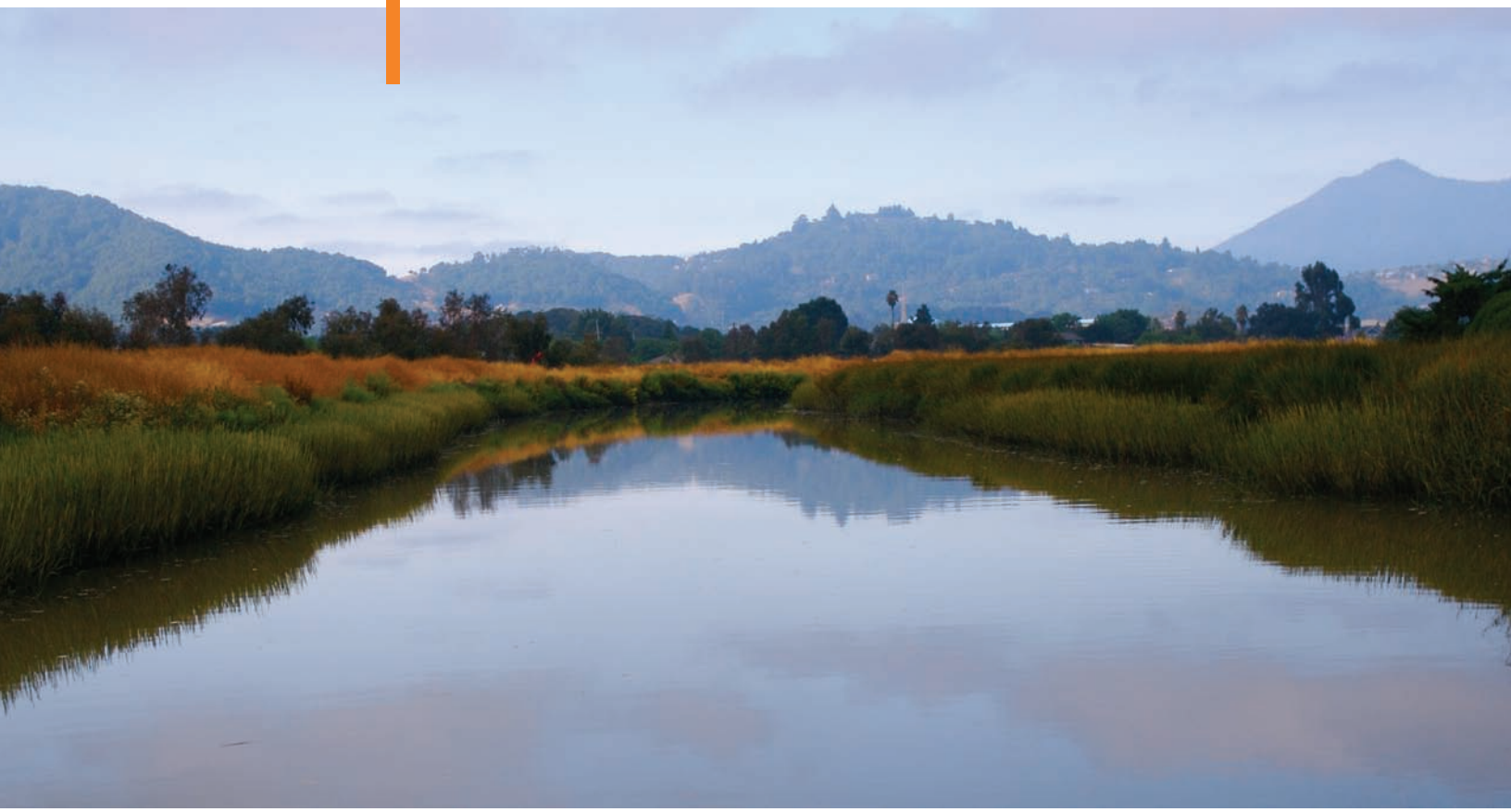
GREENING THE BAY

FINANCING WETLAND RESTORATION IN SAN FRANCISCO BAY



SAVE THE BAY

ABOUT SAVE THE BAY

Save The Bay is the oldest and largest membership organization working exclusively to protect, restore and celebrate San Francisco Bay. As its leading champion since 1961, Save The Bay is committed to making the Bay cleaner and healthier and connecting residents to it.

Save The Bay wages and wins effective advocacy campaigns to increase public access to the Bay, establish 100,000 acres of healthy wetlands around the Bay and protect the Bay from today's greatest threats: urban sprawl and pollution. This year, Save The Bay will lead thousands of volunteers in restoring 100 acres of Bay wetlands and subtidal habitats by hand and will engage and educate more than 10,000 students and adults about the Bay.

To find this report online, please visit:
www.saveSFbay.org/greeningthebay

GREENING THE BAY

Financing Wetland Restoration in San Francisco Bay

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EXECUTIVE SUMMARY/OVERVIEW

Today we have the most significant opportunity to make San Francisco Bay healthier for wildlife and people since 1961, when Save The Bay was founded to stop the Bay from being filled in. Over the next several decades, we can secure a healthy future for the Bay by restoring thousands of acres of thriving wetlands on the shoreline, reversing more than a century of degradation that reduced the size of our Bay by one-third.

