



Commemorating the **50th** Anniversary of the Don Edwards San Francisco Bay National Wildlife Refuge



At the October 8, 2022 celebration, current Project Leader for the San Francisco Bay National Wildlife Refuge Complex, Matthew Brown, provided this summary of success stories following the establishment of the Refuge.

As we celebrate 50 years of conservation at Don Edwards San Francisco Bay National Wildlife Refuge, I can't help but reflect on the famous Margaret Mead quote, "Never doubt that a small group of thoughtful, committed citizens can change the world; indeed, it's the only thing that ever has."

It was indeed a small group of thoughtful and committed citizens who initially dreamed of a National Wildlife Refuge in the San Francisco Bay, and then worked tirelessly to turn that dream into a reality. We are all so grateful for the vision and passion of conservation champions like Art Ogilvie, Dr. H. Thomas Harvey, Florence LaRiviere, Dr. Howard Shellhammer, Nancy Holmes and of course Congressman Don Edwards. It is humbling to see what they accomplished.

- **30,000 acres of public lands** surrounded by almost eight million people, making Don Edwards San Francisco Bay our nation's largest Urban National Wildlife Refuge, both in acreage and size of neighboring population.

- **38 miles of trails, kiosks and overlooks** that help more than 800,000 visitors a year connect with the natural world.
- **Thousands of acres of former salt-production ponds restored** to native tidal marsh through the South Bay Salt Pond Restoration Project, the largest wetland restoration project on the West Coast.
- **Multiple generations of families have been inspired** by the Refuge's nationally recognized environmental education and interpretive programs. These programs have been delivered on the Refuge and in schools and community centers from East Palo Alto, to Alviso, to Newark and nearly all the communities in between.
- **Species have been saved from the brink of extinction.** Don Edwards San Francisco Bay protects the habitats for nine species of Federally-listed threatened or endangered species and is now home to more than 340 plant species and 280 species of birds.
- **The establishment of the refuge paved the way** for the establishment of six more Bay-area National Wildlife Refuges; Antioch Dunes, Ellicott Slough, Farallon Islands, Marin Islands, Salinas River and San Pablo Bay NWRs. 🦋

How the Refuge Was Created and Expanded

A history by Florence LaRiviere

Although some of you have heard this amazing story many times before, we are capturing it here to preserve the institutional memories of CCCR.

It all began in 1965 with an ad placed in a local newspaper by Santa Clara County Planner Arthur Ogilvie. Frustrated by ever increasing development and loss of the Bay's shoreline, Mr. Ogilvie resorted to thinking outside the box, trying to find an answer that would stop the never-ending cycle of battles to protect the baylands. His stroke of genius was realizing that the best way to permanently protect land from development is to get the land into the public domain. The language of the ad simply read, **"If you're worried about what's happening to the shores of the San Francisco Bay, come to my office in the morning at 10 o'clock."**

Florence LaRiviere, a Palo Alto resident, was concerned by development along the edges of the Bay and by the senseless destruction of a favorite tidal marsh site buried under dredge spoils from a nearby harbor. Florence showed up, and she's been showing up ever since.

Mr. Ogilvie informed the small group that his goal was nothing less than to seek congressional authorization to establish a national wildlife refuge in South San Francisco Bay. That was the beginning of the first iteration of the Citizens Committee to Complete the Refuge, the "South San Francisco Baylands Planning, Conservation and National Wildlife Refuge Committee." And you thought Citizens Committee to Complete the Refuge was a mouthful! As Florence recently recalled:

"Most importantly along the way, we realized that since this was going to be a congressional action to establish an urban refuge, we would have to have a champion in Congress. We knew that Congressman Don Edwards was our man in San Jose and we knew that he was extremely interested in peace projects

and in civil rights, but we didn't know if he had any view of environmental protection; but those interests that he did have seemed like pretty good ones to us. So, we went to him and he said, 'Hmmm, sounds like a good idea.' He became our congressional champion and he persisted in working to obtain congressional authorization for five long years. Congressman Edwards was



The refuge groundbreaking ceremony in 1977 included (L to R) Rod Diridon, Arthur Ogilvie, Congressman Don Edwards, and Refuge Manager Robert Personius.

far more than just an originator of the legislation. On and on his devotion to this Refuge was evident.

"During that time, we went door-to-door, we went to city councils. And mostly we got fairly decent responses, 'Yes, we'd like to see the shores of the Bay in our community protected.' However, I particularly remember one mayor, and I think there were some profound statements from him, he said, 'You know you guys are carpetbaggers. I don't really know why you're here.' Which was pretty defeating. But when we got up

to leave at the end of the meeting hours later, he said, 'Thank you all for coming, this is democracy in action.' And I think that's a good saying to remember, it is democracy in action."

The work of CCCR was instrumental in helping to establish the first and largest urban wildlife refuge in the United States. In 1972, after a long and tremendous effort to overcome naysayers and with Congressman Don Edwards' tireless enthusiasm and support, the dream was realized and Public Law 92-330 was passed by Congress to establish one of the first, and what would become the largest, national wildlife refuge in an urban setting.

Public Law 92-330 stipulated that *"There shall be included within the boundaries of the refuge those lands, marshes, tidal flats, salt ponds, submerged lands, and open waters in the South San Francisco Bay...and which comprise approximately 21,662 acres within four distinct units known as Fremont (5,520 acres), Mowry Slough (7,175 acres), Alviso (3,080 acres) and Greco Island (5,875 acres)."*

Florence recalls, "For five years, we had gone around the Bay Area talking to all kinds of groups to say, "This is what is happening to our special lands." I think it was four or five times that Mr. Edwards submitted his bill, so there was great elation when, in 1972, his legislation was signed into law by President Nixon. We dusted off our hands, and settled back in satisfaction."

But as it turns out, that is not the end of the story. Fast forward to the mid 1980's, lands along the edges of the Bay were still under threat of development – familiar names such as Bair Island in Redwood City and the Whistling Wings and Pintail duck clubs in Newark. In Redwood City, Sandra Cooperman, one of the founding members of the Friends of Redwood City along with Ralph and Carolyn Nobles, recalled the decision to

file a referendum over the City Council's decision to change the zoning on Bair Island for a massive development. A referendum had never been filed before in the city. It was a hard battle, and Sandra recalled how on election night, they had lost. "But it was a tiny little margin and the word was we were going to go for a recount. [But when the votes were recounted] Well you know the number varies between 44 and 40, a very tiny margin, but we won! And it was unbelievable. But this was just the beginning."

Florence blames her dear friend and comrade in arms, Rick Epstein for what happened next. Rick met with Florence, again around the kitchen table, and pointed out that although the referendum had been successful, it didn't protect Bair Island from further development. Rick discussed the possibility of seeking congressional authorization to expand the original size of the Refuge so that lands such as Bair Island could be eventually purchased and added to the Refuge.

Florence remembers:

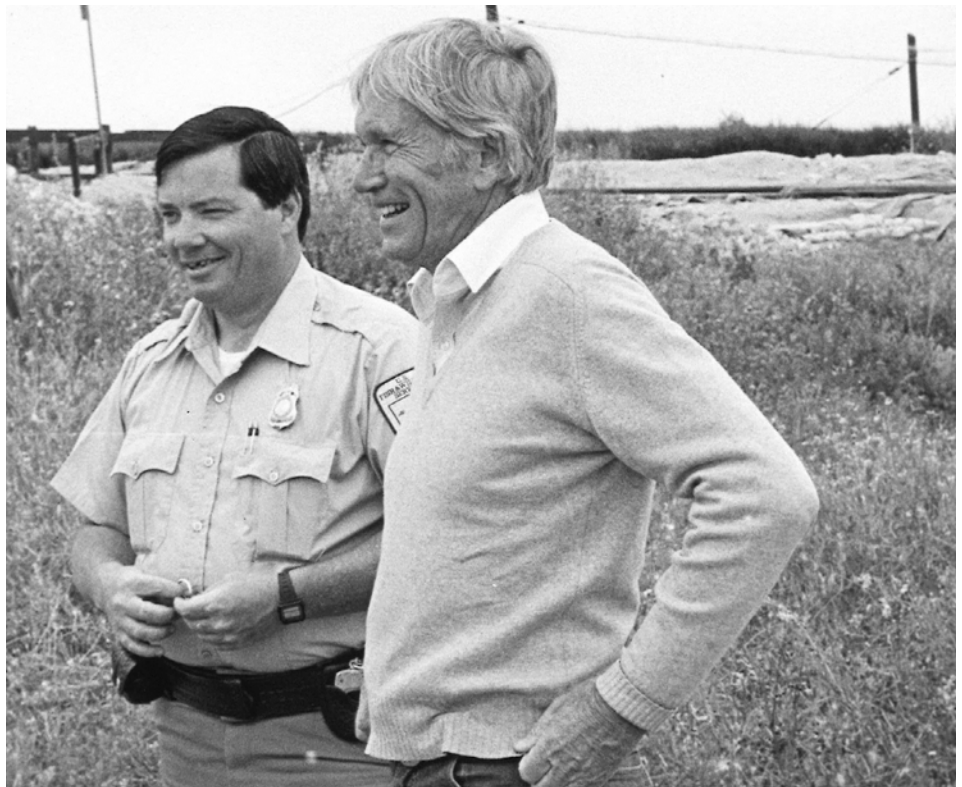
"In 1985, after the successful Bair Island referendum by The Friends of Redwood City, Rick Epstein, sitting at our dining room table said, 'Hey, why don't we go back to Congress and get Bair Island and ALL the remaining wetlands into the Refuge?' The reincarnated committee became known as The Citizens Committee to Complete the Refuge. Mr. Edwards signed on with us once more, and the ordeal began again. We educated the public on the value of wetlands to the human population and to wildlife alike. We printed bumper stickers, put on slide shows, wrote letters to the newspapers, and collected signatures to support the expansion of the refuge.

"The entire South Bay lay before us, and the question: what lands should be acquired? One hot summer day, we spread out maps all over a table upstairs at the Alviso Education Center. Those present were: Roy Lowe, of the Fish and Wildlife Service, Paul Kelly, of the California Department of Fish and Game, John Wade, of the Peninsula Open Space Trust

– all wetland experts – and Philip and I.

"The lands identified that day became the basis for the legislation that was enacted in 1988, the first year it was submitted to Congress. There was a joyous celebration that October day

owner's photo, asking him to please let Bair Island go back to nature. It worked! Within a year, the land was sold to the Peninsula Open Space Trust. Audrey Rust with the land trust stepped up and gave the Service 15 million borrowed dollars to purchase the land.



Don Edwards (right) with Refuge staff on a visit to Drawbridge. Photo courtesy USFWS.

when President Reagan signed into law the expansion of the Refuge."

From then on, it's been all up to us – stopping development, finding willing sellers, and searching for funding. Now, with the attainment of our goal within sight, the acquisition of the remaining lands is crucial.

In 1995, the San Francisco Bay National Wildlife Refuge was most appropriately renamed in Congressman Don Edward's honor.

In the 1990's, the battle to protect Bair Island continued. A new landowner, Kumagai-Gumi, proposed development of the lands, and that's when Arthur Feinstein enlisted the help of Bill Rukeyser. Mr. Rukeyser suggested placing a full-page ad in the local edition of the *New York Times* (widely read in Japan), with the company

The repayment money came from foundations, the federal government and local citizens, among them Palo Altans Betsy and Pete Peterson. And in 1998, 1,000 acres of Bair Island became part of the Refuge (approximately 2,000 acres is owned by CDFW, but managed by the Refuge).

In 2003, 9,600 acres of salt ponds in Ravenswood (Menlo Park), Mountain View and Alviso, were added to the Refuge through the South Bay Salt Pond acquisition, and today the Refuge is 30,000 acres in size.

We wish we could say, "Mission accomplished!", but several extraordinarily important sites (identified in a later article) within the expansion boundary have yet to be added to "complete" the Refuge. 🦋

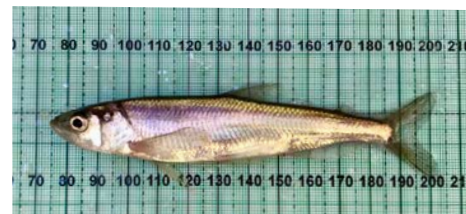
Species Protected by the Refuge



*Many species call the Refuge home. Above: **Northern Shovelers take off at Pond SF2** by Kate High. Below: **Harbor seals at Bair Island** by Carin High and **Salt Marsh Harvest Mouse on pickleweed** by M. Bias, US Department of the Interior.*

The San Francisco Bay Estuary is the largest estuary on the west coast of both Americas. Estuarine intertidal and shallow waters support tremendous biodiversity, including rare, listed, migratory and economically important species, and serve as nurseries for fisheries. San Francisco Bay has been recognized as a “Wetland of International Importance” by UNESCO’s Ramsar Convention on Wetlands. It has been identified as a Hemispheric Reserve for shorebirds by the Western Hemispheric Shorebird Reserve Network, the Network’s highest ranking. The Network states that, “San Francisco Bay holds higher proportions of the total wintering and migrating shorebirds on the U.S. Pacific coast than any other wetland.” The Bay supports hundreds of thousands of migratory waterfowl every year and has been designated an Area of Continental Significance by the North American Waterfowl Conservation Plan, and an Important Bird Area by the National Audubon Society. The Bay provides Essential Fish Habitat as identified by the National Marine Fisheries Service and supports hundreds of fish and marine invertebrate species.





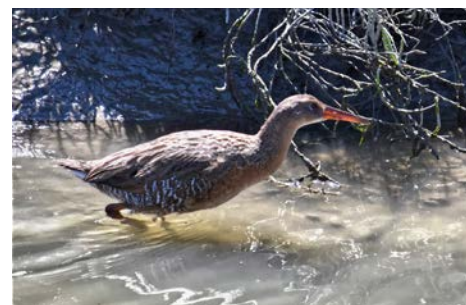
Clockwise from above: **Semipalmated Plover among Dunlin at Bair Island** by Carin High, threatened **California Tiger Salamander** by USFWS, **Longfin Smelt** by Jacob Stagg of USWFS, threatened **Snowy Plover** by Kate High, endangered **Ridgway's Rail** by Sam High, and **Northern Harrier** by Carin High.

According to the 2013 Comprehensive Conservation Plan, the Refuge was established with three major purposes, "The most important of these is the preservation of the natural resources of the South Bay, which include among others the habitat of migratory birds, harbor seals, and threatened and endangered species. (EDAW 1974)."

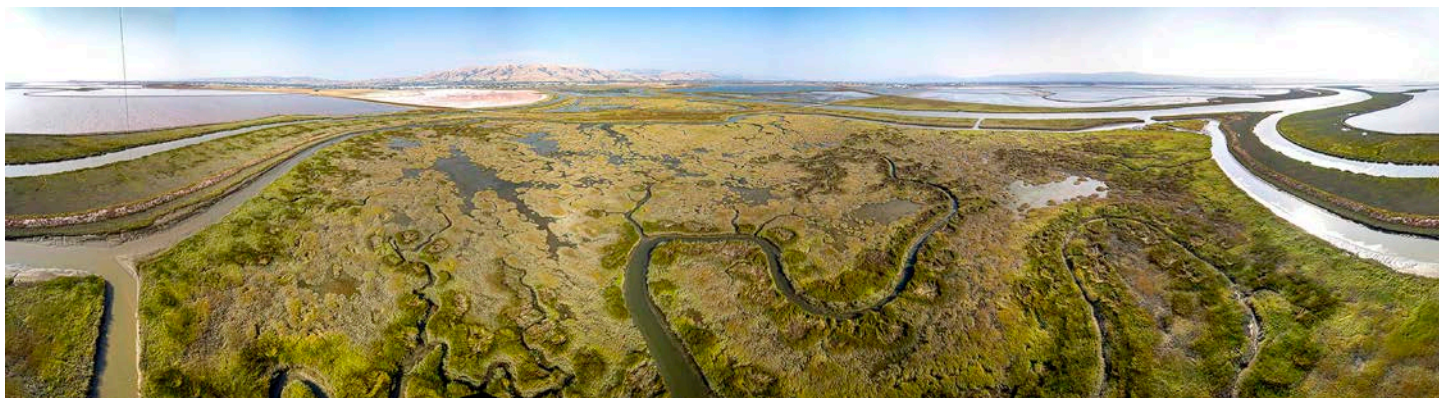
The Don Edwards San Francisco Bay National Wildlife Refuge supports

a diversity of habitats including mudflats, tidal wetlands, managed ponds, transition zone habitat, uplands and the only remaining vernal pool complex in the South Bay. This palette of habitats supports incredible biodiversity. Matthew Brown, Project Leader for the Refuge Complex has stated that the Refuge protects the habitats for nine species of federally-listed threatened or endangered

species and is home to more than 340 plant species and 280 species of birds. Recent surveys of the South Bay by UC Davis ichthyologists have identified recently-breached Pond A19 as a longfin smelt spawning hotspot, and surveys by Refuge staff have found surprising numbers of the endangered salt marsh harvest mouse in Pond A19, which is truly a testament to the importance of tidal wetlands restoration! 🐦



