ESTUARY NEWS

Bay-Delta News and Views from the San Francisco Estuary Partnership | Volume 21, No. 1 | FEBRUARY 2012

ASPHALT SPECTER

"Ducks not trucks," people chanted at a Petaluma riverside park event this January, protesting Sonoma County approval of a new asphalt plant. Locals can't understand why anyone would taint the beauty and biological riches on one highly restored river bank by building industry on the other.

Petaluma values its wetlands. Over a hundred thousand visitors have explored Shollenberger Park, fronting on the Petaluma River. Park docent Bob Dyer says 4,400 school children visited within the last five years. To the south, the Ellis Creek Recycling Facility uses vegetation-lined freshwater ponds to treat wastewater. To the north, a former dump site now called Allman Marsh was recently restored to full tidal function. More than 200 bird species inhabit or visit the wetlands complex, along with river otters and western pond turtles. Riverfront habitats also host endangered rails, mice and frogs. "It's really a national treasure," says David Keller of the Petaluma River Council.

No one should have been surprised, then, at the public response when Dutra Asphalt announced the construction of a new asphalt plant on riverside land across from Shollenberger. Sonoma County's board of supervisors approved the project's Environmental Impact Report. But the City of Petaluma filed suit to have the EIR certification overturned, charging violations of the California Environmental Quality Act and other laws. Supporting the city in the suit were Friends of Shollenberger Park, Moms for Clean Air, Madrone Audubon, Petaluma Tomorrow, and the Petaluma River Council.

Judge René Chouteau dismissed the suit in a December 23 ruling. "We lost everything," says the river council's David Keller. According to Joan Cooper of Friends of Shollenberger Park, "He skirted substantive issues and diverted attention to lesser issues. He agreed with the County and Dutra's attorneys that this was a blighted industrial area and deserved no protection from new industrial impacts." Plaintiffs are appealing the decision.

One of the CEQA issues in dispute is the baseline for plant emissions. "For the analysis of pollution produced by a new project, the baseline should be zero," contends Cooper. "The judge chose to use the baseline of Dutra's temporary plant at another site, which was actually closed at the time of application." Plant opponents are

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SUBMERGED SURPRISE IN SUISUN

Pondweed usually flourishes in sloughs, but a new survey of Suisun Bay and the West Delta mapped more than 1,000 acres of two species of these submerged native plants in open waters. Biologist Katharyn Boyer released new maps of the extent of these underwater beds this February in a project done by her team for the National Oceanic and Atmospheric Administration.

"What's really exciting is how much fish food we saw during our first look at these beds," says Boyer, a researcher for San Francisco State's Romberg Tiburon Center. "They're just covered with amphipods and isopods and, as you get up into fresher waters, with midge and crane fly larvae. We even saw adult dragon flies and spiders resting on the leaves at the surface, easy pickings for fish moving through this region."

The survey took place last summer, using a small boat, a GPS recorder and some rakes. Boyer found working with pondweeds, (*Stuckenia* spp.) much harder than working with eelgrass, the focus of her prior research. In the case of the latter, she could coordinate her field trips into the Bay with extreme low tides, which exposed the beds or left them in pretty shallow water where plants could be easily seen and sampled. The *Stuckenia* beds up in Suisun are never exposed. "There's always a meter or more of water over these beds, so it's logistically a much harder habitat to work in," she says.

But the conditions didn't stop her. Boyer's team found the greatest acreages of *Stuckenia* around Ryer, Chipps, and Wheeler Islands, with 80-100 acres at each. Many beds are small, in the 50-meter diameter range, while others span more than 1,000 meters. Most of the islands in Suisun Bay are lined with *Stuckenia* beds.

Before the survey, many biologists assumed that the submerged aquatic vegetation (SAV) in Suisun Bay was minimal and most likely widgeon grass (*Ruppia*), but nobody had ever gone out to check. In 2010, Chris Enright, senior engineer with the Department of Water Resources, brought attention to the beds

***Egeria* (left); *Stuckenia* (right); Grad student Evyan Borgnis rakes waterweeds in Suisun Bay (top). Photos by Katharyn Boyer.**

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Priorities

FRONT BURNER ISSUES FOR BAY MANAGERS

Estuary News *asked environmental and water managers around the Bay to describe their current priority issues as 2012 rolls. For live links to* MORE*, check out our new Front Burner web column:* ***www.sfestuary.org/pages/newsletter.php***

Shifting Sand Math: Sediment transport and supply to the Bay came into the agency limelight again this January, when the Bay Conservation and Development Commission approved a new initiative to develop a regional sediment management strategy, partnering with sediment managers and scientists who work with flood channels, habitat restoration, watersheds, and aggregate mining. The meeting came on the heels of the State Lands Commission's re-issued November EIR on sand mining impacts, and a USGS study earlier in 2010—both of which contain complex technical computations that don't necessarily square up with each other in terms of assumptions about Bay sediment supplies and movements. MORE

Sand mining dredge on the Bay. Photo by Kate Dallas.

