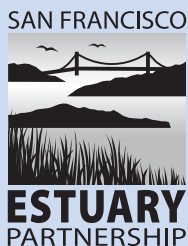


PROJECT TO PARTNERSHIP

When is a project no longer a project but recognized as a large-scale collaborative effort expected to continue for years to come? That is the question we asked ourselves a few months back. After discussions among the staff and the Implementation Committee, we have become the San Francisco Estuary Partnership, to better reflect the real nature of our work. We are pleased to unveil our new name, logo, and newsletter look, and to recommit ourselves to protecting, restoring, and enhancing the resources of our beloved Estuary.



One of our new collaborations is with River of Words ([www.riverofwords.org](http://www.riverofwords.org)), in which we sponsored a K-12 environmental art and poetry contest. View the results at [www.sfestuary.org](http://www.sfestuary.org), and watch for the poems and art in this and future issues of ESTUARY NEWS, and at our 2009 State of the Estuary conference September 29-October 1. And speaking of art, we are sponsoring another contest, open to all ages, winners to be displayed at the conference. Read about it on page 3, and help spread the word.

—Judy Kelly



LOON: 2009 Creek Seeker Prize  
 Sarah Thomas, age 14, Richmond, CA  
 Island Studio (El Cerrito) Teacher: Sandi Potter

inside

- 2 Bringing Back Beaches
- 3 He Built It . . .
- 4 Bountiful Blades
- 5 Creek Seeker Poem

# ESTUARY NEWS

Bay-Delta News and Views from the San Francisco Estuary Partnership | Volume 17, No.3 | June 2009

## INFILL OR BAY FILL?

Depending on whom you ask, the reincarnation of 1,433 acres of South Bay crystallizer ponds along the shores of Redwood City as a residential/recreational development with a wetland restoration component is either a spectacular example of new urbanist infill or poorly-timed Bay fill—and one of the largest Bay fills proposed in years. The proposal—known as the “Redwood City Saltworks”—by Cargill Salt and DMB Associates to build housing, along with soccer, baseball, football fields, and some restored wetlands, has spawned two local ballot measures (both of which failed), and a raging debate over the best use of these salt crystallizer ponds still owned and used by Cargill. The property was not included in the public acquisition of the South Bay Salt Ponds in 2003.

Historically, the crystallizer ponds—now used to dry out Bay salt—were Bay wetlands. Aerial photos taken in 1943 show that much of the area “was fully tidal, with great sloughs and dendritic channels,” according to Citizens’ Committee to Complete the Refuge’s Arthur Feinstein. Even in more recent aerial photos, says the Bay Conservation and Development Commission’s (BCDC) Will Travis, “on some of the ponds you can still see the old sloughs.”

“We could actually let wetland creep occur here if we could save this site and restore it.”

Some question the wisdom not only of filling former wetlands, but also in putting housing and other hard structures along the edge of the Bay as sea level rises, especially since so much of the Bay’s edge is already “hardened.” Wetlands act as buffers, helping attenuate

higher waters and storm events, but they need room to migrate landward. “We could actually let wetland creep occur here if we could save this site and restore it,” says Feinstein.

DMB, Cargill’s Arizona-based partner in the development, whose slogan is “a passion for great places,” says wetlands will be part of the project—but backed on their landward side by a series of giant levees. Says DMB’s John Bruno, “We recognize that sea level rise conditions need to be addressed. What we’re proposing is a new public and private partnership where we will be creating levees at our expense that not only protect the site but also all the low-lying areas around it. We will have a highly structured series of levees that address sea level rise.”

But the issues of historical wetlands, sea level rise, and wetland creep seem to have taken a back seat to a debate on whether the site is sustainable, new urbanist “infill” development, or simply bad planning. Bruno insists that the project is in fact infill. “We’re creating a new peninsula community where people can live close to work—within a five-mile radius of some of the largest employers in all of California. We have spoken to those employers: housing for executives that’s close and affordable is their number one issue. You have an economic dynamic taking place: can you continue to sustain economic growth for companies in San Mateo County if you don’t have housing? How do you provide efficient modes of transportation by which people can get to and from work? You do it by creating new communities and opportunities.” Bruno says the development will encourage new shuttle systems in Redwood City that will stop at CalTrain. “We believe we can be the catalyst for new transit; there’s a proposed new ferry terminal, lots of ways to create new transit linkages.”

*continued on page 6*

## BRINGING BACK BEACHES

An oyster shell beach and backbarrier marsh in Foster City. Photo by Peter Baye.

The beaches of San Francisco Bay have had a checkered history. Once vital wildlife habitats and valued recreational resources, they fell victim to twentieth-century development. But the persistent patterns of wind and waves have created successor beaches, and biologists and engineers are looking at ways to enhance that process.

Robin Grossinger, historical ecologist with the San Francisco Estuary Institute, says the Bay had 23 linear miles of beach in the 1850s, when the U.S. Coast Survey—the first federal science agency—prepared its topographic maps. “We were trying to map wetlands,” Grossinger recalls. “The beaches came as somewhat of a surprise. We discovered all these habitats that we used to have and that were potentially restorable.”

Beachscapes varied within the Bay. Most were in the Central Bay, formed from Pleistocene sand deposits: the Colma Formation on the San Francisco side, the Merritt Formation along the East Bay shore. There were linear fringing beaches along hard shorelines, barrier beaches sheltering lagoons and marshes, and pocket beaches in small coves. The less numerous South Bay beaches were composed of “shell hash”: fragments of prehistoric oyster shell.

