SANTA MONICA BAY NATIONAL ESTUARY PROGRAM

Annual Report
1 October 2021 – 30 September 2022

Report Date: 31 October 2022

Prepared for the United States Environmental Protection Agency

Acronyms

Army Corps	United States Army Corps of Engineers
ASBS	Areas of Special Biological Significance
BEP	Boater Education Program
BRP	Santa Monica Bay Restoration Plan
BWER	Ballona Wetlands Ecological Reserve
CalTrans	California Department of Transportation
CCMP	Comprehensive Conservation and Management Plan (formerly BRP)
CCVA	Climate Change Vulnerability Assessment
CDBW	California Department of Boating and Waterways
CDFW	California Department of Fish and Wildlife
CDPH	California Department of Public Health
CDWR	California Department of Water Resources
CMP	Santa Monica Bay Comprehensive Monitoring Program
CNRA	California Natural Resources Agency
CoSMoS	Coastal Storm Modelling System
CRAM	California Rapid Assessment Method
CRI	Loyola Marymount University's Coastal Research Institute
CSU	California State University
CVA	Clean Vessel Act
CWMW	California Wetland Monitoring Workgroup
DDT	Dichlorodiphenyltrichloroethane
DFA	Division of Financial Assistance of the State Water Resources Control Board
EIR	Environmental Impact Report
EMPA	Estuarine Marine Protected Area
EWMP	Enhanced Watershed Management Plans
FMP	Fishery Management Plan
FY	Fiscal Year
FOLD	Friends of the LAX Dunes
GB	Santa Monica Bay Restoration Commission Governing Board
GHG	Greenhouse Gases
GPRA	Government Performance and Results Act
HABs	Harmful Algal Blooms
HHW	Household Hazardous Waste
HtB	Heal the Bay
JWPCP	Joint Water Pollution Control Plant (Carson)
LACDBH	Los Angeles County Department of Beaches and Harbors
LACDPH	Los Angeles County Department of Public Health
LACPW	Los Angeles County Public Works
LACFCD	Los Angeles County Flood Control District
LACSD	Los Angeles County Sanitation Districts
LADWP	Los Angeles Department of Water and Power
LARC	Los Angeles Regional Collaborative for Climate Action
LARWQCB	Los Angeles Regional Water Quality Control Board

LASAN	City of Los Angeles Sanitation
LCP	Local Coastal Plan
LVMWD	Las Virgenes Municipal Water District
MDRA	Marina Del Rey Anglers
MPA	Marine Protected Area
MRCA	Mountains Recreation and Conservation Authority
MWD	Metropolitan Water District of Southern California
NEP	National Estuary Program
NMFS	National Oceanic and Atmospheric Administration's National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NPS	National Parks Service
NRC	Natural Resource Council
NSMBW	North Santa Monica Bay Watershed
NZMS	New Zealand Mudsnails
OA	Ocean Acidification
OPC	Ocean Protection Council
OREHP	Ocean Resource Enhancement Hatchery Program
OWDS	On-site Wastewater Disposal Systems
PCB	Polychlorinated biphenyls
POTW	Public Owned Treatment Works
Prop	Proposition Grant
PVPLC	Palos Verdes Peninsula Land Conservancy
RCDSMM	Resource Conservation District of the Santa Monica Mountains
SCW Program	Safe Clean Water Program
SCC	California State Coastal Conservancy
SCCOOS	Southern California Ocean Observing Systems
SCCWRP	Southern California Coastal Water Research Project
SCMI	Southern California Marine Institute
SFEP	San Francisco Estuary Partnership
SLC	State Lands Commission
SLR	Sea Level Rise
SMBNEP	Santa Monica Bay National Estuary Program
SMBRC	Santa Monica Bay Restoration Commission
SMMC	Santa Monica Mountains Conservancy
State Parks	California Department of Parks and Recreation
SWRCB	State Water Resources Control Board
TAC	Santa Monica Bay Restoration Commission Technical Advisory Committee
TBF	The Bay Foundation (also known as the Santa Monica Bay Restoration Foundation)
TMDL	Total Maximum Daily Load
UCD	University of California, Davis
UCLA	University of California, Los Angeles
UCSB	University of California, Santa Barbara

USC	University of Southern California
USEPA	United States Environmental Protection Agency
USFWS	United States Fish and Wildlife Service
USGS	United States Geological Survey
WASC	Safe Clean Water Program's Watershed Area Steering Committee
WBMWD	West Basin Municipal Water District
WCB	Wildlife Conservation Board
WMP	Watershed Management Plans

Overview

This annual report provides an update on the Fiscal Year 2022 (FY22) Work Plan tasks for the time period 1 October 2021 through 30 September 2022. The FY22 Work Plan is focused on a subset of actions and next steps identified in the 2018 CCMP Action Plan. Seven goals are identified in the CCMP Action Plan and are listed below. All seven goals are addressed by the actions and next steps identified in the FY22 Work Plan and this annual report. The goals are achieved through actions by many different entities, including public agencies, municipalities, and non-profit organizations that take the lead on specific projects.

Seven CCMP Action Plan goals:

1. Protect, enhance, and improve ecosystems of Santa Monica Bay and its watersheds
2. Improve water availability
3. Improve water quality
4. Enhance socio-economic benefits to the public
5. Enhance public engagement and education
6. Mitigate impacts and increase resiliency to climate change
7. Improve monitoring and ability to assess effectiveness of management actions

Structure and Annual Report

This section of the annual report is organized by the individual actions included in the FY22 Work Plan. For each action the Long-term Environmental Results from the CCMP Action Plan are identified and brief updates on implementation of the next steps are included in a table. For some next steps that required more description a narrative section follows the table. In some cases the table identified that a next step did not have project activities during this time period; this was due to a combination of factors including but not limited to funding, partner prioritizations, or permitting delays.

Additional information on activities can be found on the SMBNEP website, the CCMP Action Plan, the FY22 Work Plan, and as part of individual products produced for each project.

During this period the continued spread of the novel coronavirus and its associated disease (COVID-19) required implementing social distancing, restrictions on volunteer events, and other guidelines. SMBNEP continues to follow recommendations by the Center for Disease Control and Prevention as well as recommendations by local authorities such as Los Angeles County Department of Public Health. SMBNEP is responding to challenges and continues ongoing efforts to adapt to restrictions.

CCMP Action #1

Acquire open space for preservation of habitat and ecological services

Long-term Environmental Results / Outcomes: Publicly acquire new open space as it becomes available throughout the watershed to promote connectivity, preserve habitat, and sustain ecological services

Action #1 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support partners in identification and prioritization of key acquisition or conservation easement properties	To acquire and/or protect high priority properties that are at risk of development, or provide high diversity, include wildlife corridors, and/or provide local socio-economic benefits	Ongoing	In December 2021, MRCA acquired the final 150 acres of the 325-acre Triangle Ranch in the Santa Monica Mountains, permanently protecting this land as a public parkland. In July 2022, the City of Rancho Palos Verdes and the PVPLC acquired a 96-acre wildlife corridor that connects coastal land to the Palos Verdes Nature Preserve. See additional narrative.