Cracked Pipe Replacement: A program to prevent wet weather from overwhelming aging sewers on private property, sending untreated or partially treated sewage into the Bay, has begun in earnest. Federal and state water quality regulators are requiring East Bay Municipal Utility District (EBMUD), six East Bay cities, and one sewer district to work with their customers to fix old, cracked sanitary sewer pipes. To attack the problem, EBMUD and its partners are implementing a regional ordinance targeting private sewer laterals (PSLs). The ordinance requires property owners to get a certificate indicating that their PSLs are water-tight prior to transferring title on a property (i.e. buying or selling a home), completing a major remodel, or changing water meter size. EBMUD has also initiated a rebate program to give property owners more of an incentive to fix laterals. EBMUD says these programs amount to one of the largest efforts in the country to address wet weather issues stemming from private property. MORE

Treatment Plant Rehab: San Jose's wastewater treatment plant has been operating 24/7 since 1956 and needs a costly rehab. Federal funds built most Bay region plants 30-50 years ago, and many now need extensive infrastructure rehabilitation. A 2007 report on the condition of the San Jose/Santa Clara Water Pollution Control Plant found $1 billion in infrastructure upgrades would be needed to keep the plant operating the way it does now. The resulting master plan outlines a 30-year capital program of $2.2 billion (including not only rehabilitation, but also new projects needed to comply with upcoming regulations and changes in how biosolids are treated). In addition, the 30-year plan maps out a new vision for the San Jose shoreline encompassing flood protection, recreational, commercial, industrial, and habitat land uses. MORE

Bills for Restoration Bucks: Two bills in the congressional chutes this spring offer a "sea change" in how the region funds restoration projects, according to The Bay Institute's Marc Holmes. Senator Feinstein's and Congresswoman Speier's bills (S.97 & HR3034) open the door to much-needed geographically-based programs to restore more marsh as sea level rise threatens to drown bay margin and habitats. Advocates are urging local governments and organizations to get behind these critical bills. MORE

Levee Litigation: In an ongoing dispute between the US Army Corps of Engineers and state and local resource agencies over the management of the state's levees, the California Department of Fish and Game gave notice of its intent to sue the Corps on February 6. Fish and Game says the Corps' national policy requiring the removal of trees and shrubs on federal levees violates federal law, including the Endangered Species Act and National Environmental Policy Act. The Corps already faces litigation by Friends of the River and other nonprofits on the levee issue. Meanwhile, the federal agency has hinted at more flexibility and promised revised draft regulations on levee vegetation, still pending at press time. MORE

Nutrients Out of Kilter: Water quality watchdogs and scientists are mobilizing to develop a strategy for dealing with the rapidly changing balance of sediment and nutrients in the Bay (see *Estuary News*, December 2011, p. 13). Nitrogen enters many estuaries from fertilizer runoff, wastewater discharges and other sources, but until recently the Bay has been too turbid for these nutrients to spur problematic algae growth. Nitrogen (nitrate and ammonium) in the Bay is important for phytoplankton productivity and food for the ecosystem, but too much causes eutrophication and oxygen depletion that adversely affects growth, and can suffocate fish. "Nitrogen cycling has many dimensions, from shallow to deep water, from Golden Gate to the Delta, from ammonia to inert nitrogen gas, from urban runoff and wastewater to agriculture, from single celled organisms to endangered fish species," says water quality engineer Steve Moore. "All these dimensions require careful strategic thinking for optimal management." Both the Central Valley and S.F. Bay water boards are trying to do this kind of strategic thinking in the months ahead. In 2012, some of the thinking will come from the San Francisco Estuary Institute and the Southern California Clean Water Research Project, who are working with the S.F. Bay water board and key stakeholders to synthesize the current science and clearly articulate potential problems for different parts of the Bay. "You could say it's the mercury of this decade," says Moore. MORE

Beaver Boon: Agency and NGO staff held their first interagency meeting this January on the reappearance of beaver in the Bay Area. Current activities of the new beaver working group include mapping known beaver locations and historic range, and developing regional beaver management plans. MORE

Photo by Worth a Dam.

BUSAN SETTLEMENT DISSECTED

Four years after the *Cosco Busan* released 53,000 gallons of bunker fuel into San Francisco Bay, federal, state, and local agencies settled their suit against the vessel's owners and operators. The settlement package, a total of $44.4 million, contains dozens of proposals involving shoreline restoration and habitat enhancement for waterbirds and herring. Outlays for recreation ($18.8 million) and wildlife and habitat ($11.5 million) raised some eyebrows. The settlement's draft Damage Assessment and Restoration Plan (DARP) also illustrates the challenges of managing migratory bird populations. Although surf scoters suffered more from the spill than any other species, the plan's developers were unable to identify a project to build up their numbers; instead, the trustee agencies will invite proposals.

