

*Palo
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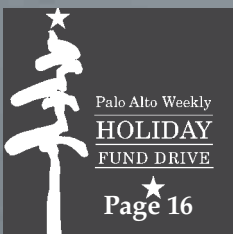
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At 1,940 acres, the Palo Alto Baylands Preserve is the largest tract of undisturbed marshland remaining in the San Francisco Bay. Much of the former marshland has been altered by human development, including the construction of large salt ponds bounded by an extensive levee system, some of which are now being returned to wetland.

The **health** of the Bay

Despite new and old chemicals and masses of misplaced plants and animals, the Bay holds its own

by Becky Trout

Photographs by Nicholas Jensen



A child rides his bike down a path through Byxbee Park just after sunset. Although winter is approaching, the recent mild, dry weather has encouraged sun-seekers and others to visit the Baylands.

Gauging the health of the San Francisco Bay is tricky. First, who to ask? Dozens of governmental agencies — federal, state and local — heaps of academics and countless nonprofit organizations study, regulate and manage the Bay.

And which qualities should be considered? The size of bird populations? The amount of mercury? The number of acres restored?

“Many people don’t realize the Bay is much more than something that looks nice when you drive across the bridge,” said Jude Stalker, a field educator with Save the Bay, a local nonprofit agency.

Overall, the future of the Bay looks much better than in years past, most experts agree.

By 1961, one-third of the Bay had been filled in and plans had been made for dams and dozens more developments, leaving only shipping channels behind, said David Lewis, executive director of Save the Bay, a nonprofit founded by Berkeley women upset by the unchecked “reclamation.”

Palo Alto wasn’t immune from the drive to develop. Its shoreline was slated for a slew of projects in the 1950s and 1960s with proposals for a hotel and restaurant, housing and industry. Those plans were derailed by the community, led by locals Lucy Evans and Harriet Mundy.

Many Bay-bordering cities spewed raw sewage and trash into the water until the 1960s. Meanwhile, salt harvesters, in particular the Leslie Salt Company (now Cargill), controlled most of the shore. Few visitors could experience the Bay firsthand.

But the environmental movement and decades of population growth have spurred a growing interest in protecting the Bay (which is actually an estuary, a mix of fresh and salt water, rather than part of the sea).

In Palo Alto, the work of Evans and Mundy was continued by City

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Bob Roth, a volunteer with Friends of Foothill Park, removes a non-native invasive plant called *Dittrichia graveolens*, a relative newcomer to the Baylands. Racing to remove the plant before the winter rainy season, Roth managed to remove about 150 pounds of the plant in an hour and a half.

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Councilwoman Emily Renzel and other Bay devotees, creating the Baylands of today.

Now, there are advanced sewage treatment plants, a near halt to diking and filling, recovering bird populations once poisoned by the chemical DDT, managed landfills, miles of trails and parks, and ambitious wetland-restoration plans.

But the coast is far from clear, experts say.

Trash lines the shore in some spots, scores of chemicals flow in via storm drains and treatment plants, and mining waste lingers in the sediment.

Ignorance or apathy persists as well.

On a recent Saturday, one fisherman left a dead bat ray in the mud of the Baylands. Gulls feasted on it, but one bit on a discarded fishing hook, which became stuck in its mouth. Twisting its head and jabbing its beak into the ground, the bird tried repeatedly to free itself.

Today, about 90 percent of the wetlands are gone, replaced with a drastically different landscape.

Non-native plants and animals have made their home in the Bay, often effortlessly displacing the native inhabitants.

The U.S. Army Corps of Engineers brought in *Spartina alter-*

niflora, found on the East Coast, in the 1970s because it was harder than the western cord grass. It spread rapidly and soon hybridized with the native *Spartina*, birthing a “cord grass on steroids,” Palo Alto Naturalist Deborah Bartens said.

The hybrid can clog waterways, transforming marsh into meadow, thwarting the movements of critters such as the endangered California clapper rail, which requires a bit of space between the grasses to move about, Bartens said.

Numerous agencies have banded together to battle the invader, applying low-toxicity herbicide, mowing and laying tarps across impacted areas. Some wetland restoration plans are even on hold until the spread of the hybridized *Spartina* is slowed. But still *Spartina* thrives.

