

Oyster Growers and Oyster Pirates in San Francisco Bay

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In the late nineteenth century San Francisco Bay hosted one of the American West's most valuable fisheries: Not the bay's native oysters, but Atlantic oysters, shipped across the country by rail and seeded on privately owned tidelands, created private profits and sparked public resistance. Both oyster growers and oyster pirates depended upon a rapidly changing bay ecosystem. Their struggle to possess the bay's productivity revealed the inequalities of ownership in the American West. An unstable nature and shifting perceptions of San Francisco Bay combined to remake the bay into a place to dump waste rather than to find food. Both growers and pirates disappeared following the collapse of the oyster fishery in the early twentieth century.

In 1902 twenty-two-year-old Oakland writer Jack London published his first book, an adventure story for boys. In the novel, London's boy hero runs away from a comfortable middle-class home to test his mettle in the rough world of the San Francisco waterfront. Plucky but naïve, Joe Bronson soon finds himself sailing down San Francisco Bay in a rickety sloop called the *Dazzler*, piloted by hard-drinking French Pete and his tough orphan sidekick, the 'Frisco Kid. The *Dazzler* joins a small fleet of boats congregating in the tidal flats along the eastern shoreline of San Francisco Bay where French Pete orders Joe and the Kid to drag a triangular piece of steel, an oyster dredge, over the muddy bottom. The men haul up mud, slime, and a few ragged oysters with each long tack through the oyster beds. Joe is disappointed at the day's meager take, but he soon learns that this work is a sham, an alibi. Under cover of dark-

The author gratefully acknowledges the comments and criticism by Robin Grossinger at the San Francisco Estuary Institute; David M. Kennedy, Richard White, and Kären Wigen at Stanford University; Michael Allen, David Ambaras, Craig Friend, David Gilmartin, Lauren Nauta, and David Zonderman at North Carolina State University; Sarah Elkind of San Diego State University; and the anonymous referees for the *Pacific Historical Review*.

Pacific Historical Review, Vol. 75, No. 1, pages 63–88. ISSN 0030-8684
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ness, French Pete intends to leave the abandoned oyster beds off Alameda and raid the commercial oyster beds in the Millbrae marshes farther down the bay.¹

Young Joe Bronson was an unwilling accomplice in stealing another man's property. His companions were pirates: oyster pirates. The muddy bottom off Alameda belonged to a San Francisco corporation. The corporation shipped juvenile oysters by train all the way from the Atlantic coast and hired men to spread oysters along plots of bay mud. Oyster growers had purchased these tidelands from the state of California, and their muddy property was as real and more valuable than any farmland. Despite the absence of fences or buildings on the oyster beds, the mud flats were as much private property as lots in downtown San Francisco. In taking oysters from the turbid water, Joe Bronson and his companions were breaking the eighth commandment and state law.

In his moralistic novel, Jack London saved his fallen hero. Joe and the reformed 'Frisco Kid foiled a robbery, earning the gratitude of society and the respect of Joe's father. London's young readers learned their lessons: Obey your father; stay out of boats with strange men; and crime doesn't pay. But in real life, as London well knew from his own experience, oyster piracy was both more rewarding and more dangerous. The happy ending to *The Cruise of the Dazzler* belies the real tensions between oyster growers and oyster pirates in turn-of-the-century San Francisco Bay.² Piracy revealed the tenuous and contested nature of property in the tidelands: Oyster growers made money because they owned the tidelands, and oysters on abandoned beds were indistinguishable from cultivated oysters. At

1. Jack London, *The Cruise of the Dazzler* (New York, 1902), 149–169.

2. Indeed, Jack London told another version of this story from the perspective of a state officer, writing of another boy-becoming-a-man who daringly captures a gang of oyster pirates in these very same waters. See London, *Tales of the Fish Patrol* (New York, 1905). He also wrote about his career as an oyster pirate and fish patrolman in his powerful, if sometimes fictional, autobiography, *John Barleycorn: Alcoholic Memoirs* (London, 1914). Both *The Cruise of the Dazzler* (1902) and *Tales of the Fish Patrol* (1905) repeat substantially the same stories, told from the perspective of the oyster pirate and that of the state patrol agent respectively. London had been a published author for only a little over two years when *The Cruise of the Dazzler* appeared, his first magazine article having appeared in 1899. For dates of writing and publication, see Jack London, Magazine Sales Notebooks, Huntington Library, San Marino, California, cited in James Williams, "Jack London's Works by Date of Composition," http://sunsite.berkeley.edu/London/Essays/comp_date.html, accessed Oct. 15, 2001.

stake were persistent questions in American history: Who should have access to natural resources? To whom did the bay belong?³

The economic bay

Those who lived along its shores in the nineteenth and early twentieth centuries made San Francisco Bay a working landscape. People went to the bay to work, make money, and get food. The estuary's tremendous productivity sustained a wide range of economic activities. Commercial fishermen took oysters, salmon, sturgeon, shrimp, crabs, shad, and a number of other valuable fish from the bay. Before 1910 every one of California's top fisheries operated in San Francisco Bay and along its shores.⁴ Although few reliable figures exist, market hunters shot thousands of ducks, geese, and other waterfowl each year for sale in San Francisco's markets. Men hunting for their own tables or informal sale may have taken thousands more. Cattlemen traditionally grazed their stock at the margin of the salt marshes.⁵ The bay was also home to a mining industry. Salt makers trapped the saline water of the bay inside shallow pools, where sun and wind produced a crop of salt crystals. In 1868 eighteen salt companies employed 150 workers, producing 10,000 tons of salt garnering about \$80,000 from salmon canners and silver miners.⁶

3. Land tenure and access to natural resources are mainstays of Western historiography. See especially Samuel Hays, *Conservation and the Gospel of Efficiency: The Progressive Conservation Movement, 1890–1920* (Cambridge, Mass., 1959); Mark David Spence, *Dispossessing the Wilderness: Indian Removal and the Making of the National Parks* (Oxford, U.K., 2000); and Theodore Catton, *Inhabited Wilderness: Indians, Eskimos, and National Parks in Alaska* (Albuquerque, 1997).

4. Bureau of the Census, U.S. Department of Commerce and Labor, *Special Reports: Fisheries of the United States, 1908* (Washington, D.C., 1921), 26–29, 42, 66–68, 86.

5. For figures on market hunting of waterfowl, see California State Board of Fish Commissioners, *Fourteenth Biennial Report, 1895–1896* (Sacramento, Calif., 1896), 40–42, 89–98. See also Baldwin Mollhausen, *Diary of a Journey from the Mississippi to the Coasts of the Pacific with a United States Government Expedition* (2 vols., London, 1858), 2: 355. For pot hunting and sport hunting in San Francisco Bay marshes, see Anthony Arnold, *Suisun Marsh History: Hunting and Saving a Wetland* (Marina, Calif., 1996); and Vernon Aubrey Neasham, *Wild Legacy: California Fishing and Hunting Tales* (Berkeley, 1973). For grazing, see testimony in *Francisco Berreyessa et al., Heirs of Guadalupe Berreyessa vs. United States, for the Place Named "Rincon de los Esteros"* (1853), Land Grant Case 239 ND [Northern District], Bancroft Library, University of California, Berkeley.

6. Titus Fay Cronise, *The Natural Wealth of California... Together with a Detailed Description of Each County* (San Francisco, 1868), 152–153. For industrial users, see William E. Ver Planck, "Salt in California," California Division of Mines, *Bulletin* 175 (1958), 107–115.

This estuarine economy converted natural resources such as grass, fish, and seawater to cash. A second group of people harvested non-cash resources. Following patterns begun by the Ohlone, the Native people of the bay region, nineteenth-century women and men gathered duck eggs, trapped fish, hunted animals, collected firewood, and harvested mussels, clams, and oysters from the shoreline. These people used the bay in ways only partly mediated by markets. Uncertain records make both these gatherers and their shoreline less visible to historians, obscuring the importance of these activities that we can collectively call “foraging.”

