



# 2021 ANNUAL REPORT

To restore and enhance Santa Monica Bay through actions and partnerships that improve water quality, conserve and rehabilitate natural resources, and protect the Bay's benefits and values

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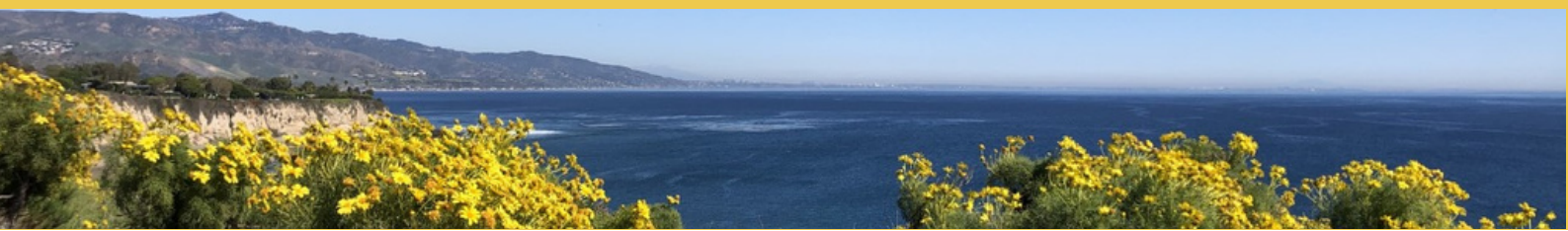
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*a year in review*

