term historical data about specific sites has been a challenge. Without such data, it is difficult to evaluate

ecosystems and how humans are impacting them, says Pawley. Sometimes, data comes from surprising sources. For the Bird Index, she used 70 years worth of data collected as part of Audubon's annual Christmas Bird Count. "People argued that [the CBC] is only an annual survey," says Pawley. "But long-term data is invaluable and can be combined with more recent data sets to evaluate trends. We have to use the data that exists and build on it."

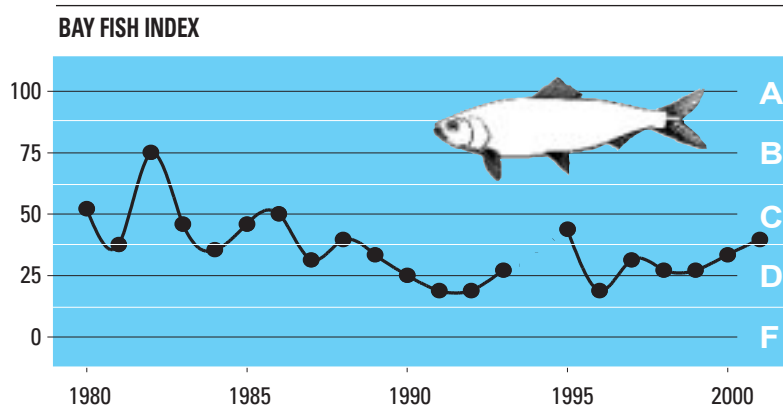
Though the work is still in progress, and grades may change before the final Scorecard is released this fall, the Bay will not receive straight A's, warns Pawley. For example, the Bay Fish Index gives the Bay a grade of C-, a score of 40 (out of 100), and a trend that shows neither an increase nor decrease during the most recent five-year period.

While aimed primarily at the general public, the Ecological Scorecard will also contain more detailed information for decision makers, along with a technical document reviewed by an expert panel and possibly published in journals and online, according to Pawley. She says the Ecological Scorecard is designed to be consistent with the formats U.S. EPA and other agencies are now developing for ecological indicators nationwide.

Following the release of the Bay Ecological Scorecard, the Institute will evaluate the Delta and the Sacramento and San Joaquin river systems. "People are tired of talking about the need to assess Bay-Delta health," says Pawley. "We thought, we know this can be done even though it's not easy. Let's set an example, build a prototype, and get the process started."

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LOV



Source: Bay Institute

ENVIROCLIP

STURGEON SLIPPING AWAY?

Despite a recent report by the American Fisheries Society concluding that the green sturgeon has declined by more than 88% in its historical range along the West Coast, in January, the National Oceanic and Atmospheric Association (NOAA) denied the prehistoric-looking fish endangered species status as requested in a petition filed by enviros last June (see ESTUARY, August 2001). The Center for Biological Diversity, the Environmental Protection Information Center (EPIC), and WaterKeepers Northern California, who filed the petition, later sued to force a determination. In response, NOAA identified two population segments—one spawning in the Klamath-Trinity and Rogue rivers; the other in the Sacramento River—and concluded that based on its review of the best available data, neither segment appears to be declining in population numbers or is in danger of extinction.

Jeff Miller of the Center for Biological Diversity says his organization, EPIC, and the Oregon National Resources Council will contest NOAA's decision. "If these were salmon populations, they'd be emergency listed tomorrow," Miller says. EPIC's Cynthia Elkins calls the agency's findings "incomprehensible," and predicts that the ruling will not withstand legal challenge.

Miller charges NOAA with ignoring the petition's scientific evidence. The finding that the Sacramento River population is stable reflects only data from San Pablo Bay surveys, he says. "They didn't look at Washington and Oregon coastal bycatch. Those statistics show a very sharp decline recently." Miller says an apparent increase in southern California green sturgeon numbers in 2001 is misleading, an artifact of the formula used to calculate relative abundance of green and the more numerous white sturgeon.