For foragers, the world was their oyster. They took what they wanted from a bay brimming with shellfish, fish, waterfowl, and useful marsh plants. As they took food from the bay, they maintained common-use behaviors that were disappearing on solid land. Everywhere in the industrializing nineteenth-century world, poor people lost access to traditional common lands and the products they had gathered there.⁷ This loss was contested. In the United States, historians have investigated a handful of cases in which local communities fought to retain common-use rights. In New Jersey, when oyster growers gained exclusive access to shellfish beds, local people resisted by stealing shellfish, kicking off a series of “oyster wars.” Late nineteenth-century deer hunters refused to obey game laws in Pennsylvania, protecting traditional access to wild meat. In New York’s Adirondack Mountains, residents fought—sometimes killed and died—to defend their customary hunting and fishing privileges in the face of national efforts to create parks. As shown in works by Bonnie McCay, Louis Warren, and Karl Jacoby, private landowners or landless people resisted corporate, state, and federal agencies’ efforts to restrict access to public lands.⁸ Yet despite the extensive

7. E. P. Thompson famously wrote of the struggles of English country folk forced into wage labor in cities following the enclosure of their common grazing and fishing lands. E. P. Thompson, *The Making of the English Working Class* (New York, 1963).

8. Bonnie J. McCay, *Oyster Wars and the Public Trust: Property, Law, and Ecology in New Jersey History* (Tucson, 1998), and McCay, “The Pirates of Piscary: Ethnohistory of Illegal Fishing in New Jersey,” *Ethnohistory*, 31 (1984), 17–37. See also John R. Wennersten, *Oyster Wars of Chesapeake Bay* (Centerville, Md., 1981); Karl Jacoby, *Crimes Against Nature: Squatters, Poachers, Thieves, and the Hidden History of American Conservation* (Berkeley, 2003); and Louis Warren, *The Hunter’s Game: Poachers and Conservationists in Twentieth-Century America* (New Haven, Conn., 1999).

literature on foraging and common lands in the East, historians have had less to say about the Far West.⁹

San Francisco Bay's tidelands offer a variation on the typical Western stories about resources sharply divided between private and public ownership. These half-land, half-water tidelands have a complicated legal history. Under English and American law, the shore above the tide line is land and, therefore, private property; below the tide line, it is ocean and therefore common property. In the nineteenth century, English jurists held that navigation was the key to the commons. Rivers or ocean shallows used for transporting goods were open to all, while non-navigable waters and their bottoms could be taken up and enclosed by individuals.¹⁰ Prior to the 1840s in California, however, Mexican law, following Spanish and Roman law, held that lands washed by the tide were the property of the nation. Mexico City consequently exempted tidal areas from the land grants that blanketed the distant province. In practice, California's tidelands were commons, and Mexican-era cattle ranchers often grazed their herds in the extensive grasslands of the salt marshes. Before and long after San Francisco Bay became part of the United States in 1848, these wetlands also supported foragers. Residents of the bay region continued to harvest bayshore habitats directly, as Native peoples had done for millennia.¹¹

Foraging embraced a whole range of productive activities in the lands and shallow waters of San Francisco Bay. One resource in particular stands out. Shellfish were some of the most accessible and valuable of all tidal resources, and also among the most affected by dramatic environmental changes in the nineteenth and twentieth centuries. Once a key element in Native economies of the region, clams and oysters became a reliable source of free protein for working-class and poor urban dwellers. They also gave rise to a

9. One exception is the centuries-old Hispano common-use tradition in New Mexico. See, among others, William deBuys and Alex Harris, *River of Traps: A Village Life* (Albuquerque, 1990), and Maria E. Montoya, *Translating Property: The Maxwell Land Grant and the Conflict Over Land in the American West, 1840–1900* (Berkeley, 2002).

10. McCay, *Oyster Wars*, xix–xx.

11. For Mexican-era grazing in the salt marshes, see testimony of Harry G. Wade, cowboy on the Rincon de Los Esteros land grant, March 21, 1860, pp. 123–128, in *Berreyessa et al. v. U.S.* (1853). For U.S.-era cattle grazing, see journal of Alfred Doten, Nov. 18–20, 1856, in Walter Van Tilburg Clark, ed., *The Journals of Alfred Doten, 1849–1903* (3 vols., Reno, Nev., 1973), 1: 315–317. For a firsthand description of living and eating on the bayshore, see *ibid.*, 311–358.

multimillion-dollar industry, the state's most valuable fishery, from the 1870s through the 1910s. Then shellfish disappeared from the region's economy. The spectacular growth of San Francisco Bay's oyster industry and its even greater collapse illustrate the relationship between property ownership, environmental change, and unequal access to natural resources. Californians sought to possess the tidelands, but changes in the landscape itself complicated this effort. The surprising story of shellfish, the quintessential tideland product, captures the complexities of the human struggle to control the tidelands' productivity.

People of the shells

The first human residents of the San Francisco Bay region made great use of the bay's plentiful indigenous shellfish species. The Ohlones ate so many oysters, clams, and mussels that the empty shells piled up into bleaching heaps along the shoreline. Some shellmounds measured tens of meters across, several meters high, and extended deep into the earth. In 1906 University of California archaeologist N. C. Nelson identified 425 remaining mounds around the bay, finding that Native people had used many as burial grounds. But Nelson warned that hundreds more sites had already been destroyed. Farmers and builders plowed the mounds flat and contractors mined the shells and bones for road pavement and soil conditioner. Mixed with rock salt, Nelson noted, the crushed shells and bones made excellent tennis courts.¹²

Struck by the insight that middens could be excellent historical sources, a series of Berkeley archaeologists explored San Francisco Bay shellmounds.¹³ These excavations revealed that humans had lived on San Francisco Bay's shoreline for many centuries, eating

12. As late as 1900 a conchologist described "the kitchen-middens and aboriginal shell-heaps and mounds that are so numerous on the adjacent shores." Robert E. C. Stearns, "Exotic Mollusca in California," *Science*, 11 (1900), 655–659. Some surviving mounds were large enough to be included as landmarks on California's first state map. Josiah C. Whitney, "Map of the Region Adjacent to the Bay of San Francisco" (Sacramento, Calif., 1873), Bancroft Library, University of California, Berkeley. N. C. Nelson, "Shell Mounds of the San Francisco Bay Region," *University of California Publications in American Archaeology and Ethnology*, 7 (1909), 309–348.

13. The famed "Berkeley School" of material culture derived from these bayshore excavations. See W. Schenk, "The Emeryville Shellmound: Final Report," *University of California Publications in American Archaeology and Ethnology*, 23 (1926), 147–282; M. Uhle, "The Emeryville Shellmound," in *ibid.*, 7 (1907), i–84; N. C. Nelson, "The Ellis Landing

tons of shellfish each year. The climate of coastal California is prone to extremes of drought or flood. As archaeologists have noted, Native people had to diversify their economies in order to cope with seasonal and decadal cycles of abundance and lack. Within that diversity, bay shellfish emerged as an unusually abundant and reliable food source.¹⁴ Because of shellfish, Bay Area peoples could stay in place for millennia, even as the seas rose and the plants and animals of the land waxed and waned.

Gold Rush foragers

As Native Americans were pushed off the tidelands, San Francisco Bay's rich shoreline habitats continued to provide abundant, nutritious wild food within easy walking distance of the Far West's largest urban center. [See Figure 1] Fresh food was particularly welcome in Gold Rush-era San Francisco, where men recently arrived from Atlantic shores found a familiar smorgasbord of intertidal species available for the taking. In spring of 1851 San Francisco's *Daily Alta* reported, "The mud flats up in Happy Valley present an interesting view at low tide. About a thousand more or less of the great unwashed tribe of this city are there busily engaged in gathering crabs and clams on which the city epicures may feast." "It is an interesting occupation," continued the *Alta's* reporter, "and the followers of it are usually up to the knees in the delicately scented mud that abounds in the classic vicinity of Rincon Point." One of that "great unwashed tribe," a teenaged miner from Plymouth, Massachusetts, found "plenty of muscles [*sic*] in the rocks along shore," which he collected in his handkerchief for dinner.¹⁵ Large numbers of newcomers to San Francisco ate what they could gather from the still abundant salt marsh and tidal mudflats. Miners relied on

Shellmound," in *ibid.*, 7 (1910), 357–426; and E. Gifford, "Composition of Californian Shellmounds," in *ibid.*, 12 (1916), 1–29.