Now-endangered birds like the western snowy plover may have nested on the historic beaches, which doubled as high-tide roosts for other shorebirds. Old herbarium specimens attest to a unique beach plant community, including the endangered California sea-blite (*Suaeda californica*), Pacific dunegrass, and goldenrod. Extirpated from San Francisco Bay by 1960, *S. californica* survived only in Morro Bay until recent reintroductions. Crissy Field and Marin’s Strawberry Point were once famous for their tasty beach strawberries. Grunion, recently rediscovered in the Bay, likely spawned on historic sandy beaches.

“The beaches were much appreciated in the nineteenth century,” Grossinger explains. “We didn’t have the broad Southern California sand beaches, but our beaches were still part of the cultural repertoire. People would come from San Francisco to summer at the East Bay beaches. There were big annual celebrations there. It was part of our cultural connection to the Bay.”

The few beaches that had survived development through the 1940s were obliterated by what UC Berkeley geographer Richard A. Walker calls “the postwar splurge of filling and abuse.” Riprap now armors much of the Bay’s edge. Among the

few intact historic beaches is the one that frames Whittell Marsh at Point Pinole, fed by headland erosion. But it’s shrinking, in part due to the wakes of passing ferries.

Today we’re down to about seven miles of beach. Some well-known sites, like Alameda’s Crown Beach, are completely artificial. Others form a ghost image of historic beaches. “Most have reformed bayward of where they were,” says Grossinger. “The places where they were have largely become filling. Some are in similar location and orientation to the historic beaches. Similar natural processes are still at work. We need to think about how that’s happening and how we can enhance it.”

Coastal plant ecologist Peter Baye, who prefers to talk about beach replenishment rather than restoration, describes the new generation of beaches as “small, scattered, and not well observed.” They’re owned by a mix of public agencies: Eastshore State Park, the Ports of San Francisco and Oakland, the cities of San Leandro and Foster City, the National Park Service. Some get heavy recreational use; others are completely neglected. They’re potentially significant habitat: Radio Beach near the Bay Bridge Toll Plaza is used by roosting Caspian and elegant terns.

Baye, who has been reintroducing *Suaeda* at San Francisco’s Pier 94, the Emeryville Spit, and San Leandro’s Robert’s Landing, sees other ways of categorizing the beaches: “From a habitat standpoint, there are certain beaches with outstanding value based on location, isolation, and size. Others have high engineering feasibility and urban park values. We could bleed off recreation pressure from some beaches and let those without good habitat take the brunt.”

Most of today’s beaches are sediment-limited. Baye wants to make sand from dredge operations available for beach replenishment, something he pioneered at Pier 94 with waste from gravel mining operations. “Most of the sand dredged out of the Bay has been dedicated to tidal marsh restoration in places that never had sand, like Hamilton Field and Montezuma Wetlands,” he says. “We shouldn’t be treating sand as waste material. We need to assign geomorphic and ecological priority to the use of sand resources, for maximum beneficial reuse of dredge material.” Dredged sand might be pumped directly to sites like Roberts Landing. The Eastshore State Park beaches are also close to dredging sources, including the ongoing Bay Bridge work.

The sustainability of beach nourishment relates to the larger—and controversial—question of the Bay’s sediment budget, and whether commercial sand mining, which removes a million tons a year, is interfering with the natural flow of sediment. No mitigation has ever been required for these operations.

Baye and Far West Engineering’s Roger Leventhal have developed proposals for several

## COMPETING FOR CUTS

Can Californians reduce their water consumption by 20% in the next 11 years? Governor Schwarzenegger set that target in 2008 in a message to state legislative leaders, proclaiming that he would direct agencies to develop a more aggressive water conservation plan and would welcome legislative support.

Late in April, the state’s “20 x 2020 Agency Team” released a draft report, establishing consumption baselines in gallons per capita per day and spelling out statewide and regional goals. Baselines reflect urban residential, commercial, and industrial use of non-recycled potable water; agriculture is not included. Coastal regions would have relatively modest targets, lower than the statewide 20%: the San Francisco Bay Area would have to cut back by 16%; the South Coast by 17. For interior regions, goals range from 30% (San Joaquin Valley) to 39% (Colorado River).

Proposals include policing leaks, adopting innovative water-saving technologies, and rebates for water-thrifty clothes washers. For landscape irrigation—which currently accounts for half of urban potable water use statewide—the plan suggests irrigation controllers, two-day-per-week watering restrictions, reeducation of landscape architects and maintenance contractors, installation of separate landscape meters, and promotion of graywater and captured rainwater use.

While the draft plan is out for public comment, related bills are working their way through the legislature. Assembly Bill 49, authored by Mike Feuer (D-West Hollywood), would codify the governor’s directive, mandating efficient water management practices. A previous version that included agricultural-use targets was defeated last year.

Meanwhile, two other pending bills address water conservation “offsets” for new developments. AB 1408, authored by Paul Krekorian (D-Burbank) and cosponsored by East Bay Municipal Utility District and the Planning and Conservation League, would encourage voluntary reduction in water demand for new developments, and offsets for new use through a mitigation fund. Like AB 49, it’s a scaled-back version of a bill that failed last year, which would have mandated that new developments be water-neutral.