Our Important Tidal Wetlands Need Protection from Sea Level Rise



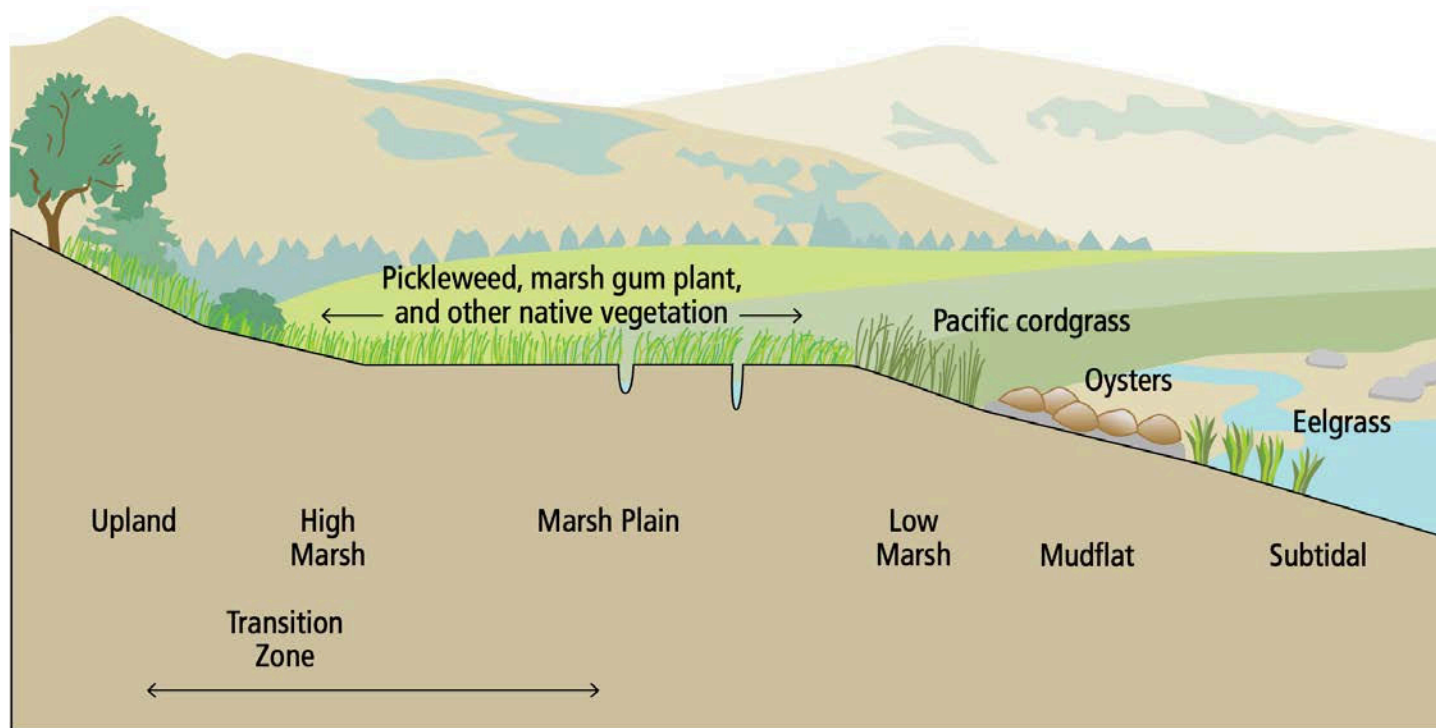
Restored tidal wetlands in Pond A21 captured by Cris Benton, aerial kite photographer. Photo courtesy of Cris Benton.

Most of us can only enjoy the beauty of tidal wetlands from their edges, by walking along trails that skirt their boundaries or boardwalks that cross over them. The photo of restored tidal wetlands in Pond A21 in the South San Francisco Bay captures the beauty and variations in habitat and topography, as well as the interplay between slough traces and tidal wetlands vegetation that might not be evident at ground level.

Complete tidal wetlands systems are important for the health and resilience of the Bay. What is a “complete

tidal wetlands system?” According to the 2015 “Baylands Ecosystem Habitat Goals Update,” a complete tidal wetlands system includes a continuum of habitats from the “open waters of the bay through intertidal mudflats, tidal marshes, and adjacent terrestrial areas” emphasizing all the aspects of the baylands ecosystem and the full gradient of ecological functions and services.

Figure 11 of the report, shown below, provides a graphic cross-section representation of a “complete tidal wetland.” As shown in the figure, the high marsh and upland areas are



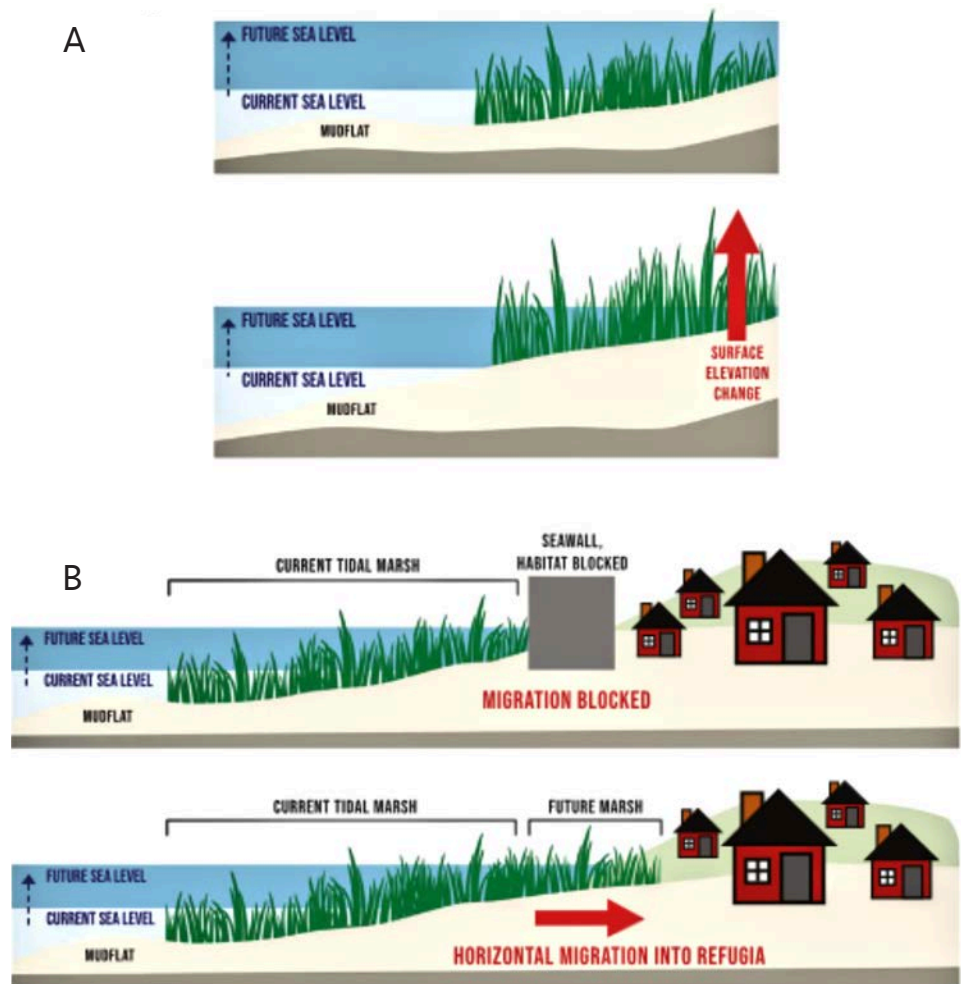
Schematic of the complete tidal wetland system. Figure 11 from the 2015 Baylands Ecosystem Habitat Goals Update.

key habitat components and they can provide a place where tidal wetlands vegetation can migrate as sea levels continue to rise.