14. The history of anthropological thinking about Native California economies appears in Barbara Bocek, "Hunter-Gatherer Ecology and Settlement Mobility Along San Francisco Creek" (Ph.D. thesis [dissertation], Stanford University, 1986). See also Thomas C. Blackburn and Kat Anderson, eds., *Before the Wilderness: Environmental Management by Native Californians* (Menlo Park, Calif., 1993), and M. Kat Anderson, *Tending the Wild: Native American Knowledge and the Management of California's Natural Resources* (Berkeley, 2005).

15. "Crabbing," *San Francisco Daily Alta California*, April 13, 1851. For "muscles," see Alfred Doten journal entry for Feb. 6, 1856, in Clark, ed., *The Journals of Alfred Doten*, 1: 259.

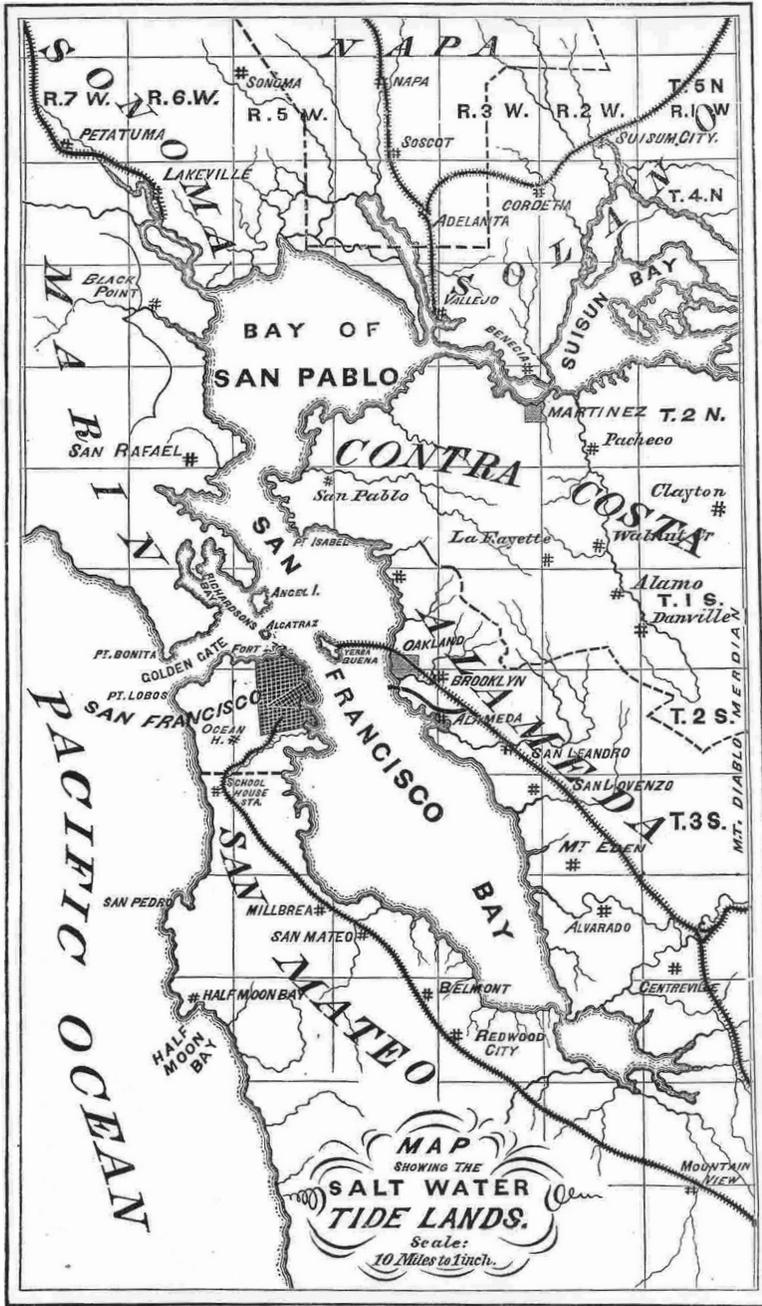


Figure 1. "The Tide Lands of San Francisco Bay," U.S. Department of Agriculture, *Report of the Commissioner of Agriculture* (Washington, D.C., 1873).

the intertidal zone, but their activities also changed it, causing some of the greatest environmental changes ever to occur in San Francisco Bay.

No human impact on San Francisco Bay has been more extensive or had more dramatic effect than the sediment washed into the bay by nineteenth-century gold miners. From the 1850s to the 1880s, miners wielding water cannons washed stupendous quantities of rock and soil from Sierra Nevada mountainsides. Miners did find gold, but for every ounce they captured, they washed tons of soil downstream, releasing about eight times more earth than was moved during construction of the Panama Canal. These mining wastes raised the bed of the Sacramento River thirteen feet at the state capital.¹⁶ More than a century after the end of the hydraulic mining, large portions of San Francisco's bay floor are still paved with this former Sierra soil. In 1862 this slow-moving landslide coincided with a rare meteorological event to create an unprecedented ecological disaster. Rivers already filled with mining sediments had to absorb the greatest known rainfall in California history. So much water fell from the sky between November 1861 and January 1862 that California's Central Valley became an "inland sea."¹⁷ Floodwaters overwhelmed tides in San Francisco Bay, converting the bay into a river for more than two weeks. The floods and the thirty-year underwater landslide of hydraulic mining debris gave San Francisco Bay a new, shallower bottom and swept away its plants and animals.¹⁸

16. Bay Institute, *From the Sierra to the Sea: The Ecological History of the San Francisco Bay-Delta Watershed* (Novato, Calif., 1998), chapter 3, p. 23; Grove Karl Gilbert, *Hydraulic Mining Debris in the Sierra Nevada* [U.S. Geological Survey Professional Paper 105] (Washington, D.C., 1917), 29.

17. John L. Chin, *Shifting Sands and Shattered Rocks: How Man Has Transformed the Floor of West-Central San Francisco Bay* [U.S. Geological Survey Circular 1259] (Reston, Va., 2004), and Ray B. Krone, "Sedimentation in the San Francisco Bay System," in T. J. Conomos, ed., *San Francisco Bay: The Urbanized Estuary* (San Francisco, 1979), 85–96. For a firsthand account, see William Brewer, *Up and Down California in 1860–1864*, ed. by Francis P. Farquhar (1933; Berkeley, 1966), 328. The phrase "inland sea" comes from Robert Kelley, *Battling the Inland Sea: Floods, Public Policy, and the Sacramento Valley* (Berkeley, 1989).

18. This shared biota is described in Edward F. Ricketts and Jack Calvin, *Between Pacific Tides* (Stanford, Calif., 1939). For comparable species listings in eastern estuaries, see Rachel Carson, *The Edge of the Sea* (New York, 1955), William Crowder, *Between the Tides* (New York, 1931), and Leland W. Pollock, *A Practical Guide to the Marine Animals of Northeastern North America* (New Brunswick, N.J., 1998). Joel Hedgpeth has argued that the 1862 floods wiped out the bay's entire estuarine biota. Joel W. Hedgpeth, "San Francisco

Miners created a new kind of bay. Other Californians struggled to find species that could thrive in it. Federal, state, and local authorities worked to make California's rivers, lakes, and bays more productive, as they saw it, by adding edible and marketable fish and shellfish species. Late nineteenth-century Americans worked hard to "improve" newly colonized western landscapes by dredging, draining, and planting trees, but they also added familiar plants and animals.¹⁹ Beginning in 1870, the California Fish Commissioners sought to improve the state's fisheries by adding new species from the Atlantic. Armed with a small state appropriation, the commissioners shipped thousands of freshwater and Atlantic species across the country in special rail cars, although they often failed to keep sea animals alive.²⁰ Undaunted by disaster, the fish commissioners went on to bring dozens of species across the country in aquarium cars. This early faith in biodiversity now seems ironic, as some of the species that federal and state authorities worked so hard to introduce to California have become some of the state's least-wanted. Many of the introduced species became invaders, displacing valued native species.²¹

Bay: The Unsuspected Estuary, a History of Researches," in Conomos, ed. *San Francisco Bay*, 9–30, esp. 11–12. For a suggestive article on the impact of freshwater floods on Pacific coast estuarine communities, see G. E. MacGinitie, "Some Effects of Fresh Water on the Fauna of a Marine Harbor," *American Midland Naturalist*, 21 (1939), 681–686.