Action #1 Narrative:

The Triangle Ranch Acquisition was funded by SMMC, Los Angeles County, WCB, LACSD, and the 2021-2022 State budget. Triangle Ranch is a crucial linkage for habitat preservation, watershed protection, and wildlife movement including safe passage for mountain lions via the Wallis Annenberg Wildlife Crossing (see Action #14). The property includes coast live oak woodland, chaparral, purple sage scrub, native and annual grassland, and valley oak savannah.

The Palos Verdes Nature Preserve expansion was funded by the City of Rancho Palos Verdes, USFWS, WCB, and PVPLC. The newly acquired 96 acres consists of grasslands, coastal sage and cactus scrub, and woodland, providing food and habitat for an array of endangered, threatened, and sensitive species including the Palos Verdes blue butterfly, the El Segundo blue butterfly, and coastal California gnatcatcher. In August 2022, PVPLC launched a $30 million campaign to fund habitat restoration and fire risk mitigation on the property including invasive species removal and establishment of drought-tolerant native plants.

CCMP Action #2

Restore kelp forests in the Bay to improve the extent and condition of the habitat

Long-term Environmental Results / Outcomes: Restore 150 acres of kelp forest to improve habitat functions, local fisheries, and coastal resilience

Action #2 Next Steps / Project Name	Objectives	Status	Annual Report Update
Implement the rocky reef/kelp forest restoration project	To restore three acres of rocky reef kelp forest by reducing urchin density within barrens to the target 2 urchins per square meter to allow the reestablishment of giant kelp; To inform statewide restoration and management of kelp forest/rocky reefs	Ongoing	Partnered with commercial urchin harvesters to cull urchin densities within 3.78 acres of urchin barrens off White Point and Point Fermin, Palos Verdes; TBF pre-monitored 7.51 acres of urchin barren, with culling activities in progress during this time period at White Point and Point Fermin in collaboration with SeaTrees and Force Blue. The SMBRC Governing Board approved the SMBNEP FY22-23 Bipartisan Infrastructure Law Work Plan for eight projects at its 18 August 2022 meeting and the SMBRC Executive Committee approved the budget and staff section at its 15 September 2022 meeting, including funding for the Palos Verdes Kelp Restoration Project.
Biological response monitoring of restoration areas	To track the response of the kelp forest community after restoration activities occur	Ongoing	Conducted all pre- and post-restoration monitoring for 3.78 acres cleared during this project period; annual biological response surveys were conducted on 10 August 2022.

Action #2 Next Steps / Project Name	Objectives	Status	Annual Report Update
Develop recommendations for the deposition of materials from Rindge Dam or other suitable sources to augment sediment supply	To support scientific analyses, inform priorities, and assist with site evaluations and communications for material deposition	Ongoing	No activities occurred during this reporting period.
Conduct carbon sequestration assessment of kelp restoration project	To assess carbon sequestration potential of kelp forest restoration	Ongoing	No activities occurred during this reporting period.

Action #2 Narrative:

Teams of restoration divers (via SCUBA) have been clearing the ocean floor of excesspurple sea urchins (*Strongylocentrotus purpuratus*), thereby reducing herbivory and allowing for the natural recruitment and development of giant kelp (*Macrocystis pyrifera*). During the reporting period of 1 October 2021 through 31 March 2022, 7.51 acres were pre-monitored, and 3.78 acres of reef were cleared of excess urchins off White Point and Pt. Fermin. Restoration activities at Pt. Fermin occurred in collaboration with Force Blue and NFL Green with the goal of restoring a “football-field” area of kelp. This event used veteran combat divers to reduce urchin density, while local aquariums and TBF staff hosted educational and trash cleanup programs on the beach. The event was far-reaching and televised throughout the country. These sites continue to contain very high urchin densities with little to no macroalgae. Additional efforts will continue to be conducted to further work at White Point and Point Fermin.

A total of 58.53 acres of reef have been restored along Palos Verdes since the beginning of the project in July 2013. In that time, TBF and partners documented the development of a variety of macroalgae communities occurring on the reefs, higher densities and biomass of kelp bass (*Paralabrax clathratus)* and other fish species within restoration sites,

increased density of CA spiny lobster (*Panulirus interruptus)*, higher algal and invertebrate diversity at all restoration sites, and increased *Strongylocentrotus*spp. gonadosomatic indices. These increases are comparable to reference site values. Focusing on kelp restoration areas where *S. purpuratus* suppression had occurred, canopy percent cover and kelp acreage increased in the completed restoration sites.

CCMP Action #3

Recover abalone populations in the Santa Monica Bay and region to support rare species and socioeconomic benefits to people

Long-term Environmental Results / Outcomes: Establish 2-3 minimally viable green and red abalone populations (i.e., at least 2,000 abalone per hectare) in the Bay; establish 1-2 viable white abalone populations (i.e., at 2,000 abalone per hectare) in the Bay

Action #3 Next Steps / Project Name	Objectives	Status	Annual Report Update
Establish abalone outplanting sites and conduct juvenile and larval outplanting	To reintroduce abalone, test effectiveness of outplanting methods, and assess habitat site suitability	Ongoing	Maintained temperature and dissolved oxygen logger deployments at outplanting site; SAFEs were stocked with 414 white abalone on 30 September and vaulted 28 October 2021; a second outplant site was established off Palos Verdes on 9 March 2022; additional site prep was completed deploying SAFE bases on 25 March 2022; SAFEs and BARTs were stocked with 749 red abalone on 18 May and 16 June 2022, respectively. Additionally, 991 white abalone were outplanted to the initial outplant site on 18 May and 16 June 2022. On 15 and 30 September 2022, 368 red abalone were outplanted to the second site. On 15 and 30 September 2022, 313 white abalone were outplanted to the initial site. The SMBNEP FY22-23 Bipartisan Infrastructure Law Work Plan approved by the SMBRC Governing Board and Executive Committee includes funding for the Palos Verdes Abalone Restoration Project.

Action #3 Next Steps / Project Name	Objectives	Status	Annual Report Update
Monitor abalone restoration and reference sites	To conduct SCUBA-based surveys within outplant sites to assess the survivability of outplanted abalone and suitability of the site for future outplanting efforts	Ongoing	Outplant monitoring occurred at scheduled intervals of one week, two weeks, and one month post SAFE opening, followed by quarterly site monitoring thereafter; during this reporting period, 49 live white abalone were observed on site and 467 white abalone shells were collected; during this reporting period, 36 live red abalone were observed on site and 123 red abalone shells were collected.
Captive spawn abalone	To research captive spawning and larval culturing techniques, and raise abalone in aquaculture facility for outplanting	Ongoing	No captive abalone were spawned at SCMI during this reporting period.
Maintain aquaculture facility for abalone	To facilitate captive spawning and rearing of red and white abalone in support of future restoration activities for outplanting in the wild; to serve as central staging facility for southern California outplant efforts	Ongoing	TBF and SCMI staff continued to operate and maintain two abalone laboratory spaces at SCMI, housing red and endangered white abalone; staff transferred ~6,900 juvenile white abalone from the Bodega Marine Lab on 13 January 2022 to The Cultured Abalone Farm, Southwest Fisheries Science Center, and SCMI. On 13 June 2022, 708 juvenile white abalone were transferred from Aquarium of the Pacific (AOP) to SCMI.