In 1999, the *Baylands Ecosystem Habitat Goals* report detailed where and how much Bay shoreline habitat should be reestablished to make the Bay ecosystem healthier. That report recommended restoring shoreline sites to increase tidal wetlands acreage to a total of 100,000 acres around the Bay, recreating vital, productive habitat that was nearly lost.

Save The Bay and many other partners are working hard to achieve this vision of 100,000 acres of healthy, thriving wetlands around the Bay – but the lack of steady, reliable funding to implement wetland restoration opportunities already in hand is the greatest obstacle to success.

Save The Bay's report, "Greening the Bay," presents our vision for a vibrant, healthy Bay ecosystem and outlines necessary steps to achieve it. This report documents the total estimated cost to restore an additional 36,176 acres of shoreline property already acquired and awaiting restoration to tidal wetlands. For the first time, this report assembles the projected costs of restoration projects being pursued all around the Bay, from Vallejo to San Jose. We highlight the political and institutional challenges facing government agencies and Bay advocacy organizations that need significant funds to restore our region's most precious natural resource. We reveal the overwhelming public support for Bay restoration and public willingness to bear the cost. We recommend specific policy initiatives to adequately fund the restoration of San Francisco Bay, which we will pursue.

For this opportunity to save the Bay again, we are all indebted to many people, including those who have made great advances in restoration science and practice, government agencies, conservancies and park districts who have purchased land and maintain it on shoestring budgets, and environmental organizations and individuals who have worked tirelessly over the years to ensure that the Bay's wetlands are restored and protected.

Over the last four decades, dedicated Bay Area residents have overcome overwhelming odds to prevent San Francisco Bay from being destroyed. By securing the funds necessary to fully restore Bay wetlands now, we can make the Bay healthier for people and wildlife long into the future.

SAN FRANCISCO BAY

The Region's Most Precious Asset

The Bay Area's quality of life and economy depend on a healthy and vibrant San Francisco Bay. This natural treasure defines our region, provides recreation and beauty, moderates our climate and generates many millions of dollars in economic benefits.

The Bay Area's quality of life and economy depend on a healthy and vibrant San Francisco Bay.

The largest estuary on the West Coast, the Bay is home to 500 species of wildlife, 128 of them threatened or endangered, like the California clapper rail and salt marsh harvest mouse. The Bay is a crucial resting spot for millions of migrating birds, and its sheltered waters provide critical nurseries for fish.

After the Gold Rush, the Bay was drastically altered by mass urbanization. People destroyed Bay wetlands to create more land, diked and drained marshes to create agricultural fields and salt ponds, and dammed many of the rivers that provided fresh water to the Bay and spawning habitat for salmon. Today it is one-third smaller than its original size and only five percent of the Bay's original wetlands remain.

By the 1960s, San Francisco Bay was being filled in at a rate of two square miles per year, and raw sewage and chemicals flowed into it unchecked. Today the Bay is cleaner, but polluted runoff from our roads, cars and homes still carries motor oil, pesticides, trash and toxic chemicals into the Bay, impairing water quality and threatening fish, wildlife and people. Many other threats remain unresolved.

The Bay is home to 500 species of wildlife, 128 of them threatened or endangered.

In the last 45 years, the Bay was saved from irreversible destruction only because

▸ In the last 45 years, the Bay was saved from irreversible destruction only because residents came together to stop massive Bay fill, regulate pollution and protect threatened shoreline sites where habitat can be restored.

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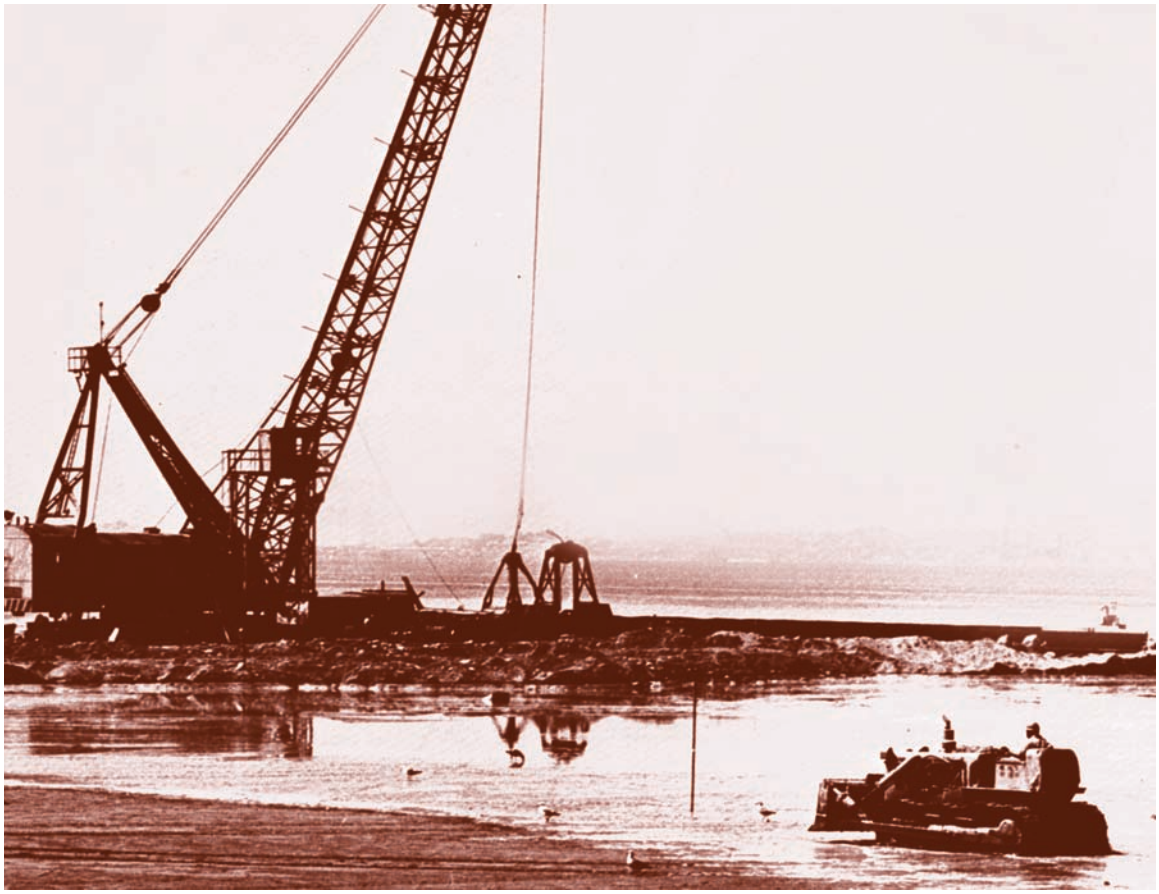
In 1999, the San Francisco Bay Area scientific community published the *Baylands Ecosystem Habitat Goals*, a consensus, scientific blueprint detailing the amount of restored habitat around the region needed to make the Bay healthy and sustainable.