19. On the larger context of "improving nature" in California and English-speaking colonies worldwide, see Ian Tyrrell, *True Gardens of the Gods: Californian-Australian Environmental Reform, 1860–1930* (Berkeley, 1999). The mania for introducing new species that eventually brought carp and lobsters to San Francisco was part of a worldwide enthusiasm on the rise during the 1870s. For a broad view of species introductions, part of what Alfred Crosby has called a "portmanteau biota" that permitted European "ecological imperialism" worldwide, see Alfred W. Crosby, *Ecological Imperialism: The Biological Expansion of Europe, 900–1900* (Cambridge, U.K., 1986). For a critique of Crosby's claim that European species dominated transoceanic transfers, see Ian Tyrrell, "Beyond the View from Euro-America: Environment, Settler Societies, and the Internationalization of American History," in Thomas Bender, ed., *Rethinking American History in a Global Age* (Berkeley, 2002), 168–191.

20. John F. Skinner, *An Historical Review of the Fish and Wildlife Resources of the San Francisco Bay Area* [Water Projects Branch Report 1] (Sacramento, Calif., 1962), 11. This report is available through Bay Area libraries. Board of Fish Commissioners, *Biennial Report 1879–80* (Sacramento, Calif., 1880), 18; Jerry C. Towle, "Authored Ecosystems: Livingston Stone and the Transformation of California Fisheries," *Environmental History*, 5 (2000), 64.

21. See Darin Kinsey, "The Fish Car Era in Nebraska," *Railroad History*, 177 (1997), 43–67, and John R. Leonard, *The Fish Car Era of the National Hatchery System* (Washington,

Historians have previously written about these publicly funded efforts to introduce and propagate game fishes such as Eastern brook trout, striped bass, and American shad.²² But the first aquatic species introduced to the Pacific Coast were shellfish. Private imports of Atlantic oysters dwarfed the efforts of public agencies. There was money to be made in shipping oysters to the Pacific. In the first years of the Gold Rush, miners desperate for a taste of home paid high prices for canned oysters shipped around the tip of South America. The real thing soon replaced canned oysters. In 1869 one of the first transcontinental trains connecting the Atlantic to the Pacific carried live oysters from New York harbor to San Francisco Bay. In the following year, entrepreneurs replaced market-size mollusks with barrels full of spat: baby oysters attached to dime-size pieces of shell. Local operatives transplanted the tiny oysters onto tidelands located around the bay. Washed twice daily in the estuary's nutritious soup, Atlantic oysters rapidly fattened to market size. A staple food of working people, transplanted Atlantic oysters became a multimillion dollar industry in California.²³

D.C., 1979). For the story of aquatic introductions to California during this period, see Board of Fish Commissioners, *Biennial Report 1879–1880*, 17–18; see also Towle, “Authored Ecosystems,” 54–74. On introduced species' devastating impact on California, see Peter B. Moyle, “Introductions in California: History and Impact on Native Fishes,” *Biological Conservation*, 9 (1976), 101–118. Specialists in the field of biological invasions have called San Francisco Bay the most invaded estuary in the world. See A. N. Cohen and J. T. Carlton, “Accelerating Invasion Rate in a Highly Invaded Estuary,” *Science*, 279 (1998), 555–558. See also Carlton and Cohen, *Nonindigenous Aquatic Species in a United States Estuary: The Case Study of the Biological Invasions of the San Francisco Bay and Delta* (Washington, D.C., 1995); and Carlton, “Biological Invasions and Cryptogenic Species,” *Ecology*, 77 (1996), 1653–1655.

22. See, for example, Towle, “Authored Ecosystems,” 54–74; Joseph E. Taylor III, *Making Salmon: An Environmental History of the Northwest Fisheries Crisis* (Seattle, 1999); Byron Anderson, “Biographical Portrait: Spencer Fullerton Baird (1823–1887),” *Forest History Today*, 8 (Fall 2002), 31–33; and David Starr Jordan, “Spencer Fullerton Baird and the U.S. Fish Commission,” *Scientific Monthly*, 17 (1923), 97–107.

23. Eugene M. Hattori and Jerre L. Kosta, “Packed Pork and Other Foodstuffs from the California Gold Rush,” in Allen G. Pastron and Eugene M. Hattori, eds., *The Hoff Store Site and Gold Rush Merchandise from San Francisco, California* (San Francisco, 1990), 82–93. Food historian Joseph Conlin has reprinted a Gold Rush-era menu from San Francisco's “What Cheer” restaurant advertising “oysters fried in crumbs” for fifteen cents, fried clams for ten, and clam chowder for a nickel. Joseph Conlin, *Bacon, Beans and Galantines: Food and Foodways on the Western Mining Frontier* (Reno, Nev., 1986), 118–123, 141. Skinner, *A Historical Review*, 32.

Oyster growers and oyster pirates

Descriptions of working-class waterfront life in nineteenth-century San Francisco are surprisingly rare, given the central role the bay played in the economic and cultural life of the western metropolis. It has been all too easy to forget that San Francisco Bay was once a working bay with something akin to the watermen's cultures of Long Island Sound and Chesapeake Bay. We know this vanished world partly through the work of novelist Jack London, a product of the bayshore working-class neighborhoods in West Oakland, Alameda, and San Francisco. London spent much of his childhood on Oakland's wharves, where his stepfather worked as a watchman. He embraced oyster piracy after working as a child laborer in an Oakland cannery. The cannery hours were long, the pay poor, and the conditions hellish. Seeking to escape the factory, London borrowed money from his African American nursemaid and bought a workboat, the *Razzle Dazzle*. With his sloop, London joined the gangs of young men who raided the privately owned beds of Atlantic oysters planted along the eastern shoreline of San Francisco Bay.²⁴

London's later Yukon Gold Rush writings are better known, but his first book-length work dealt with the freedom and self-confidence he found as a waterman on San Francisco Bay.²⁵ For London, the bayshore offered an alternative to the poverty and hopelessness of factory work. In a publicity sketch for his publisher, London recalled the challenges and rewards of work on the water: "At fifteen [I] left home and went upon a bay life. San Francisco Bay is no mill pond by the way. I was a salmon fisher, an oyster pirate, a schooner sailor, a fish patrolman, a longshoreman, and a general sort of bay-faring adventurer—a boy in years and a man amongst

24. On London generally, see Clarice Stasz, *Jack London's Women* (Amherst, Mass., 2001), 28. See also Alex Kershaw, *Jack London: A Life* (London, 1997); Russ Kingman, *A Pictorial Life of Jack London* (New York, 1979); and Irving Stone, *Sailor on Horseback: The Biography of Jack London* (Boston, 1938), esp. 31–32. On London and the waterfront, see Stasz, *Jack London's Women*, 23–28. See also Frank Irving Atherton, "Jack London in Boyhood Adventures," *Jack London Journal*, 4 (1997), 16–172. See also London's own version of this important moment and its consequences for his life in London, *John Barleycorn*.

25. London's writing always contained autobiographical elements, and at times it is hard to tell what is carefully reconstructed fact and what is fictional embellishment. His books on San Francisco Bay are particularly hard to classify, given their combination of romantic story with superb and accurate detail about working life.

men.”²⁶ For London, as for the fictional protagonists of these books, working on the bay was adventurous, healthy, and freeing.

In London’s fictional works, the protagonist is the patrolman who enforces the fish and game laws or the child accomplice, forced to steal oysters, who resists lawlessness. In his own life, however, London appeared equally willing to break the law or to enforce it. In the case of Atlantic oysters, the law was clear: No one might take oysters from private beds or tidelands leased out by the state to a grower. But when oyster pirates like London stole shellfish from planted beds while pretending to harvest oysters from abandoned beds, they exploited an inherent problem in the statute. There was no way to tell which oysters had been legally harvested and which were stolen. The moral law was more problematic, given that the tidelands leased by the state were property of the people of California and that shellfish harvest was a tradition still carried out on the beaches and mudflats of the bay. For many in the general public and for popular writers like Jack London, oyster beds seemed to be the monopoly of common resources by privileged capitalists. Thus, oyster pirates could enjoy community support when they violated private property. London’s choices and the dilemma faced by hundreds of other oyster pirates originated in the rise of new industry in San Francisco Bay and the privatization of the former tidal commons that accompanied it.