Oiled Scoter. Photo courtesy Ron Sullivan.

In a recent interview, Baykeeper's Deb Self criticized the recreation allocation, despite her organization's membership, which includes many kiteboarders, swimmers and kayakers. "Recreation wasn't that impacted by the spill, compared with impacts on habitat, food resources, and actual fish and wildlife," she says.

Steve Hampton of the Department of Fish and Game's Office of Spill Prevention and Response (OSPR) says the shares emerged from the negotiation process with the responsible parties, with bird, habitat, fish and other teams developing separate components. "Each injury was negotiated independently. It's not a pie that we divide up ourselves, it's a pie that we build," says Hampton. But Self is concerned that if a good proposal comes in for a scoter project, there will be "a lock on how much is available" due to the pre-existing recreational commitments.

Self, a member of OSPR's Technical Advisory Committee, also argues that the $5 million for birds is too low because oiled birds were undercounted. She notes that the US Coast Guard, in a review of incident preparedness, identified search and collection as "one of the greatest shortcomings of the response." Hampton disagrees: "The bird search and collection was the most complete and well documented of any oil spill in the world. We estimated bird mortality based on a complicated model taking into account un-searched areas, search efficiency, and scavenging rates. The modeling was designed to get at what we missed." Self counters that the wildlife teams were understaffed, even though there were a number of available teams with training. "Assets went untapped," she says.

Hampton acknowledges the scoter dilemma, especially regulations requiring compensation for birds injured in the form of projects that "create" birds. "We don't know what to do for scoters to bring the numbers back up. They've been a tough nut to crack for a long time," he says. One possible project, removing derelict fishing nets from scoter stopover habitat in Puget Sound, was preempted by a local initiative.

USGS biologist Susan De La Cruz agrees that surf scoters are a difficult species to do restoration for. "Nobody can identify the exact factors causing population declines," she says. Last year's Christmas bird count underscored the drop in scoters and scaup. The settlement fund trustees want proof that projects will result in more scoters, and prefer projects benefiting scoters that show strong site fidelity to their winter habitats in the Bay.

Another beneficiary of the settlement is the marbled murrelet, a seabird that nests in coastal conifers. Only three dead murrelets were retrieved after the spill, but the species is endangered and its Central Coast population is "in free fall," according to Hampton. An effort to control ravens and jays that prey on murrelet nests was recently expanded in scope, thanks to the settlement.

Commercial herring fishers pursued their own suit against the ship's owners for economic damages. September's settlement deals only with the eelgrass beds where hard hit Pacific herring spawn. Eelgrass restoration pioneer Katharyn Boyer of San Francisco State University says the plants themselves were not significantly damaged. "What the settlement suggests is pretty reasonable, both in terms of creating herring habitat and other benefits. We can kill two birds with one stone."

Beach and shoreline restoration targets include Albany Beach and Aramburu Island off the Marin coast. Coastal plant ecologist Peter Baye, already working on Aramburu, was surprised by the targets. "Albany Beach has great urban recreational value and accessibility, but, with the chronically high dog use, the wildlife habitat potential is relatively low." But Hampton thinks Albany is "the most attractive project in the East Bay—it's big, almost ready to go, and the East Bay Regional

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SUBTLETIES OF SPILL FOR FISH

You can't count dead fish as easily as oiled birds. Teasing out precisely how the *Cosco Busan* spill impacted the Pacific herring that spawn in San Francisco Bay has taken years of study by a large scientific team from UC Davis, the Washington State Department of Fish and Wildlife, and NOAA's Northwest Fisheries Science Center. What's critical is what the bunker oil did to herring eggs—including those laid after the spill—and embryos. The team's report, with NOAA's John Incardona as lead author, has just been published in *Proceedings of the National Academy of Sciences.*

Previous research had shown that herring embryos exposed to crude oil had lethal developmental abnormalities, notably heart arrhythmia and swelling of the heart and yolk sac. Incardano's group tracked lab-fertilized herring embryos suspended in cages in the Bay and collected naturally-spawned embryos at both oiled and unoiled sites. Embryos spawned at all three oiled sites died at higher rates and had more physical abnormalities, showing what the authors called "an unexpectedly severe (i.e., lethal) form of developmental toxicity." Caged embryos had heart defects but lower mortality.