“AB 1408 is intended to give a boost to sustainable growth in the housing industry,” says EBMUD’s Doug Wallace, whose agency piloted the bill’s concepts at the Camino Tassajara development near Danville, Contra Costa County. “Conservation measures really give us great opportunities for accommodating

continued on page 8

continued on page 8

## HE BUILT IT AND THEY CAME

Bud Abbott and Brian Mulvey are two neoprene-clad specks bobbing in the shallows off of the Marin Rod & Gun Club just west of the Richmond Bridge. They're drifting among 40 PVC stakes marking the artificial reefs and patches of eelgrass that Abbott, Kleinfelder's Mulvey and Rena Obernolte, SFSU's Kathy Boyer (see page 4) and a team of volunteers have placed in these in the waters, starting in 2005, in the hope that native oysters (*Ostrea lurida*) will have a place to call home. But their efforts may be attracting more than oysters. In February and April, Abbott pulled five acoustic receivers out of the mud near the reefs and discovered that half a dozen acoustically tagged salmon



Abbott (left) maneuvers a reef ball into the Bay.

and steelhead had visited the reefs. The fish, having made their way down the Estuary, had been tagged and released in the upper Sacramento River near the Red Bluff diversion dam and near the confluence of the Sacramento and American Rivers. The receiver data indicated that the fish had been hanging around the reefs for nearly an hour. "These data strongly suggest that salmon do feed in shallow water, and that they're foraging in habitat we created," says Abbott.

Abbott, an environmental consultant and member of Marin Rod & Gun Club, has been working for the past several years with the NOAA Restoration Center, the Rod & Gun Club, and several other partners to create structures under the surface of the Bay that will attract these desirable mollusks (also known as Olympia oysters). A federal species of concern, Olympia oysters range from southeast Alaska to Baja, California, and were once abundant in the Estuary. In 2007, the California Ocean Protection Council and the Coastal Conservancy funded UC Davis researchers to conduct an Estuary-wide survey of oysters and their predators and parasites, to support development of a Bay-wide oyster restoration plan. The researchers found low oyster densities in many locations.

Back in 2004, a Rod & Gun Club member hung some oyster shells on strings off of the gun club's pier in an attempt to find out if native oysters were in the area. "[He] was pretty successful," says Abbott. With a grant from NOAA and the Fish America Foundation, Abbott then hung more strings, and pounded some five-foot stakes topped with clusters of oyster shell into the muck. "We got a few oysters," he recalls. His next effort was to create "pyramids" of bags of oyster "cultch" (cleaned oyster shell) at different depths. "Those were very successful but labor intensive," says Abbott.

The following year, with another grant from NOAA and the Fish America Foundation, he created some 75-foot-long "barrier reefs" of oyster cultch, at minus-one/two/and four feet, stacked up "like Lincoln logs": "We had a very good oyster set at minus two feet but it was a difficult undertaking."

The next year he installed 26 mounds of shells, (2-3 feet in diameter with about 30 bags of cultch per mound: "We had a resounding success." And last fall, with funding from the National Fish and Wildlife Foundation, he placed four reef balls out on the mudflats, invisible from the surface other than when their tops are exposed at extreme low tide. The reef balls are formed in a fiberglass mold and made of sand and ice-age oyster shells dredged from the Bay and donated by Jerico Products. Abbott calls it BayCrete®. The reef balls weigh about 300 pounds each but can be floated into place and recovered as needed. Similar balls have been used to restore coral reefs and mangroves.

Abbott says, "The loss of vertical, hard structural habitat in the Bay is a limiting factor, not only for oysters, but also for many other species. "Most structural elements except man-made piers, such as the big rocks in the Bay, anything up in the water column, a sunken boulder or branch—have been removed as navigation hazards or dredged up by the Army Corps. Those things above the mud line are essential habitat for numerous creatures—tunicates, mussels, hydrozoans, bryozoans, amphipods—that need to attach to something hard; they can't survive in the mud. We've removed essential habitat for a whole community of organisms in our quest for boating safety and commercial shipping. In order to restore the functionality of the Bay ecosystem, we need to provide substrate that includes structural elements that add habitat complexity to the environment and home for millions of sessile organisms to attach to."

While his initial focus was oysters, says Abbott, he's seen gobies, herring, birds, and harbor seals cruising his structures. "By restoring structure for oysters, you restore the biological community and the synergy between the com-

continued on page 8

## YOUR VIEW OF THE ESTUARY: JURIED ART CONTEST

How do you see the San Francisco Bay Estuary, that unique place where land, ocean, and fresh waters meet? Do you have a favorite view or scene that "means" the Estuary—from the Delta to the Carquinez Strait to Lake Merritt to the South Bay? The San Francisco Estuary Partnership is seeking art for possible use in a postcard, our web site, and other materials—we are looking for scenes or impressions of the Bay, its marshes, and/or streams or rivers entering the Bay. All media (except video) are acceptable—oil, water color, pastel, pen and ink, block prints of all types, and photos.

\$1,000 first prize winner  
\$500 second place  
\$250 third place

The Estuary Partnership retains the right to use the artwork (credited) in print and on line.

Please submit your entry either as a slide labeled with title of piece and your name (to the address below) or as a jpg—no larger than 2 MB—emailed to [lowensvi@sbcglobal.net](mailto:lowensvi@sbcglobal.net) no later than August 1, 2009. Slides cannot be returned.

For more information, contact:

Lisa Owens Viani  
San Francisco Estuary Partnership  
1515 Clay Street, 14th Floor  
Oakland, CA 94612  
(510) 622-2337

We will contact the top 20 winners for possible use in a display at this year's State of the Estuary Conference at the downtown Oakland Marriott, Sept. 29-Oct. 1. No more than three entries per artist, please. Original art pieces must be no larger than 24" by 36"; artists will be responsible for delivering and retrieving their art. Digital entries may also appear on our web site, and contest submission is considered permission to use.