San Francisco Bay’s oyster industry

The popularity of shellfish in nineteenth-century America spread nationwide. Residents of coastal cities ate oysters daily, and inlanders consumed them as well. Oysters can create a nearly airtight seal by clamping their shells closed and, if kept in an insulated space, will stay alive for days. Thanks to the railroad, loggers in Idaho, meat packers in Chicago, and miners in Colorado could all enjoy fresh oysters. Canned American oysters had an even more extensive market, reaching consumers all over the world.²⁷

26. Jack London to Houghton Mifflin & Co., Jan. 31, 1900, Jack London Papers, Special Collections, Stanford University Libraries, Stanford, Calif.

27. For consumption of canned oysters by Native American miners during California’s Gold Rush, see George P. Hammond and Dale L. Morgan, *Captain Charles M. Weber: Pioneer of the San Joaquin and Founder of Stockton, California* (Berkeley, 1966).

It is hard to understand this mania for shellfish today, when few Americans consume oysters on a daily basis. But a century ago, oysters provided inexpensive, high-quality food for working people. One authority estimated that six Atlantic oysters, served raw, provided 100 percent of the recommended daily allowance of iron and copper, 50 percent of iodine, and about 10 percent of an adult's daily need for protein, calcium, phosphorus, vitamin A, and B-vitamins. In the age before refrigeration, clams and oysters were veritable vitamin pills, supplying essential nutrients to workers often poorly supplied with fresh fruits and vegetables.²⁸

Contemporary descriptions make clear that oysters were ubiquitous in nineteenth-century San Francisco. Mark Twain, for example, reported on an 1865 theft of oysters, averring that stealing oysters was a crime on a par with massacre, rape, and firebombing churches. San Francisco novelist Frank Norris included oysters in his rendition of a typical turn-of-the-century San Francisco street scene. There were "cheap restaurants, in whose windows one saw piles of unopened oysters weighted down by cubes of ice, and china pigs and cows knee deep in layers of white beans."²⁹ For Norris, oyster sellers were a part of the daily life of San Francisco's working classes, as common and as popular as the espresso stands that now serve a more fastidious class of urban workers on the same city streets. All those working people eating all those shellfish were supplied by one of the country's greatest and least-likely fisheries.

The oysters making all this money were not the native oysters of San Francisco Bay. California's oyster industry was dependent on imports. The first immigrant oysters were larger and tastier relatives of San Francisco Bay's native *Ostreola conchaphila* brought from the Pacific Northwest. Between 1851 and 1869 entrepreneurs transported live adult oysters from Shoalwater (now called Willapa) Bay, along the Washington State coastline, and stored them on mudflats near the city of San Francisco. A handful of beds dotted the Marin shoreline; others were located at the mouths of tidal inlets along the eastern shore of the bay, notably near present-day Richmond harbor and the San Antonio Creek estuary, now the tip of Alameda

28. For oysters as treatment for anemia (iron deficiency), see H. Levine, R. E. Remington, and F. B. Culp, "The Value Of The Oyster In Nutritional Anemia," *Journal Of Nutrition*, 4 (1931), 469.

29. *San Francisco Californian*, Nov. 25, 1865; Frank Norris, *McTeague: A Story of San Francisco* (New York, 1899), 4.

Island. “Olympia” oysters from Washington Territory supplied the California market for a few years after 1850, and there were sporadic efforts to import another Pacific oyster species from Mexico. Just in time for Christmas dinner in 1865, Mark Twain reported eight tons of shellfish had arrived from oyster beds in Mexico. In Twain’s opinion, the larger Mexican oysters were “far superior to the poor little insipid things we are accustomed to here.”³⁰

The completion of the transcontinental railroad introduced a golden age of oysters in California. In October 1869 San Francisco’s *Alta California* celebrated, “The first carload of Baltimore and New York oysters in shells, cans, kegs, all in splendid order, has arrived, packed and shipped by the pioneer oyster house of the west, A. Booth, Chicago, Ill.” At first, firms like Booth and Company shipped mature eastern oysters to the San Francisco market, but this practice gave way to raising young oysters on San Francisco Bay tidelands. During the boom period of 1870 to 1920, commercial oyster growers fenced large areas in San Francisco Bay and constructed a series of “oyster houses,” or raised platforms, amid the fenced beds in order to process oysters and house watchmen to dissuade thieves.³¹ [See Figure 2]

At first, oystermen parked their newly imported oysters on the shallow mudflats across the bay from the city of San Francisco, the former site of native oyster reefs. These beds were close to markets but were otherwise less than ideal locations for young oysters. Some of the shallowest tidal flats in the entire San Francisco Bay system, the oyster beds were exposed to winter storms. Furthermore, annual floods of cold, sediment-laden mountain runoff from the Sacramento and San Joaquin rivers smothered young oysters. On several occasions in the 1850s and 1860s, newspapers reported huge losses of oysters. Despite these dangers, oyster growers did not shift their

30. Elinore M. Barrett, “The California Oyster Industry” [Resources Agency of California, Department of Fish and Game, *Fish Bulletin*, 123] (Sacramento, Calif., 1963), 21–26. See also Barrett, “The Oyster Industry of California” (M.A. thesis, University of California, Berkeley, 1961). These sites were favored locales of Central California’s Costanoan peoples, and it is striking how closely the locations of commercial oyster beds correspond to ancient shellmounds. Barrett, “The California Oyster Industry,” 30. *Virginia City Territorial Enterprise*, Nov. 23, 1865.

31. *San Francisco Alta California*, Oct. 22, 1869; Ernest Ingersoll, “The Oyster-Industry,” in George Browne Goode, ed., *History and Present Condition of the Fishery Industries* (Washington, D.C., 1881), 202; Barrett, “The California Oyster Industry,” 20, 24–25.

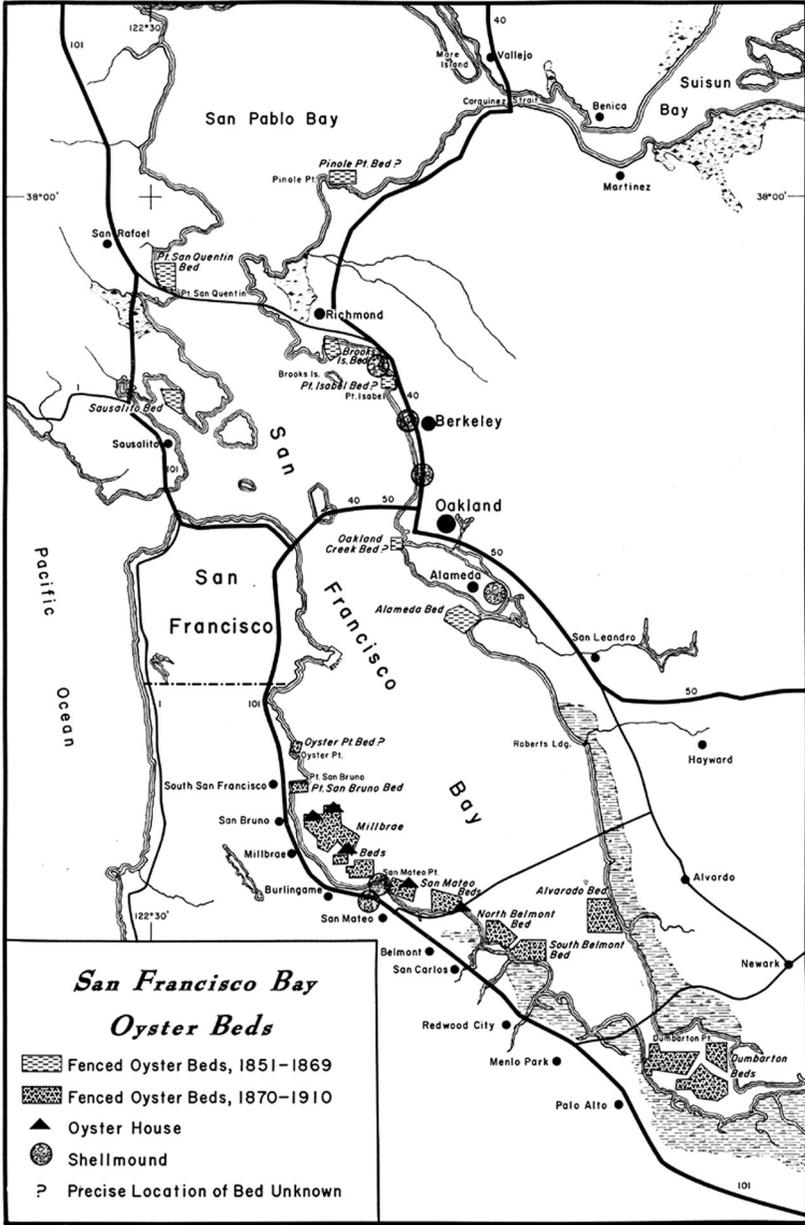


Figure 2. "San Francisco Bay Oyster Beds, 1851-1910," in Elinore M. Barrett, "The California Oyster Industry," California Department of Fish and Game, *Fish Bulletin 123* (Sacramento, Calif., 1963).

operations to the more sheltered tidelands of the far south and west bay until after 1870.