Action #3 Narrative:

TBF operates and maintains two mariculture facilities located at SCMI. These spaces serve as a wet lab and hatchery for abalone rearing, experimentation, and long-term housing of broodstock. The facility is a registered aquaculture facility and has been certified as “sabellid free” by CDFW.

For the fall 2021, spring 2022, and fall 2022 outplant events, a total of 1,718 white abalone were selected and tagged for outplanting off Palos Verdes into ten SAFEs and four BARTs. A second transplant site was established off Palos Verdes on 9 March 2022. Nine SAFE bases and four BARTs (CDFW) were deployed and were stocked with a total of 1,117 red abalone in during the spring and fall 2022 outplants.

Site monitoring follows this schedule after SAFEs have been opened, (allowing abalone to egress onto the reef): one week, two weeks, one month, and quarterly. Site monitoring is not performed if weather or ocean conditions do not permit a safe or productive day of diving. For assessment, the site is broken into ten 4 x 30-meter surveys and the divers will survey that area in approximately 40 minutes. Divers use flashlights to investigate crevices and carefully look under small rocks for abalone. When a diver encounters an abalone, its location, length (if able to measure), tag ID (if able to read), and any other notes are recorded.

TBF visited the site twenty times during this reporting period. During those visits a total of 49 live white abalone 36 live red abalone were observed. As the outplanted abalone are juvenile, their behavior is to retreat deep into the cracks and hide to avoid predation. A meaningful assessment of the success of these outplants is appropriate following three to five years, based upon work conducted in the Puget Sound, when these individuals are likely to achieve adult size. At that time these adult abalone will be resilient to most predatory actions and position themselves on open faces of the reef.

In addition, 467 white abalone shells and 123 red abalone shells have been collected from individuals that were depredated or died. Many of the shells collected showed growth following outplant; meaning some of the individuals survived for a period of time and the habitat is providing sufficient foraging opportunities for the abalone to grow.

On 13 January 2022, TBF staff transferred over 6,900 juvenile white abalone from the Bodega Marine Lab to The Cultured Abalone Farm, South West Fisheries Science Center, and SCMI. Approximately 1,500 animals from this transfer were selected for outplanting in spring 2022, and the remaining animals are being held and cared for in southern California partner facilities until they grow large enough to be outplanted. On 13 June 2022, 708 juvenile white abalone were transferred from Aquarium of the Pacific to SCMI to bolster numbers for the fall 2022 outplant.

CCMP Action #4

Assess and restore seagrass habitats in the Santa Monica Bay and nearshore environments to benefit marine ecosystems and improve coastal resilience

Long-term Environmental Results / Outcomes: Restore 2-5 acres of seagrasses to the Bay to improve habitat functions and coastal resilience

Action #4 Next Steps / Project Name	Objectives	Status	Annual Report Update
Survey the extent and condition of seagrasses in the Bay using R2Deep2, side-scan sonar, and SCUBA divers to inform the Comprehensive Monitoring Program	To survey the extent and condition of seagrasses in the Bay using SCUBA divers and side-scan sonar, to inform the CMP and restoration activities	Ongoing	TBF and project partners conducted numerous SCUBA-based surveys to monitor seagrass within the Bay at transplant and donor sites; quarterly surveys were conducted on 20 October 2021, 4 February 2022, 18 April 2022, and 28 July 2022; additional surveys conducted at transplant sites on 7 December 2021 and 17 February 2022 to collect sediment cores and deploy physical oceanographic sensors; surveys conducted at donor sites on 13 December 2021, 14 February 2022, 25 May 2022, 26 July 2022, and 23 September 2022 to deploy sensors; further assessment of donor bed conditions occurred on 3 November 2021 for annual surveys; TBF, Paua Marine Research Group, Vantuna Research Group, and Scripps Institution of Oceanography procured CA State Proposition 50 funding to utilize SCUBA-based surveys, side-scan sonar, and deployment of biophysical oceanographic sensors to further elucidate key data gaps outlined in the CMP surrounding SAV and soft-bottom habitat within the Bay (see additional narrative).

Action #4 Next Steps / Project Name	Objectives	Status	Annual Report Update
Develop restoration methods for eelgrass (*Zostera pacifica*) in the Santa Monica Bay	To improve understanding and probability of success for offshore eelgrass restoration using transplant methods	Ongoing	Continued collaboration with Paua Marine Research Group and partner agencies to improve understanding of eelgrass restoration methods to apply to the pilot project.
Conduct pilot restoration project(s) of offshore eelgrassin the Bay	To conduct a pilot restoration project of offshore eelgrass in the Bay within a one-acre footprint	Ongoing	TBF staff and partners implemented a pilot project *Z. pacifica* transplant effort in July 2021; during this reporting period, TBF and project partners conducted quarterly monitoring at the transplant sites on 20 October 2021, 4 February 2022, 18 April 2022, and 28 July 2022; transplanted eelgrass was observed at the sites 150+ days post-transplant activities (see additional narrative).
Evaluate restoration potential of seagrasses in the Bay, harbor, wetlands, and nearshore environments	To improve understanding and probability of success for seagrass restoration projects	Ongoing	Outreach to seagrass experts throughout CA was initiated through a TAC to inform transplant methods and monitoring protocols; genetics study continued with final sample processing expected during the upcoming reporting period; TBF staff continued participation on the regional Submerged Aquatic Vegetation Scientific Advisory Committee to inform regional standardization for seagrass monitoring; TBF staff also participated on the Estuarine MPA Management Advisory Committee and the Bight 2022 Submerged Aquatic Vegetation workgroup; quarterly monitoring of sites will continue through 2022 (see additional narrative).

Action #4 Narrative:

Santa Monica Bay Subtidal Eelgrass Restoration: This innovative project, funded by State Coastal Conservancy (LA Living Shoreline Project), Honda Marine Science Foundation, and NEP Coastal Watershed Grants Program, incorporates the experimental establishment of subtidal eelgrass offshore of Dockweiler Beach, Redondo Canyon, and Malaga Cove within Santa Monica Bay. TBF staff participated on a regional Submerged Aquatic Vegetation Technical Advisory Committee, led by SCCWRP. This group provided external scientific input and recommendations to the subtidal components of the restoration project, while concurrently spreading awareness of the importance of open coast eelgrass transplants. Further, TBF staff convened preeminent SAV researchers in California to establish the "Santa Monica Bay Subtidal Eelgrass Restoration Project Technical Advisory Committee" (TAC), comprised of researchers from academic institutions, governmental agencies, and environmental consultants. This group proved invaluable in refining the approach of the project and providing essential recommendations and insights into transplanting and monitoring processes. The members of the TAC expressed overwhelming support for the project and highlighted the importance of conducting this work.