A central recommendation of this report is to attain at least 100,000 acres of tidal wetlands around the Bay, which would provide a wide range of benefits to make the Bay ecosystem healthier and its water cleaner.

Using the *Habitat Goals*, scientists, government agencies, environmental organizations and residents have worked to restore San Francisco Bay. Together we have made significant progress toward protecting this vital natural and economic asset, and the ambitious 100,000 acre goal is actually in sight. **Reaching that goal within the next several decades requires decisive action now.**

Although only five percent of the Bay's original wetlands remain, they account for 90 percent of California's total remaining tidal wetlands.



Dredging the old Third Street Terminal, Oakland. By the 1960s, San Francisco Bay was being filled in at a rate of two square miles per year, and raw sewage and chemicals flowed into it unchecked.

WETLANDS ARE VITAL TO FISH, WILDLIFE AND PEOPLE

Wetlands are the lungs of the Bay, giving life to hundreds of fish and wildlife species that depend on them for survival and billions of small organisms that thrive in Bay mud to form the base of the food chain. In addition to providing vital habitat for fish and wildlife, wetlands provide major benefits to the community:

Clean Water

Healthy Bay wetlands trap polluted runoff before toxics can reach open Bay water. Estimates are that up to 70 percent of the toxics in the San Francisco Bay come from polluted runoff.[1] Wetlands absorb and filter out many pollutants found in runoff, such as pesticides and fertilizers from farms and gardens or motor oil from cars. This filtering keeps the Bay water cleaner, and clean water is a key ingredient for a healthy Bay ecosystem.

Wetlands produce $4,650 per acre in flood control and dredging cost savings compared to engineered dams, reservoirs and channels.

Economic Benefits

Bay wetlands provide measurable economic benefits to the region. Wetlands produce $4,650 per acre in flood control and dredging cost savings compared to engineered dams, reservoirs and channels. Because wetlands purify water so well, they are often used for tertiary treatment by municipal sewage plants.

Although only five percent of the Bay's original wetlands remain, they account for 90 percent of California's total remaining tidal wetlands. A 1992 case study estimated that California's wetlands provided as much as $22.9 billion in value to the state annually, not including the incalculable value to wildlife.

Wetlands-based recreation and tourism in California generates $200 million annually. Seventy-one percent of fish caught in California waters depend on wetland habitat, making San Francisco Bay a major contributor to the estimated $890 million in retail value of fish sold each year across the state.[2]

Helps Curb Global Warming

Scientists have found that tidal salt marshes capture carbon from greenhouse gases in the air efficiently and effectively, helping to counter global warming. Every acre of restored, healthy salt marsh captures and converts at least 215 grams of carbon dioxide into plant material annually – equivalent to global warming emissions from driving 2,280 miles. Unlike some other plants, tidal salt marsh plants release only negligible amounts of methane (a powerful greenhouse gas) when they decay. These findings have led scientists from the United Nations and the White House to recommend wetland restoration as a strategy to fight global warming.[3]

Flood and Erosion Control

Wetlands act as sponges, slowing down and soaking up large quantities of water runoff during rainstorms and tidal inflow. Wetlands slowly release the water over a few weeks, which can help prevent massive flooding.

Wetlands prevent erosion by slowing down runoff, causing sediment in the water to settle on the bottom. The roots of wetland plants also hold sediment in place. Because tidal salt marshes provide natural flood control, significant wetland restoration may be a cost-effective way to help reduce the impact on developed shoreline areas of future sea level rise due to global warming.

Nurseries for Wildlife

Most Bay wetlands are in protected areas that are sheltered from big waves and fast-moving water and are ideal nurseries for young wildlife. Healthy wetlands provide food resources and protection from predators for fish, birds and mammals that use them to nurse and raise their young. Without these sheltered habitats, young salmon, water birds, seals and raptors might not survive.

► Healthy wetlands provide food resources and protection from predators for fish, birds and mammals that use them to nurse and raise their young.