Oyster growers stayed put so long for both ecological and social reasons. South of San Francisco, the nineteenth-century bay was shallower and marshier. The edges of marsh faded almost imperceptibly into tidal channels and so out toward open water. Miles of marsh separated solid ground from the open water of the bay. Into the twentieth century, the South Bay was largely rural, with towns concentrated at “landings” on tidal sloughs where shallow-draft sailing vessels could sail through the marshes with cargoes of grain, vegetables, and hay for San Francisco markets.³² The sloughs allowed anyone with a shallow skiff to move freely around the tidal flats where oysters were planted; such easy access may have concerned oyster growers. Jack London’s stories suggest that growers were reluctant to move their beds because the South Bay sloughs were home to oyster thieves.

By the end of the nineteenth century, oysters were the most valuable fishery in California. Together with approximately 400 tons of canned oysters brought from the East, oyster sales in the San Francisco Bay area reached the staggering annual sum of \$1,250,000 in 1888. San Francisco Bay oyster growers averaged more than \$500,000 from 1888 to 1904. San Francisco Bay oysters earned more than any other California fishery but whalebone from 1888 to 1892, ranked first from 1895 to 1904, and were second only to salmon as late as 1908.³³ At the turn of the twentieth century, oysters were a basic part of the Western diet and a key California industry. No one predicted the oyster’s fate in the following decades.

Decline

The first decades of the twentieth century saw tremendous changes in the bay’s water quality. A boom in population brought consequent increases in human waste. California’s rapidly expanding

32. The finely detailed maps of the U.S. Coast and Geodetic Survey (USCGS) convey the South Bay community’s dependence on tidal creeks. USCGS surveyors mapped and individually labeled homesteads in the 1860s, often clustered at the top of navigable sloughs in hamlets such as Hayward’s Landing, Mowry’s Landing, and Eden’s Landing. See, for example, “San Francisco Bay, Southern Part” (Washington, D.C., 1882).

33. Hubert Howe Bancroft, *History of California 1860–1890* (San Francisco, 1890), 83; Bureau of the Census, *Fisheries of the United States, 1908*, 26–29, 42, 66–68, 86; Barrett, “The California Oyster Industry,” 29–31.

fruit and vegetable industry shipped their wares to South San Francisco Bay canneries that dumped waste into what was already the warmest, least flushed part of the estuary. Industrial effluents skyrocketed as slaughterhouses and dairies increased production to keep up with demand. Entirely new industries appeared on the bayshore, including three oil refineries on San Pablo and Suisun bays and a copper smelter at Carquinez Strait.³⁴ Meanwhile, prolonged drought in the 1910s sparked greatly increased freshwater diversion upstream. In a state still largely without water storage capacity, rivers dwindled to trickles. Salinity levels in the already salty South Bay jumped to near ocean levels.³⁵

Until World War I the oystermen of San Francisco Bay reaped a succulent harvest of fat, tasty bivalves. But after 1915 oyster harvests unexpectedly dipped to 2 million pounds in 1916 and then crashed to less than 900,000 pounds in 1917. For the next three years oyster harvests recovered slightly, but after 1921 San Francisco Bay's oyster production slumped, and by the early 1930s the industry was clearly finished. This collapse paralleled a gradual decline in oyster production nationwide. From a high of about 200 million pounds taken annually from 1890 to 1910, U.S. oyster harvests fell to 54 million pounds in 1954.³⁶ Even before oyster harvests first crashed, signs that something was wrong appeared. In 1905 San Francisco oystermen described their transplanted Atlantics as "thin" and "watery," in contrast to their customary robust growth. One observer attributed the change to vaguely defined "pollution." Yet in 1914 growers reported an exceptional growth spurt in oysters on the Burlingame beds, and peaks and valleys in oyster production had not been uncommon.³⁷

34. H. Foster Bain, "Mines and Mining," in American Association for the Advancement of Science (AAAS), Pacific Coast Committee, *Nature and Science on the Pacific Coast: A Guide-Book for Scientific Travelers in the West* (San Francisco, 1915), 65–74, esp. 69. For oil refineries, see Ralph Arnold, "Petroleum Resources and Industries of the Pacific Coast," in *ibid.*, 75–87, esp. 79.

35. Rapid changes in salinity or temperature can stress oysters and open them up to disease or other dangers that normally are not fatal. Ted Grosholtz, Department of Environmental Science and Policy, University of California, Davis, to author, Oct. 2, 2003.

36. Skinner, *A Historical Review*, 42–44. A. F. Chestnut, "Oyster Reefs," in H. T. Odum, B. J. Copeland, and E. A. McMahan, eds., *Coastal Ecological Systems of the United States* (2 vols., Washington, D.C., 1974), 2: 171–203, esp. 198.

37. For watery oysters, see Paul Bonnot, "The California Oyster Industry," *California Fish and Game*, 1 (1935), 65–80, 67. For the claim that pollution was to blame, see Barrett,

Early twentieth-century San Francisco Bay, however, received enormous quantities of biological wastes, including untreated organic effluent from slaughterhouses, tanneries, and city sewers. These were the classic pollutants of the early industrial city.³⁸ The problem with sewage is not that it is toxic to oysters but rather that it carries diseases that can harm those who eat them. Oysters may actually benefit from some sewage, as they apparently did in the late nineteenth-century bay. But too many nutrients cause many problems for oysters and especially for their human consumers. Lacking any organized sewage treatment, coastal waters were probably at their filthiest during the first decades of the twentieth century.³⁹ In 1913, commenting on the effect of wastewater on fisheries, Stanford zoologist Harold Heath charged that sewers affected shellfish: “While the wastes discharged from cities and towns may not directly seriously disturb clams or fish, they may destroy the much more delicate organisms on which these larger animals subsist and so vitally

“The Oyster Industry of California,” 5–6, 10–11, 19–20. See also Harold Gilliam, *San Francisco Bay* (Garden City, N.Y., 1957), 172. Experts on declining oyster populations in Chesapeake Bay and Long Island Sound have suggested that chemical contaminants, low oxygen levels, or simply changes in sediment, salinity, and temperature stress oysters and increase their susceptibility to disease. Whitman Miller, Smithsonian Environmental Research Center, to author, Oct. 22, 2003; Grosholtz to author, Oct. 2, 2003. For 1914, see “San Francisco Bay Oysters,” *California Fish and Game*, 2 (1916), 208.

38. Martin V. Melosi, *The Sanitary City: Urban Infrastructure in America from Colonial Times to the Present* (Baltimore, 2000), notes that investment in sewage disposal facilities far outstripped sewage treatment technology; the widespread adoption of the water closet in the early twentieth century ensured that America’s waterways became open sewers. While sewage was the primary concern for early twentieth-century scientists, heavy metals and other toxic discharges from industrial plants around San Francisco Bay certainly fouled the bay, as contemporaries recognized. For a description of Bay Area industrial waste dischargers in 1915, see Bain, “Mines and Mining,” 68–69. See also J. A. Holmes, Edward C. Franklin, and Ralph E. Gould, “Report of the Selby Smelter Commission” [U.S. Bureau of Mines, *Bulletin* 98; one of a series of freestanding reports issued by the Department of the Interior] (Washington, D.C., 1915); and Timothy LeCain, “The Limits of ‘Eco-Efficiency’: Arsenic Pollution and Cottrell Electrical Precipitator in the U.S. Copper Smelting Industry,” *Environmental History*, 5 (2000), 336–351. For fears of pollution from a proposed copper smelter near San Mateo, see R. E. Swain to Stanford University Board of Trustees, Jan. 24, 1907, Horace Davis Papers, Stanford University Archives, Stanford, Calif. For the impact of Prohibition-era moonshiners on tidal streams south of San Francisco, see Anonymous, *A Spirit of Independence: Brisbane Before Incorporation* (Brisbane, Calif., 1996), 7.