As the battle returns to the courts, NOAA has placed the sturgeon on its candidate list and will revisit its status in five years. But Miller and Elkins fear that by then, it will be too late for this long-lived, slow-growing, vulnerable fish.

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JE

HOW I SEE IT

WHEN DOES AN EMERGING POLLUTANT COME OF AGE?

MIKE CONNOR



Governmental agencies charged with protecting the public from toxic chemicals must not only address old problems caused by previous regulatory lapses but also potential new problems that surface as new products are produced. In October 2001, ESTUARY made us aware of an emerging class of pollutants—polybrominated diphenyl ethers (PBDEs)—that the Regional Monitoring Program (RMP) has found in increasing concentrations in Bay fish. In March 2002, the California Department of Toxic Substances Control reported that Bay Area women had significantly higher levels of these contaminants in their breast tissue and blood than did women tested in Japan and Europe.

PBDEs are chemicals mixed that are into plastics in consumer products — computer monitors and televisions, to name just a few — to meet flame retardant standards. When plastic products are degraded, discarded, or recycled, PBDEs find their way into the environment.

Because the chemical structure of PBDEs is so similar to that of polybrominated biphenyls (PBBs) and polychlorinated biphenyls (PCBs), their general chemical, biological, toxicological, environmental, and aquatic properties are likewise similar to these compounds, which have already accumulated in the environment. It is possible that the environmental toxicity of PBDEs could be as bad as that of PBBs and PCBs, but there is currently only partial toxicological information available for them.

In response to the RMP and recent human contamination findings, the S.F. Regional Board has put PBDEs on a “watch list,” a bill has been introduced in the state legislature to ban them, and environmental groups have petitioned environmental agencies to add PBDEs to the list of contaminants threatening the Bay’s health.

How do we decide whether we have enough data to take action? If reducing scientific uncertainty is critical to making good policy choices, additional studies can help. But studies take time, and we can lose ground while we’re waiting for results. The speed at which PBDEs are being incorporated into products makes it imperative

to develop policies soon. The Agency for Toxic Substances and Disease Registry estimates that 75 million pounds of PBDEs were produced in the United States in 1999, compared to 85 million pounds for PCBs at their peak production in 1970.

Environmental concentrations of PBDEs are probably below levels of toxicological impact—concentrations in Great Lakes salmon are 5-10% of the total amount of PCBs in those fish, for example, and the trend may be similar in S.F. Bay. But PBDE concentrations are increasing rapidly. Already we find that young children have significantly more PBDEs in their blood than older people, that breast milk concentrations are doubling every five years, and that concentrations in Arctic seals are doubling at similar rates.

Our knowledge of PBDE properties and market uses can help us weigh the need for more information vs. the need for action. PBDEs are comprised of three classes of commercial formulations. Penta (five bromine atoms) products are used in foams for seat cushions. Octa (eight bromine atoms) products are used in plastic, rubber, and textiles. Deca (10 bromine atoms) are used in computer housings and wiring. Most of the PBDE congeners found in wildlife and people are from the Penta-BDE, which the European Union banned in 2001. Most of the products manufactured in the United States use the Octa and Deca-BDE formulations. We do not yet know whether these compounds are transformed into more hazardous forms as they degrade or are incinerated.

I believe it will be easier to reach a scientific consensus on PBDEs by separating them into their different formulations because their chemical properties, biological risks, and market uses are so different. Significantly more information exists for Penta-BDE, and the risks from delaying action on Penta-BDE are much higher than for the other two formulations. But we must also develop a specific schedule for evaluating products containing Octa- and Deca-BDEs because of the enormous volume of material entering the market every year. Otherwise, we may need to add PBDEs to the list of “legacy” pollutants our children will wish we had managed more wisely.