The overbite or Asian clam, the size of a stretched-out quarter, is another problem. It was discovered in Suisun Bay in October 1986 and quickly became the most common critter along the floor of the Bay. The clam gobbles up tiny plant and bacterial materials faster than they are produced, leaving little for anyone else to eat.

In addition to invasive species, the Bay has too much mercury, copper and other heavy metals, relics from mining’s heyday, experts say.

These chemicals have led the

state’s Office of Environmental Health Hazard Assessment to warn adults to eat no more than two meals of fish caught in the Bay a month.

Most mercury in the South Bay comes from Bay Area mercury mines, said Richard Looker, a water-resources control engineer with the San Francisco Bay Regional Water Quality Control Board.

The mercury becomes dangerous, however, when it comes in contact with a certain type of bacteria that thrive in wetlands, throwing an additional challenge at restoration experts, Looker said. Ridding the Bay of dangerous levels of mercury will take a long time, he added.

New compounds continually creep into the Bay as well. A flame retardant used in furniture and electronics, known as PBDE, is found throughout the Bay and known to be toxic to some organisms, according to the San Francisco Estuary Institute, which leads Bay-related scientific efforts.

Perfluorinated chemicals (PFCs) — found in stain guards, waterproofing agents, firefighting foam and papers such as microwave popcorn bags — are also widespread and at the strongest concentrations in the South Bay, according to the institute. PFCs can cause cancer and developmental abnormalities, the institute reports.

Polychlorinated biphenyls, PCBs — used in insulators and hydraulic fluids — also plague the Bay, causing development and immune abnormalities.

These chemicals, pervasive in society, pose the biggest challenge to wastewater treatment, said Phil Bobel, manager of the city’s Environmental Compliance Division.

Major industrial water users — such as CPI, Hewlett Packard, and others — can be monitored, he said.

But the treatment plant wasn’t crafted to ferret out synthetic chemicals, including pharmaceuticals, that are found in nearly everything and everyone.

And often, the chemicals bypass the treatment process entirely, entering the Bay directly through the storm drains, Bobel said, pointing out the importance of watching what goes down the gutter.

Despite all of the Bay’s troubles, all is not so dreadful. Huge dikes are no longer discussed and wastewater treatment has grown increasingly more effective.

A new law sponsored by state Sen. Joe Simitian (D-Palo Alto) and signed by the governor in October imposes strict new regulations will prevent more invasive plants and animals from accidentally ending up in the Bay. The law targets the

discharge of ships’ ballast water, which is carried for stability but often harbors foreign plants and animals as well.

The San Francisco Bay Area has a national reputation for protecting the environment and a devoted constituency of volunteers who descend on the Bay annually to pick up trash, removed invasive plants, educate others, and assist with the restoration of wetlands.

And grand goals have been set to restore the wetlands. The South Bay Salt Pond Restoration Project alone aims to reclaim 15,100 acres formerly used by Cargill in the South Bay.

Perhaps most importantly, the Bay is still here — filled with birds and critters, open to sailboats and canoes, rimmed with trails for joggers, bikers and dog walkers — a green/blue expanse offering fresh air, space and slowness amidst a buzzing built-up metropolis.

“It gives us a relief from . . . too much traffic, too many people,” said Bob Roth, who recently helped uproot the invasive *Dittrichia graveolens* from the Baylands. “It’s a place to recharge your batteries.” ■

Staff Writer Becky Trout can be e-mailed at btrout@paweeekly.com.

Helping the Bay

Everyone can pitch in to keep the Bay clean, according to Deborah Bartens, a naturalist with the city of Palo Alto. What to do?

- Watch what goes down storm drains, which flow into the Bay without treatment. Dispose of oil, antifreeze and other toxics at the city's Recycling Drop-Off Center from 8 a.m. to 5 p.m. daily except for holidays. Take Embarcadero Road east to the Bay, turn right, and it is on the right.

- Don't dump drugs down the drain. Take them instead to the Palo Alto Regional Water Quality Control Plant at 2501 Embarcadero Way during business hours to properly dispose of them.