Hiroko Kusuda





## MUD SHRIMP BLUES

It sounds like a science-fiction scenario: an alien hijacks a host's body, shuts down its reproductive system, and drives it to extinction. But Oregon State University invasion ecologist John Chapman says it's happening in intertidal mudflats from southern Alaska to Morro Bay, with profound ecological consequences.

The victim is a burrowing detritus-feeder called the blue mud shrimp (*Upogebia pugettensis*). Although historically rare in San Francisco Bay, *U. pugettensis* was once common enough in nearby Bolinas Lagoon to be an important prey item for shorebirds like the long-billed curlew, a California Species of Special Concern. Benthic-feeding sharks and skates fed on adult shrimp, and juvenile coho and Chinook salmon ate the larval stage. According to Chapman, the shrimp used to account for a thousand tons of biomass in Oregon's Yaquina Bay, filtering 80% of the water column every day.

The parasite is an isopod crustacean, *Orthonotogriffis*, first described from Yaquina Bay in 2004. Chapman says it's unlikely to be a native species, and may have traveled from Asia in ballast water. "It has three pelagic larval stages and can survive for a long time in rotten conditions," he explains. "It's incredibly good at finding its host. It can find a bucket of shrimp in the middle of an otherwise empty bay."

*O. griffis* insinuates itself into the mud shrimp's gill chamber. "Once it gets in, it essentially castrates the mud shrimp," Chapman says. "It doesn't eat the gonads, but it takes all the blood it can from the host without killing it." Parasitized female shrimp lack the resources to produce eggs. The shrimp live only five to seven years; with no new generations, an infested population winks out.

"It's prudent to say that we have a serious problem," Chapman says. He was unable to find any blue mud shrimp in recent surveys in San Francisco Bay, Bodega Bay, Tomales Bay, Bolinas Lagoon, and Elkhorn Slough. The species is hanging on along the Oregon coast, but declining.

Chapman's goal, frustrated by lack of funding, is to culture the shrimp in captivity and return it to infested estuaries once the isopod has run out of hosts. "The San Francisco Bay Area is an intensely invaded place. We're discovering that the solutions are sometimes in places like Yaquina Bay which weren't changed as much."

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## Restoration

### BOUNTIFUL BLADES

When it comes to habitat, few would argue over the need to restore the wetlands that formerly fringed the Estuary, or the streams and rivers that wind their way into it. But just as valuable can be the less obvious habitats hidden beneath the Bay's grey-green surface. One of those is a blooming underwater grass—not a seaweed—known as eelgrass (*Zostera marina*), its common name aptly capturing its eel-like look. The plant lives underwater but still pollinates and produces seeds. Scientists describe each blade of eelgrass as a "food factory": the blades collect diatoms, decaying plant and animal matter, and bacteria, which provide food for invertebrates that in turn become appetizers for hungry fish and seabirds. The undulating green blades—sometimes over six feet long—also shelter salmon and Dungeness crabs. Herring and pipefish hide in it and rear their young. "It's a foundation species," says eelgrass expert Katharyn Boyer at San Francisco State University's Romberg Tiburon Center. "It is habitat forming on a surface that is otherwise featureless. It's like kelp beds or coral reefs—if the coral reef isn't there, you just have sand. Put the coral there, and the whole ecosystem forms around it." It's the same idea in an estuarine system, says Boyer. "If you get the eelgrass in there, you get the whole community that is attracted to it." Eelgrass has other benefits besides habitat: it improves water clarity by removing particulates from the water column, causing sediment to drop out, and takes up nutrients and filters pollutants. Yet most of our knowledge about it comes from research in other estuaries. "We don't know very much about it in San Francisco Bay," says Boyer.

In the Estuary today, only an estimated 3,000 acres of eelgrass remain, for the most part in isolated "beds" or "meadows," one of the largest—about half of the total acreage—in one single giant bed along the North Richmond shoreline, according to Boyer. Other beds are spread around the Central Bay, with a few in the northern Bay, and some near Alameda. A few very small beds are located farther south near San Mateo. Boyer says a model produced by Keith Merkel & Associates (funded as mitigation for eelgrass impacts from the Bay Bridge replacement project) shows the potential for 10 times that much eelgrass in the Bay, although she thinks the model may be slightly optimistic.

For the past four years, Boyer has been conducting experiments in the lab and field to determine the best methods for growing—and restoring—eelgrass in the Bay. Boyer started with a "mesocosm" study in 2005 in which Bay water flowed continuously through large tanks at the edge of the Bay to simulate natural conditions. "We started with a controlled approach to assess the potential for seed-based restoration instead of heading right out and throwing seeds all over the Bay," says Boyer. In this NOAA/Coastal Conservan-

cy/Ocean Protection Council-funded study, Boyer and her assistants collected eelgrass flowers with ripening seeds from three existing beds in the Bay and then used them to seed the tanks. Sand for the tanks was purchased from a supplier, but her team took small sediment cores from each location from which they collected the seed, for use in inoculating the soils with microbial communities from the donor beds. "We had good germination and clonal spread from all three populations," says Boyer.