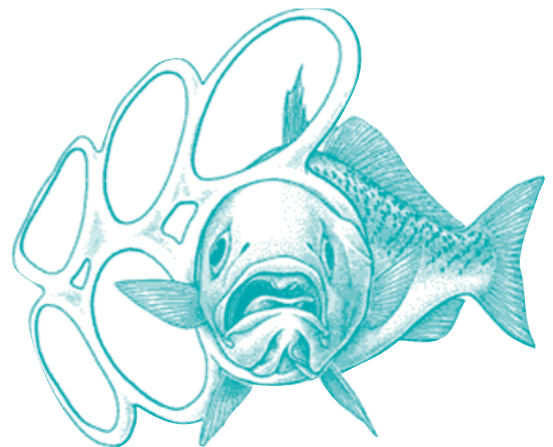
Dr. Mike Connor is Executive Director of the San Francisco Estuary Institute.

POLLUTION

PLASTIC PLAGUE

A grim picture is emerging from the central and north Pacific Ocean, and it can be described in one word: plastics. Between 1999 and 2002, Capt. Charles Moore and researchers with the Algalita Marine Research Foundation made several trips to an area in the Pacific Ocean halfway between San Francisco and Hawaii. Because this zone—about the size of Africa—is filled with floating plastic debris, they dubbed it the “Synthetic Sea.”

Plastics accumulate in this region because of the subtropical high, a system of spiraling warm winds traveling from the equator to the North Pole that produces a funnel-like current. This current pulls in plastics that make their way to sea from the street litter of towns and cities on the Pacific Rim as well as from container ships from Asia that lose cargo during their voyages. Moore’s findings show that the plastic in this Synthetic Sea has tripled in the past 10 years, outweighing surface zooplankton by a ratio of 6-to-1.



Closer to home, California’s coastal wind conditions combine with the winds of the subtropical high, creating polymer-laden surf, explains Moore. Any waste from the Synthetic Sea that breaks away and gets within 50 miles of the shore is blown into bays and onto beaches, wreaking havoc with local ecosystems.

Plastics pose many dangers to wildlife. Seadwelling birds and other species do not always distinguish between prey and plastics. They ingest six-pack rings, bottle caps, and pen caps, among other odds and ends, which make them feel satiated, interfering with their need to find appropriate food and depriving them of nutrients. The plastics contain endocrine-disrupting compounds, such as

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SCIENCE

SALMON NEED THEIR NOSES

Dams are being torn out of rivers, gravel dumped back into them, and riparian canopies replanted alongside, yet all of these good acts may not be enough to bring back healthy salmon populations. Research by the National Oceanic and Atmospheric Association's Nat Scholz and others at the Northwest Fisheries Science Center in Seattle warns that pesticides—particularly diazinon and some of its likely replacements—may affect basic salmon behavior by impairing the fish's highly developed sense of smell. Without that sense, salmon can't tell whether they are migrating up their natal stream or should have taken a turn several streams back. Scholz found that fish exposed to sub-lethal doses of diazinon (i.e., doses that do not kill the fish outright) did not respond defensively when researchers added scents to the test tanks to simulate the smell of a predator. And according to similar research in Britain, male salmon exposed to diazinon did not respond to scent signals given off by female fish about to release their eggs.

Although the U.S. EPA is phasing out the use of diazinon, one of the most ubiquitous pollutants in Bay creeks, the next pesticides coming down the pipe may be just as bad. The S.F. Regional Board's Bill Johnson and TCD Environmental's Kelly Moran recently drafted a study of the chemicals likely to replace diazinon (see *Now in Print*). Those chemicals—including other organophosphates (such as malathion), pyrethroids, and carbamates—may cause the same problems for fish as does diazinon, according to Scholz's research. Plus, even though diazinon itself is being phased out, it may not disappear from stormwater runoff for quite a while, says Johnson, who suspects that consumers will stockpile it before the ban on urban uses is completely in place in late 2004. While not as persistent as organochlorine pesticides like DDT, diazinon can have a half-life of several months, and people could continue to use it for years to come, says Johnson.

Pyrethroids, which are more acutely toxic to salmon than organophosphates, are sticky and may not wash off into waterways as easily as diazinon. But no one really knows for sure what will happen once their use increases, says Johnson, who cautions that different pyrethroids can interact with each other, causing greater toxicity

than one alone. "As long as our approach to pest management consists mainly of applying chemicals first, then we're always going to have this problem," Johnson says.

