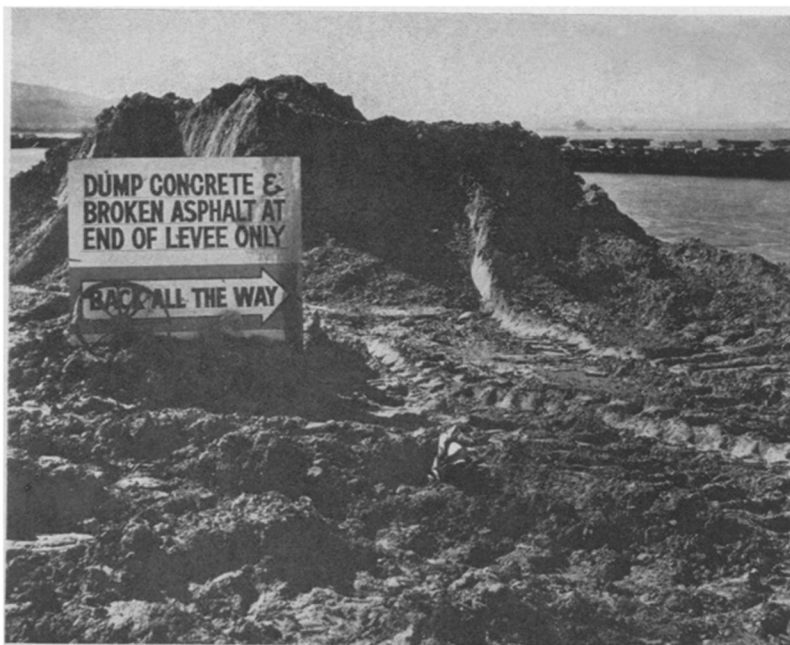


Guarding the bay

San Francisco's natural wonder is once again in danger of being filled to death

by Pearl Marshall



For two centuries the Spanish sailed past the entrance to San Francisco Bay without knowing it was there. It wasn't until 1769 that a land expedition stumbled on its spreading wonder. Since then it has become one of the principal harbors in the world, and its fame as a natural and commercial resource is worldwide.

But if development of the area is not soon regulated, the bay may once again be as hard to find for modern men as it was for Spanish explorers.

More than 280 square miles of diking and filling by commercial and government developers have shrunk the bay to less than two-thirds its original size in the past 100 years. And some conservationists fear it may one day become nothing more than a "stagnating and foul smelling open sewage drain."

So pressing is the problem of the dwindling bay that California Gov. Ronald Reagan says he will call a special legislative session if a strong bill governing fill is prevented from passing before the regular session is adjourned later this year.

The Bay Conservation and Development Commission (BCDC), which has sharply curtailed filling since its creation in 1965, is scheduled to die 90 days after the session ends. The bay would then be open to uncontrolled filling.

"Seventy percent of its waters are less than 18 feet deep at low tide," says Ira Michael Heyman, Professor of Law and City and Regional Planning at the University of California. "This means that 248 square miles of tide and submerged lands are susceptible of reclamation for urban uses, according to U.S. Army Corps of Engineers estimates. Such reclamation would leave 187 square miles of bay as deep water chan-

nels. It would shrink portions of the bay to the dimensions of a river."

Conservation legislators are pushing a bill that would continue the commission, extend its jurisdiction over the salt ponds at the bay's southern end and over a 100-foot strip of shoreline.

The commission was created to control fill through the granting of permits and to prepare a plan for the conservation of the bay and development of its shoreline following failure of local government to halt filling.

This plan, presented to the legislature last January, shows extensive future filling would have dramatic effects, including an increase in smog and temperature and the loss of significant numbers of fish and bird life.

"If twenty-five percent of the existing bay were filled, temperature could increase at the bay's south end by five degrees in summer and decrease as much as three degrees in winter," says Prof. Albert Miller, San Jose State College climatologist. He believes that winter rainfall over the nearby Santa Clara Valley would be decreased slightly.

"In the winter the bay acts as a hot plate," he explains. "Reduction in the temperature would mean less heat to create convection, which produces rain and showers."

Miller finds that the open waters of the bay and salt ponds act as a great natural thermostat moderating the climate in adjacent fertile valleys, and the wind blowing across the open waters, salt ponds and marshes, disperses most air pollution originating in other parts of the bay area.

He theorizes that climatic changes "might in turn have effects on agriculture."

Clifford W. Graves, BCDC associate

planner, says BCDC took Miller's conclusions and presented a hypothetical case to members of the viticulture staff of the University of California, who were familiar with conditions in nearby Napa Valley and factors affecting quality of grapes. They concluded that such climatic changes would upset the delicate ecological balance that supports some of the nation's finest vineyards.

"The rise in temperature resulting from bay fill would probably not affect the total production in these parts of the Napa and Sonoma Valleys," the staff found. But it points out that certain quality grape varieties now planted there may have to be replaced.

Recent experiments have confirmed that vines exposed to air pollution suffer from leaf damage and yield fewer, poorer grapes. And, as Miller found, filling the bay would lead to increased air pollution of areas in the valley.

The reduction in significant numbers of fish and bird life is a loss difficult to calculate, because human benefits from fish and wildlife of the bay include food, economic gain, recreation, scientific research, education and general environmental quality.

Millions of birds of the Pacific flyway from Canada to Mexico find this largest estuary along California's coastline an essential resting place, feeding area and wintering ground. The bay also boasts almost 100 species of fish.