Complete tidal wetlands play a crucial role in maintaining the ecological health and biodiversity of the Bay and we benefit from the many ecosystem services provided by them. Tidal wetlands provide flood protection from sea level rise, flood desynchronization of storm waters, reduce erosion through wave attenuation, improve water quality, provide habitat for many federally and state threatened and endangered species, provide important habitat for resident and migratory waterbirds, act as nurseries for fish and shellfish species, and can draw down and store large amounts of atmospheric carbon making tidal wetlands a crucial habitat in combating climate change. In addition, tidal wetlands provide passive recreation opportunities for wildlife viewing, fishing, etc.

Since the 1800's, California has lost between 90-95% of its coastal wetlands to development and other habitat altering activities, and the San Francisco Bay-Delta ecosystem supports over 77% of the State's remaining coastal wetlands. In recognition of the importance of this habitat to maintain and improve the ecological health and biodiversity of the Bay, efforts are underway throughout the Bay-Delta ecosystem to restore tidal wetlands. One of the largest efforts is occurring

Complete tidal wetlands support climate resilience by offering flood protection from sea level rise, reduced flooding from stormwaters, reduced erosion, and carbon storage.



Schematic of mechanisms to increase wetland resilience to long-term sea level rise: positive net surface elevation change (A) and horizontal migration into refugia (B). The illustration shows the mean peak water height during spring tides as the current sea level. Figure from 2022 Climate Central.

within the Refuge – the South Bay Salt Pond Restoration Project.

Despite these significant restoration efforts, our Bay's tidal wetlands are faced with the existential threat of

sea level rise. Tidal wetlands have two natural methods for responding to sea level rise: First, they can grow vertically (accretion) through the capture of sediment and growth of vegetation. Second, they can migrate landward where shoreline slopes permit. These processes are depicted in the figure above from a 2022 Climate Central paper, "Vulnerability and Resilience of U.S. Coastal Wetlands to Accelerating Sea Level Rise."

However, in the highly urbanized San Francisco Bay Area, human alterations have seriously compromised the natural resilience of wetlands. First, in many sections of the Bay, development goes right up to the edge of the Bay,

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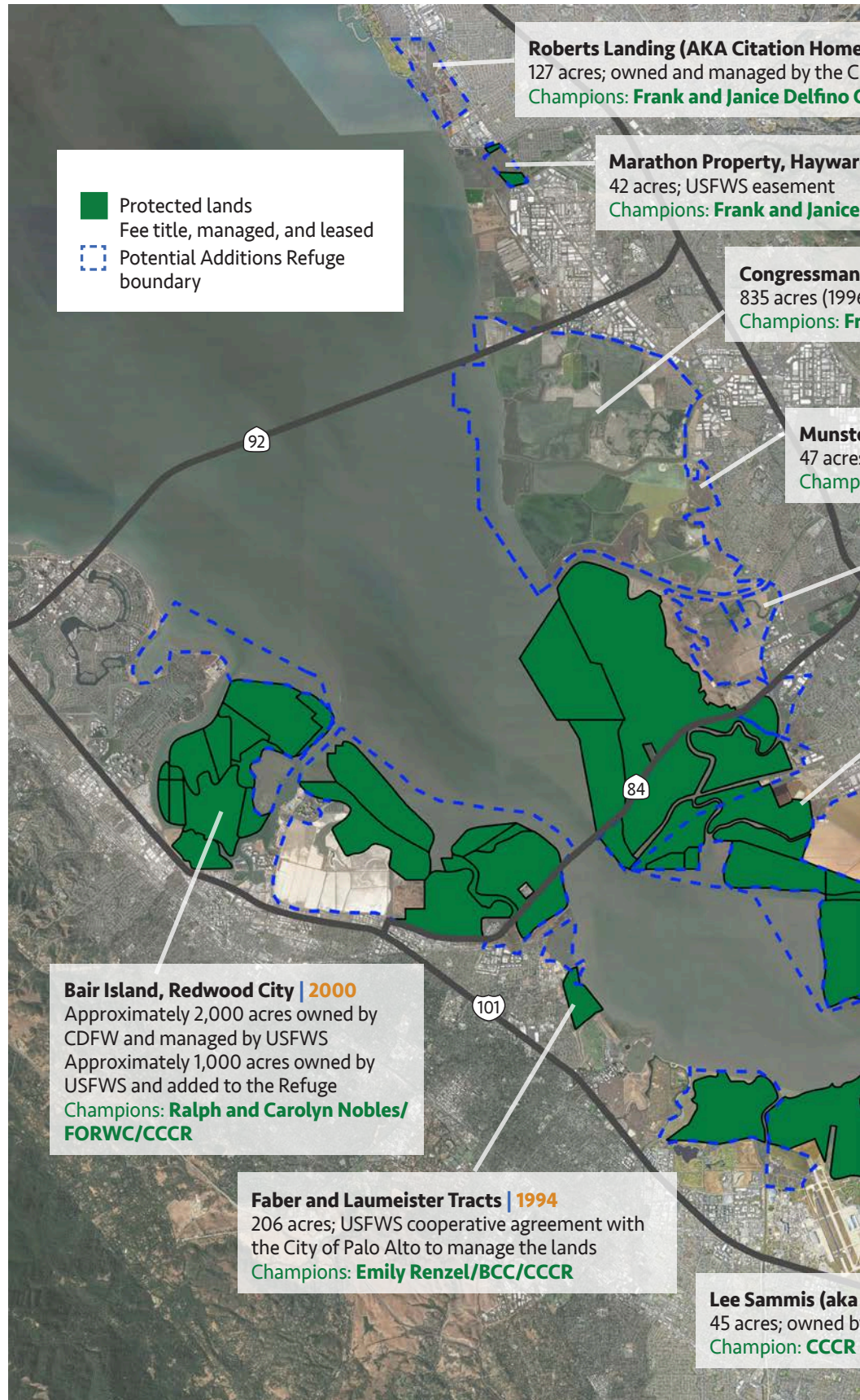
The Refuge and Lands Pro

The pieces of legislation passed by Congress in 1972 and 1988 approved the establishment and expansion of a national wildlife refuge in South San Francisco Bay that could include up to 43,000 acres. The first major addition of acreage to the Refuge occurred in 1977 when the USFWS purchased fee title of 14,151 acres of salt ponds from Leslie Salt Company on the east side of the bay.