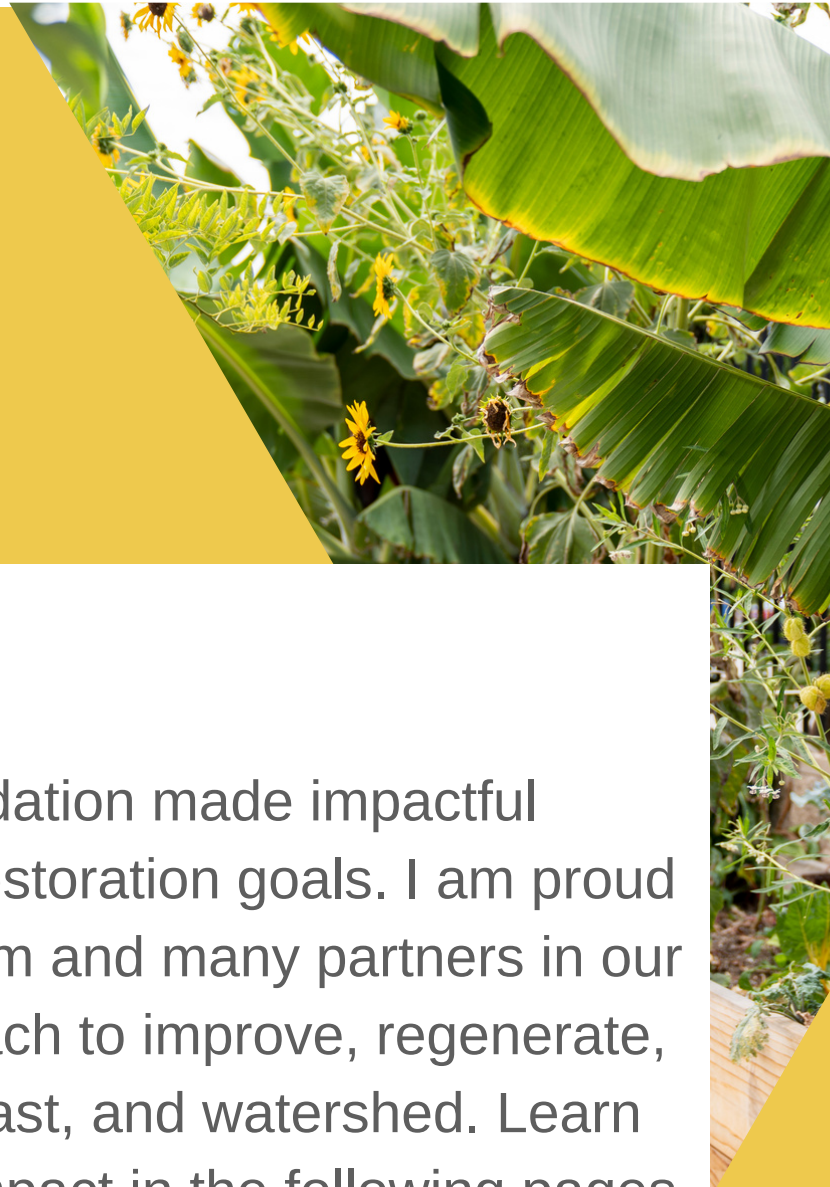
# A MESSAGE FROM CEO TOM FORD

Dear Friends,

In 2021, The Bay Foundation made impactful progress towards our restoration goals. I am proud of the efforts by our team and many partners in our ecosystem-wide approach to improve, regenerate, and protect our bay, coast, and watershed. Learn more about our 2021 impact in the following pages.

Cheers,  
Tom Ford

Chief Executive Officer  
The Bay Foundation



# 2021 AT A GLANCE

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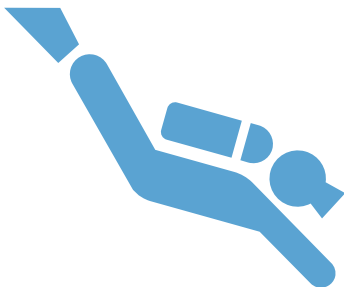
**29,930**

pounds of iceplant were pulled from our coastal restoration sites



**145**

volunteers have donated their time to restoration projects at the Ballona Wetlands Ecological Reserve and LAX Dunes



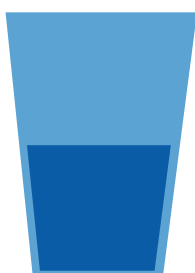
**287**

hours were spent underwater by TBF marine biologists, completing a total of 549 dives



**100**

plants were planted at Environmental Charter Middle School Inglewood's community garden with the power to reduce ~200 KG of carbon emissions



**58,799**

58,799 single-use disposable food and beverage items were eliminated from the waste stream at 3 LA County yacht clubs

# OCEAN RESTORATION

# RESTORING KELP FORESTS

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Kelp forest ecosystems are found in temperate coastal regions around the world. In Santa Monica Bay, our beautiful kelp forests, when healthy, are dominated by giant kelp (*Macrocystis pyrifera*). Giant kelp grows from rocks on the ocean floor all the way to the sea surface where it spreads out to form a dense canopy. The three-dimensional kelp forests of southern California support an incredibly diverse and biologically productive ecosystem that is home to more than 700 species of algae, invertebrates, fish, and marine mammals.



Giant kelp is one of the fastest growing organisms on the planet, and as it grows, it pulls carbon dioxide from the seawater as part of the first stage of a carbon sequestration pathway. Their ability to address ocean acidification and reduce coastal erosion makes kelp forests incredibly valuable in our efforts to adapt to climate change in Los Angeles.

# RESTORING KELP FORESTS

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A multitude of impacts over the past 170 years has resulted in the loss of roughly 80% of our kelp in LA. Frequently, under compounded stressors, the kelp forest is converted into an urchin barren that is not able to provide the same diversity, productivity, or coastal protection. Without algae, the barren offers little carbon sequestration services. To reverse this trend and create more stable kelp forests, The Bay Foundation (TBF) has led the Palos Verdes Kelp Restoration Project, reducing the number of urchins on the reef and allowing the kelp forest to return.