Although they couldn't identify the chemical fingerprint of *Cosco Busan* oil in the maldeveloped herring, Incardona and colleagues believe the abnormalities were not caused by background pollutants. The herring were hit with a double whammy, bunker fuel chemicals interacting with sunlight. These dual factors explain the divergent fates of embryos hatched in the sunlit shallows and those caged in deeper, more turbid water. Studies of zebrafish indicate bunker oils have a stronger phototoxic effect than crude oil. The specific component responsible is still unknown. Their conclusion: "The simplest explanation…is that an uncharacterized and slowly weathering component of *Cosco Busan* bunker oil accumulated in the naturally spawned herring embryos, and then interacted with sunlight during low tides to produce lethal phototoxicity." JE

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CONTINUED FROM COVER

ASPHALT PLANT

also concerned at the lack of a toxic spill containment emergency plan. "In theory, the plant's discharges would go through on-site mitigation wetlands and ultimately into the river. But the county didn't require mitigation wetlands," says Keller.

Truck traffic to the new plant is also a point of controversy. Dutra says it will truck in material for three years, then switch to a conveyer belt across an adjacent property owned by Shamrock Aggregate. However, Shamrock says it has no such agreement with Dutra. Plant opponents argue that emissions from the plant plus the truck traffic would exceed regional standards for nitrous oxide. Even if built, the conveyer belt would impact mitigation wetlands and a heron and egret colony.

Keller and Cooper also claim irregularities in the CEQA process. "They had what they called a final EIR," recalls Keller, "but two hours before the supervisors' final vote they dumped another couple hundred pages. None of it was recirculated." Cooper says this was consistent with previous board actions limiting public discussion of the plant siting.

For its part, Dutra's web site maintains that the project "has undergone extensive environmental review and is subject to requirements and conditions that will ensure protection of air quality, the ecology of the Petaluma River, adjacent wetlands and species habitat, aesthetics and the environment, while continuing to provide a local source of asphalt production required for public works and private development projects that are important for the community."

However the appeal goes, the plant is not a done deal. Permits from the US Army Corps of Engineers, the California Department of Fish and Game, and the Bay Conservation and Development Commission will be required, and a long list of preconstruction conditions must be met.

"The judge isn't recognizing the millions of dollars and efforts of thousands of people that went into restoration along the Petaluma River. It's as if the whole context of restoration in the Bay was irrelevant," says Keller.

Cooper agrees everyone on her side of the river dispute was extremely disappointed. "That decision woke the sleeping giant of the public." JE

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Regulation

THE CASE AGAINST STRIPERS

A controversial Delta coalition wants to see more blame for salmon loss in the Sacramento River placed on the striped bass eating their young. Critics say it's not that simple, and suggest the coalition may be more interested in preserving water deliveries than protecting endangered fish.

Freshwater diversions, migratory obstacles, and changing food webs have stressed salmon for decades, but the Coalition for a Sustainable Delta wants to direct more attention to introduced striped bass. "Everything suggests this predator is a significant problem," says Michael Boccadoro, spokesman for CSD. "We're not trying to misdirect attention from the pumps. Addressing impacts from the pumps needs to be part of any comprehensive solution. But we need to address all the stressors, not pick and choose."

In 2008, the coalition and four Kern County water districts sued the California Department of Fish and Game to eliminate striped bass size and bag limits for recreational fishing. Concurrently, NOAA's National Marine Fisheries concluded that bass predation on salmon and steelhead was "an important stressor warranting action," and also recommended removing the limits.

In a settlement of the suit, approved last April by US District Judge Oliver Wanger, Fish and Game agreed to revise its regulations. The new version, with a minimum size limit of 12 inches and a bag limit of six bass per day, will be up for approval this month. Prominent fish biologists say the case against stripers is inconclusive, and question the coalition's motives.

CSD, a partially tax-exempt 501(c)(5) group, describes itself as "water users who depend on the Delta for conveyance of a large portion of their water supplies and individuals who utilize the Delta for aesthetic and recreational enjoyment." Funding comes from individual users, among them Stewart Resnick, owner of Paramount Farms and a prominent contributor to political candidates. "We've been accused of being an Astroturf organization, but we are not and don't claim to be a grassroots group," says Boccadoro. "We do research, identify stressors, and file litigation to force agency officials to do their jobs."

In a post on the California Water Blog site last winter, UC Davis fish biologist Peter Moyle and fish ecologist William Bennett questioned the argument that reducing striped bass numbers would increase populations of threatened species. That, they wrote, assumes that striped bass predation regulates populations of salmonids and smelt, and that other predators would not make up for any decrease in bass predation, among other assumptions. According to Moyle and Bennett, most of the juvenile salmon and steelhead lost to striped bass are hatchery products, poorly adapted to the wild. "By messing with a dominant predator (if indeed it is), the agencies are inadvertently playing roulette with basic ecosystem processes." Any control program should include intensive research and an adaptive management plan "to make sure the alleged cure is not worse than the disease." In any case, they wrote, "the ultimate cause of decline in these species is adverse water management throughout the Central Valley." Boccadoro is unimpressed: "The Fish and Game proposal includes exactly the sort of intensive research and adaptive management that they say is important."