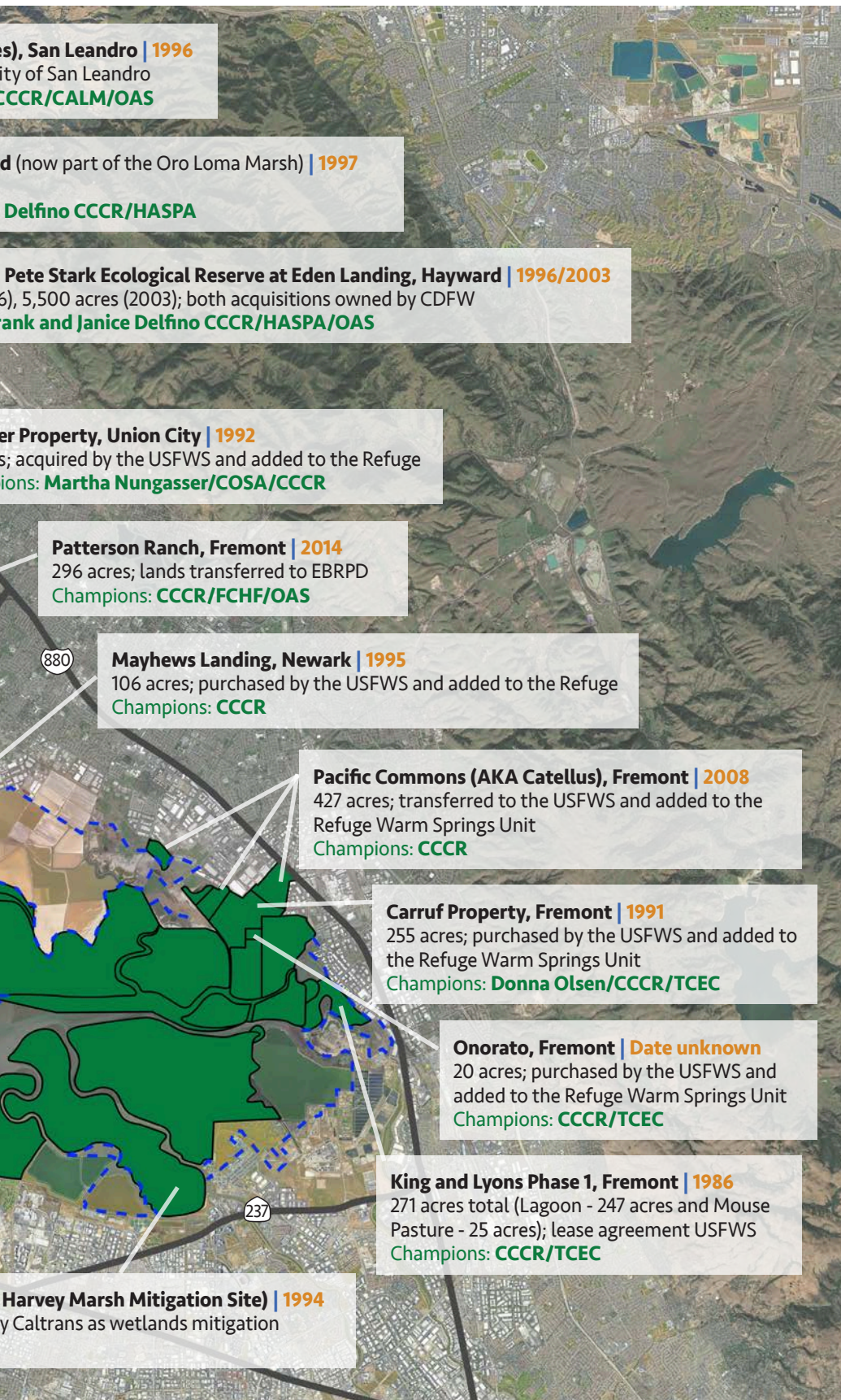
However, the work was not completed with the passage of legislation. Development pressure along the edges of the Bay has always been intense. The fact that lands have been identified as ecologically desirable and as "Potential Additions" to the Refuge does not mean these lands are protected from development.

To save these critical baylands, countless hours have been spent by CCCR individuals and member groups over the past five decades to fight development of these lands. Over time, lands identified within the Refuge Potential Additions Boundary have been permanently protected from development by the Refuge or other entities through purchases of land, land donations and when the Refuge agrees to accept land after permit-required wetlands mitigation has been successfully completed.

The map included on these pages captures many of the lands CCCR members and local member groups and partners have worked so hard to protect from development – sometimes for decades. The places on the map reflect grassroot campaigns, led by "ordinary" people who care deeply about the ecological health of the Bay and the wildlife these places can support. There isn't space to capture all the stories associated with the struggles to protect these lands, like Margaret Lewis and Linda Patterson standing in front of bulldozers to stop



Protected from Development



(s), San Leandro | 1996
City of San Leandro
Champions: CCCR/CALM/OAS

d (now part of the Oro Loma Marsh) | 1997
Champions: Delfino CCCR/HASPA

Pete Stark Ecological Reserve at Eden Landing, Hayward | 1996/2003
5,500 acres (2003); both acquisitions owned by CDFW
Champions: Frank and Janice Delfino CCCR/HASPA/OAS

er Property, Union City | 1992
s; acquired by the USFWS and added to the Refuge
Champions: Martha Nungasser/COSA/CCCR

Patterson Ranch, Fremont | 2014
296 acres; lands transferred to EBRPD
Champions: CCCR/FCHF/OAS

Mayhews Landing, Newark | 1995
106 acres; purchased by the USFWS and added to the Refuge
Champions: CCCR

Pacific Commons (AKA Catellus), Fremont | 2008
427 acres; transferred to the USFWS and added to the
Refuge Warm Springs Unit
Champions: CCCR

Carruf Property, Fremont | 1991
255 acres; purchased by the USFWS and added to
the Refuge Warm Springs Unit
Champions: Donna Olsen/CCCR/TCEC

Onorato, Fremont | Date unknown
20 acres; purchased by the USFWS and
added to the Refuge Warm Springs Unit
Champions: CCCR/TCEC

King and Lyons Phase 1, Fremont | 1986
271 acres total (Lagoon - 247 acres and Mouse
Pasture - 25 acres); lease agreement USFWS
Champions: CCCR/TCEC

Harvey Marsh Mitigation Site | 1994
y Caltrans as wetlands mitigation

the illegal destruction of wetlands on Mayhews Landing in Newark. Victories such as Bair Island reflect over a decade of hard work by many individuals and are noteworthy because of the large size of the parcels protected and restored; however, activists like Florence LaRiviere also revel in the memories of celebrating the protection of the 45 acres of the Lee Sammis parcel in Alviso. She remembers how precious and beautiful the wetlands on that site were to her and the great joy she and other CCCR members felt once they knew the lands had been saved. She also remembers the 20-acre Onorato site in south Fremont.

If you have stories about the efforts to protect any of these lands, please consider sending them to us at cccrrefuge@gmail.com. ✈

Lands in and around the Refuge protected over the years. This is based upon a map that appeared in the 2013 Comprehensive Conservation Plan for the Refuge. The Potential Additions boundary marked by the blue line approximates the line mapped in 1990. Note that parcels added after 2013 are not reflected on the map.

ACRONYMS
Baylands Conservation Committee [BCC], California Department of Fish and Wildlife [CDFW], Citizens for Alameda's Last Marshlands [CALM], Citizens for Open Space in Alvarado [COSA], Friends of Coyote Hills and Fremont [FCHF], Friends of Redwood City [FORWC], Hayward Area Shoreline Planning Agency [HASPA], Ohlone Audubon Society [OAS], Tri-City Ecology Center [TCEC], U.S. Fish and Wildlife Service [USFWS]

Tidal Wetlands

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so the historic open space areas where wetlands might migrate are no longer available.

All it takes is a look at a Google Earth image of the South Bay and it will quickly become evident that as sea levels continue to rise there are very few places remaining where it is possible for tidal wetlands to migrate landward. Traditional flood control protection such as levees and seawalls only further restrict the ability of Bay habitats to respond to sea level rise.

Second, so many of the creeks and rivers that flow into the Bay have been dammed and engineered into culverts, significantly reducing the quantity of sediment that would otherwise reach the Bay and be available for our wetlands to keep pace with sea level rise.

A recent San Francisco Estuary Institute (SFEI) publication, "Sediment for Survival," makes it clear that without access to sediment supplies and/or options to migrate landward, much of the Bay Area's wetlands risk drowning as sea levels rise.

However, there is still hope. The Bay's scientific community also makes it clear that through our actions today, we can ensure a future for the Bay's wetlands.



This photo taken during a King Tide of Bay tidal wetlands demonstrates that the vertical slopes of traditional levees leave very little horizontal space for tidal wetlands to migrate as sea levels continue to rise. Photo by Carin High.