Baseline monitoring surveys of extant Z. pacifica donor sites were conducted by project partners in October 2020 at donor sites off Catalina Island, including deploying a physical oceanographic sensor tracking wave characterization. Further baseline monitoring occurred in April, May, June, and August 2021, including side-scan sonar mapping and SCUBA-based surveys. The Scientific Collection Permit application required to harvest Z. pacifica from identified donor sites and the subsequent transplant to restoration sites was approved by CDFW on 28 May 2021. The CDP waiver application was approved on 8 July 2021 and development and approval of the QAPP (Quality Assurance Project Plan) by EPA occurred on 7 June 2021.

The project harvested Z. pacifica material from two donor beds on the backside of Catalina Island, Palisades, and East End, to utilize for three transplants within Santa Monica Bay due to the extant bed stability, size, high turion density, and selected depth range. The overall size of both the Palisades (97 acres) and East End (21 acres) were expansive. Transplant material was harvested on three separate cruises and transplanted the same day into soft bottom substrate 35-40 feet in depth. This occurred on 20, 22, and 27 July 2021 to three distinct transplant sites off Redondo Beach, Malaga Cove, and Dockweiler Beach, respectively. Each site received roughly 500 turions, shoot-like structures supporting the blades of the eelgrass. Two methods were utilized: one used a single turion placed into holes excavated by divers, and the second bundled 8-10 turions together. Thus far, post-transplant monitoring was conducted at 24 hours, 1-week, 2-weeks, 1 month, and two quarterly surveys after transplant activities to inform survivability; quarterly monitoring will continue through 2022.

Survivability varied from site to site and by method. In general, survivability at 24 hours was 100% across all sites and methods, except for the single shoot method at Dockweiler which had a survivorship of 91%. At the one-month interval

survivorship at Redondo (85% single and 85% bundle) and Malaga (86% single and 77% bundle) outperformed Dockweiler (74% single to 26% bundle). At the 20 October 2021, quarterly survey survivorship at Redondo (80% single and 61% bundle) and Malaga (83% single and 60% bundle) outperformed Dockweiler (60% single to 11% bundle). At the 4 February 2022, quarterly survey survivorship at Malaga (36% single and 27% bundle) outperformed Redondo (0% single and 0% bundle) and Dockweiler (0% single to 0% bundle). At the 18 April 2022, quarterly survey survivorship at Malaga (14.3% overall) outperformed Redondo and Dockweiler (0%). On the 28 July 2022 quarterly survey, no of eelgrass was observed.

During this reporting period, TBF and project partners conducted numerous SCUBA-based surveys to monitor seagrass within the Bay, both transplant and donor sites. Quarterly monitoring events occurred on 20 October 2021, 4 February 2022, 18 April 2022, and 28 July 2022. Additional transplant site visits to deploy sensors and collect cores occurred on 7 December 2021 and 17 February 2022, and donor site visits to deploy sensors on 13 December 2021, 14 February 2022, 25 May 2022, 26 July 2022, and 23 September 2022. Additional visits to transplant and donor sites are scheduled for the upcoming reporting period for both biological monitoring surveys and to retrieve and deploy additional sensors.

Relatedly, TBF, alongside Paua Marine Research Group, Vantuna Research Group, and Scripps Institution of Oceanography, procured CA State Proposition 50 funding to utilize SCUBA-based surveys, side-scan sonar, and the deployment of a suite of biophysical oceanographic sensors (light, temperature, dissolved oxygen, among others) to further elucidate key data gaps outlined in the CCMP surrounding SAV and soft-bottom habitat within the Bay. Project partners will deploy sensors at nine sites to acquire a suite of environmental data metrics. A three-pronged data acquisition program will address the central scientific problem of determining key physical environmental drivers influencing the realized niche of Z. pacifica and enhance applied restoration efforts from local to regional scales with significant potential benefits for southern California coastal shelf habitats. Among a variety of deliverables include a side-scan sonar map of ~1000 acres of soft-bottom habitat in multiple discrete locations within SMB, encompassing areas spanning east and west of Point Dume in Malibu, as well as the Redondo canyon, the establishment of a comprehensive baseline census for Z. pacifica at nine geographically distinct sites, and creation of a novel Z. pacifica environmental monitoring program aimed at elucidating data gaps.

CCMP Action #5

Assess and implement offshore artificial reefs to benefit marine ecosystems and provide socioeconomic benefits to people

Long-term Environmental Results / Outcomes: Implement artificial reef projects to achieve 69 new acres of rocky reef habitat of a similar condition as reference reef habitats

Action #5 Next Steps / Project Name	Objectives	Status	Annual Report Update
Implement rocky reef restoration project off Palos Verdes	To restore 69 acres of rocky reef habitat lost to landslides activity using high relief rocky modules that will resist future burial from sediment deposition	Ongoing	In April 2022, the Palos Verdes Reef Restoration Project (funded by Prop 12) completed the second-year monitoring report; In August 2022, the project released a video showing project outcomes 18 months after construction (see additional narrative).
Annual monitoring with the use of side scan sonar and SCUBA based surveys	To assess nearshore coastal marine habitats using side-scan sonar and SCUBA to inform data gaps in the CMP and future restoration projects; to understand the movements, positions, and permanence of great white sharks, giant sea bass, and other species of interest in SMB	Ongoing	Communications between TBF, VRG, and SIO occurred during this reporting period resulting in submission of a Prop 50 grant proposal to seek funding for Santa Monica Bay, Catalina Island, and La Jolla soft bottom habitat and extant eelgrass bed surveys; proposal was accepted and is expected to elucidate gaps in knowledge. Acoustic Telemetry Sensor Array recorded 3,552 detections of seven individual juvenile white sharks; most detections occurred from December 2021 to March 2022; data will inform the CMP; data provided by CSULB shark lab.

Action #5 Next Steps / Project Name	Objectives	Status	Annual Report Update
Preliminary work regarding the benefits of dynamic revetments and nearshore reefs	To preliminarily advance work towards understanding dynamic revetments and nearshore reefs, including feasibility of using recycled concrete for construction	Ongoing	Conversations and preliminary research occurred, including participation in some webinars and discussions about these adaptation strategies; some elements were incorporated into LCPs by coastal municipalities (e.g., City of Manhattan Beach); cobble placement by State Parks for protection of the Adamson House in Malibu is being considered. The SMBNEP FY22-23 Bipartisan Infrastructure Law Work Plan approved by the SMBRC Governing Board and Executive Committee includes funding for the Santa Monica Breakwater Rocky Intertidal Preserve Project.