In collaboration with Boyer, Sarah Cohen and Brian Ort, also at the Romberg Tiburon Center, compared genetic diversity in the populations from which the seed came and then compared the diversity that came up in the seedlings. "We found that this was a good technique for maintaining



Eelgrass and seeds. Photos by Kathy Boyer.

genetic diversity," says Boyer. The other benefit of this controlled experiment, she adds, was that they were able to learn quite a bit about how seeding works and about the resiliency of the plants to disturbances they might experience in the field. "Greater genetic diversity has been shown to provide a greater level of resiliency," explains Boyer.

In 2006 Boyer's lab set up three new ½-acre plots in the Bay itself, in which they compared different restoration techniques along with the source of the seeding material. "We were able to monitor how different populations recruited under different field conditions through two growing seasons," says Boyer. Two out of the three plots were successful; the Richardson Bay plot, predicted by a model as being highly suitable for eelgrass, failed. "We went to a place that we thought was a slam/dunk, and it turned out to be the least successful," says Boyer. "That taught us that we really need to learn a lot more about site selection." The other two larger-scale efforts included one in the Larkspur area off of San Quentin and one at the Marin

Rod & Gun Club: after two years of growing, both of those sites boast 5,000 new shoots, says Boyer. One interesting detail about each of these efforts is that the sites are very muddy. "The majority of eelgrass beds are found on sandier sediments," says Boyer. The theory is that in muddier areas, there will be more sediment suspended in the water, not conducive to eelgrass getting enough light for growing. "So far the two restoration sites are doing well, but there's always the possibility of storms or a set of conditions where there won't be enough light. We'll have to monitor through a bunch of winters to really tell."



At the restoration sites, three different techniques were used to get the grass established. One involved collecting the plant's flowers in the field, letting their seeds drop out in a tank, and then hand-broadcasting the seeds. "That was a complete failure," says Boyer. The second involved transplanting vegetative shoots using a frame that temporarily holds the plants in place until they root ("pretty poor success"), and the third involved collecting ripe seeds from flowering eelgrass, plopping them into "pearl nets" (mesh bags), and attaching the pearl nets to buoys anchored at a restoration site. "The buoys arc around with the tides and as the seeds reach maturity, they drop through the mesh of the pearl nets to settle on the Bay floor," says Boyer. "If all goes well, seedlings emerge to populate the restoration site the following spring. This method has had a high level of success, says Boyer. "Plants have established from all three donor populations. They are spreading and dropping seeds that are producing new seedlings; we're hoping they will be self-sustaining." After two years of

monitoring, that appears to be the case, says Boyer, but she wants to conduct additional monitoring, and her funding—through state bonds—was frozen until recently.

These experiments led to a new effort in which the researchers are first attempting to establish very small test plots. "If we manage to get them established at this small scale, we'll say maybe this is a site where we should consider a larger project. We don't want to put a lot of time and effort into large scale restoration unless we've determined the area is going to be suitable."

Meanwhile, another experiment is taking place on subtidal lands beneath the Bay in Marin, where researchers and consultants are working with the property owners—the Marin Rod & Gun Club—to try to create more habitat for salmon. There, Boyer is working with NOAA and the Gun Club's Bud Abbott to re-establish oyster shell reefs and eelgrass. "We're looking to see what food resources and habitats they will provide for salmon smolts," says Boyer. "We know that tagged salmon are visiting them." Four different habitat configurations are being compared: the first consists of placing mounds of oyster shells from Drake's Bay on the Bay floor. Eelgrass is then planted in patches among the mounds. The two types of potential habitat placed together will be compared to oyster shell mounds alone, eelgrass alone, or plots left without any habitat structure." The eelgrass planting in this project utilizes both seeding and a new technique developed by graduate student Stephanie Kiriakopolos, which involves attaching plants to the top of bamboo stakes shoved deep into the sediment to hold the plants in place until they establish their roots.

In the process of doing these projects, new questions have arisen, says Boyer. "We're doing lots of work beyond putting plants in the ground. We're learning about trophic interactions within the eelgrass beds and about how fish use the beds." Sometimes the findings are not always welcome. Boyer's graduate student Lindsey Carr surveyed different eelgrass beds in different seasons over a year and found that almost all of the eelgrass was supporting invasive invertebrate species. "That leads to interesting questions about how the invasives interact with the eelgrass and fish," says Boyer. She hopes to answer these—and more—questions with experiments in smaller tanks. "In some places the plants grow quite deep and in other places quite shallowly. It's not clear for restoration purposes which factors influence the plants at different depths. But we can test that, grow them at different depths." Boyer says the questions that come up help researchers understand eelgrass ecosystems better than they did before. "Restoration is not just its own end point but feeds back to issues like how we conserve existing beds and how we consider them in the process of doing restoration. How big of a bed can we collect from without doing any damage? Are there certain ones we shouldn't collect from at all?"

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Excerpt from Strawberry Creek Watershed:  
Site-Specific Sculpture  
Berkeley Montessori School,  
7th grade class  
Berkeley, California  
Teachers: Lisa O'Reilly & Simon Hurd  
2009 Creek Seeker Prize

## CREEK SEEKER GRAND PRIZE WINNER

### Misunderstood

In a sacred place, a creek is alive,

Shallow, murky, moving water.

A water-strider walks along the water.

"Look closely, follow our movements,"  
the green water whispers.

A misplaced turtle bobs up and down,  
swimming gracefully.

Its striped shell and red head floats near the  
surface and then disappears.

Ripples spread over and over again,  
like a never-ending secret.

A wilted tulip drifts by.

Water springs out creating unforgettable  
ripples.

And if you look closely, you can see the copper  
glow of pennies, the creek hopelessly misun-  
derstood for a fountain. Dead leaves drift upon  
the water.