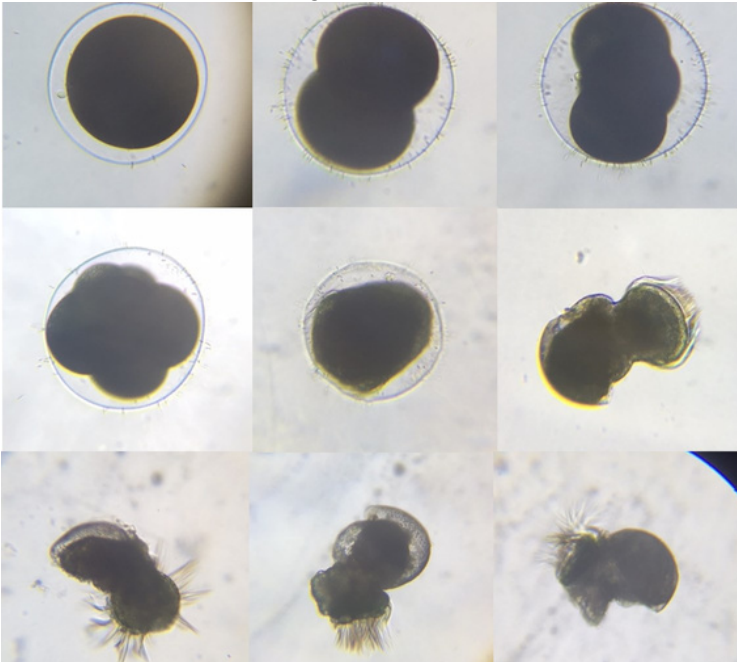
Over 57 acres of reef have been transformed back to kelp forests over the past nine years with dive teams spending more than 10,000 hours underwater. Throughout this time, TBF and partners have documented increased giant kelp canopy, higher densities of kelp bass and California spiny lobster, and higher algal and invertebrate diversity at all restoration sites. This project is internationally recognized as one of the largest and most successful efforts of its kind.



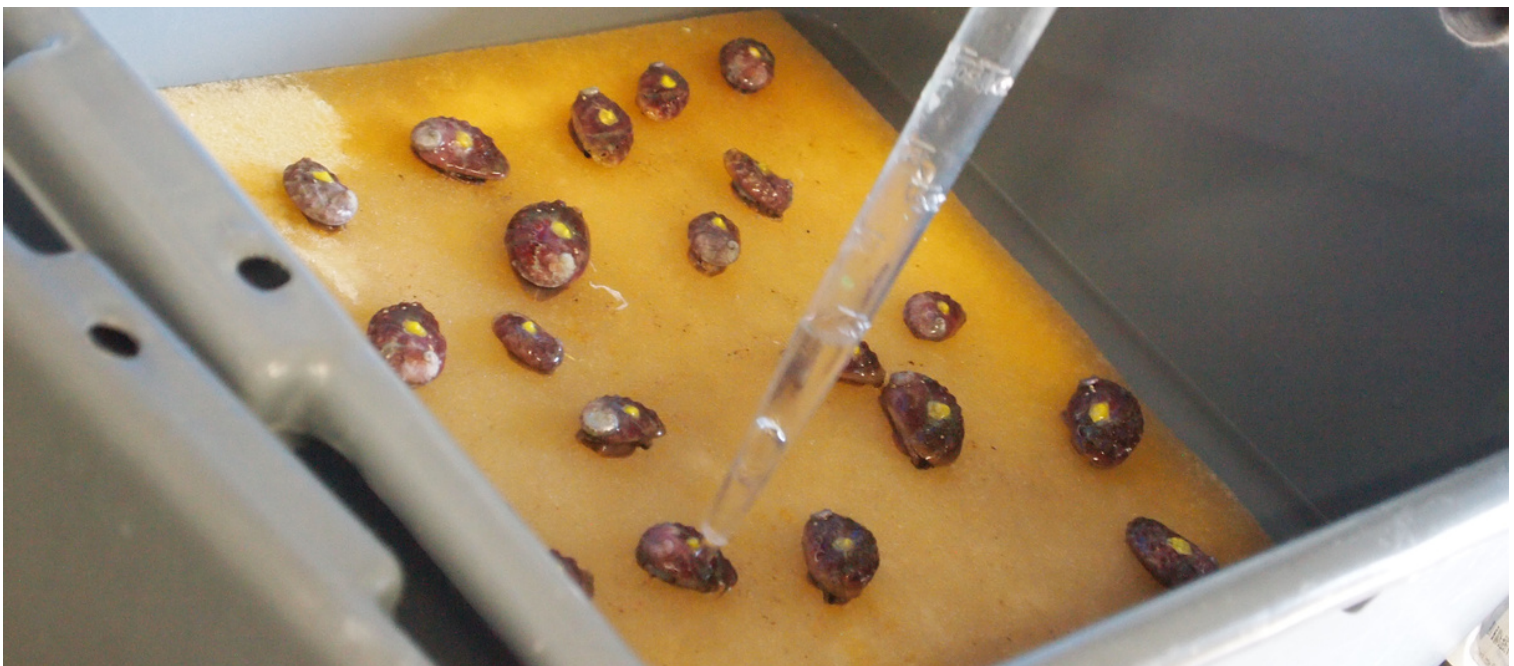
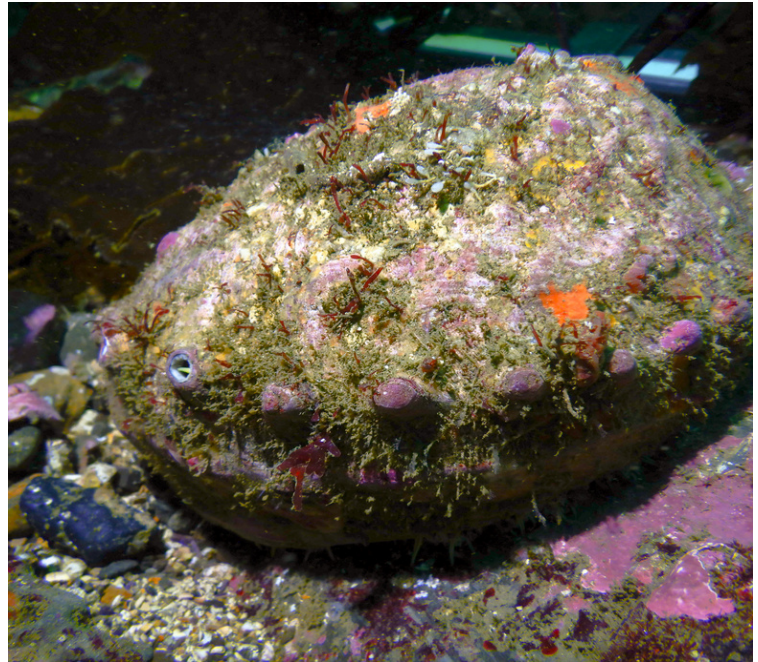
# RECOVERING ABALONE POPULATIONS