HOW CLOSE ARE WE TO THE 100,000 ACRE TIDAL WETLAND GOAL?

In 1999, when the *Baylands Ecosystem Habitat Goals* was published, about 40,000 acres of tidal wetlands existed in the Bay – 60,000 acres short of the 100,000 acre goal.

Over the last seven years, full tidal action has been restored to additional shoreline areas to create 4,238 acres of wetlands in Napa, Hayward, Oakland and other sites.

An additional 32,850 acres of restorable Bay shoreline has been purchased by government agencies such as the U.S. Fish and Wildlife Service, the California Department of Fish and Game and the California Coastal Conservancy, and by private organizations and land trusts. These wetland restoration projects are each in different stages of restoration planning and construction. State and federal resource agencies have identified another 4,660 acres as priority parcels for acquisition.

► Thousands of acres of former salt ponds are now designated as ecological reserves and are being restored to tidal wetlands.

South Bay

The largest and highest-profile opportunity is the South Bay Salt Ponds (13,000 acres), which the U.S. Fish and Wildlife Service and the California Department of Fish and Game purchased from Cargill Salt in 2003. The restoration of these former salt ponds will completely change the face of the South Bay, connecting residents to a shoreline from which they were walled off for over a century. Also in the South Bay are Pond A4 (310 acres) and Pond A18 (856 acres). Bair Island (1,400 acres) in Redwood City is being restored after decades of citizen action prevented it from being developed into another Foster City.

North Bay

Significant restoration projects in process include Napa-Sonoma Marsh (10,000 acres), Hamilton Field/Bel Marin Keys (2,434 acres), Montezuma Wetlands (1,876 acres), Sears Point (970 acres), Cullinan Ranch (1,564 acres), Napa Plant Site (1,460 acres), Dutch Slough (1,166 acres) and Bahia (418 acres).

East Bay

Additional ponds at the Eden Landing Ecological Reserve in Hayward (722 acres) are being planned for restoration.

► In October 2006, a levee breach at the Eden Landing Ecological Reserve in Hayward connected a dry 300-acre former salt pond to Bay tidal action for the first time in a century.

To reach the 100,000 acre goal scientists have set, approximately 22,912 additional acres will need to be purchased and restored from remaining diked historic baylands and salt ponds. Specific project sites have not yet been determined.

LONG-TERM INVESTMENT NEEDED TO ACHIEVE GOAL

Since the 1960s, when the destruction of Bay wetlands was accelerating, we have made significant progress to restore the Bay, creating regulations that protect wetlands and building public understanding about their importance.

The major challenge to achieving 100,000 acres of tidal wetlands is adequate funding.

The major challenge to achieving 100,000 acres of tidal wetlands is adequate funding. Wetland restoration requires long-term, consistent funding for future acquisition, planning, on-the-ground construction, and operations and maintenance, including modifying levees and protecting electric transmission lines and other existing infrastructure to allow for restoration.

Save The Bay estimates it will cost about $1.43 billion over 50 years (see Appendix A) to fully restore the 36,176 acres that are in hand. Some $370 million has already been devoted to these restoration efforts: $254 million to purchase the land and $116 million for planning, initial construction, scientific studies and monitoring, and operations and maintenance.

To date, most of the restoration funds have come from statewide resources bonds – sources that have met only a portion of the need and have not been consistently available. Other funds have come from federal and private regional sources. To leverage the $370 million already invested into full restoration requires a reliable and coordinated funding approach and the will of Bay Area residents and civic leaders.

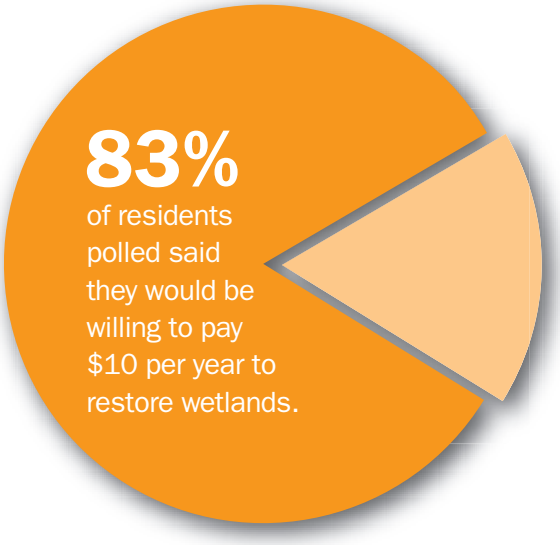
This $1.43 billion estimate does not include the future cost of purchasing and restoring an additional 22,912 acres to reach the 100,000 acre goal.

CHALLENGES TO SECURING FUNDS

CHALLENGE #1: $1.43 billion is a significant yet achievable expense.

The estimated cost of restoring San Francisco Bay wetlands is significant yet achievable over the 50 year time-frame envisioned. **A modest annual average investment over 50 years will produce significant benefits for the Bay's health and the region's economy for present and future generations.** This investment is equivalent to $4 annually for each Bay Area resident, which is not even half the cost of one movie ticket.

A strong majority of Bay Area residents say they would make this kind of investment. In 2006, 83 percent of residents polled by EMC Research said they would be willing to pay $10 per year in taxes or fees to restore wetlands that would result in cleaner Bay water, provide flood control benefits, enlarge the San Francisco Bay National Wildlife Refuge and increase shoreline access for the public (see **www.saveSFbay.org/greeningthebay** for full poll results).