Action #5 Narrative:

The Palos Verdes Reef Restoration Project aims to restore the nearshore ecological rocky-reef community, support an estimated six tons of reef fish and a proportional amount of invertebrates, and increase the abundance of commercial and recreational species, offsetting historical losses to ecosystem services. The project received $1,409,000 in Prop 12 funds for construction and post-construction monitoring for Year 1. Vantuna Research Group and Southern California Marine Institute completed construction of an artificial reef in September 2020 to restore rocky reef habitat near Bunker Point off the Palos Verdes Peninsula, which involved strategically placing 57,000 tons of quarry rock in a 42-acre area. During this reporting period, the project leads released a video showing the outcomes of the project and completed the Year 2 post-construction monitoring report, indicating a faster-than-expected increase in biomass including fish and giant kelp and no observation of invasive species. Although juveniles were not analyzed this report, many juvenile fish were observed that are expected to continue to increase fish biomass in the area over the coming years. Four acoustic receivers were purchased by TBF in 2016 to improve the coverage of the Southern California Acoustic Telemetry Network, led by Dr. Chris Lowe at CSU Long Beach. Three receivers were first deployed in May 2017 to sites in the northern Santa Monica Bay, with the fourth subsequently included within the network. Currently, there are eight receivers deployed throughout the Santa Monica Bay to inform SMBNEP of the movements, positions, and permanence of great white sharks, giant sea

bass, and other species of interest. Data generated by this expansion of the network will improve protection and understanding for these species and contribute to the CMP. The receivers were downloaded bi-monthly, cleaned, and redeployed to their moorings.

During this reporting period, the receivers detected two Giant Sea Bass (Stereolepsis gigas) and two shovelnose guitarfish (Rhinobatos productus). Additionally, twelve individual white sharks (ten juveniles and two adults) (Carcharodon carcharias), were detected throughout the Bay in the last year. Semi-annual species count updates are provided to TBF by Dr. Lowe's lab at CSULB. Another round of summary data products will be produced in the coming months and included in the US EPA 320 semi-annual progress report for October 1, 2022-March 31, 2023.

CCMP Action #6

Restore coastal strand and foredune habitat to beaches and sandy shores to improve coastal resilience

Long-term Environmental Results / Outcomes: Restore 10 acres of coastal strand and dune habitat along Santa Monica Bay beaches to improve ecological function, increase coastal resilience, and provide habitat for rare species

Action #6 Next Steps / Project Name	Objectives	Status	Annual Report Update
Continue long-term monitoring of the Santa Monica Beach Restoration Pilot Project	To continue long-term monitoring to inform coastal resilience, ecosystem benefits, and adaptive management of the restoration area; to convert the site to a permanent feature of the coastline	Ongoing	Completed 5-year scientific monitoring program; Vegetation continues to expand, and dunes continue forming; data from southern portion of restoration area show over 0.5 meters of sand accretion, with dunes along fence lines of up to a meter in height; snowy plovers regularly recorded in monitoring data; since the original project permit was set to expire in 2021, City of Santa Monica opted to pursue a permit amendment to establish the site as a permanent feature of the coastline; TBF continued working with the City to draft a CDP amendment, including supplemental documents, such as the new Adaptive Management Plan; site checks and physical and biological surveys will continue at the frequency described in the Adaptive Management Plan set to be finalized in the next reporting period.

Action #6 Next Steps / Project Name	Objectives	Status	Annual Report Update
Conduct Phase 1 (outreach and planning) and Phase 2 (implementation) of the Malibu Living Shoreline Project	To restore three acres of beach and dune habitat to improve coastal resilience and ecosystem benefits and improve public engagement	Ongoing	Coastal Development Permit (CDP) for the project was obtained in December 2020; through coordination with LACDBH, a Right of Entry (ROE) permit was obtained in December 2020; project implementation occurred in December 2020 through February 2021; through restoration actions, approximately 25 tons of invasive iceplant was removed; other implementation actions included planting of over 500 native plants, seeding, and installation of sand fencing and biomimicry stakes; the first three rounds of semi-annual post-restoration monitoring were completed in June, October-November 2021, and June 2022; in February 2022, TBF conducted supplemental seeding of the sites and planted an additional 245 plants at Point Dume and 99 plants at Zuma Beach; community and student restoration and stewardship events commenced in March 2022 and are ongoing; interpretive signage was installed in May 2022; the Year 1 Annual Report was finalized in May 2022; adaptative management and site maintenance are ongoing.

Find funding for and implement another beach and bluff restoration project	To restore 3.5 acres of bluff, beach, and eelgrasshabitat as part of a living shoreline pilot project (Los Angeles Living Shoreline Project); restore dune habitats in Manhattan Beach through iceplant removal and revegetation with native plants	Ongoing	Continued work on the Manhattan Beach Dune Restoration project; obtained a Right of Entry Permit (ROE) to conduct scientific monitoring on-site in May 2021 and amended the permit in December 2021 to include implementation and post-restoration activities; the final Coastal Development Permit (CDP) application package, including the Restoration and Monitoring Plan (RMP), was submitted in August 2021 and the CDP permit was obtained January 2022; obtained LA County Flood Control District Permit in January 2022; obtained ROE permit from LACDBH in December 2021; Implementation commenced in January 2022; nearly 28 tons of iceplant was removed, 1,400 native dune plants have been planted, the project boundary and post and rope pathways were delineated, and sand fencing segments were installed to promote dune growth; the first round of post-restoration monitoring was conducted in August 2022; seeding of the site is planned for October 2022; supplemental planting is anticipated to occur in fall-winter 2022-23?; site maintenance and monitoring is ongoing The SMBNEP FY22-23 Bipartisan Infrastructure Law Work Plan approved by the SMBRC Governing Board and Executive Committee includes funding for the Venice - Marina Del Rey - Playa del Rey Foredune Beach Restoration Project, Adamson House Living Shoreline Project, and Beach Management Certification Program.
		Ongoing	Continued work on the Los Angeles Living Shoreline Project; CDP application package for the beach and bluff, including the Restoration and

Action #6 Next Steps / Project Name	Objectives	Status	Annual Report Update
			Monitoring Plan, was submitted in July 2021 and a Coastal Development Permit (CDP) Waiver was subsequently obtained in October 2021; obtained State Parks Scientific Collection permit in November 2021; obtained a Right of Entry Permit (ROE) to conduct scientific monitoring on-site in May 2021 and amended the permit in December 2021 to include implementation and post-restoration activities; continued to coordinate with City of Los Angeles Bureau of Engineering on permitting for the bluff portion of the project, including submitting application packages for a Right of Way Permit and a local CDP; implementation of the beach portion of the project was initiated in January 2022 and completed in March 2022; the first round of post-restoration monitoring of the beach site occurred in July 2022; site maintenance is ongoing; implementation of the bluff restoration is expected to begin in October 2022. Submitted a Scope of Work for the Santa Monica Dune Restoration project, which was selected by a Trustee Council to receive mitigation funding from the Refugio Beach oil spill; coordinated with CDFW and NFWF to receive funding to begin implementation of the project in partnership with City of Santa Monica; the grant agreement was executed in August 2022; project activities are expected to begin in fall 2022.