Environmental consultant Charles Hanson prepared two reports in support of the CSD suit. Hanson, who has worked for water contractors in the past, concluded that Fish and Game had underestimated striped bass predation on salmonids, especially in the Sacramento River. Based on a 1967 Fish and Game study of bass stomach contents and other literature, he developed correction factors ("All I did was change one or two assumptions in a Fish and Game spreadsheet and let the spreadsheet calculate predation loss") and got much higher loss percentage estimates for spring-run and winter-run Chinook salmon.

Hanson doesn't believe reducing striped bass numbers would increase those of other predators like Sacramento pikeminnow. He couldn't find data on the difference in predation risk between hatchery and wild salmon.

Independent fish biologist David Ostrach, formerly with UC Davis, is skeptical about Hanson's conclusions, noting that his reports were not peer-reviewed. "Predation by striped bass on juvenile salmon and steelhead is documented, but there is no evidence it makes a difference to numbers of returning salmon," Ostrach stated in a letter to the Game and Fish Commission. He also raised what he called a social justice issue: "Changing the regulations as suggested would encourage subsistence fishermen in the Delta to catch and eat more contaminated striped bass." Bass often contain mercury at levels unhealthy for frequent human consumption.

Boccadoro expects the Commission to approve the new limits, "even though they're under a lot of pressure from fishing interests to reject them. If that happens, it will just end up back in court and the case is even stronger. At that point, there can be no compromise: it will be the elimination of size and bag limits." JE

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Interview

STEVE CROOKS ON BLUE CARBON

In the heated international debates over who should do what about climate change, the groundbreaking work of scientists like Steve Crooks often gets overlooked. Yet it is Crooks and his colleagues who will make a crucial difference in whether global agreements work once the shouting is over.

Crooks, a British wetlands geomorphologist, joined water gurus Philip Williams & Associates ten years ago. Crooks spent several years immersed in West Coast wetlands restoration but in 2008 became involved in international efforts to establish carbon trading protocols for wetlands.

Crooks now globe trots from one meeting to another of working groups for the International Panel for Climate Change, The International Union for the Conservation of Nature (IUCN) and Conservation International. As a scientist and negotiator, he plays a delicate dual role that shows how conservation is practiced in an age of complex science and equally complex political challenges.

Crooks attended the recent international climate summit in South Africa. ESTUARY *caught up with him before he left for a European Union meeting soon afterwards.*

What were the nuts and bolts breakthroughs in Durban? An agreement establishing legally binding but as yet unspecified emissions targets. This new treaty is to be in place by 2015. The good news is that the big emitters, the United States and China, are part of this process. The bad news is that major action on climate change has been kicked well down the road. One of the Durban successes was the setup of The Green Climate Fund, which will provide money from the developed world to support mitigation and adaptation in the developing world. But negotiators have yet to agree on where those funds are going to come from.

What's the holdup? Political wrangling between large emitters and now the added problems of the economy. The Germans already put $150 million a year into similar funds. But getting commitments out of countries like the US is a slow process.

Is stopping deforestation still a priority? Trees capture CO_2 from the atmosphere and turn it into wood. Since it's out of circulation, that CO_2 doesn't contribute to the warming of the planet. But when someone chops down a tree, the CO_2 is released back into the atmosphere. Based on that, there's been a lot of effort in the past 10 years to preserve forests.

Does the United Nations have an international funding mechanism for forest preservation? That's the focus of REDD (The United Nations Collaborative Program on Reducing Emissions from Deforestation and Forest Degradation). The Green Climate Fund has a broader mandate, which covers REDD but could also be extended to conservation of coastal ecosystems, and adaptation.

I saw a shift in thinking at Durban to: we can't stop climate change, so we should gird ourselves for the consequences. We're warming at the very high end of projections. Until now, we haven't been focusing on adaptation because everyone has wanted the mitigation to work. The focus has been on reduced industrial emissions and ecosystem-based programs like REDD. But if we're going to fail at mitigation we will be forced into dealing with the realities of adaptation, not only internationally but here in the US. Failing to act until there's a crisis could be disastrous. We're not only anticipating sea level rise in coastal communities, but stepped-up desertification with the possibility of food shortages in various parts of the world. So far, $30 billion is promised for climate change readiness activities.