Most of the estimated expense is a one-time investment, with more than 80 percent needed for planning, construction and monitoring of the restoration projects. Once restored, tidal marshes function naturally with low maintenance. The remaining expense is for ongoing operations and maintenance, security, public access facilities and protecting other infrastructure at restored marshes.

CHALLENGE #2: State and federal government agencies own most of the restorable land, but are not providing adequate funding to implement restoration.

Most of the $370 million already invested in San Francisco Bay wetland restoration has come from state and federal funds, but no complete system exists to track all sources that have funded Bay restoration. Save The Bay's research indicates that state resource bonds have contributed at least $167 million to Bay restoration, but it is unclear how much of the remainder has come from federal and local sources.

Six of the major restoration projects underway, totaling 31,746 acres, are on state or federal property. Unfortunately, state and federal agency budgets to manage these large areas have remained static even after the California Department of Fish and Game acquired 6,900 acres and the U.S. Fish and

Wildlife Service acquired 9,600 acres of South Bay Salt Ponds in 2003. The agencies now shoulder significant new responsibilities to manage land and water with complex infrastructure and the West Coast's largest wetland restoration project. For example, a single Bay Area Fish and Game staff person is responsible for all wildlife issues in three counties as well as managing over 6,400 acres of Fish and Game property. The lesson learned a decade after state resource agencies acquired North Bay salt ponds for restoration is that inadequate funding for operation and maintenance of the ponds can lead to significant problems and even higher restoration costs. Underfunding resource agencies managing Bay projects also increases the risk of flooding from levee failures and other threats to public safety.

Save The Bay relies on 5,000 volunteers each year to restore vital habitat by removing invasive weeds, planting native seedlings and cleaning up trash from the Bay shoreline.

Competition for state and federal funds to acquire and restore land is intense, but it is vital that state and federal agencies adequately fund the San Francisco Bay shoreline land they own, and invest in its complete restoration.

CHALLENGE #3: There are few steady local or regional funding mechanisms supporting Bay wetland restoration.

To date, local public funding has only provided support for modest shoreline acquisition and restoration projects by open space districts or cities. Because there is strong public support throughout the Bay Area for funding Bay restoration, regional mechanisms should be established to channel locally-generated funds toward this work.

Federal funding has leveraged private funding, as demonstrated by the generous support provided for the acquisition and initial planning of the South Bay Salt Ponds project by the William and Flora Hewlett Foundation, the Gordon and Betty Moore Foundation, the David and Lucile Packard Foundation and the Richard and Rhoda Goldman Fund. Individual and institutional philanthropic sources from the Bay Area could be tapped to close the funding gap for Bay restoration. Business and corporate support may also be helpful in spurring matching contributions.

There are many ways to raise funds from a mix of federal, state and local sources and coordinate their disbursement and oversight. Greater contributions from all levels will be needed to meet overall Bay restoration goals.

CHALLENGE #4: Region-wide coordination of projects and funding is inadequate.

Many agencies and stakeholders are actively involved in restoring San Francisco Bay, and every agency crafts budgets differently. Some agencies and projects lack complete budgets and timelines, making it difficult to establish a comprehensive regional funding strategy that coordinates and sequences implementation. To secure the increased funding necessary to restore Bay wetlands, the region needs a formal, coordinated set of project priorities based on consistent budgeting and project readiness. That approach will help agencies and stakeholders advocate effectively for increased restoration dollars.

Currently there is no comprehensive accounting of Bay restoration funds from federal, state and other sources collected in one place. State bond allocations to San Francisco Bay from different agencies are not collected in one database. Without a complete compilation of funding already invested in the Bay, it will be difficult to leverage those funds strategically for additional support.

CHALLENGE #5: Government agencies, environmental organizations, cities and counties, and other stakeholders do not advocate with one voice.

The region is fortunate to have dozens of organizations, agencies and communities supporting Bay restoration, especially because there is so much work to do. While each entity has its own interests driven by organization mission, mandates, jurisdictional boundaries and other factors, the Bay Area public takes a broader view. The Bay is an ecosystem that touches nine counties and millions of people and ignores municipal borders. The EMC Research poll shows that Bay Area voters want to protect and restore the Bay as a whole – their support is not limited to individual projects or local priorities. There is high willingness in all nine Bay Area counties to pay modest taxes for Bay wetland restoration.

Establishing shared regional priorities for project funding and sequencing, and advocating for those shared priorities with one region-wide voice, is essential to success in securing needed state and federal funds.

There are practical benefits to advocating with one voice. Government agencies and elected officials hearing a consistent message will develop a clear understanding of Bay funding needs. Residents being asked for funding support will have high confidence that their dollars will be used wisely. Project funding decisions will less often be left to chance or the influence of the most seasoned lobbyists. Instead, project need, readiness and benefit to the Bay and community can determine the sequencing of implementation and funding.

POLICY RECOMMENDATIONS

Save The Bay proposes the following policy recommendations that address the challenges to raising the $1.43 billion needed for a healthy, restored San Francisco Bay.

RECOMMENDATION #1: Establish a regional special district to oversee Bay wetland restoration funding.

San Francisco Bay is the heart of the Bay Area, transcending county and city borders. The Bay needs to be protected and restored as one entity, by and for the whole region.