Action #6 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support efforts to standardize sandy beach monitoring and a regional approach to restoration	To continue efforts to standardize sandy beach monitoring and data collection for southern California through stakeholder partnershipsand CMP implementation	Ongoing	Continued ongoing coordination with the Beach Ecology Coalition group, including presenting in January 2022 as part of the virtual winter meeting; continued stakeholder and agency communications; continued the Site Suitability Model analysis project in partnership with CRI, LACDBH, and State Parks; continued CRI beach characterization study, including work on a manuscript; TBF staff was elected to the Board of Directors of ASBPA in September 2021 and participated in several board meetings.
Conduct community restoration events in the northern 48-acre dune area	To engage community through hands-on stewardship and habitat restoration through eventsheld at the LAX Dunes	Ongoing	TBF halted public community events in March 2020 through September 2021 as required by LA County Public Health due to COVID-19; events reconvened in October 2021; from October 2021 through September 2022, TBF held 17 community restoration events, where a total of 286 volunteers removed approximately 19,048 lbs (684 bags) of non-native vegetation.

Action #6 Narrative:

Malibu Living Shoreline Project: This project, in partnership with the City of Malibu, Los Angeles County Department of Beaches and Harbors (LACDBH), and State Coastal Conservancy (SCC) aims to restore approximately three acres of sandy beach and dune habitats at Zuma Beach and Point Dume Beach to improve coastal resilience and increase the health of the beach systems through a living shoreline approach. All permits, including ROE and CDP, were obtained in winter 2020.

Implementation was conducted in winter 2020-21 and resulted in removal of approximately 25 tons of invasive iceplant and other non-native vegetation from the project area. Implementation also included planting of over 500 native plants, seeding, and installation of post and rope fencing to delineate the project boundary and pathways, and sand fence segments and biomimicry stakes to promote dune growth. Project documents are publicly available on the project's webpage.

During this time period, work focused on post-restoration monitoring, adaptative management and site maintenance, and continued outreach and community engagement. The first three rounds of post-restoration scientific monitoring were conducted in June, October-November 2021, and June 2022. TBF also continued site maintenance to remove non-native vegetation, remove trash from the site, and repair post and rope fencing and sand fencing segments. Results from a special research study by CRI found that the biomimicry stakes were effective at accreting sand. The biomimicry stakes were removed in November 2021. In February 2022, TBF performed supplemental seeding of the sites and planted an additional 245 plants at Point Dume Beach and 99 plants at Zuma Beach. Plants and seed were manually watered due to lack of natural rainfall. In addition, interpretive signage was installed in May 2022. The Year 1 Annual Report was finalized in May 2022.

TBF also continues to present at conferences and to other groups about this project, including the Beach Ecology Coalition and others. Additionally, TBF had frequent communications with the City of Malibu and LACDBH for outreach and event planning. TBF coordinated with LACDBH to secure special events permits for community and student restoration events. The first community and student restoration event was held in March 2022 and resulted in removal of approximately 360 lbs of non-native vegetation. Community restoration events are ongoing and will primarily occur in the winter/spring when annual weeds are most abundant.

Los Angeles Living Shoreline Project: This innovative project, in partnership with LACDBH, State Parks, SCC, and Honda Marine Science Foundation, aims to implement a multi-habitat approach to restore approximately 3.5 acres of beach and coastal bluff habitat. This project at Dockweiler Beach directly supports a disadvantaged community and adds to SMBNEP's efforts to improve coastal resilience in Los Angeles County. It also incorporates the experimental establishment of offshore eelgrass within a one-acre footprint (see Action #4 – eelgrass).

Significant progress was made during this reporting period, including permitting, coordinating and finalizing logistics for implementation, continued outreach and monitoring, and project implementation. Significant collaboration occurred through communications with various agencies such as SCC, California Coastal Commission, LACDBH, LA County Public Works, City of Los Angeles, California Department of Parks and Recreation, LA County Lifeguards, US Fish and Wildlife Service, CDFW, US Environmental Protection Agency, and others. TBF continues to present at conferences and to other

groups about this project (e.g., El Segundo Blue Butterfly Coalition, Beach Ecology Coalition).

For the beach and bluff components of the project, TBF coordinated with LACDBH to amend the existing ROE permit to include implementation and post-restoration activities. In addition, a CDP Waiver for the project was issued by the Coastal Commission in October 2021. A Scientific Collecting Permit through State Parks was also obtained in November 2021. TBF implemented the beach portion of the project in January through March 2022. As part of implementation activities, TBF and LACC removed the old existing plover enclosure fence and replaced with symbolic post and rope fencing. The outer project perimeter was also delineated with post and rope fencing and single sided post and rope was installed to create several pathways to help guide beach visitors through the site. In addition, non-native sea rocket was hand pulled, and the project area was subsequently seeded with native dune species. Approximately 200 native plants were planted in the project area outside of the plover enclosure. Sand fencing segments were also installed in this area to help promote dune growth. In addition, several seeding plots were set up to track the germination of various dune species. The first round of post-restoration monitoring was performed in August 2022.

For the bluff portion of the project, additional coordination and permitting with the City of Los Angeles Bureau of Engineering was necessary. TBF submitted a Right of Way permit application to the City in December 2021 and a local CDP application in January 2022. Following submission of the CRP application package, the City of Los Angeles waived the need for a local CDP. A Right of Way permit was obtained in July 2022. Implementation of the bluff is expected to begin in October 2022.

Manhattan Beach Dune Restoration: This project aims to restore approximately three acres of dune habitat along the beach in the City of Manhattan Beach to provide infrastructure protection and increase coastal resilience, while improving habitat quality through invasive plant removal and native plant establishment. The project is located on existing back dunes along the coast of Manhattan Beach, adjacent to Bruce’s Beach, from approximately 36th Street to 23rd Street, within approximately 0.6 miles of coastline. The restoration project involves the removal of non-native vegetation, seeding / planting of native vegetation, strategic installation of sand fencing and other features to help establish vegetation, installation of symbolic fencing, and installation of educational features like interpretive signage.

The project design incorporated input from partners, experts, and public stakeholders through an innovative outreach and community engagement strategy that utilized virtual workshop, stakeholder meetings, and an outreach video submission to solicit feedback. In addition, TBF consulted with a Native American representative who engaged in the project as a cultural advisor. The project garnered widespread support from local stakeholder groups and community members. TBF continues to present at conferences and to other groups about this project.

Substantial progress was made during this reporting period including completing restoration planning, securing final permits, commencing implementation and community restoration events, scientific monitoring and maintenance, and continuing engagement with stakeholders and news outlets. TBF obtained a ROE permit to conduct scientific monitoring on-site in May 2021 and amended the permit in December 2021 to include implementation and post-restoration activities. The final CDP application package, including the Restoration and Monitoring Plan, was submitted in August 2021 and subsequently approved in January 2022. TBF drafted the application for the LACFCD permit in October 2021 and received and secured the Flood Construction Permit in January 2022.

Restoration implementation commenced in January 2022 and is ongoing. With support from LACC, community volunteers, and project partners, TBF removed and disposed of nearly 28 tons of iceplant and planted 1,400 native dune plants. The post and rope pathways and project boundary have also been delineated and sand fencing segments were installed to promote dune growth. TBF coordinated with LACDBH to obtain Special Events Permits for community restoration events to support implementation. Seeding of the site is expected to occur in October 2022 with supplemental planting anticipated for later in fall 2022. The project has been featured by several local news outlets, including a story by Spectrum News, and TBF continues to promote the project and associated community restoration and stewardship events.