White abalone are an endangered, algae-eating marine snail that were once abundant throughout southern California. Today, their numbers are low due to historic overfishing, disease, and poor reproduction. White abalone are important members of kelp forests as they compete with urchins for space, which limits urchins from decimating the forests and ultimately fosters ecosystem biodiversity.

Larval Stages of Red Abalone



Adult Wild White Abalone



Tagged White Abalone Basted with Seawater



# RECOVERING ABALONE POPULATIONS

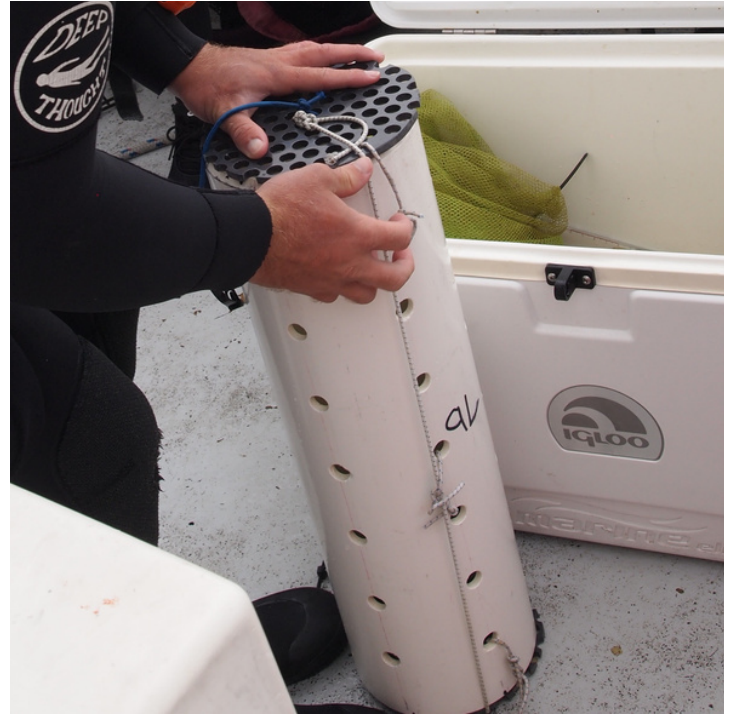
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In previous years, TBF and partners have worked to restore this species to southern California's rocky reefs by outplanting thousands of captive-bred individuals. TBF assists these efforts through the operation and maintenance of two mariculture facilities located at the Southern California Marine Institute. These spaces serve as a hatchery for abalone rearing, method development, and long-term housing of broodstock. In addition to the operation of these mariculture facilities, TBF researchers coordinate with other partners to outplant animals into SAFEs (Short-Term Abalone Fixed Enclosures), and BARTs (Baby Abalone Recruitment Traps) along the southern California coast.