The Bay needs to be protected and restored as one entity, by and for the whole region.

The San Francisco Bay Conservation and Development Commission (BCDC) demonstrates the success of a regional approach to regulating shoreline development and public access. That agency's regional jurisdiction allowed it to introduce comprehensive regional planning of shoreline development and to block cities' individual plans to pave over the Bay.

Open space districts, park districts and other local special districts each have the authority to raise significant regional funds to acquire land, create greenbelts and protect upland open space. Some of these districts support small shoreline restoration projects within their own boundaries.

The Bay, however, lacks a single, regional body that can raise funds for land-owning agencies to maintain and enhance Bay shoreline sites and restore wetlands. **Because the Bay is one entity, we recommend that a regional Bay special district be established immediately to explore, promote and coordinate local and regional public fundraising mechanisms, and to develop priorities and sequencing for allocating funds.** The special district should have a governance structure that ensures efficient and successful operations – this may include representatives from key state, regional or local agencies, elected officials, and other appropriate stakeholders.

There are several ways a special district could help secure regional funding. A promising option would be for the district to establish benefit assessments in communities adjacent to all or parts of the Bay, as used successfully by open space districts throughout the state.

It would be efficient and appropriate to establish this special district with the California Coastal Conservancy's San Francisco Bay Area Conservancy Program serving as the foundation. That program already has defined boundaries that encircle the Bay to include all nine Bay Area counties, its mission and priorities emphasize restoring San Francisco Bay wetlands, it makes grants for those purposes from state bond funds and it already manages several large Bay restoration projects. The Conservancy, however, lacks the additional authority to raise and collect funds as a special district. The Conservancy could gain that authority through entering into a joint powers authority with other jurisdictions, through state legislation or through a public vote.

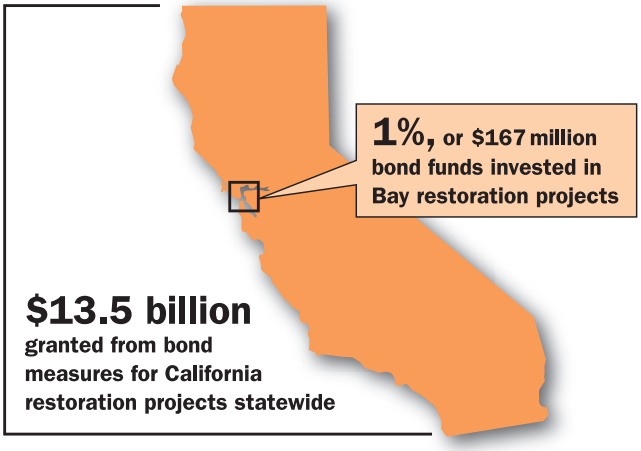
RECOMMENDATION #2: Target state and local resource bonds and other public sources to provide significant funds for Bay restoration.

California voters are supportive of statewide measures that fund open space and environmental protections – since 2000, voters have passed Propositions 12, 40, 50 and most recently 84. Although support for all four natural resource bonds was higher among Bay Area voters than statewide, Bay projects have received a disproportionately small fraction of the $13.5 billion those measures contained for open space and park protection, water quality improvements, acquisition of public lands and wetland restoration. Despite San Francisco Bay's importance to California, only about 1% of the total bonds to date (approximately $167 million) have been invested in Bay restoration projects, with $108 million from Proposition 84 still available for allocation to Bay projects.

Important examples of bond support for Bay projects include:

- $1 million from Proposition 12 for Hamilton Field restoration planning
- $1.2 million from Proposition 12 and $1.05 million from Proposition 40 for Napa-Sonoma Marsh restoration planning, design and monitoring
- $1 million from Proposition 50 for Sears Point restoration planning
- $12.9 million from Propositions 40 and 50 for restoration planning and management for the South Bay Salt Ponds.

Local funding measures can also have a significant impact on the Bay shoreline, although they have not been pursued frequently enough. Oakland voters overwhelmingly supported Measure DD in 2002, which provided $198 million to improve water quality, restore creeks and the waterfront, renovate parks and enhance recreational facilities. In 2004, the East Bay

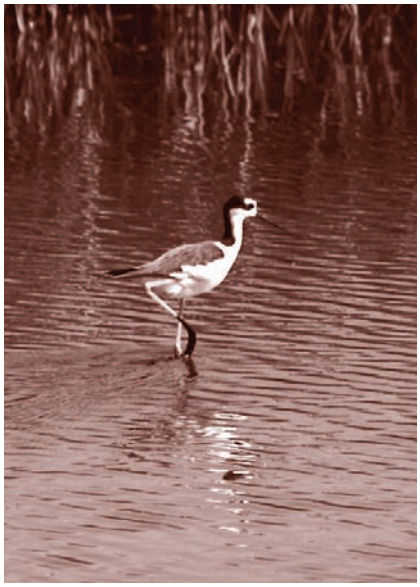


Regional Park District sponsored Measure CC, a modest parcel tax to fund habitat restoration and public access infrastructure, which passed with more than the two-thirds vote necessary.

Save The Bay recommends that future statewide natural resource bonds provide significantly more funding for San Francisco Bay restoration. We also recommend that local and regional entities consider raising funds to enhance their Bay shoreline, provide public access for their residents and create vital habitat.