The turtle observes this silently.  
While the only spectator in the creek is Abe  
Lincoln's copper face.

Misunderstood  
Caroline María Woods-Mejía, age 12  
Berkeley, California  
Poetry Inside Out  
Teacher: John Oliver Simon  
2009 Creek Seeker Grand Prize

**SAN JOSE KNOWS THE WAY (TO A CLEAN BAY)**



As part of a new partnership between Save the Bay and San Jose, the state's third-largest city could become a role model for other cities attempting to tackle the quality of their runoff into the Bay. The first to sign on to Save the Bay "Cities Keep it Clean" program last fall, San Jose has pledged—through a city council resolution—to implement several voluntary measures designed to improve water quality, including banning plastic bags or charging a fee for them, holding zero-waste community events, working with hospitals and pharmacies to keep pharmaceuticals out of wastewater, and expanding its use of Integrated Pest Management, among others.

The city recently installed 34 barn owl boxes in city parks and eight bat boxes in community gardens. "We're monitoring and inspecting the boxes a few times per year," says San Jose's Matt Weber. "We'll give it at least three years and relocate them if they're not working in those sites." Just as importantly, says Weber, is the fact that the effort has been highly popular with residents. "We've gotten a lot of positive feedback, and it's certainly been helpful in educating the public about pesticides and water quality and stormwater runoff." Owls and bats aren't the only alternative pest controllers being used: sheep and goats will munch on about 500 acres of weedy city land this year. Grazing helped the city avoid using about 77 pounds of herbicide in 2008, says Weber, and reduced emissions from gas-powered mowers.

All eyes will be on San Jose, says Save the Bay's Jessica Castelli. "Because their population is so large, any actions they take to reduce polluted runoff are going to have a huge impact on protecting the Bay. By working with them, we're opening the door for other cities to notice and say 'Hey, San Jose is doing it; we probably should too.'"

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**INFILL OR BAY FILL?** (CONTINUED FROM PAGE 1)

Responds Feinstein, "This is not infill; there's no city there: this is a whole brand new development. It's isolated because of Highway 101, and 101 isolates it from CalTrain—the idea that this is the perfect transit hub can quickly be seen as wrong."

In 2008, Save the Bay sponsored Measure W, which would have altered the Redwood City charter to allow voters, instead of city council members, to decide the fate of development on land zoned open space. The crystallizers are currently zoned as "tidal plain" for "mineral use, salt making, and other open space," according to Save the Bay's David Lewis. But opponents worried that the measure would force homeowners to ask the city to approve every home improvement project, and the measure failed. Redwood City countered Save the Bay's measure with its own Measure V, which

bicyclists pedaling just a few feet from the Bay and kayakers paddling through placid wetlands—possibly next to endangered rails and other sensitive species. "A critical point," says Feinstein, "is that this project is within the [authorized] boundary of the Don Edwards National Wildlife Refuge."

Says Lewis, "There is no question about what should be done out there with sea level rise and flooding issues; the area should be kept undeveloped, restored to tidal marsh." He points out that the same type of crystallizer ponds in Napa have been successfully restored. And Feinstein adds that restoring crystallizer ponds is hardly rocket science, citing LaRiviere Marsh in the South Bay as an example. "It was a crystallizer. In 10 years after digging a ditch without any science it's now full of clapper rails and shorebirds."

As ESTUARY NEWS went to press, no formal development application had yet been filed by Cargill/DMB. But, says Lewis, "Maps show 20,000-30,000 people. That's a 50% growth in the

*"How it plays out/how we decide to respond and handle this as a society will be very interesting. This is probably the ultimate test case of what we should do about climate change and sea level rise." —Will Travis, BCDC*

would have changed the charter so that only decisions related to the Cargill salt works site required a vote. Measure V failed as well.

Ultimately, the decision on whether to approve the project—for now, still a conceptual design—will come down in part to BCDC (although Cargill disagrees that BCDC has jurisdiction over the crystallizers, it has agreed to abide by BCDC's rules), and regulators like the U.S. Army Corps of Engineers and the S.F. Bay Regional Water Quality Control Board. In March, DMB briefed BCDC commissioners on its "50/50 balanced approach" conceptual plan ("50% for wetlands restoration, recreation, and open space uses and 50% for a mix of housing and community uses"), which it stresses has had input from over 10,000 citizens, the design talents of Peter Calthorpe and other experts, and the endorsement of the Redwood City-San Mateo County Chamber of Commerce, the San Mateo County Economic Development Association, the San Mateo County Association of Realtors, the Bay Planning Coalition, and the Peninsula Coalition.

Says BCDC's Will Travis, "Both positions have great merit. How it plays out/how we decide to respond and handle this as a society will be very interesting. This is probably the ultimate test case of what we should do about climate change and sea level rise."

But sea level rise is not the only worry. The site is near Bair Island and Greco Island, both full of clapper rails and other wildlife. Artists' conceptual renderings of the project on DMB's web site show

size of Redwood City." Did DMB/Cargill consider any alternative sites for this development?

Says Bruno, "Back in 2003 this property along with an additional 16,000 acres was offered up for sale to the U.S. government for restoration. The government had a fixed amount of money to spend; this parcel in Redwood City was taken out of the large transaction that is the salt pond restoration project. So Cargill is asking now whether production of industrial salts is the highest and best use of the property. The alternative [to not developing the site] is that Cargill continues to make salt there, with no money for acquisition, no money for restoration."