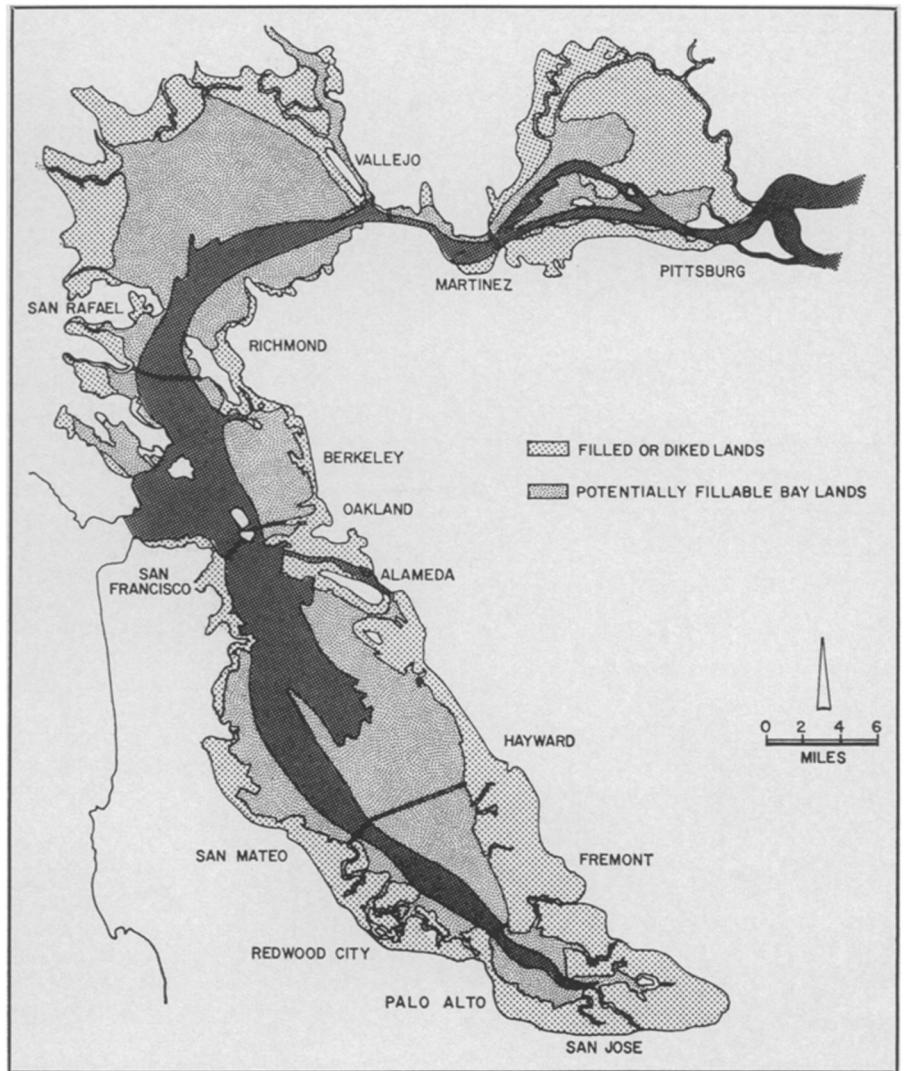
All rely either directly or indirectly on the marshes and mud flats—the areas most susceptible to early filling. These are a vast marine-life nursery where microorganisms, plant, fish, waterfowl and shorebirds live in a delicate balance created by nature.

"The amount of marshlands remaining in the bay is relatively small," says



Photos: Susan Landor

Dwindling San Francisco Bay (right) will soon be subject to more filling (above) and pollution (bottom) if pending bills fail.



BCDC

Graves. "I believe the present area is about 50 square miles, but they have a most critical effect on the ecology of the bay."

The marshes and flats are not only essential nurseries and feeding grounds; they play a complex part in combating water pollution, thereby keeping the bay waters sufficiently healthy to support marine life. The algae of the mudflats, exposed to abundant light alternating with abundant water, produce and expel oxygen into the water and air. This dissolved oxygen helps break down pollutants in the water from industrial and agricultural sources.

"A substantial amount of oxygen comes from this source," Graves says. The rest comes from absorption at the bay surface and wave action. Tidal interchange transmits the oxygen to deeper waters.

This is why one of BCDC's major conclusions is that the surface of the bay and the total volume of water should be kept as large as possible in order to maximize active oxygen interchange, vigorous circulation and effective tidal action.

Not only are areas of marshland and mudflats sometimes destroyed by fill and dredging projects, but they can be affected by changes in sedimentation patterns. The natural patterns are altered when filled, dykes or breakwaters affect the tidal circulation.

"In many cases," says Graves, "the new sedimentation patterns will result in the filling and raising of former marshes and mudflats. They are then no longer subjected to tidal flow."

Another problem that may have to be faced in the future is maintaining the gradual change from saltwater to fresh flow of the rivers so necessary for the survival of anadromous fish such as king salmon, steelhead and striped bass as they progress upstream to their spawning grounds. An abrupt change of salt to fresh water would probably end them.

Though barriers and dykes might have some effect, Graves emphasizes, "much the greatest danger comes from the prospect of diversion of fresh water by projects of the State Department of Water Resources and the Federal Bureau of Reclamation, to southern California." ◇