# RECOVERING ABALONE POPULATIONS

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The SAFEs and BARTs provide protection to the outplanted abalone as they acclimate to life in the ocean. In 2021, nearly 1,400 white abalone were outplanted. Post-outplant, TBF divers monitored the site 23 times to identify any abalone and assess the quality of the habitat. It is expected for these outplanted abalones to hide in cracks and crevices for up to three to five years. At that time, these three to five-year-old adult abalone will be free from most predators and position themselves on open faces of the reef, allowing partners to determine project success.



# RESEARCHING AND RESTORING EELGRASS

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Eelgrass (*Zostera* spp.) is a marine flowering plant that forms “meadows” and is found in temperate regions throughout the world. Eelgrass and other seagrasses provide several ecosystem benefits and services including nursery habitat development, carbon sequestration, erosion reduction, and water quality improvements. Despite the ecological function and importance of seagrasses, these habitats are experiencing staggering rates of loss through numerous global threats and local stressors. Taking action, TBF and Paua Marine Research Group (PMRG) initiated a pioneering effort, the Santa Monica Bay Subtidal Eelgrass Restoration Project, to collect data on this understudied habitat and to inform the efficacy of eelgrass restoration in Santa Monica Bay.



In July 2021, 306 square meters of eelgrass from two donor beds on Catalina Island were transplanted to three geographically distinct sites in Santa Monica Bay. TBF and PMRG divers are closely tracking eelgrass health, fish community, and oceanographic conditions to understand the drivers of transplant success.



# BEACH PROTECTION

# IMPLEMENTING LIVING SHORELINES

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Los Angeles beaches are recognized around the world for their warm sunshine, cool breezes, and fun waves. Each year, tens of millions of visitors enjoy beach volleyball, surfing, family visits, and more. This amount of human activity has caused substantial changes to these beaches over time. The construction of structures like parking lots, roads, piers, groins, revetments, storm drains, and daily maintenance activities such as grooming or raking have removed most of the plants, dunes, and deterred wildlife from this coast. TBF, and its many partners, are bringing back these dunes, plants, and wildlife. Scientific monitoring results show that these projects create beaches with higher elevation and more complexity, helping to hold back the ocean, while simultaneously preserving recreation for people and refuge for wildlife. These “living shorelines” help provide nature-based solutions to address climate change, add beauty, and protect our coast from erosion and flooding.



# IMPLEMENTING LIVING SHORELINES

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## Malibu

TBF and partners are aiming to restore approximately three acres of sandy beach and dune habitats at Zuma Beach and Point Dume Beach to improve coastal resiliency and increase beach health. In 2021, TBF's work focused on community outreach, restoration activities, monitoring, and site maintenance. To start this effort, approximately 25 tons of invasive iceplant and other non-native vegetation were removed from the project area. Invasive plants, such as iceplant, choke out native vegetation and prevent dunes from forming. The site was subsequently seeded, and over 500 native plants were planted. Sand fence segments and biomimicry stakes were installed to promote dune growth.