Lastly, TBF worked with City of Manhattan Beach and others to prepare a pre-proposal for another dune restoration project in conjunction with a stormwater water quality proposal led by the City.

Santa Monica Dune Restoration: This project is being planned in partnership with City of Santa Monica, California State Parks, Audubon Society, and public stakeholders and will include restoration of approximately 4.5 acres of beach habitat on Santa Monica Beach, including the area with the current snowy plover enclosure. This project was approved to receive funding by the Refugio Beach Oil Spill Trustee Committee in September 2021 through the National Fish and Wildlife Foundation. The grant agreement was executed in August 2022. Project outreach, stakeholder engagement, planning, design, and permitting are expected to begin in fall 2022.

Beach Monitoring: In partnership with Loyola Marymount University's Coastal Research Institute (CRI), this research program is conducting a beach characterization study and informing a Site Suitability Model (SSM) analysis to determine potential areas for beach restoration, evaluating factors such as coastal infrastructure, sea level rise vulnerability, and physical and biological characteristics, while contributing information to SMBNEP's Comprehensive Monitoring Program. These research projects serve to evaluate existing conditions, assess the potential threats faced by these beaches, as well to determine which sites have the highest probability of being successfully restored with a high adaptive capacity.

During this reporting period, existing data continued to be compiled and analyzed, with work continuing a draft manuscript started in partnership with TBF, CRI, and Morro Bay National Estuary Program. Data were analyzed from public databases such as wind data from National Weather Service to inform the beach characterization work and SSM; other multivariate and spatial analyses were also performed. Summary results were presented to the winter Beach Ecology Coalition meeting in January 2022, and other venues, with a presentation in development for the April SETAC meeting (Dr. John Dorsey is an invited speaker). Work continued evaluating and combining GIS layers for the site suitability analysis and discussions with coastal municipalities and agencies will serve to inform its future use. Lastly, a Proposition 50 grant application package was approved by SMBRC and waterboards to fill data gaps for the sandy shore chapter of the CMP. TBF was the lead, in partnership with UCSB, CRI, USC Sea Grant, Pepperdine, and the Center for Urban Resilience.

CCMP Action #7

Restore and maintain the entire LAX Dunes system to support native plants, wildlife, and rare species

Long-term Environmental Results / Outcomes: Restore 48 acres of LAX Dune system to improve native dune functions and provide habitat for rare species; Maintain larger 300-acre Preserve to benefit rare species and dune plants and wildlife

Action #7 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support LAWA in long-term maintenance and adaptive management of the 48-acre northern dune area	To continue and strengthen partnership with LAWA to restore and maintain the LAX Dunes	Ongoing	Continued to coordinate and work with LAWA and project partners on seed collection, plant propagation, habitat restoration, future restoration planning, and monitoring; conducted ongoing scientific monitoring; finalized and submitted the Revised Ecological Landscape Plan in April 2021 (approved by Coastal Commission); assisted LAWA in preparing a CDP amendment for submission for the Coastal Dune Improvement Project (CDIP) (see additional narrative); conducted non-native species removal, planting, and seeding along with project partners, LACC and IOEI, and in accordance with Revised Ecological Landscape Plan, in December 2021 through March 2022; revegetation activities consisted of planting approximately 13,500 native plants and seeding with 3.62 lbs of native seed within the CDIP area; compliance monitoring was performed in spring 2022; TBF began drafting the first Ecological Monitoring Report on behalf of LAWA, which is expected to be finalized in October 2022.

Action #7 Next Steps / Project Name	Objectives	Status	Annual Report Update
Engage underserved students and volunteers and inland communities	To recruit underserved students and volunteers, particularly from inland communities, to participatein hand-on stewardship and restoration at the LAX Dunes	Ongoing	TBF halted public community events in March 2020 through September 2021 as required by LA County Public Health due to COVID-19; TBF reconvened community restoration events in October 2021; from October 2021 through September 2022, a total of 286 volunteers participated in community events; TBF continued planning internally to improve ability to connect with underserved communities, including discussions in its Justice, Environment, Diversity, and Inclusion (JEDI) Committee.
Initiate planning for areas within the adjacent dunes, including baseline monitoring	To conduct baseline monitoring and developrecommendations for habitat management	Ongoing	Conducted several site visits with LAWA and project partners in the adjacent 52-acre dune area; project partner, California Botanic Garden, performed seed collection and vegetation monitoring in the adjacent dune areas; TBF consulted with LAWA on restoration planning actions in the entire 300-acre LAX Dunes, including reviewing the draft Replacement Plan, which identifies restoration priorities in the dunes; TBF continued monitoring planning for the adjacent 52-acre dune area.

Action #7 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support LAWA in long-term maintenance and adaptive management of the 48-acre northern dune area	To continue and strengthen partnership with LAWA to restore and maintain the LAX Dunes	Ongoing	Continued to coordinate and work with LAWA and project partners on seed collection, plant propagation, habitatrestoration, future restoration planning, and monitoring; conducted ongoing scientific monitoring; finalized and submitted the Revised Ecological Landscape Plan in April 2021 (approved by Coastal Commission); assisted LAWA in preparing a CDP amendment for submission for the Coastal Dune Improvement Project (CDIP) (see additional narrative); conducted non-native species removal, planting, and seeding along with project partners, LACC and IOEI, and in accordance with Revised Ecological Landscape Plan; revegetation activities consisted of planting approximately 13,500 native plants and seeding with 3.62 lbs of native seed within the CDIP area; compliance monitoring was performed in spring 2022; TBF began drafting the first Ecological Monitoring Report on behalf of LAWA, which is expected to be finalized in October 2022.

Action #7 Narrative:

The LAX Dunes are the largest remaining remnant contiguous coastal dune system insouthern California. The 302-acre dune site is owned and managed by Los Angeles World Airports (LAWA). The site provides habitat for over 900 species, including the beautiful and delicate federally endangered El Segundo Blue Butterfly. During this period, TBF assisted LAWA in obtaining a Coastal Development Permit (CDP) amendment for the Coastal Dunes Improvement Project (CDIP) to reflect the inclusion of the Revised Ecological Landscape Plan (2021).

TBF also continued coordination and work with LAWA and partners on revegetation efforts, habitat restoration, future restoration planning, and scientific monitoring of the LAX Dunes.

Lead botanist project partner, California Botanic Garden (CalBG), conducted seed bulking and plant propagation; project ornithologist, Cooper Ecological Monitoring performed avian surveys of the site; scientific consulting partner and restoration ecologists, Coastal Restoration Consultants,advised ongoing restoration and planning for future restoration activities; LACC and IO Environmental and Infrastructure (IOEI) conducted non-native vegetation removal and native seeding and planting. In total, TBF, LACC, and IOEI, planted approximately 13,500 native plants in winter-spring 2021-22.

TBF performed compliance monitoring in spring 2022. Data was subsequently entered, analyzed, and compared to success criteria. Furthermore, TBF began drafting the first Ecological Monitoring Report, which is expected to be finalized in October 2022. Supplemental planting and seeding is anticipated for fall-winter 2022. Non-native removal is ongoing.