- Ask for brake pads that contain less copper. As brakes wear, tiny copper particles drop off and are washed into the Bay when it rains, harming Bay creatures.

- Minimize the use of pesticides and other chemicals on your lawn.

- Wash your car at a car wash, where wastewater is treated before it reaches the Bay.

- Pick up pet waste, which can contain bacteria and nutrients not good for Bay life.

- Properly dispose of cigarette butts — the most common litter — which contain plastic and nicotine, both dangerous in the Bay.

- Volunteer to remove invasive plants, clean up trash, or teach kids with one of the many nonprofit organizations who support the Bay. A few include: Acterra, CLEAN South Bay, Environmental Volunteers, Save the Bay and Sierra Club Loma Prieta Chapter. ■

Sources: Save the Bay, Regional Water Quality Control Plant information

—Becky Trout



Isaac Tello, an eighth-grader at Sunnyvale Middle School, transplants a young meadow barley to a larger pot in the nursery at Palo Alto Baylands, in a class led by Save the Bay.



Eighth graders from Sunnyvale Middle School are eager to taste a sample of pickleweed while on a field trip to the Palo Alto Baylands led by Save the Bay.



Above, white pelicans use teamwork to surround fish and feed on them on an early, foggy morning at the Baylands.

The pelicans use the Baylands as a stopover during seasonal migration. Right, a willet walks along the banks of a slough that has been treated with an herbicide to kill a non-native cord grass, *Spartina alterniflora*. Introduced by the Army Corps of Engineers, it has hybridized with Baylands natives, nearly wiping them out.



The Bay's dogged denizens

Winter visitors to the Baylands are most likely to see birds, City of Palo Alto Naturalist Deborah Bartens said.

Some favorite birds and a few other Bay inhabitants include:

- California clapper rail — An endangered species, clapper rails are more than one foot tall and secretive, hiding in small sloughs and most active around sunrise and sunset.

- Seventeen species of wintering ducks

- Western sandpiper, an abundant and small shorebird that breeds in Siberia and Alaska.

- Long-billed curlew, a large shorebird with a very long curved bill.

- Marbled godwit, a large shorebird with a long bill that curves up. It breeds in south-central Canada and north-central United States.

- Long-billed dowitcher, a medium-sized bird that looks like a sewing machine as it lifts its head, according to Bartens.

- Birds of prey, including peregrine falcons, northern harriers, and red-tailed hawks, can be found hunting from the power towers. Falcons, previously very rare due to the chemical DDT and other threats, are now regulars, Bartens said.

- Salt marsh harvest mouse — Nocturnal, tiny and endangered, the chances of spotting one aren't good, Bartens said. They can swim and climb, live in grass nests, and feed on seeds and grass.

- Harbor seals — After the tidal influence was returned to the former boat harbor, it began to be frequented by harbor seals, who fish while the tide is in and can be occasionally spotted, Bartens said.

- Microscopic critters, the most populous of Bay life forms, are visible through the microscope in the Lucy Evans Baylands Nature Interpretive Center, which is open afternoons and some mornings.

- Although the bat rays themselves probably won't be visible, at low tide visitors can see the craters they leave behind after uprooting their clam dinners.

Bartens plans to introduce some of the Bay's avian winter residents Saturday, Dec. 9 from 10 to 11:30 a.m. at the Nature Center in the Baylands. It is free and all over age 8 are welcome. ■

Sources: Deborah Bartens; South Bay Salt Pond Restoration Project; Cornell Lab of Ornithology.

—Becky Trout



Donna Seaward of Oakland volunteered to assist Save the Bay on a canoe trip through the Palo Alto Baylands sloughs in November. Oakland-based Save the Bay works with Baylands park staff to educate the public about the marshland's ecosystem.

A Bay in winter

It's winter now in the Baylands. Soon, fresh water will swell South Bay creeks, racing into the Bay and displacing the salty water that has accumulated during the long dry period.

The beauty of the wetlands, always subdued, becomes even subtler, City of Palo Alto Naturalist Deborah Bartens said.