Unless money is found for public acquisition—and Cargill would have to decide to discard its Redwood City Saltworks plans and become a willing seller—the S.F. Bay Regional Water Quality Control Board may have the last word, when it determines whether or not the crystallizer ponds are waters of the state and the project constitutes Bay fill. "That's the \$64,000 question," says the Water Board's Bruce Wolfe. "When it came up as part of the South Bay Salt Pond Project in 2000-2001, it was never conclusively defined by the federal agencies. In our view, there's definitely a proposed jurisdictional impact, yet a determination on how much has yet to be made."

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## Conferences & Workshops

**JUNE 20-21**

### **SALMONAID FESTIVAL**

TOPIC: Celebration of California's wild salmon

LOCATION: Jack London Square, Oakland

SPONSOR: SalmonAid

[www.salmonaid.org](http://www.salmonaid.org)

**JUNE 22-26 WEDNESDAY-SATURDAY**

### **CALIFORNIA RAPID ASSESSMENT METHOD TRAINING**

TOPIC: CRAM for riverine and depression wetlands

LOCATION: Napa

SPONSOR: San Francisco Estuary Institute

<http://www.cramwetlands.org/CRAMtrainingREG>

**JUNE 25 THURSDAY**

### **COASTAL PRAIRIE SEMINAR**

TOPIC: Conservation and Ecology of California's Coastal Prairie

LOCATION: Moss Landing Marine Lab

SPONSOR: Elkhorn Slough Coastal Training Program

[www.elkhornsloughctp.org/training](http://www.elkhornsloughctp.org/training)

**JULY 12-17 SUNDAY-FRIDAY**  
**INTERNATIONAL SOCIETY FOR RIVER SCIENCE CONFERENCE**

TOPIC: First triennial meeting

LOCATION: Tradewinds Resort, St. Petersburg, FL

SPONSOR: International Society for River Science

[www.stpt.usf.edu/coas/espg/riverconference/home.asp](http://www.stpt.usf.edu/coas/espg/riverconference/home.asp)

**JULY 15-17 WEDNESDAY-FRIDAY**

### **WATER MANAGEMENT SHORT COURSE**

TOPIC: Ecology and the Use of Wetlands for Water Treatment

LOCATION: UC Extension, Berkeley

SPONSOR: Water Resources Center Archives

[www.unex.berkeley.edu/gogreen/](http://www.unex.berkeley.edu/gogreen/)



## Hands On

**JULY 11 THURSDAY**

### **EVENT: WETLAND WEEDING PROJECT**

LOCATION: Martin Luther King Jr. Regional Shoreline, Oakland

SPONSOR: Save the Bay

[www.savesfbay.org](http://www.savesfbay.org)

*A Sea Level Rise Strategy for the San Francisco Bay Region.* San Francisco Bay Conservation and Development Commission, September 2008. [www.bcdc.ca.gov/planning/climate\\_change/SLR\\_strategy.pdf](http://www.bcdc.ca.gov/planning/climate_change/SLR_strategy.pdf)

*California's Wetland Demonstration Pilot Program: A Final Draft Project Report.* Martha Sutula et al. December 2008, Southern California Coast Water Research Project. [www.wrmp.org/docs/572\\_SFEI600\\_CAWetlandsDemonstrationProject\\_final.pdf](http://www.wrmp.org/docs/572_SFEI600_CAWetlandsDemonstrationProject_final.pdf)

*Contaminants in Fish from California Lakes and Reservoirs.* Jay Davis et al. March 2009, Surface Water Ambient Monitoring Program. [www.waterboards.ca.gov/water\\_issues/programs/swamp/lakes\\_study.shtml](http://www.waterboards.ca.gov/water_issues/programs/swamp/lakes_study.shtml)

*Human Impacts on Salt Marshes: A Global Perspective,* edited by Brian R. Silliman, Edwin D. Grosholz, and Mark D. Bertness. June, 2009, University of California Press. [www.ucpress.edu/books/pages/10553.php](http://www.ucpress.edu/books/pages/10553.php)

*Living with a Rising Bay: Vulnerability and Adaptation in San Francisco Bay and on its Shoreline.* San Francisco Bay Conservation and Development Commission, April 2009. [www.bcdc.ca.gov/proposed\\_bay\\_plan/bp\\_1-08\\_cc\\_draft.pdf](http://www.bcdc.ca.gov/proposed_bay_plan/bp_1-08_cc_draft.pdf)

## SAVE THE DATE

**SEPTEMBER 29-30, OCTOBER 1**  
**TUESDAY-THURSDAY**

## State of the Estuary Conference

TOPIC: Ninth biennial conference; "Our Actions, Our Estuary" focuses on current and upcoming challenges to the Estuary and its wildlife and water quality; emphasis on how cities around the Bay can build healthy resilient watersheds in light of changing climate and precipitation patterns, and sea level rise.

LOCATION: Downtown Oakland Marriott

SPONSOR: San Francisco Estuary Partnership, California Coastal Conservancy, and others

## Call For Posters

**DEADLINE: JULY 17, 2009**

Posters can address the conference theme or other Bay-Delta topics, including habitat restoration and protection, water supply, water and/or sediment quality, public outreach, policy and management, socio-economic issues, and environmental education programs related to the Estuary.