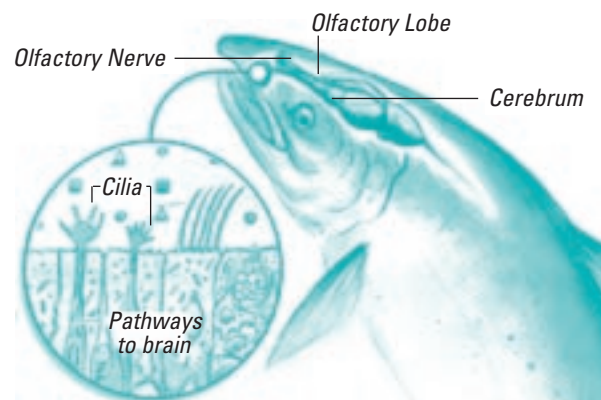
Meanwhile, the sub-lethal toxicity that results when fish are exposed to pesticides for a few hours or less during stormwater runoff events is the subject of a lawsuit against the U.S. EPA by environmental and commercial fishing groups in the Pacific Northwest. The groups claim the agency has only looked at the acute effects of pesticides and has not done enough to protect threatened and endangered salmon from their sub-lethal effects, such as the behavioral changes seen in the new studies. A U.S. District Court judge ruled in the groups' favor and by the end of 2004, the U.S. EPA must consult with the National Marine Fisheries Service under Section 7 of the Endangered Species Act about 55 pesticides thought to have adverse effects on salmon, including listed salmon species in the Sacramento-San Joaquin River systems and the Bay-Delta Estuary. One result of these consultations could be new limits on how much pesticide can be used and how close to streams it can be applied.

During a recent six-week study of two creeks near Seattle, 88% of coho entering an urban stream died within just a few hours, compared to only one fish in the rural stream, prompting enviros there to seek a ban on pesticide use on public lands. Although the cause of the fish deaths has not been determined conclusively, pesticide-laden water is the prime suspect, according to Washington Department of Ecology director Tom Fitzsimmons. Enviros are calling for Seattle to develop a long-term creek restoration plan that includes the pesticide ban, more stringent stormwater regulations, and even a requirement that the city daylight creeks that have been put underground in pipes.

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LOV

ANATOMY OF A FISH NOSE



Guillermo Munro, Seattle Post

NEXT GENERATION

S.F. ROCKS!

Teaching urban kids about hills, valleys, and babbling brooks when concrete and pavement camouflage the landscape can be a challenge. But despite the fact that San Francisco's Mission, Islais, and Yosemite creeks flow mainly in culverts beneath the ground, some S.F. State University geoscientists decided to use a watershed theme to teach the city's high school students about the city's landforms. They came up with a trendy, teenager-friendly program title—SF ROCKS—and a \$1.25 million, five-year grant from the National Science Foundation to attract traditionally underrepresented high school students—blacks, Latinos, and Pacific Islanders—to the geosciences.

"For years, we had been told that geosciences was the least diverse of all the sciences," explains project coordinator and professor Lisa White. At most San Francisco high schools, says White, geosciences are taught as part of the ninth grade integrated science curriculum. The S.F. State professors thought using San Francisco's geology, with its different rock types and faults, and focusing on the eastern part of the city in the Bayview-Hunters Point and Mission districts, might be a good way to attract students from underrepresented ethnic groups.

Over the past year and a half, SF ROCKS has been introduced into the science classes of about 500 ninth graders from Burton High. Twelve of those students will be selected to take part in a summer institute at S.F. State, where they will gain field experience and receive extra mentoring from geoscience professors and undergraduates from S.F. State and the City College of San Francisco. Ultimately, the project will expand to include five high schools in eastern San Francisco.

This year, many of the students installed rain gauges in their backyards and collected data to understand how the city's diverse topography affects rainfall. Says White, "Students learn where the hills and valleys are in the city and how topography relates to water flow and watersheds." They are also learning about inherent

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WATERWORKS - CONTINUED

need to be able to operate them when we need them, at any time of year," says Hildebrand, adding that a booster pump to ensure that water levels in irrigation channels are high enough to allow farmers to pump during high export periods is also essential.