This includes working together to permanently protect our remaining undeveloped baylands, mapping and preserving wetland migration areas, thoughtfully planning wetland restoration projects to incorporate varying elevations to respond to sea level rise, transporting sediment to support wetland accretion, and innovative ideas such as removing dams that are no longer needed and restoring historic creek-Bay connections that return sediment flows into the Bay and produce "mini deltas" that can withstand even

some of the highest sea level rise projections. Though we all know, a good idea doesn't implement itself – it's going to take all of us working together to ensure the Bay Area prioritizes the health and resilience of our Bay as we plan the future of our region.

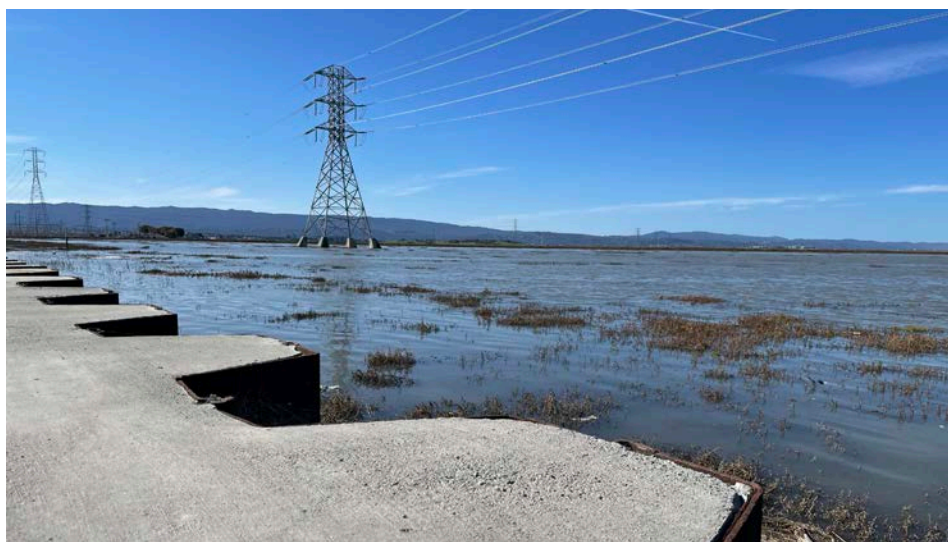
The paper by Climate Central, focusing on wetlands in the U.S., states, "Wetlands could increase in area by 25% or decline by 97% by 2100 depending on the pace of sea level rise, how fast wetlands can grow vertically, and **especially how much land is conserved for wetlands migration.**

Each of these factors is controlled, to at least some extent, by human choices." [emphasis added]

An important conclusion of the report is "**The future of [coastal] wetlands in the U.S. depends largely on the choices humans make now.**"

<https://www.climatecentral.org/report/vulnerability-and-resilience-of-u-s-coastal-wetlands-to-sea-level-rise>

Our article on page 14 describes why it is so important to renew our efforts to "complete the Refuge" by acquiring lands that can provide tidal wetlands migration space. 🌊



Tidal wetlands in the Mosley Tract (northwestern end of the Dumbarton Bridge) completely inundated during a King Tide, with Bay waters right up to the edge of a concrete wall. Photo by Carin High.

Memories from Our Refuge Managers

Rick Coleman

**Project Leader Refuge Complex
1986-1993**

I look back fondly at my time at the Refuge Complex. It was an exciting and challenging time. Some of the highlights we accomplished at the San Francisco Bay National Wildlife Refuge were the doubling of the size of the of the Refuge; breaching old salt pond levees to restore tidal flow to places like the LaRiviere Marsh. These lands now support the endangered Ridgway's Rail and salt marsh harvest mouse, and rare plant species such as the Point Reyes Bird's Beak. There was the acquisition of the Carruf property and with that purchase, protection of rare vernal pool habitat and species in the southern portions of Fremont. We greatly expanded environmental education with an emphasis on training teachers to run these programs at the Refuge and in their classrooms. That's some of what we worked on. It was a wonderful experience that influenced the rest of my career within the National Wildlife Refuge System.



Mendel Stewart

Project Leader Refuge Complex 2004 - 2012

There are so many wonderful memories of my time at SFBNWR Complex but being involved with the restoration of thousands of acres of wetlands was a big highlight. I often said that work perfectly illustrated the societal transition from the age of habitat destruction to the new age of habitat restoration. Of course, I also can't forget the incredible story of why that restoration work became possible. It was due to the dedication of a small group of citizens who said "not on our watch" and then proceeded to create the first urban National Wildlife Refuge in the nation. I had the pleasure to get to know some of them and try to do my part at recognizing their efforts such as the event to dedicate a trail at Bair Island in honor of Ralph Nobles. All these are wonderful memories of a place with a rich and dynamic history.



Marge Kolar

Project Leader Refuge Complex 1994-2004

One of my fondest memories was from 2003, when the National Wildlife Refuge System celebrated its 100th Anniversary and each refuge was asked to develop an appropriate event. Our event was a train trip through Drawbridge with actors in period costumes describing what life was like 100 years ago in that small salt marsh community. Our Visitor Services staff convinced the Altamont Commuter Express folks that the event would be good PR for the newly formed company and arranged for passengers to be picked up at the Fremont station by one of the new ACE trains. Staff also convinced Union Pacific to halt all other traffic on the line for 30 minutes, so our train could stop at the ghost town of Drawbridge for the actors to play their parts. The train then went to San Jose and returned, stopping again at Ponds A21/22 to discuss the upcoming restoration of the ponds. About 100 passengers enjoyed the trip, the play, a special 1903 newspaper edition, and a light lunch all while learning about the refuge's ghost town and upcoming wetland restoration plans.



Anne Morkill

Project Leader Refuge Complex 2012-2020

The Don Edwards San Francisco Bay National Wildlife Refuge is a living testament to the power of community and partnerships. Thanks to the efforts of conservation-

minded local citizens and elected officials fifty years ago, the refuge today represents the best of the National Wildlife Refuge System: a wild oasis in an urban landscape set aside for the conservation and restoration of the fish, wildlife, plants and their habitats for the benefit of present and future generations of Americans. My favorite

recollections are from levee breaches, when just as the last plug of dirt is removed and bay waters rush in for the first time in a hundred years, flocks of shorebirds immediately swoop in to their new home as if to say thank you! It is a magical moment that makes all the years of planning meetings and stacks of reports worth the effort!



Matthew Brown
Refuge Manager 2019-2021
Project Leader Refuge Complex 2021

As we look back on all that has transpired over the last 50 years, one can't help but wonder what the next 50 years will bring. In some ways the challenges the Refuge faces are more complex/global than they were when the Refuge was established, with sea level rise and a changing climate already impacting Refuge resources. Sadly, we also see the impacts of climate change having the greatest impact on traditionally underserved and economically disadvantaged communities.



But in these challenges, there is hope. The restoration work taking place is making the Refuge more resilient to our changing world. Perhaps

more importantly, the Refuge is committed to working with and for those traditionally underserved communities, to not only minimize the daily impacts of climate change on their homes and families, but to inspire and grow the next generation of thoughtful and committed citizens who will continue to shape and change the world. The Citizens Committee to Complete the Refuge and its members have been our guiding light for 50 years, and I am confident you will continue to inspire us into the future.

Many thanks to all of you.

John Bradley
Deputy Refuge Complex Manager 2004-2012

Important to me as a resident among the eight million residents of the SF Bay Area and as a deputy manager was the size and extent of the Refuge complex. The

Don Edward's Refuge Complex protects a variety of habitats and wildlife populations, among which provide secure sanctuary for several threatened and endangered species.

What a challenge and honor it has been to be connected with the conservation and protection of these species.

Most of my fondest time at the refuge, not unsurprisingly, included trips out into the refuge, nighttime survey of the Santa Cruz long-toed salamander, survey of the Lange's metalmark butterfly, presence-absence trapping in Salicornia-dominated salt marshes along the San Francisco Bay shoreline of salt-marsh harvest mouse... plus performing at the annual bird festival at San Pablo NWR, playing the rhythm guitar for the Mucky Muck music group and participating in the annual Halloween parties at the Environmental Education Center in Alviso.