# IMPLEMENTING LIVING SHORELINES

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## Los Angeles

TBF and partners are implementing a multi-habitat approach to restore almost four acres of beach and coastal bluff habitat at Dockweiler State Beach. In 2021, we made significant progress on permitting, project outreach, finalizing a Restoration and Monitoring Plan (June 2021), and preparing for implementation.



# IMPLEMENTING LIVING SHORELINES

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## Manhattan Beach

Approximately three acres of beach dune habitat are being restored in Manhattan Beach. The goals of this project are to implement nature-based protection measures against sea-level rise and coastal storms, and increase engagement of the community through enhanced beach experiences, outreach, and education. Collectively these goals advance TBF's approach towards increased coastal resilience.



In 2021, TBF conducted project outreach, finalized restoration and monitoring plans, and acquired necessary permits. Implementation began in early 2022, with more seeding and planting to occur in 2022 and 2023.



# IMPLEMENTING LIVING SHORELINES

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## Santa Monica Dune Restoration

Community outreach, planning, funding, and permitting are the starting point for TBF's restoration projects. In 2021, this second dune project progressed through early stages of development. Starting in 2022, approximately four and a half acres of beach habitat on Santa Monica Beach will be created.



Western snowy plover

A portion of this site will be designed to protect the federally threatened western snowy plover. Project partners include TBF, the City of Santa Monica, California State Parks, Audubon Society, and public stakeholders. This project will be funded by the Refugio Oil Spill Trustee Committee and managed through the National Fish and Wildlife Foundation.

# RESTORING DUNES

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The LAX Dunes, also known as the El Segundo Dunes, are the largest remaining contiguous coastal dune system in southern California. The 302-acre dune site is owned and managed by Los Angeles World Airports. The site provides habitat for over 900 species, including the beautiful and delicate federally endangered El Segundo Blue Butterfly.



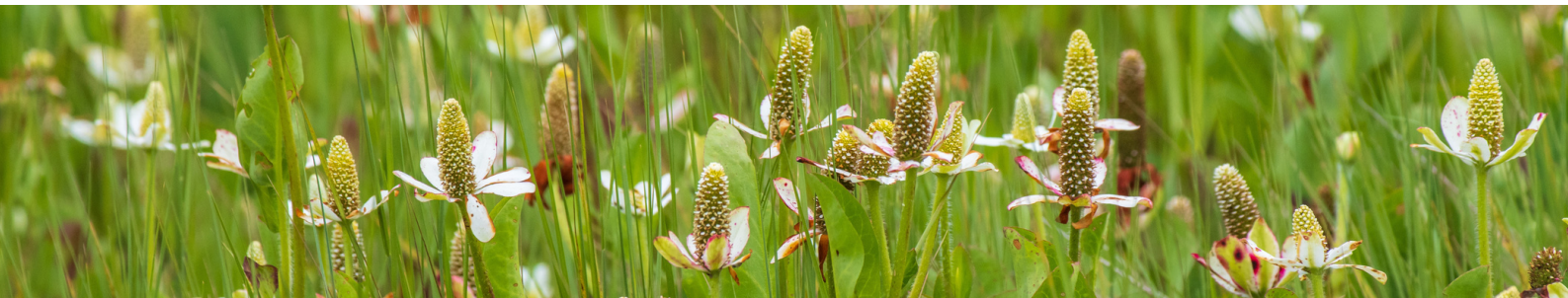
In 2021, TBF continued restoration logistics and implementation of this project. From fall to winter 2021, several community restoration events took place where volunteers removed non-native vegetation. In addition, TBF, LA Conservation Corps, and IO Environment and Infrastructure planted approximately 10,800 native plants.

# WETLANDS REVITALIZATION

# BALLONA RESERVE COMMUNITY STEWARDSHIP PROJECT

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TBF, in partnership with the California Department of Fish and Wildlife, Friends of Ballona Wetlands, and community volunteers are removing invasive vegetation while strengthening public involvement and stewardship at the Ballona Wetlands Ecological Reserve.



In 2021, TBF continued maintaining and expanding the restoration site. Community events were temporarily postponed due to COVID-19; however, events reconvened in August 2021. From August through December 2021, a total of 112 volunteers removed nearly 30,000 pounds of non-native vegetation over the course of 10 community restoration events. Scientific monitoring of the site is also ongoing.