Water quality is another big concern, not only for farmers, who worry that higher exports will worsen longstanding salinity problems, but also for municipal agencies that take water directly from the Delta. In comments on the SDIP, the Contra Costa Water District noted that an interim draft of the EIS/EIR predicted that chloride concentrations at the District's Old River intake could more than double as a result of the project. Poor water quality at the intakes might require the District to release more water from Los Vaqueros Reservoir, adversely affecting the District's water supply reliability. "There should be no water quality impacts on us," says the District's Samantha Salvia, adding that the District is working with CALFED to ensure that the CALFED program as a whole achieves its goal of continuous improvement in water quality.

The SDIP is particularly worrying to environmentalists and fisheries groups because it is being launched amid serious questions about the mechanisms that were supposed to provide baseline environmental protections against the effects of pumping. For example, says Swanson, the Environmental Water Account—established by CALFED to "replace" water when environmental concerns require that pumping be curtailed—is "still a work in progress. It has never acquired anywhere near the amount of water it was expected to, and this year it expects to be 100,000 acre-feet in debt," largely because it has not received its anticipated funding, and its ability to acquire water through operational flexibility has not met expectations. Even worse, a federal court last year threw out the procedures adopted by the U.S. Department of the Interior under the Clinton Administration to account for the 800,000 acre-feet of so-called b(2) water set aside under the Central Valley Project Improvement Act for environmen-

tal restoration. The ruling effectively cut the water that could be used for environmental enhancements by approximately 200,000 acre-feet. Both EWA and b(2) water are part of the assumptions upon which actions in the CALFED ROD are based—and enviros say that until the EWA and b(2) are fully implemented, any increased pumping is out of the question.

Cal Fish & Game's Diana Jacobs acknowledges that "the EWA needs to be on solid footing as part of the plan." She emphasizes that the EIS/EIR will evaluate a range of alternatives, and that among the issues being explored is the possibility that the "EWA may need increased resources to mitigate for increased pumping."

The uncertainty over environmental water may be a symptom of an even larger problem: the perception by many that the Bush Administration is abandoning the federal government's commitments under CALFED, and thereby undermining the

entire process. "This administration has made it clear that they are pushing storage and conveyance projects while undercutting environmental protections," says Wesselman, pointing out that the Department of the Interior is not challenging the b(2) ruling, but is rather issuing new rules that affect it. "SDIP is the keystone in the arch," he adds. "Without it, all the other supply projects become less feasible and desirable. Increased Northern California storage doesn't do Metropolitan Water District or Westlands much good without the ability to move [water] through the Delta via increased pumping."

Ultimately, Wesselman says, what is needed is more balanced implementation of the entire CALFED ROD. "There are cheaper and less environmentally destructive ways to provide water for California's growth than more pumping," he says.

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PROPOSED SOUTH DELTA PLUMBING PLAN



- Increase maximum allowable diversion capacity at Clinton Court Forebay/Harvey O. Banks Pumping Plant
- Construct permanent operable fish control structures at the head of Old River
- Construct operable barriers to improve water supply reliability and water quality
- Dredge channels to reduce barrier operations and accommodate improvements to agricultural diversions

PLACES TO GO & THINGS TO DO



WORKSHOPS & SEMINARS

MAY
7
WEDS — FRI
THRU
9

ACWA 2003 SPRING CONFERENCE

TOPIC: Financing our water future, an issue of dollars and sense.

SPONSOR: Assoc. of Ca. Water Agencies

LOCATION: South Lake Tahoe (916)441-4545

www.acwanet.com/events/03_spring_conf.asp

MAY
13
TUES

ENVIRONMENTAL HISTORY SEMINAR

TOPIC: Environmental history of Tulare Lake.