More memories from

Chris Barr
Deputy Refuge Complex Manager 2015-present

It's important to take a moment like a 50th celebration and reflect on the past, acknowledge current efforts, and look to the future of the bay.

While there is so much more to do with the urgency of sea level rise, it's uplifting to see residents within Bay Area communities pushing for a common goal. I know the future is bright for I see it in the eyes of the next generation, eager to learn and getting involved with hope and passion for the Bay's future.



Roy Lowe
Refuge Manager 1981-1985

In 2009, former Refuge Manager Roy Lowe shared his thoughts about why there was a need to go back to Congress to seek expansion of the original size of the Refuge of 23,000 acres:



"While the original establishment of the 23,000 acres of refuge was heroic, it became clear to many of us in the mid 1980's that there were still huge threats to habitat around the south bay and that some important habitats were not included in the original refuge boundary. One of the major shortcomings of the original refuge

establishment was the failure to include significant areas of upland and wetland transition habitat or very important seasonal wetlands and vernal pool habitats. The upland and wetland transition habitats are critical to the survival of the California clapper rails and the salt marsh harvest mouse because they provide escape cover during the high tides. Without this habitat these species are exposed to serious predation. The ability of large acres of tidal marsh to support these species could be greatly reduced due to the lack of high tide cover habitat. This really hit home for me when we conducted high tide airboat surveys of clapper rails and I saw how vulnerable they were.

One of the concerns I had was that I didn't think it was enough to rely on federal and state wetland regulations to protect the wetlands around the South Bay. Despite the strength of these regulations, wetland losses still occurred. However, my biggest concern was the future. What problems would the Refuge be facing in 50 or 100 years? My simple answer is, if you really want to protect habitat in perpetuity you need to own it and manage it."

our Refuge Managers

Clyde Morris

Refuge Manager 1998-2009

My favorite memory from my time as the Refuge Manager was the day in 2006, when the Island Ponds (A-19, 20 & 21) were breached. This allowed the first tidal flows back into the South Bay salt ponds after the historic acquisition of 16,500 acres from Cargill in 2003.

My heart and mind swelled with pride and tears came to my eyes when we had finally accomplished a goal set so many years ago by the Citizens to Complete the Refuge who had sat around a kitchen table. The Citizens discussed how to restore the South Bay back to what the Indigenous people had maintained under their stewardship. So many NGOs, private citizens, elected officials and governmental agencies had come to support the Citizen's vision and that day was a huge step forward in what has become a slow but successful fulfillment of the restoration dream.



Eric Mruz

Refuge Manager 2010 - 2014

The first breach – island ponds 2006: I remember it being a crisp summer morning as we shuttled partners and stake holders in boats out to the Pond A21 levee. I needed to put boards down in order to get folks from the boats over the sticky bay mud up onto the levee. We stood on the levee waiting for the rising tide looking at the huge amphibious excavator floating in the water ready to perform the breach.



After years of designing, planning, permitting, and dealing with someone taking the amphibious excavator for a joy ride down the slough the night before, we were ready to breach the levee and start the restoration process of former salt ponds. Seeing the San Francisco Bay finally flow back into Pond A21 after over 100 years of being diked was one of the most enjoyable experiences of my career. I felt grateful for the opportunity to make landscape level changes in the Bay to fight climate change and create habitat for a variety of species for decades to come. Happy 50th anniversary to Don Edwards San Francisco Bay NWR.

Jared Underwood

Refuge Manager 2017-2019

The Refuge is a truly amazing place. A place that is both a remnant of our past and the path forward for our future. Where the animals that inhabited the Bay long before our coming are still found, and as a resource that will provide us with protection from the effects of the climate crisis that we have created. By protecting and restoring the marshes of the refuge, we both protect this legacy and allow for climate adaptation to continue. As sea



level rises, the marshes can grow to meet it and limit its impacts to our human environment, while still providing habitat for the unique and exquisite creatures found nowhere else in the world, or that need the marshes for wintering, breeding or stopover habitat. The refuge is also a place for healing of the soul, where we can feel close to nature and far from the hustle and bustle that surrounds the Bay. One of my favorite experiences on the refuge is to be on a trail and truly feel that I am in the middle of wilderness, yet only be hundreds of feet from millions of people.

Ann Spainhower

Refuge Manager 2022 – current

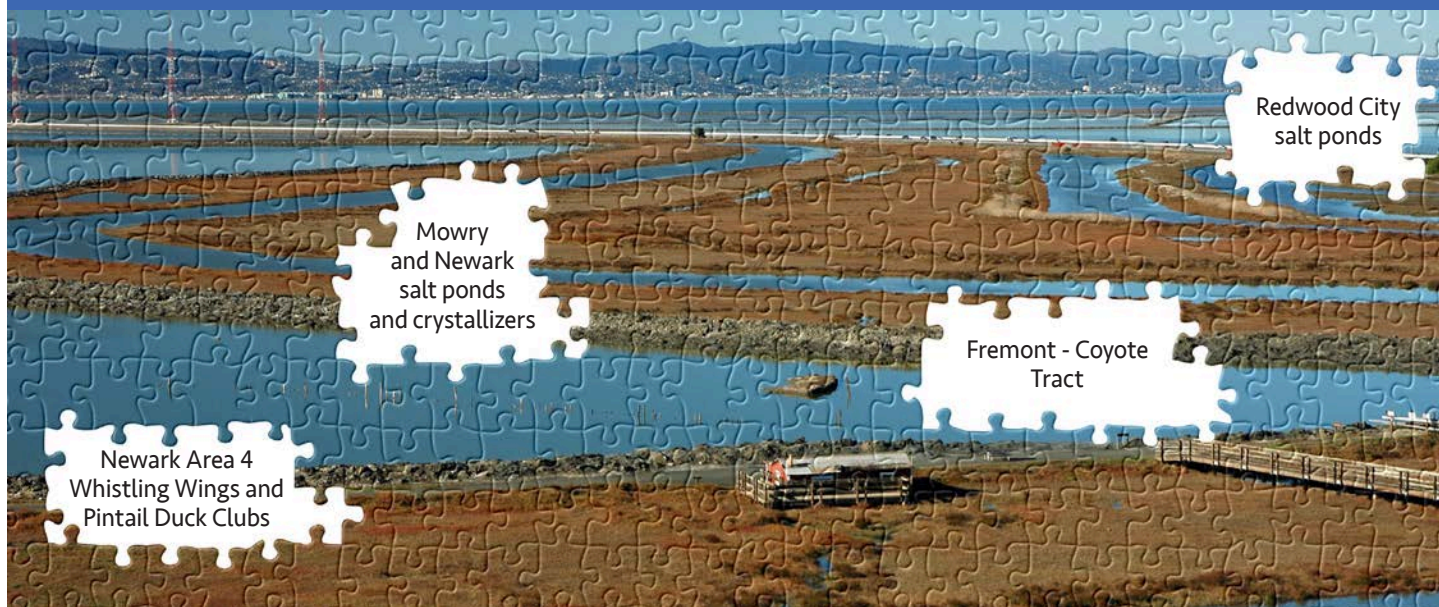
I have been the Refuge Manager for Don Edwards San Francisco Bay NWR for only a short time –

I started July 2022. The first time I visited the refuge was shortly after being awarded the position, and before starting the job. I walked the marsh trails in Alviso and Fremont and was immediately struck by the beauty of the marsh and how it felt isolated from the megalopolis that surrounded it. Right in the middle of this populated region the birds are varied and numerous, the rabbits and ground squirrels are busy running about, and occasionally a grey fox may be seen. I was also struck by the enormity of the work that has been done in the past 50 years here, and the many hands that have had a role in conserving this land and restoring it so that it benefits both native wildlife and the American public.