[www.sfestuary.org](http://www.sfestuary.org)

## CALL FOR NOMINATIONS

**DEADLINE July 31, 2009**

### **OUTSTANDING CCMP IMPLEMENTATION PROJECTS**

Friends of the San Francisco Estuary is seeking nominations of outstanding environmental projects that implement one or more actions in the Comprehensive Conservation and Management Plan (CCMP), a blueprint for restoring and maintaining the chemical, physical, and biological integrity of the San Francisco Bay-Delta Estuary. Awards will be presented at the 9th Biennial State of the Estuary conference. The CCMP was revised in 2007 and now contains 201 recommended actions in nine program areas: 1) Aquatic Resources; 2) Wildlife; 3) Wetlands Management; 4) Water Use; 5) Pollution Prevention and Reduction; 6) Dredging and Waterway Modification; 7) Land Use and Waterway Modification; 8) Public Involvement and Education; and 9) Research and Monitoring. (Please refer to the revised CCMP for a complete list of the program actions. For a copy, call (510) 622-2304 or download at [www.sfestuary.org](http://www.sfestuary.org).)

Nominations must be received at the San Francisco Estuary Partnership office by 5:00 p.m., Friday, July 31, 2009. Projects will be rated on the basis of the Criteria for Nominations and Award Considerations listed in the Call for Nominations at [www.sfestuary.org](http://www.sfestuary.org). More than one nomination may be submitted. Final selection will be made by the Board of Directors of the Friends of the San Francisco Estuary. Projects will be notified of the results in early September. For more details, see [www.sfestuary.org](http://www.sfestuary.org) or contact Joan Patton (510) 622-2406; [jpatton@waterboards.ca.gov](mailto:jpatton@waterboards.ca.gov).

### **JEAN AUER AWARD**

The San Francisco Estuary Partnership seeks nominations for individuals to receive the Jean Auer award, given in memory of this Bay Area environmentalist, whose groundbreaking efforts were directed particularly at improving water management in California. The award will be presented at the 9th Biennial State of the Estuary Conference.

Nominees from the public and private sector are eligible. Individuals should have made a significant contribution toward enhancing environmental quality in the Bay-Delta Estuary. Nominees working on water-related issues will receive special consideration.

Nominations should include the name, address, phone number, and email address of the nominee, together with a one-page description of the nominee's accomplishments and rationale for his/her selection. Please include your own name and contact information. The San Francisco Estuary Partnership Selection Committee will decide on the award recipient in early August and notify nominees in early September.

Send nominations to Joan Patton at the San Francisco Estuary Partnership no later than Friday, July 31, 2009.

San Francisco Estuary Partnership  
Attn: Joan Patton  
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## SAN FRANCISCO



## ESTUARY PARTNERSHIP

ESTUARY NEWS is your news source on Bay-Delta water issues, estuarine restoration efforts, and the many programs, actions, voices, and viewpoints that contribute to implementation of the S.F. Estuary Partnership's Comprehensive Conservation and Management Plan (CCMP). Views expressed may not always reflect those of Estuary Partnership staff, advisors, or CCMP committee members. ESTUARY NEWS is published bimonthly and is funded by the San Francisco Estuary Partnership.

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## COMPETING FOR CUTS (CONTINUED FROM 2)

growth," agrees PCL's Charlotte Hodde. Developers would still have to verify an adequate water supply as required by the Kuehl Bill (SB 221).

Hodde says 1408 would require participating developers' new homes to be more water-efficient, with covenants and restrictions locking in conservation measures for future owners. The mitigation fund would improve water efficiency in existing housing stock within the service district of a development's water agency. Forty percent of fund proceeds would be earmarked for low-income communities.

The competing bill, AB 300, was introduced by Anna Caballero (D-Salinas) with the support of the California Building Industry Association. "We initially liked it less well," Wallace says. "There was less clarity about what constitutes voluntary conservation measures, and fewer solid provisions for verification." But AB 300 has since been amended to include a mitigation fund, and the two may eventually be merged.

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## BEACHES (CONTINUED FROM 2)

Bay beaches. Roberts Landing, where sandbars are already forming, is a priority, although hoped-for Federal Emergency Management Agency funding did not come through. Leventhal is optimistic about support for a project at the mouth of Pinole Creek, and work at Marin's Aramburu Island is underway. "We'd like to build a few projects and monitor them to see how they perform," he says.

"There really hasn't been a constituency for beaches," Baye concludes. "But that's changing. It's where tidal marshes were in the 1970s." There's growing awareness of the role of barrier beaches in buffering marsh erosion and of ecological links between beaches and eelgrass beds. The Bay Conservation and Development Commission (BCDC) has shown interest in the context of a regional sediment management planning process. "BCDC is taking on the challenge of sea-level rise big time," adds Leventhal. "Beach nourishment could be a flexible natural solution to increased wind and wave energy in the Bay." The age of riprap may finally be ending.

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## HE BUILT IT . . . (CONTINUED FROM 3)

munity attached to reef structures and eelgrass," says Abbott. "We see eelgrass popping up where it hasn't been in 20 years."

Abbott's efforts aren't the only ones to restore subtidal structural habitat: over the past decade similar projects have been led by Save the Bay, San Francisco State University, the Natural Heritage Institute, and others. Efforts to monitor those projects and coordinate techniques are underway. "Right now we're struggling a bit with procedures," says Abbott. "How do you do it safely and how do you do it most efficiently? We're fumbling along, trying different methods to provide structure in the Bay and determine how these structures can improve water quality, shore stabilization, ecological benefits and services. The monitoring has just started and we hope to find funding for another two years of monitoring that will provide the data needed to model the productivity of these structures and their benefits to salmon smolts and other species of fish and shellfish."

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