SPONSOR: Water Resources Center Archives

LOCATION: U.C. Berkeley

Linda Vida, (510)642-2666 or water-arc@library.berkeley.edu

www.lib.berkeley.edu/wrca/ccow.html

JUNE
5
THU & FRI
6

LOWER AMERICAN RIVER SCIENCE CONFERENCE

TOPICS: Fish habitat, in-stream flow, and effects of dams; groundwater vs. surface water basins; conjunctive use.

SPONSOR: Cal State University

LOCATION: Cal State University, Sacramento

(800)858-7743

www.cce.csus.edu/conferences



HANDS ON

APR
26
SAT

BAY FESTIVAL

TOPIC: Environmental education and the Bay. Music, food, and activities for the whole family.

SPONSOR: City of Berkeley Marina Experience Program

LOCATION: Berkeley Marina

www.ci.berkeley.ca.us/marina/marinaexp/bayfest.html

APR
26
SAT

TWILIGHT MARSH WALK

TOPIC: Experience twilight in the salt marsh on an easy stroll along the Tidelands Trail. Reservations requested.

SPONSOR: U.S. Fish & Wildlife

LOCATION: Don Edwards S.F. Bay National Wildlife Refuge Visitor Center, Fremont

(510)792-0222

MAY
10
SAT

INTERNATIONAL MIGRATORY BIRD DAY

TOPIC: Celebrate the 11th annual International Migratory Bird Day and explore the refuge to find out what you can do at home to protect wildlife. Activities for all ages.

SPONSOR: U.S. Fish & Wildlife

LOCATION: Don Edwards S.F. Bay National Wildlife Refuge, Alviso

Sharon Miyako, (408)262-5513, ext. 102 desfbay.fws.gov/Tideline/IMBD.htm

MAY
17
SAT

CALIFORNIA WATER QUALITY MONITORING SNAPSHOT DAY

TOPIC: Help watershed programs take samples and check water quality as part of the Snapshot Day taking place along the entire California coast.

SPONSORS: California Coastal Commission, with the State Board, the Coastal Watershed Council, and others, including Friends of the Estuary.

LOCATION: California coastline

Steve Cochrane, (510)622-2337 or sc@rb2.swrcb.ca.gov



JOB/VOLUNTEER/ INTERNSHIP OPPORTUNITIES

APR
7
MON

ECOLOGY/RESTORATION INTERNSHIPS

APRIL -JULY

TOPIC: Conduct breeding bird censuses (territory mapping), vegetation surveys, egg dating, bird identification, data entry, and various odd jobs with S.F. Bay Bird Observatory's landbird and waterbird programs.

SPONSOR: S.F. Bay Bird Observatory

LOCATION: South S.F. Bay

Janet T. Hanson, jthanson@sfbbo.org

www.sfbbo.org/intern.htm

MAY
30
FRI

RECOGNITION CLEAN WATER ACT AWARD NOMINATIONS

Nominees are sought from among municipalities and industries for its U.S. EPA's Clean Water Act Recognition Awards for outstanding and innovative technological achievements through waste treatment and pollution abatement programs. Deadline: Friday, May 30.

Maria Campbell, (202)564-0628

www.epa.gov/OW-OWM.html/pdfs/o-m-guidance03.pdf

MAY
9
FRI

CALL FOR PAPERS

ASSOCIATION OF STATE WETLAND MANAGERS NATIONAL SYMPOSIUM

Abstracts of 250 words or fewer addressing science, program/policy, and legal issues related to wetlands, as well as aquatic and/or watershed assessment and management, are welcome. Additional topics will be considered on a case-by-case basis. Abstracts due Friday, May 9.

SPONSOR: Assoc. of State Wetland Mgrs.

CONTACT: Jeanne Christie, (301) 292-4815 or Sharon Weaver, (518)872-1804, or www.aswm.org/calendar/2003am/wet2003cfp.pdf

NOW IN PRINT & ONLINE

Anniversary Photos: 25 Years of Protecting Mono Lake.

January 2003. Mono Lake Committee.

www.monolake.org/photogallery/25thphoto/index.html

CALFED Annual Report 2002.