39. On the history of sewage treatment, see Melosi, *The Sanitary City*. For a fine description of the waste history of one San Francisco Bay community, see Sarah Elkind, *Bay Cities and Water Politics: The Battle for Resources in Boston and Oakland* (Lawrence, Kans., 1998), 31–32, 145–155.

affect the fishing industry. Without much doubt this is now an important factor in various localities.”⁴⁰

In the 1910s and 1920s scientists defined pollution as the presence of organic chemicals resulting from biological wastes, particularly sewage and effluents from tanneries and slaughterhouses.⁴¹ Attempting to establish the actual harm from human waste, scientists at the University of California looked for hydrogen sulfide, a foul-smelling gas associated with the breakdown of organic waste and prevalent when waste-consuming bacteria use up all the oxygen in water, indicating low oxygen levels in water bodies. Near sewer outfalls on Oakland’s industrial waterfront and along the nearby Alameda shoreline, hydrogen sulfide levels were so high that they “caused an inestimable amount of damage to the paint of buildings and marine structures,” in the words of a committee of engineers.⁴² Nevertheless, a panel of scientists concluded in 1928 that, despite tremendous waste inputs, elevated hydrogen sulfide levels occurred in only a few locations around San Francisco Bay and in none of the oyster beds. Strong tidal currents effectively mixed effluent into the ocean and river waters of the estuary, keeping the whole well oxygenated. Despite the sewage, oysters were not asphyxiating.⁴³

Yet even where human waste had no harmful effect on oysters themselves, it could have a devastating impact on the oyster industry. Widely publicized cases of food poisoning involving oysters contributed to a growing sense of outrage at the abuses of industrial capitalism and rising distrust in the safety of even basic foods like shellfish. Public perceptions of oyster health mattered; no one

40. Harold Heath, “Investigation of the Clams of California,” in California Fish and Game Commission, *Fish Bulletin*, 1 (1913), 27.

41. Clyde C. Kennedy, “A Sanitary Survey of the Oyster Beds of San Francisco Bay” (M.S. thesis, Berkeley, 1912); F. B. Sumner, “A Report Upon the Physical Conditions in San Francisco Bay, Based Upon Operations of the U.S. Fisheries Steamer ‘Albatross’ During the Years 1912–1913,” *University of California Publications in Zoology*, 14 (1914), 1–198; Robert C. Miller, W. C. Ramage, and Edgar L. Lazier, “A Study of the Physical and Chemical Conditions of San Francisco Bay, Especially in Relation to Tides,” in *ibid.*, 31 (1928), 201–267.

42. Committee of East Bay Engineers, *Preliminary Report Upon Sewage Disposal for the East Bay Cities of Alameda, Albany, Berkeley, El Cerrito, Emeryville, Oakland, Piedmont, San Leandro, and Richmond to the East Bay Executive Association* (Oakland, Calif., 1938), 8–9, cited in Elkind, *Bay Cities and Water Politics*, 146.

43. Miller, Ramage, and Lazier, “A Study of the Physical and Chemical Conditions of San Francisco Bay,” 201–267.

wanted to eat a potentially dangerous food. Oyster and meat-packing scandals spurred federal investigations of meat-packing facilities and demands for greater regulation of food processing. The public grew alarmed and consumers changed their purchasing habits—or stopped buying meat, poultry, and shellfish. In 1906 Congress passed the Pure Food and Drug Act, and companion legislation authorized inspection of food processors and quarantined suspect foods. Between pollution, environmental changes, habitat loss, and fears of food poisoning, San Franciscans turned away from their oysters at the same time that San Francisco Bay became a less beneficial habitat for shellfish.⁴⁴

Responses

Those responsible for the state's fisheries attributed the decline to overharvesting. In 1913 fisheries scientist Harold Heath worried that clam digging was the greatest danger to shellfish in San Francisco Bay. He noted that San Francisco Bay soft shell clams reached maturity and marketable size only after a full year of growth. Digging or raking destroyed young clams before they could reproduce. Heath charged that "wholesale, irresponsible digging is probably largely accountable for the depleted condition noted in the case of many of the clam beds of the State." Heath foresaw greater pressure by commercial clam diggers and foragers alike, warning that as human populations grew, so would demand for accessible marine resources like bay clams. In an ideal world, state-owned tidelands would be "owned by or leased to responsible parties who consider the future as well as the present." Private ownership would ensure long-term productivity, but, since the beds were the property of the state, Heath grudgingly admitted, "the general public is entitled to

44. Upton Sinclair, *The Jungle* (New York, 1906). See also Sinclair, "What Life Means to Me," *Cosmopolitan*, 41 (1906). Shellfish were implicated in one of the most infamous scandals. See H. W. Conn, "The Outbreak of Typhoid Fever at Wesleyan University," in Connecticut Board of Health, *Seventeenth Annual Report of the State Board of Health of the State of Connecticut, 1893* (New Haven, Conn., 1895), 243–264. Food historians recognize a fundamental shift in the American diet during the Progressive era, partly in response to muckraking journalists' exposure of risks from industrially processed foods and partly following newly authoritative (if sometimes sadly wrong) medical science. This is the era that gave us hygiene, home economics, and baby formula. See, for example, Harvey Levenstein, *Revolution at the Table: The Transformation of the American Diet* (New York, 1988).

the benefits.” He ignored any threat from pollution, which of course crossed all property boundaries.⁴⁵

California officials turned to restrictions on harvesting to address falling shellfish populations, even when the problem was habitat loss. Often these restrictions baldly enforced the social prejudices of the day. The state’s first fishing license bill applied only to “Mongolian,” that is, Chinese, fishermen. Asian men, but not their white competitors, were required to purchase state licenses to fish. In 1914 Stanford biologist Frank Weymouth urged the state legislature to close fishing for Dungeness crab, telling the state fishery commission and the state legislature, “We are still in the position of conserving a natural resource, a task of comparative ease when contrasted with that of restoring it after it has been exhausted.⁴⁶ Weymouth’s warning was followed by closed seasons, size limits, restrictions on harvesting gear, and requirements that commercial and even sport fishers must purchase fishing licenses. These requirements fell most harshly on the backs of Asian commercial clambers but were also onerous for poor people of every race, who foraged at all seasons and who could not afford to pay for licenses. [See Figure 3]

Fear of disease, lost habitat, reduced shoreline access, and increased state regulation also influenced the number of people seeking wild food and the public’s attitude toward foraging. This transformation of attitudes is strikingly visible in one of the first environmentalist books about San Francisco Bay. Harold Gilliam, writing in 1957, noted that a few people still dug clams and pried oysters from the rocky areas south of San Francisco and along the Marin shoreline. But he warned that danger lurked for the shellfish forager: “Properly cooked, they are palatable and safe, but inexperienced chefs run the risk of typhoid.”⁴⁷ Gilliam’s warning illustrates how far attitudes had shifted since the gleeful mayhem of the Gold

45. Heath, “Investigation of the Clams of California,” 28. Mitchell Postel has argued that pollution from industry and city sewers killed the oyster industry and that regulators ignored this evidence in their obsession with alleged overfishing by Chinese shrimp fishers. Mitchell Postel, “A Lost Resource: Shellfish in San Francisco Bay,” *California History*, 67 (1988), 26–41.

46. F. W. Weymouth, “Investigation of the Life History of the Dungeness Crab (Cancer magister),” in California Fish and Game Commission, *Fish Bulletin*, 1 (1913), 32. See also Postel, “A Lost Resource,” 26–41.