The tall cord grasses break down; the nutrients fueling their summer growth will retreat to their roots. The autumn reds of pickleweed, the low-growing marshland succulent, will pale as the salt concentrations subside.

And should there be a big storm, the marsh acts like a sponge, soaking up the extra liquid and buffering the land from surges, Bartens said.

Flocks of all sorts of birds are abundant, foraging and frolicking, stopping off on their migration.

But as the rain cleans the air and land, it washes all the dirt of summer — fuel residues and trash — down drains and into the Bay, said David Lewis, executive director of Save the Bay.

Sewage treatment, while still up to standards, becomes a bit trickier when the plant is inundated with extra water that seeps into sewage pipes, which weren't designed to keep it out, said Phil Bobel, the manager of the city's Environmental Compliance Division.

But the breaks of sun between the storms bring brilliant blue skies, and soon, the fresh green growth of spring. ■

—Becky Trout

The history of the Baylands

The Bay known to pre-colonial Native Americans was bigger. It was shaped by the ocean and creeks, hills and winds, untouched by industrial dredging or gold-mining silts.

Then, the land transitioned through acres of marshland before the plants gave way to the water. The marshes nourished thousands of birds, some simply for a spell on their journey north to breed or south for the winter.

In 1841 botanist William Breckzenridge, on a federal exploration expedition, wrote of the Baylands: “We saw vast flocks of geese... Both geese and ducks were so tame that we could walk up and shoot as many of them as we had a mind to.”

A decade later, the U.S. government started to encourage the “reclamation” of the wet lands, thought worthless and in need of improvements. For \$1 an acre, anyone could scoop up hundreds of acres of Bay frontage, to fill or use to produce salt.

Access for boats from the Palo Alto area was provided as early as 1873 at Wilson’s Landing near the current Palo Alto Municipal Golf Course clubhouse. And by 1896, baths had been constructed in the Baylands and were growing in popularity.

In the late 1800s, the effects of hydraulic mining — washing away hillsides for gold — in the Sierra began to be felt in the Bay, when the inundation of silt and contaminants clogged much of the Delta and made the Bay shallower, before hydraulic mining was outlawed in 1884.

At the time, trash was taken east and just dumped.

The area’s population started to swell and Palo Alto took the lead in 1896, just two years after its incorporation, by developing a preliminary sewage system. Concerns about tide-propelled sewage prompted the city to begin treating the raw materials in 1934, decades before other communities caught on. They were then discharged 700 feet offshore. One of the top troubles at the plant was chicken feathers from a poultry processing plant on El Camino Real.

In the early 1900s, Palo Alto City Engineer John Fletcher Byxbee Jr., for whom the Baylands are formally named, envisioned a grand landscape of parks, pools, an airport, yacht harbor, golf course, sewage treatment plant, wildlife refuge and industry.

The city began buying the land in 1921 and eventually acquired 1,940 acres. Depression-era work programs provided the manpower to fill in land for the airport and golf course.

Educator Lucy Evans, Harriet Mundy and other locals rallied to save the Bay from a wide-reaching development proposal in the 1960s that would have replaced most of the marsh with a hotel, restaurant and other buildings.

Calls for cleaner water in the late 1960s led Mountain View, Los Altos and Palo Alto to band together to build an expanded and improved wastewater treatment facility, which was opened in 1972.

The harbor, leased to the county, was open until 1986. The high costs of dredging to keep it navigable and the environmental effects of dumping the dredged material sparked a heated battle in the early 1980s, leading to the harbor’s closure.

In 2004, a Baylands Environmental Service Center was the talk of the town. The next year, the council considered replacing the current Municipal Service Center, headquarters for the Utilities and Public Works departments, with an auto mall.

And now, a large project to improve flood control and restore San Francisquito Creek could alter the landscape; interest in additional playing fields could refigure the golf course, and the fate of the airport, currently leased to Santa Clara County, remains unknown. ■

Sources: Ruth Wilson and Lucy Evans 1976 speech; Palo Alto Historical Association, City of Palo Alto; “Palo Alto: A Centennial History”; South Bay Salt Pond Restoration Project.

—Becky Trout



A morning fog cloaks the Baylands during a rising tide.