# COMMUNITY ENGAGEMENT

# COMMUNITY ENGAGEMENT

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TBF's Community Engagement Program builds partnerships that enrich communities and serve watershed health. This program teams up with schools, businesses, harbors, organizations, and individuals to further collective impact.

TBF recognizes the great potential of individual action to protect the environment and strengthen community. The diverse efforts of this program involve collaboration, education, training, infrastructure, and outreach so people are empowered to make positive change in their communities.



# EDUCATING RECREATIONAL BOATERS

TBF continued working with the southern California coastal boating communities to prevent pollution and increase stewardship. In 2021, this program distributed 2,700 California Boater Kits to recreational boaters, monitored over 70 sewage disposal facilities from San Diego to Santa Barbara, created a do-it-yourself fishing line recycling guide, trained over one hundred individuals to become Dockwalker environmental educators, and produced educational videos on marine composting toilets and Marine Protected Areas.



# EDUCATING YOUTH ON COMPOSTING AND COMMUNITY GARDENING

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TBF's Table to Farm program works with Environmental Charter Schools' (ECS) three campuses, Environmental Charter Middle School Inglewood, Environmental Charter Middle School Gardena, and Environmental Charter High School Lawndale to implement community composting. These three compost facilities serve the school, community, and local restaurants interested in recycling their organic food scraps.



In 2020, TBF and ECS established a community garden just outside of Environmental Charter Middle School Inglewood's (ECMSI) campus. This garden utilizes compost to grow nourishing produce for the surrounding community.



# EDUCATING YOUTH ON COMPOSTING AND COMMUNITY GARDENING

In 2021, the ECMSI community garden continued to thrive. As COVID-19 restrictions were lifted, in-person engagement opportunities, such as events and volunteer days, were planned. ECMSI hosted several community events to celebrate the garden, from Earth Day festivities, summer camp, volunteer events, and more. Through the collaboration of ECMSI, TBF, students, families, and community volunteers, the garden will continue to be maintained and grow as a space that provides nutritious produce and opportunities for learning.



# REDUCING DISPOSABLE FOODWARE AT THE SOURCE

Clean Water Action and Clean Water Fund's ReThink Disposable prevents waste before it starts. TBF implements this technical assistance program with local governments, businesses, and consumers to minimize single-use food and beverage disposable packaging. In doing so, restaurants and other food business operators cut costs and improve the dining experience for patrons. This benefits the environment by conserving resources, preventing waste, and reducing ocean pollution at the source.



In 2019, Clean Water Action and Clean Water Fund partnered and trained TBF to implement ReThink Disposable in Los Angeles. In 2021, TBF partnered with California State Parks and California Coastal Commission's Boating Clean and Green Program to implement ReThink Disposable at three LA county yacht clubs with food service. By implementing ReThink Disposable, the three clubs annually eliminate 58,799 single-use disposable items, 845 pounds of trash prevented from entering landfills, and \$2,726 in total net savings.

# REDUCING DISPOSABLE FOODWARE AT THE SOURCE

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Additionally, TBF is part of the Reusable LA coalition, a strong network of partners working to resolve LA's plastic pollution issue by championing a reusable culture through legislative advocacy, outreach, and engagement. In 2021 Reusable LA advocated for Skip The Stuff legislation, which would require take-out foodware accessory single-use items - such as utensils, straws, condiments, napkins, and more – to be provided only upon request to reduce waste. By the summer of 2021, the City of LA adopted a Foodware Accessories on-Request Ordinance and LA County passed legislation limiting single-use take-out accessory items.

REUSABLE | LA



**COASTAL  
RESEARCH  
INSTITUTE**

# COASTAL RESEARCH INSTITUTE

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In 2021, TBF and Seaver College of Science and Engineering jointly supported faculty and student led research at Loyola Marymount University's Coastal Research Institute (CRI). Four faculty fellows and 12 students conducted research across the following programs: climate modeling, coastal habitat restoration, grunion temperature study, invertebrate metabolism and physiology study, microplastics in intertidal invertebrates, native plant germination microbe study, and an assessment of Ballona Creek trash to inform the Interceptor Project. The research projects also engaged external partners such as the LA County Department of Public Works, Pepperdine University, and others. Results were presented at scientific conferences and two manuscripts were submitted to scientific journals for review.