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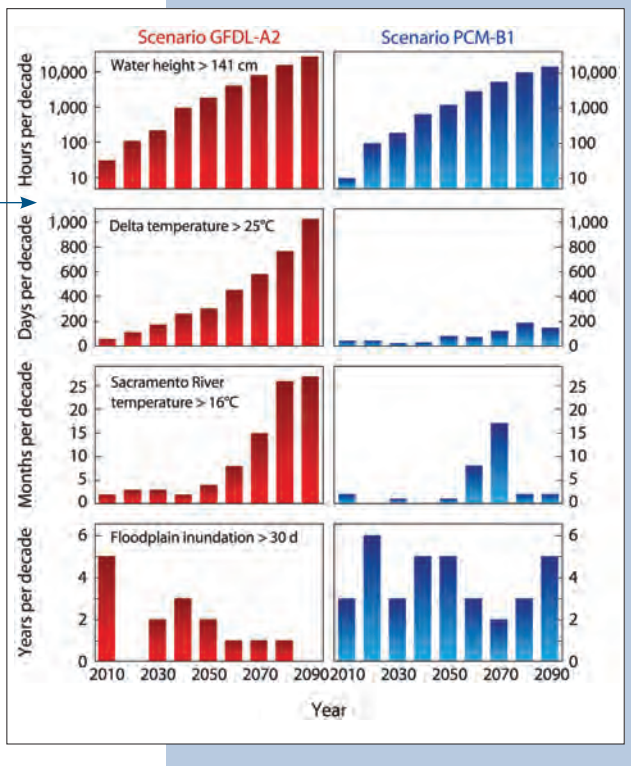

Projected 2010-2099 changes in the occurrence of extreme environmental conditions in the San Francisco Estuary-Watershed system for two scenarios: A2-fast in red and B1-moderate in blue. The indicators count projected exceedences each decade of threshold values based on historical extreme water elevation or having significance for sustainability of native species of fish (lethal water temperatures) or habitat restoration through management of floodplain habitats. For results of this study consult: http://www.plosone.org/article/info%3Adoi%2F10.1371%2Fjournal.pone.0024465

burningissue

DELTA IN HOT WATER

A USGS-led climate science team warns that sea level rise will intensify conflicts in the Bay-Delta estuary over management of water supply and ecosystem restoration. Their "CASCADE" study, released last November, offers the first integrated assessment of how the estuary will respond to both moderately-paced and fast climate warming scenarios between 2010 and 2099 (see chart). Results suggest, among other things, that the combined effect of increasing water temperature and salinity could reduce habitat quality for endangered Delta smelt and winter-run Chinook salmon, and intensify the challenge of sustaining their populations.

The CASCADE 1 team tracked nine environmental indicators using the two warming scenarios. CASCADE 2 studies are now exploring how a climate-changed Delta ecosystem might respond to a major levee break with flooding of multiple islands, or to the construction of a new water conveyance facility. Other new project components will model sediment dynamics and marsh survival. "What's unique about Cascade (particularly Cascade 2) is the whole-system approach—the integrated treatment of atmosphere, watershed, estuary, and coastal ocean in order to understand ecosystem impacts," says Noah Knowles of the USGS.

Events

MARCH 3
FAT SATURDAY PLANTING PARTY
LOCATION: MLK Jr. Regional Shoreline, Oakland
SPONSOR: Save the Bay
www.savesfbay.org; (510) 452-9261

MARCH 14
PLANTING FOR BUTTERFLIES
LOCATION: Palo Alto Baylands
SPONSOR: Save the Bay
www.savesfbay.org; (510) 452-9261

MARCH 14-16
WATER FACILITIES TOUR
TOPIC: Lower Colorado River Tour
LOCATION: Hoover Dam to Salton Sea
SPONSOR: Water Education Foundation
(916) 444-6240; www.watereducation.org/tours

APRIL 4-7
30TH ANNUAL SALMONID RESTORATION CONFERENCE
TOPIC: Focusing on a New Generation of Watershed Recovery
LOCATION: Veterans Memorial Center, Davis
SPONSOR: Salmonid Restoration Federation
www.calsalmon.org

FEBRUARY THROUGH MAY
TOPIC: Frog Survey
LOCATION: West Contra Costa County
SPONSOR: SPAWNERS
www.spawners.net/frogs

Just Published

A Review of Human Disturbance Impacts on Waterbirds by Kathi L. Borgmann. Audubon California, September 2011. www.sfbayjv.org/resources.php#shorebirds_WHSRN

Alameda County Breeding Bird Atlas by Bob Richmond, Helen Green, and David C. Rice. Golden Gate and Ohlone Audubon Societies, December 2011.