RECOMMENDATION #3: The San Francisco Bay Area congressional delegation should make full funding of the San Francisco Bay National Wildlife Refuge Complex a high priority, so the nation's largest urban wildlife refuge can meet its increasing land management and restoration responsibilities.

Of the major Bay wetland restoration projects in progress, 13,286 acres are located on refuge land. Federal funding for the San Francisco Bay National Wildlife Refuge Complex, which includes the Don Edwards San Francisco Bay National Wildlife Refuge and six other area refuge units, has not kept pace with the massive increase in its size and land management needs. This funding shortfall threatens the Refuge Complex's ability to manage large, priority restoration projects within its boundaries, including the South Bay Salt Ponds and Bair Island. Because total funding for national wildlife refuges has remained flat or decreased, it is vital that Congress increase the baseline budget for operations and maintenance of Bay refuges.



Over the next five years, the Refuge Complex requires $2.4 million as a permanent addition to its base budget to support increased staffing, operations and maintenance and restoration monitoring. An additional $28 million in one-time expenditures is needed to implement restoration to benefit threatened and endangered species and other public access facilities.

The Don Edwards San Francisco Bay National Wildlife Refuge, which is located in the South Bay, faces unique challenges as a wildlife oasis in the middle of an urban setting.[4] More than two million people live within a ten-mile radius of the Refuge, and over 700,000 visitors explore the refuge every year. Virtually overnight, with the purchase of the South Bay Salt Ponds, the refuge grew in size by one-third without a comparable increase in budget. Staff is now responsible for the operations and maintenance of 70 miles of levees, water control management structures, evaluation and monitoring required by regulatory agencies, and additional outreach, security and environmental education responsibilities.

The Defenders of Wildlife 2004 report, *Refuges at Risk*, lists the Don Edwards National Wildlife Refuge as one of the nation's ten most threatened national wildlife refuges. Without significant funding to protect and restore the refuge and surrounding lands, the report warns that the restoration process will languish and increased urbanization and growth will threaten the Refuge and the endangered wildlife it protects.

NOTES AND SOURCES

1 *Changing the Course of California's Water: The Impact of Polluted Runoff on our Aquatic Resources and Responsible Actions We Can Take.* By Jim Mayer, through the Lindsay Museum, 1995.

2 Allen, J., Cunningham, M., Greenwood, A., and Rosenthal, L., 1992. *The Value of California Wetlands: An Analysis of Their Economic Benefits.* Campaign to Save California Wetlands.

3 U.S. Climate Change Technology Program: Technology Options for the Near and Long Term (2005), para 3.2.1.6, available at www.climatetechnology.gov/library/2005/tech-options/tor2005-3216.pdf ("Because they are inherently highly productive and accumulate large below-ground stocks of organic carbon, restoring lost wetlands and protecting those that remain clearly represents an immediate and large opportunity for enhancing terrestrial carbon sequestration"); Intergovernmental Panel on Climate Change, Special Report on the Regional Impacts of Climate Change: An Assessment of Vulnerability, para 5.3.1.6, available at www.grida.no/climate/ipcc/regional/104.htm#adapt.

4 In response to local citizens' concerns that the Bay and its wildlife were being threatened by the urbanization of the South Bay, U.S. Congressman Don Edwards established the nation's first congressionally-mandated national wildlife refuge in 1974. Named the Don Edwards San Francisco Bay National Wildlife Refuge in 1995, the Refuge is the nation's first "urban refuge" and remains the largest national wildlife refuge in a metropolitan area. The San Francisco Bay National Wildlife Refuge Complex also includes the Antioch Dunes, Ellicott Slough, Farallon, Marin Islands, Salinas River and San Pablo Bay National Wildlife Refuges.