47. Gilliam, *San Francisco Bay*, 144, 172–173.

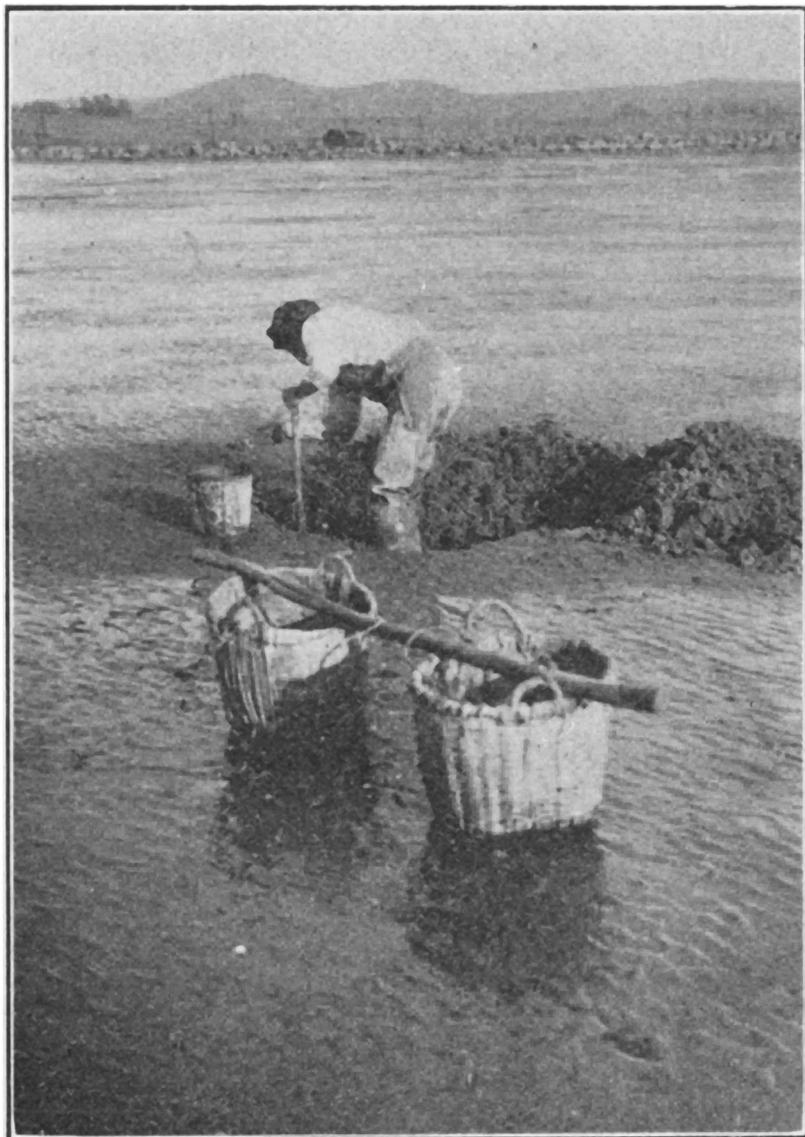


Figure 3. "Chinese Man Digging Soft-Shell Clams, San Pablo Bay, 1921," Frank Weymouth, "The Edible Clams, Mussels and Scallops of California," California Fish and Game Commission, *Fish Bulletin*, 22 (1921).

Rush era. What had once been a food on everyone's plate was now seen as a marginal and dangerous food for marginal people.

The end of eating out of the bay meant the end of an industry too. Unable to make a profit growing oysters, the Morgan Oyster Company, last of San Francisco Bay's growers, sold most of its oyster beds in 1923 to Pacific Portland Cement Company. For nearly fifty years thereafter cement companies dredged the Atlantic oyster shells and the reefs of ancient native oysters that lay beneath, converting the shells to cement for the highways and cities that now lined the bay.⁴⁸ Losing the oyster industry hurt many others beyond the growers themselves. Harvesting local foods from the bay shallows helped maintain a direct relationship with that place. It was an expression of trust: Nature provides, and people eat. Losing that trust led to a fundamental shift in use and in the public perception of San Francisco Bay. In the twentieth century, far fewer people relied on San Francisco Bay for food than in previous generations. In part, this lost use was due to changes in ownership and property law, changes that denied large portions of the bay to common use. The bay also provided less to eat after decades of pollution, colonization by aggressive species, and fill of crucial shoreline habitats. Finally, many residents of the bay area turned away from the bay. They no longer saw the bay as nature's smorgasbord but rather as a potential trip to the hospital.

Yet even with the total destruction of the Atlantic oyster in San Francisco Bay, foraging did not cease. Other species, including several flourishing invasives, were still available to those willing to climb over fences and risk typhoid. In the mid-twentieth century, foraging became an illegal activity, an underground behavior, ever more closely associated with society's marginal members—recent immigrants, the poor, social outcasts. Partly because of this association, eating out of the bay became more dangerous. State officials responded to pollution by simply declaring that wild foods should not be eaten. Public access to San Francisco Bay's wild foods shifted from collecting tideland species to sport fishing from boats, an activity that requires more infrastructure and that targets different species. Later, striped bass, halibut, and salmon catches also

48. Cement dredgers removed approximately 30 million tons of oyster shells between 1924 and 1967. Harold Goldman, *Salt, Sand, and Shells: Mineral Resources of San Francisco Bay* (San Francisco, 1967), 10–19.

declined, and the State Department of Fish and Game imposed lower daily catch limits and encouraged catch-and-release fishing. As the state and environmentalists increasingly warned the public that wild foods were dangerous, people changed their relationship to the bayshore. Rather than addressing the problem of increasing pollution and disappearing habitat, residents around San Francisco Bay slowly came to accept that they could not eat out of the bay. These lost practices reflected a changing environmental consciousness. Lost uses led to lost interest. By the middle decades of the twentieth century it could seem natural that San Francisco Bay would be a refuge for birds but not for people.

By the 1920s the oyster industry was dying, and no one has sold or stolen a San Francisco Bay oyster since 1956. However, one oyster is unexpectedly surviving in San Francisco Bay. In the past few years, researchers monitoring San Francisco Bay's water quality began noticing an unfamiliar species clustering around the outfall pipes of one of the worst polluters in the region, the Chevron Oil Refinery at Richmond. This odd little mollusk is *Ostreola conchaphila*, the native oyster of the bay, seldom seen since the nineteenth century. Apparently—and exactly how remains a mystery—the little native oyster hung on through the hard years of mining debris and low oxygen in one of the most unlikely places in the bay. The native oyster's success has inspired a handful of dedicated scientists and conservationists to seek to restore the native oyster and its once massive reefs to other parts of San Francisco Bay.⁴⁹

Restoring native oysters seems like a laudable goal, but history tells us that the mere presence of oysters is not enough. The bay's surviving shellfish are loaded with toxic heavy metals and industrial chemicals. Like the bay they live in, these oysters are a living record of a century and a half of mining, urban effluent, and industrial wastes. They are only a partial success, because they cannot be eaten safely. No one can use them, either commercially or as foraged food. Only when it is once again safe to eat from San Francisco Bay can we call it a success.

49. *Ostreola conchaphila* has made a remarkable comeback in recent years. Since 2002 a small but dedicated group of ecologists and environmentalists has been working to restore the native oyster in San Francisco Bay. Christine Sculati, "Still Hanging On: The Bay's Native Oysters," *Bay Nature*, 4 (July 2004), 34–38; Paul Rogers, "In Restoring Oysters, Scientists See New Hope for the Bay," *San Jose Mercury News*, June 8, 2004.

The story of shellfish in San Francisco Bay is surprising in several ways. It indicates, first of all, the complexity of environmental change and the ways in which it is often caught up in the complexities of human social change. What was bad for native oysters could be good for eastern oysters; the mud and pollution that was bad for the bay's ecology as a whole actually benefited introduced oysters. The success of Atlantic oysters depended in part upon being made property, but that property was unstable because the remnant oysters in abandoned beds were indistinguishable from cultivated oysters.

These kinds of lessons are staples of environmental history. But this story goes beyond those traditional lessons. Oyster raising was merely one episode in the search for productivity that has typified not only San Francisco Bay, but also tidelands and wetlands in general over the last hundred years. That each landscape seems so temporary, so fleeting, and such a failure in hindsight, should give us pause. Maximum productivity for a single use has not given much of a guide to using the bay in the long run. The fate of San Francisco Bay's oysters reminds us that environmental change is always going to take place within human frameworks that are unable to contain it. Making oysters private also created pirates. Both growers and pirates could use the law as a shield. The ability of oysters to survive in the muddy bay was not the result of the virtues of private property, and private property could not protect oysters against further changes in the bay. From the perspective of social equity, even the survival of the native oyster in San Francisco Bay appears only a partial success. The mere presence of oysters is not enough. Toxic oysters that the poor cannot eat are poignant reminders of the inequalities of the modern bay.

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