At a Crossroads in Our Region's Health: Freight Transport and the Future of Community Health in the San Francisco Bay Area by Catalina Garzon et al. Pacific Institute, December 2011. pacinst.org/reports/crossroads_for_health

Califlora: A Literary Field Guide, edited by Terry Beers. Heyday, January 2012. heydaybooks.com/book/califlora

East Contra Costa Historical Ecology Study by Branwen Stanford et al. S.F. Estuary Institute, November 2011. www.sfei.org/HEEastContraCosta

Structural and Functional Loss in Restored Wetland Ecosystems by David Moreno-Mateos et al. PLoS Biology, January 2012 www.plosbiology.org/article/info:doi/10.1371/journal.pbio.1001247

INTERVIEW CONTINUED

What role could wetlands play in adaptation? In the policy arena, people are realizing that wetlands store a lot of carbon below ground, within the soil. This carbon is released when wetlands are drained, and levees are built. Inland there has been a lot of activity around how to conserve peat carbon stocks and we are extending this to include coastal systems. A raft of countries in the developing world have converted their peat fields to grow palm oil and biofuels. In coastal areas, destruction of mangroves to build shrimp farms has huge environmental impacts and is a major source of greenhouse emissions. When you convert mangrove forests to aquaculture you release a lot of carbon very quickly. Economic incentives can be part of the solution in many countries.

How much potential does carbon trading have in California? A lot. California was the first state to establish a cap and trade system to reduce emissions. That starts in 2013, and should result in improved power plant technology and greater potential to invest in a wide swath of environmentally beneficial projects. Wetlands are not there yet but we are working on it. An area of particular interest is the Sacramento – San Joaquin Delta, where the drainage of wetlands to create farmland has dug a hole that's about three billion cubic meters in size. Every year the Delta releases about five million tons of CO_2. That's about one percent of California's greenhouse gases, more than the emissions of some countries. If erosion continues unchecked, there's still around a billion tons left to go. Carbon financing could help restore the Delta's wetlands, provide an income for landowners, and reverse emissions—potentially.

What's the mechanism? A national carbon trading registry, The Climate Action Reserve, works with the California Air Resources Board (CARB), through which large energy producers and consumers can offset their emissions. They do this by investing in projects that reduce emissions in a variety of ways: reducing emissions from power plants, biological projects such as growing trees, or preventing emissions from wetlands.

Will carbon trading in wetlands happen soon? There are protocols for trees but they don't exist yet for wetlands. We're working on standards that would allow states, primarily California and west coast states, to trade through the climate action reserve. I can see this happening two to five years out.

Natural mangrove forest. Photo courtesy Catherine Lovelock, University of Queensland. INSET: Mangrove deforestation. Photo courtesy Frida Sidik, University of Queensland.

Tell us more about your leap from Bay Area wetlands to global carbon trading. Phil Williams & Associates, now merged with ESA, is known for a strong environmental ethic, and we've pushed to connect climate change activities with coastal conservation. Now this concept is hitting its stride. Blue Carbon—that's what we're calling management and trading of coastal wetlands carbon—is becoming part of the picture internationally. We recently met at the European Parliament in Brussels to engage with agencies and NGOs on how to advance Blue Carbon in the ever-changing environmental frameworks of the European Union.

Are you establishing similar collaborations in the U.S.? Absolutely. We work with Restore America's Estuaries and here in the Bay Area with organizations like The Bay Institute. We're also working with scientists at the USGS and universities around the country.

Do you spend half your life on planes these days? Yes, but we also buy carbon credits to make up for all that jet fuel. And I do have occasional downtime. I live near Richardson Bay. The marsh is exactly 200 meters long so I can do a gin and tonic survey from my deck of what's changed.

One gin and tonic equals 200 meters? That's only an approximation. SZ

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☐ Bimonthly 8-page, option to receive PDF or paper version
☐ Monthly email blasts + quarterly paper magazine (with PDF option)
☐ Web-only, with monthly email blasts of top news
☐ Add interactive media to option marked above (Twitter/blogs/Facebook)

5) Which general topics interest you most in *Estuary*?
☐ Flows & water supply ☐ Creeks
☐ Watershed issues ☐ Climate change
☐ Endangered species ☐ Citizen action
☐ Agency insider news ☐ Agriculture
☐ Restoration ☐ Social justice
☐ Stormwater ☐ Invasive species
☐ Contaminants ☐ Science
☐ Fish ☐ Birds ☐ Plants
☐ Personal views and opinions
☐ Environmental regulations
☐ Land use decision-making
☐ Calendar & publications list

6) What topics are not being covered in *Estuary* that should be?

_____

_____

_____

_____

7) How often do you read something you didn't know in *Estuary News*?
☐ Never ☐ Rarely
☐ Occasionally ☐ Frequently

8) How often does an *Estuary* story lead you to:

Contact someone to find out more?
☐ Never ☐ Rarely
☐ Occasionally ☐ Frequently

Learn of an unexpected connection between projects or subjects?
☐ Never ☐ Rarely
☐ Occasionally ☐ Frequently

Inspire you to write a letter of concern?
☐ Never ☐ Rarely
☐ Occasionally ☐ Frequently

Mention a story to a friend or colleague?
☐ Never ☐ Rarely
☐ Occasionally ☐ Frequently

Contact a political representative?
☐ Never ☐ Rarely
☐ Occasionally ☐ Frequently

9) How would you rate *Estuary*?