January 2003. CALFED Bay-Delta Program.

www.calfed.water.ca.gov/AboutCalfed/AnnualReport2002.shtml

California Floodplain Management Report: Recommendations of the California Floodplain Management Taskforce.

December 2002.

fpmtaskforce.water.ca.gov/forms/FPMTGReport121602.pdf

Desalination and Water Purification Technology Road Map—A Report of the Executive Committee.

February 2003. BurRec & Sandia National Laboratories (U.S. Department of Energy).

www.usbr.gov/water/desal.html

Getting in Step: Engaging and Involving Stakeholders in Your Watershed.

January 2003. U.S. EPA.

www.epa.gov/owow/watershed/outreach/documents

Insecticide Market Trends and Potential Water Quality Implications (draft).

Kelly D. Moran. February 2002. TDC Environmental, LLC for the S.F. Estuary Project.

www.tdcenvironmental.com/draftreport.pdf

Invasive Spartina Program Programmatic Environmental Impact Statement/Report (draft).

February 2003. S.F. Estuary Invasive Spartina Project, U.S. Fish & Wildlife & California Coastal Conservancy.

Nutrients in Salmonid Ecosystems: Sustaining Production and Biodiversity.

February 2003. John Stockner, ed. American Fisheries Society.

www.fisheries.org/cgi-bin/hazel.cgi/hazel.cgi

Preparing for a Changing Climate: The Potential Consequences of Climate Variability and Change (draft).

September 2002. California Regional Assessment Group for the U.S. Global Change Research Program. www.ncgia.ucsb.edu/pubs/CA_Report.pdf

A Scientific Basis for the Prediction of Cumulative Watershed Effects.

January 2003. U.C. Berkeley.

nature.berkeley.edu/forestry/curr_proj/cwe/cwe_i.html

September 2002 Klamath River Fish Kill: Preliminary Analysis of Contributing Factors—A Report by Northern California North Coast Region of DFG.

January 2003. Cal Fish & Game.

www.dfg.ca.gov

S.F. Bay Trail Project Bay Trail Maps.

March 2003. ABAG.

(510)464-7900 or www.baytrail.org/map.html

The World's Water 2002-2003: The Biennial Report on Freshwater Resources.

January 2003. Peter Gleick. Island Press.

www.islandpress.org/books

POLLUTION CONTINUED

bisphenol A or di-n-butylphthalate. The chemical structures of these endocrine disruptors are close enough to natural hormones that they bind with hormone receptors in species ranging from fish to reptiles to mammals and can inhibit biological functions, such as sexual development and reproduction, and compromise immune systems.

Externally, plastics can maim or kill wildlife. Jennifer Witherspoon of the Marine Mammal Center recalls "Michelin," a sea lion found with a rubber tube wound so tight around his neck that he had to be euthanized. An elephant seal with packing strap around her middle was luckier and rescued in time. "We cut the strap, and she doubled in size. She hadn't been able to take a breath in some time," says Witherspoon.

As we continue to use products that end up on the streets and in the Bay, the plastic plague will likely continue. Because we know so little about the potential impacts of plastics, the San Francisco Estuary Institute has begun sampling water, sediment, and tissues in Bay dwellers like mussels to try to develop

a more complete picture of phthalates, a polymer used to make plastics more flexible. In a 2002 study, SFEI identified five different phthalate compounds in the Bay. Says SFEI's Mike Connor, "Phthalates are found in the Bay as well as throughout much of the United States, but we still don't have a clear consensus on how much of a risk they pose."

Contact: Capt. Charles Moore (562)439-4545; Jennifer Witherspoon (415)289-7341
KC

ROCKS CONTINUED

weaknesses in rock formations, says White, and about environmental hazards, such as chromium, that may leach naturally from Franciscan Complex rocks, the main formation in San Francisco. Eventually, they will look at liquefaction and slope stability issues too, says White, and will get wet in the creeks in McLaren and Glen Canyon parks when they study channel morphology and water quality.

Contact: Lisa White (415)338-2061;
<http://sf-rocks.sfsu.edu> **LOV**

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