# MONITORING AND RESEARCHING BEACHES

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This research program continues to advance beach characterization studies to inform a Site Suitability Model. This model will be applied to determine potential areas for beach restoration and nature-based adaptation. Key factors to evaluate these beaches include coastal infrastructure, sea level rise vulnerability, and physical and biological characteristics. Ultimately these data will inform the Santa Monica Bay National Estuary Program's Comprehensive Monitoring Program.



Existing data continued to be compiled and analyzed, with results contributing to a draft manuscript. Ongoing data collection in the field, as well as other sources such as wind data from National Weather Service, were incorporated into analyses. This work will continue in 2022.

# HARMFUL ALGAL BLOOMS

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Harmful Algal Bloom (HAB) phytoplankton species can pose a threat to the environment and human health. To address a HAB data gaps for the Santa Monica Bay, water samples were collected from 19 sites across the Bay and into the mouth of Ballona Creek. Through the ongoing analysis of these samples, several species of concern were identified as persistent throughout the year, including *Pseudonitzschia*, *Lingulodinium*, *Ceratium*.



This work highlights the need to regularly monitor HAB species and prepare for the potential need for further management of blooms in Santa Monica Bay. A manuscript is currently in development.

# WHO WE ARE

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## Board of Directors

Our Board of Directors oversees the TBF operations. TBF's Board of Directors meets several times a year and its meetings are currently open to the public.

## Staff

Our staff is comprised of science and policy experts who are passionate about understanding and protecting the Santa Monica Bay and the Bay watershed.

# PHOTOS

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Title Page: Laura Doss-Hertz, Contents: TBF, CEO Message: Laura Doss-Hertz, Kelp Bass: TBF, Diver and Kelp: Laura Doss-Hertz, Underwater Kelp Scene: TBF, Diver and Urchin: TBF, Abalone Larvae: TBF, Pink Abalone: TBF, Abalone Basting: TBF, Abalone Closeup: Oriana Poindexter, Abalone Measurement: Laura Doss-Hertz, Abalone Tagging: TBF, SAFE: TBF, BART: TBF, Divers in Water: TBF, Black Perch in Eelgrass: Adam Obaza, Diver in Eelgrass: Adam Obaza, Living Shoreline Intro: Laura Doss-Hertz, Malibu Shoreline Scientists: Laura Doss-Hertz, Malibu Shoreline Scene: Laura Doss-Hertz, Los Angeles Shoreline Dune: Laura Doss-Hertz, Los Angeles Shoreline Fencing: Laura Doss-Hertz, Los Angeles Shoreline Scientists: Laura Doss-Hertz, Manhattan Beach Shoreline Scientists: Laura Doss-Hertz, Manhattan Beach Shoreline Scene: Laura Doss-Hertz, Santa Monica Dune Restoration Plover: TBF, Los Angeles's Dune: TBF, Ballona Wetland Group: TBF, Ballona Wetland Worker Duo: TBF, Ballona Wetland Grasses: TBF, Community Engagement Group: TBF, Fishing Line Recycler: TBF, Marine Composting Toilet: TBF, Boater Education: TBF, Garden Box: Laura Doss-Hertz, Volunteer Eddie: Laura Doss-Hertz, Staff Working in Garden: Laura Doss-Hertz, Dr. Matthews: Laura Doss-Hertz, Garden Watering: Laura Doss-Hertz, Community Garden Volunteers: TBF, Staff Carrying Weeds: Laura Doss-Hertz, Before and After Water Cooler: TBF, Reusable LA logo: Reusable LA, ReThink Disposable Straws Upon Request Sign: TBF, Coastal Research Institute Intro: TBF, Beach Quadrat: TBF, Beach Wrack Transect: TBF, Harmful Algae Pseudo-nitzschia: Canva Pro Photos, Santa Monica Bay Overlook: Canva Pro Photos