Readability (interesting stories)
☐ Poor ☐ Okay ☐ Good ☐ Excellent

Diversity of points of view
☐ Poor ☐ Okay ☐ Good ☐ Excellent

Substance
☐ Poor ☐ Okay ☐ Good ☐ Excellent

Accuracy
☐ Poor ☐ Okay ☐ Good ☐ Excellent

Appearance
☐ Poor ☐ Okay ☐ Good ☐ Excellent

Timeliness
☐ Poor ☐ Okay ☐ Good ☐ Excellent

Size and Length
☐ Poor ☐ Okay ☐ Good ☐ Excellent

10) What do you like best and least about the newsletter?

_____

_____

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11) Were you aware that *Estuary* had a paid subscription option of $20-50 per year?
☐ Yes ☐ No

Avid reader.

12) Publication of *Estuary* is heavily subsidized by the S.F. Estuary Partnership. If you do not now pay to receive it, how much would you be willing to pay per year?
☐ $0 ☐ $20 ☐ $50
☐ $100 (20 copies for your office)
☐ $250 (supporting subscription)

13) Where do you get similar information to that provided in *Estuary News*?

_____

_____

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14) Please tell us a little about yourself so we know our readers.
☐ Agency-Gov ☐ NGO ☐ Elected
☐ Scientist ☐ Student ☐ Teacher
☐ Activist ☐ Public ☐ Other

15) How many years have you been reading *Estuary*?
☐ 1-5 ☐ 5-10 ☐ more than 10 years

Give us the name and email address of five people you think might be interested in receiving *Estuary News*, and we will send them one PDF sample issue and one follow up email. We will also enter your name in a raffle to win one of three copies of the new book *Natural History of San Francisco Bay* by Estuary's editor Ariel Rubissow Okamoto. Just email your five names and email addresses to *bayariel@sbcglobal.net* with a subject line "survey raffle."

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SUBMERGED SURPRISE IN SUISUN

CONTINUED FROM COVER

after noticing their extent using Google Earth. Soon afterwards, Boyer got the NOAA grant to do the first survey.

Botanist Peter Baye, brought in to help identify the SAV species, described what he's seen on the new NOAA survey maps as an "invasion" of native pondweeds not previously recorded west of Brown's Island. "Traditionally most SAV in the northern estuary was presumed non-native or detrimental for fish, but the emerging Suisun story may revise that view." says Baye. Baye also points out that *Stuckenia* was a favorite food of canvasbacks in the historic adjacent wetlands of Suisun Marsh, but today's managed marsh conditions—designed to favor waterfowl hunting—don't favor this native pondweed.

Based on her initial look at the beds, Boyer thinks the *Stuckenia* may not only offer fish plentiful food items, but also provide a much more open, light and turbid habitat than the Brazilian *Egera densa* choking Delta waterways. *Stuckenia* has no leaves on its lower stem, only branching out in the top meter of water near the surface. *Egeria*, by contrast, fills the water column with dense vegetation creating dark places for predators like striped bass (see p. 4) to hide. The dense plant material also traps sediments, clearing pockets of water in the beds where small native fish can't find any visual refuge like they can in the more turbid pondweed.

Getting a better handle on the ecology of the *Stuckenia* beds will be part of two new studies Boyer started this February. Her first study, for the Delta Science Program, will examine patterns in vegetative cover and biomass, as well as invertebrate abundance and community composition. Her second study, for the CALFED Ecosystem Restoration program, will explore the patterns in distribution of these beds in relation to salinity. At press time, Boyer was out collecting plant material to grow in tanks. In the lab, she'll use the tank specimens to experiment with how these SAV beds could shift with changing salinity patterns.

Drought, sea level rise, and levee breaches for restoration all promise a saltier Delta in the decades ahead, so more habitat could open up for *Stuckenia*. "We could see these beds expanding further up estuary into places now dominated by non-natives, which is exciting, especially if this could be native habitat beneficial to native fish species in the future." ARO

Contact: Katharyn Boyer, katboyer@sfsu.edu
NOAA Map Preview: http://online.sfsu.edu/~katboyer/Boyer_Lab/Pondweeds!.html

BUSAN SETTLEMENT

CONTINUED FROM PAGE 3

Park District's first choice. The recreational component there will be funded out of the recreation pot, not the habitat pot." A large chunk of recreation funds will go to National Park Service facilities. Other public entities and some private groups (like dock owners) can submit their own proposals.

Golden Gate Audubon's Mike Lynes is glad the trustees didn't just throw up their hands over the scoters: "I appreciate that they've left the door open. Overall, I agree with most of the priorities. The document was made with quite a bit of deliberation." JE

Contact: Steve Hampton, shampton@ospr.dfg.ca.gov; Mike Lynes, mlynes@goldengate-audubon.org; Deb Self, deb@baykeeper.org.