CREDITS

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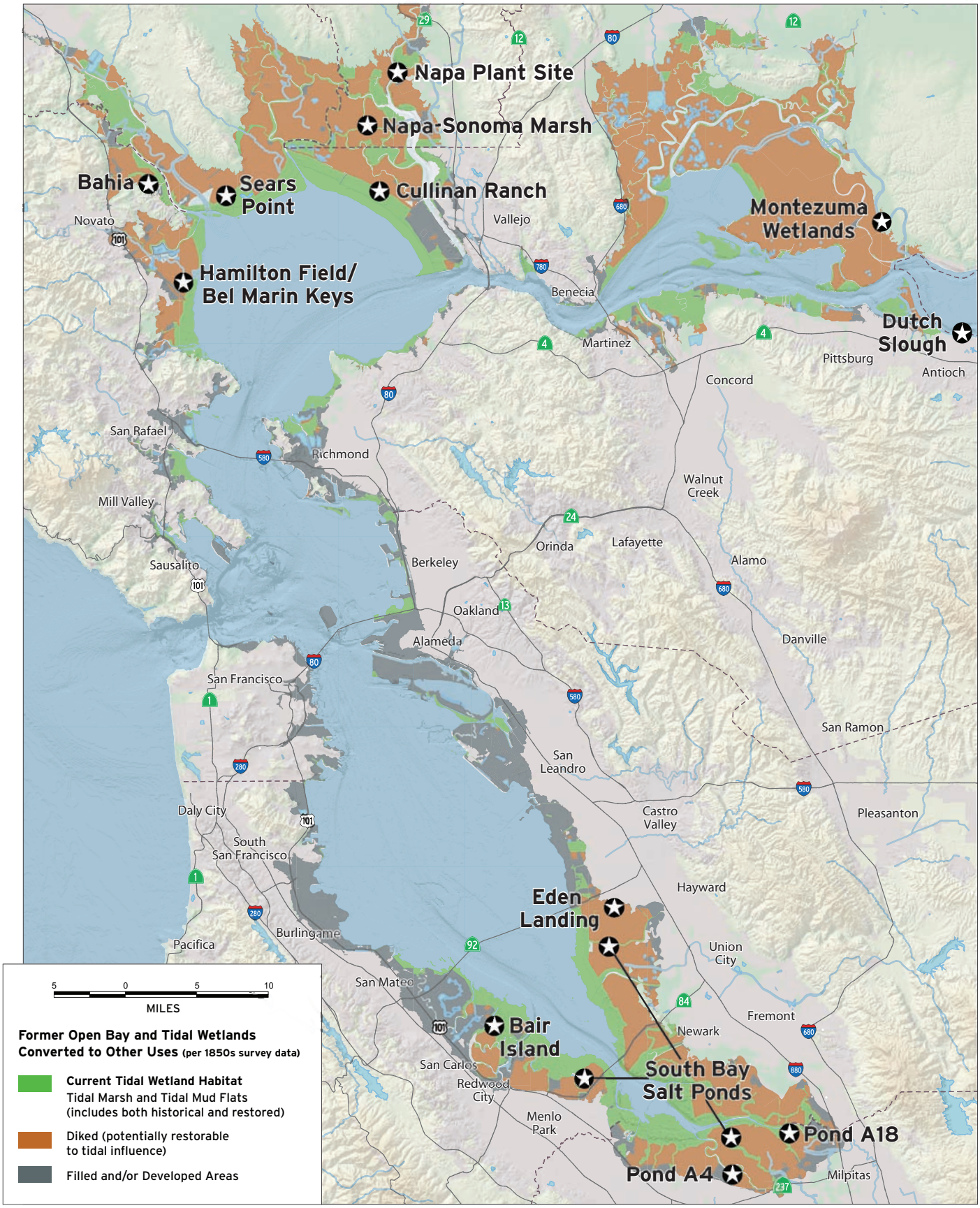
APPENDIX A

Completing these planned restoration projects will nearly double the Bay's tidal marsh

	Investment to Date: $370 Million				Funds Needed to Complete: $1.43 Billion				
Tidal Wetland Restoration Project	**Tidal Acres**	**Landowning Agency (Year Acquired)**	**Acquisition**	**Planning & Implementation**	**Planning**	**Implementation**	**Monitoring (10 years)**	**Operations & Maintenance (50 years)**	**Total Needed:**
Montezuma Wetlands	1,876	Montezuma Wetlands, LLC (late 1980s)	$4,450,000	$44,500,000	$0	$100,000,000	$5,000,000	$5,000,000	**$110,000,000**
Napa-Sonoma Marsh	10,000	CA Dept of Fish & Game (1994)	$10,000,000	$6,000,000	$0	$40,000,000	$3,140,000	$3,000,000	**$46,140,000**
Cullinan Ranch	1,564	US Fish & Wildlife Service (1996)	$6,000,000	$500,000	$0	$12,000,000	$500,000	$9,500,000	**$22,000,000**
Eden Landing	722	CA Dept of Fish & Game (1996)	$12,500,000	$1,600,000	$0	$3,300,000	$625,000	$1,500,000	**$5,425,000**
Bair Island	1,400	US Fish & Wildlife Service (1999)	$15,000,000	$1,824,000	$0	$8,175,942	$720,000	$1,710,000	**$10,605,942**
Pond A4	310	Santa Clara Valley Water District (2000)	$5,890,000	n/a	n/a	$1,550,000	$465,000	n/a	**$2,015,000**
Napa Plant Site	1,460	CA Dept of Fish & Game (2003)	part of SBSP	$850,000	$0	$4,500,000	$625,000	$2,250,000	**$7,375,000**
Hamilton Field/ Bel Marin Keys	2,434	CA Coastal Conservancy (2003)	$16,000,000	$25,500,000	$0	$165,800,000	$6,500,000	$4,430,000	**$176,730,000**
Bahia	418	Marin Audubon Society (2003)	$15,800,000	$350,000	$0	$2,200,000	$1,000,000	$1,000,000	**$4,200,000**
South Bay Salt Ponds	13,000	US Fish & Wildlife Service / CA Dept of Fish & Game (2003)	$100,000,000	$33,000,000	$0	$750,000,000	$30,000,000	$200,000,000	**$980,000,000**
Dutch Slough	1,166	CA Dept of Water Resources (2003)	$38,000,000	n/a	$4,000,000	$30,000,000	$750,000	n/a	**$34,750,000**
Sears Point	970	Sonoma Land Trust (2005)	$17,000,000	$2,200,000	$2,380,000	$15,700,000	$1,200,000	$1,500,000	**$20,780,000**
Pond A18	856	City of San Jose (2005)	$13,500,000	n/a	n/a	$4,280,000	$1,284,000	n/a	**$5,564,000**
TOTALS:	**36,176**	--	**$254,140,000**	**$116,324,000**	**$6,380,000**	**$1,137,505,942**	**$51,809,000**	**$229,890,000**	**$1,425,584,942**

SAN FRANCISCO BAY ESTUARY – TIDAL WETLANDS, THEN AND NOW

✪ *Wetland restoration at these sites will nearly double the Bay's tidal marsh.*



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