It is one of my greatest desires that there will come the time when this location is a common stop for Bay Area residents and visitors alike, and when it is rare to hear from people that they lived in the Bay Area their whole life and never knew this refuge existed. This land is your land, and while we are here to provide areas for conservation of natural resources, a significantly important part of our focus is to support visitors through offering opportunities for a variety of outdoor activities including photography, wildlife watching, fishing, hunting and environmental education. 🦋

A Call to Action: Complete the Refuge



Do you have a favorite image of San Francisco Bay? One of ours is the view from the Janice Delfino Memorial Bench on top of the hill at the Don Edwards San Francisco Bay National Wildlife Refuge Headquarters in Fremont. It's a breathtaking vista of the Bay and its varied habitats, and we are reminded that if not for the establishment of the Refuge in 1972, the landscape could have been strikingly different. Instead of sweeping vistas of San Francisco Bay and lands that support iconic species like the salt marsh harvest mouse, Ridgway's Rail and multitudes of shorebirds and waterfowl, we could be looking out onto a sea of development devoid of the marshes and the wildlife that enrich our lives.

The fact that the Refuge now permanently protects 30,000 acres of baylands from urbanization, supports a diversity of species and habitats and provides miles of trails for Bay Area residents to enjoy is certainly cause for celebration! This would not be possible without the extraordinary efforts, passion, persistence, and skill of CCCR members and member groups and partners over the past fifty years. Our deepest gratitude to all who work tirelessly to protect wetlands and the Refuge.

It is also the perfect time to reflect on the work yet to be done to ensure the Refuge continues to thrive in this era of climate disruption. Just like the image of the incomplete puzzle, the work of completing the Refuge is not finished. Undeveloped lands around the edges of the bay continue to be consumed by development despite all we know about the coming threat of sea level rise. Sea level rise will not only pose a threat to our communities and infrastructure, but will also have negative impacts on baylands habitats and wildlife.

In the South Bay in particular, the pattern of developing right up to the edges of salt ponds or the Bay shoreline has left very few places where tidal wetlands could migrate landward as rising sea levels drown existing marshes. Tragically, some of the remaining tracts of land that could provide landward tidal wetlands migration space are under imminent threat of development and could be lost to the bay ecosystem forever. We risk losing thousands of acres of tidal wetlands in the South Bay if we do not protect these crucial areas of undeveloped uplands and historic baylands.

Now is the time to redouble our efforts to protect the invaluable lands listed below. These areas have been identified in countless reports focused on the ecological health of the Bay as important places that should be permanently protected for the ecological benefits they can provide now and into the future. These reports include peer reviewed, science-based documents including the 1999 Goals Project, the 2013 USFWS Tidal Marsh Ecosystem Recovery Plan, the 2015 Baylands Ecosystem Habitat Goals Update and the 2019 San Francisco Bay Shoreline Adaptation Atlas.

Newark Area 4 (500 acres)

The former Whistling Wings and Pintail Duck Clubs in Newark's Area 4 are located in a site that has been identified in reports such as the San Francisco Estuary Institute's "Sediment for Survival" as an area with "Higher potential for long-term baylands resilience with respect to vertical accretion with polder [diked baylands] filling: Local inorganic sediment supply combined with Bay inorganic sediment supply could go a long way toward meeting demand for existing and restored baylands..."

Area 4 is an amazing mix of wetland habitats (seasonal, brackish, muted tidal) that grade landward to transition zone habitat and uplands. The site currently supports the federally-listed endangered salt marsh harvest mouse and provides habitat for resident and migratory waterbirds. Permanent protection of this site could expand important habitat and provide climate change resilience for tidal wetlands and for the adjacent communities of Newark and Fremont.

Mowry and Newark Salt Ponds and Crystallizers (3,000+ acres)

The salt ponds and crystallizers are still used to produce solar salt. If and when salt production ceases, these 3,000+ acres are highly coveted for restoration to tidal wetlands, transition zone habitat and tidal wetlands migration space. The Newark and Mowry ponds are all close in elevation relative to the intertidal marsh zone; therefore, they have the inherent potential to develop tidal marsh vegetation faster, and with less need for sediment input. This is particularly important as we face the realities of dwindling sediment supplies to San Francisco Bay. The ponds are contiguous with the largest tracts of natural tidal marsh supporting endangered Ridgway's Rails in the South Bay, as well as endangered salt marsh harvest mouse habitat. They are especially valuable because they are naturally more likely to regenerate stable tidal marsh in the face of near and long-term accelerated rates of sea level rise.

We must continue to advocate for the permanent protection of these lands from development if we want to protect the biodiversity and ecological health of San Francisco Bay. There is a lot at stake, and it begins with ensuring that places remain in the South Bay where tidal wetland habitat will continue to thrive in this era of sea level rise.

Fremont-Coyote Tract (90 acres)

Permanent protection of the 90+ acre Fremont-Coyote Tract could complete an important corridor of baylands habitat that lies adjacent to the Dumbarton Bridge just north of the Refuge. Today, this privately-held parcel located directly between Coyote Hills Regional Park and the Refuge is a missing link. Loss of this site to development would lead to destruction of valuable habitat, fragmentation of adjacent habitats and a reduction in the upland area where tidal marsh species may move up slope in response to rising sea levels.

The intertidal channel that historically carried tidal flow to the site is currently an engineered channel that conveys flows beneath Highway 84 from the Refuge marshes over to the Fremont-Coyote Tract. Preservation of this channel ensures the

site hydrology could be easily improved to enhance the habitat. Previous surveys of this site have indicated that more than 75 of the approximately 91 acres would meet the criteria for wetlands. Thus, 83% of the site is already providing some wetland function. The endangered salt marsh harvest mouse has been documented on site in the pickleweed habitat. Improved water flow to the area would enhance tidal action and improve habitat for the mouse.

Redwood City Salt Ponds (1433 acres)

These salt ponds represent an unrivaled opportunity to restore tidal wetlands on the San Mateo County shoreline. This site is unique due to its proximity to the Port of Redwood City and the potential for beneficial reuse of sediment dredged from Redwood Creek by the Port. The dredged sediment could be utilized for tidal wetlands restoration to elevate the marsh plain helping restored wetlands keep pace with rising sea levels. Restoration of tidal wetlands and high marsh habitat would expand the extent of available habitat for endangered species, and provide all the benefits that tidal wetlands create for wildlife and our communities including carbon sequestration and climate change resilience. Restoration of tidal marsh vegetation could happen relatively quickly because the ponds are not subsided below the level of the adjacent marsh plain. 🐭



Sea level rise poses drowning threats to habitats and species, including the endangered salt marsh harvest mouse. Photo by Rachel Tertes.

We are indebted to Dr. Howard Shellhammer and the professors of San Jose State University for getting the salt marsh harvest mouse federally listed as an endangered species. It is only found in tidal wetlands and diked baylands of San Francisco Bay.



Refuge entrance in Fremont. Photo by Kate High.

Photos, front cover, top row, L to R:
Endangered Contra Costa goldfields, Warm Springs Unit Refuge. Photo by Carin High.

Threatened Western Snowy Plover, Refuge Headquarters. Photo by Kate High.
Endangered salt marsh harvest mouse, Refuge. Photo by Rachel Tertes.
Point Reyes Bird's Beak, LaRiviere Marsh. Photo by John Bradley.

Common Yellowthroat, LaRiviere Marsh. Photo by Carin High.

Front cover, center:
LaRiviere Marsh. Photo by Sam High.

Front cover, bottom row, L to R:
Paul Souza, Regional Director USFWS. Photo by Stephen Nguyen.
Florence and Philip LaRiviere. Photo by Kate High.

Refuge Complex Project Leader Matthew Brown with Florence LaRiviere. Photo by Stephen Nguyen.

Dr. Howard Shellhammer, Judge Leonard Edwards, and Florence LaRiviere. Photo by Carin High.
Desiree Munoz. Photo by Kate High.
Dr. Howard Shellhammer, Florence LaRiviere, and Nancy Holmes. Photo by Carin High.



This special report commemorating the 50th anniversary of the Refuge is a publication of the Citizens Committee to Complete the Refuge, an all-volunteer nonprofit public benefit corporation.

Our mission is to save the Bay's remaining wetlands by working to place them under the protection of the Don Edwards San Francisco Bay National Wildlife Refuge, and to foster worldwide education regarding the value of all wetlands.

Support is welcome from anyone interested in saving wetlands.

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