Public community events were halted starting March 2020 through September 2021 as required by LA County Public Health due to COVID-19. Events reconvened in October 2021. From October 2021 through September 2022, TBF held 17 community restoration events, where a total of 286 volunteers removed approximately 19,048 lbs (684 bags) of non-native vegetation.

LMU’s Coastal Research Institute and Dr. Michelle Lum’s laboratory also continued work on identifying plant growth promoting bacteria of California native plants that can be used as an inoculum to enhance restoration efforts. Preliminary analysis showed a number of bacteria isolates are plant growth promoting bacteria and appear to enhance the germination and/or growth of native plant species. Dr. Lum and her research student implemented an experimental inoculated seed germination project at the LAX Dunes in December 2020 and monitored through summer 2021. Seeds of both species being evaluated had germinated beginning in March 2021, data analyses are still being undertaken.

CCMP Action #8

Restore coastal bluff habitats in the Bay watershed to support ecosystem services

Long-term Environmental Results / Outcomes: Restore 5 acres of bluff habitats in the SMB watersheds to support ecosystem services

Action #8 Next Steps / Project Name	Objectives	Status	Annual Report Update
Use Beach Bluff Restoration Master Plan to explore bluff restoration and continue recoveryof El Segundo Blue Butterfly	To provide habitat and ecological benefits in support of the recovery andeventual delisting of the endangered El Segundo Blue Butterfly and to restore bluff habitats	Ongoing	TBF continues ongoing communications with LAWA to develop a restoration plan and enhance habitat for the El Segundo Blue Butterfly at the LAX Dunes, especially within theEl Segundo Blue Butterfly Preserve (southern dunes); participated in several meetings with LAWA and Wildlands Conservation Science (WCS) related to future restoration planning for the Preserve and the entire LAX Dunes complex and reviewed and provided feedback for the draft Replacement Plan; continued ongoing participation and support for the El Segundo Blue Butterfly Coalition (ESB Coalition), a group of public stakeholders, organizations, and agencies dedicated to restoration for the butterfly; TBF supported efforts by LACDBH to conduct bluff and beach restoration associated with the RV Park expansion at Dockweiler Beach; TBF included seacliff buckwheat (*Eriogonum parvifolium*), host plant for ESB, in the planting palette for the Los Angeles Living Shoreline Project and Manhattan Beach Dune Restoration Project (Action #6).

Action #8 Next Steps / Project Name	Objectives	Status	Annual Report Update
Identify partners and funding to support bluff restoration projects	To establish project partners, project sites, andidentify potential funding sources in support of bluff restoration	Ongoing	Continued to identify and coordinate with project partners, agencies, and stakeholders toprioritize project locations; continued work as part of ESB Coalition; continued discussions with LACDBH and City of Los Angeles for additional bluff restoration projects on Dockweiler Beach; see also updates as part ofthe Los Angeles Living Shoreline Project (Action #6).
Initiate restoration of one bluff restoration project	To restore 13 acres of rare coastal bluff habitat to support threatened and endangered wildlife and plant species, reduce coastal erosion, improve water infiltration, and enhance public access	Ongoing	Implementation of the Abalone Cove Habitat Restoration Project (funded by Prop 12) continued during this reporting period, including planting, weed removal, seed collection, trainings on seed collection and species of concern at the site, irrigation repairs, restoration monitoring, and trail maintenance events (see additional narrative); see also the narrative for Action 6 for the Los Angeles Living Shoreline Project.
Initiate Pt. Dume stair replacement and bluff restoration projectto benefit people and wildlife	To replace a deteriorated beach access staircase and restore bluff habitat atPoint Dume State Beach	Ongoing	Construction of the Point Dume State Beach staircase was completed and is open to the public for use; restoration of native plant species impacted by construction was initiated.

Action #8 Narrative:

SMBRC staff continued to coordinate with SCC in overseeing implementation of the Abalone Cove Habitat Restoration which involves habitat restoration of 13-acres at Abalone Cove Reserve in Rancho Palos Verdes.

The restoration includes the removal of invasive trees, shrubs, and herbaceous plants; the propagation of native plant species; irrigation and planting specifications; maintenance schedule; and monitoring and reporting protocols. During this reporting period, the project released captive-reared Palos Verdes blue butterflies, an endangered species endemic to Palos Verdes Peninsula, into the restoration site; observed endangered El Segundo blue butterflies at the site, further south than usually observed demonstrating the importance of native habitat along coastal bluffs; planted 1,400 plants; removed weeds with volunteer support; collected seeds, seeded open areas, and held a training on seed collection and processing for interns and the community; held monthly trail maintenance events and trainings for City of Rancho Palos Verdes staff for species of concern at the site; repaired irrigation; and initiated restoration monitoring.

Additional coordination between TBF and LACDBH continues regarding potential bluffrestoration projects adjacent to County beaches, including several sites at DockweilerBeach, and one being led by LACDBH. Several bluff restoration projects are being conducted in the SMBNEP study area by partners such as Palos Verdes Peninsula Land Conservancy, Los Angeles Conservation Corps, City of Redondo, and South Bay Parkland Conservancy. Projects are removing invasive species, planting natives, and providing habitat for the federally endangered El Segundo Blue Butterfly. Additional work continues through a stakeholder engagement group known as the El Segundo Blue Butterfly Coalition (ESB Coalition), bringing together partners from many different non-profit groups, agencies, and representatives from municipalities. The ESB Coalition is working on several projects, including updates to their new website, a mapping tool to track restoration efforts, and coordination of project updates and discussions from many partners.

CCMP Action #9

Implement Malibu Creek Ecosystem Restoration Project (Rindge Dam and other barrier removals) to support ecosystem restoration

Long-term Environmental Results / Outcomes: Complete implementation of the Malibu Creek Ecosystem Restoration Project including the removal of barriers to improve stream and riparian habitats and to benefit the steelhead trout

Action #9 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support lead agencies in effortsto complete the design and engineering plansfor the Malibu Creek Ecosystem Restoration Project	To develop design and engineering plans to remove Rindge Dam and additional barriers, to restore terrestrial and aquatic habitat connectivity and establish natural sediment transport regime	Ongoing	In February 2022, WCB approved $12.5 million to complete studies, develop engineering plans and specifications to a 90 percent level of completion, and all required permitting; a Notice of Exemption was filed and a Request for Qualifications was released to select a contractor to lead the planning, engineering, and design phase (see additional narrative).

Action #9 Narrative:

The lead agencies for the Malibu Creek Ecosystem Restoration Project are the US Army Corps of Engineers (federal) and the California Department of Parks and Recreation (state). The primary purpose of the project is to restore aquatic habitat connectivity along Malibu Creek and its tributaries, establish a more natural sediment regime from the watershed to the shoreline, and restore aquatic habitat of sufficient quality along Malibu Creek and tributaries to sustain or enhance indigenous populationsof aquatic species within the next several decades, allowing for migratory opportunities to about 15 miles of aquatic habitat that have been unreachable for many decades in this watershed. The project report signed by the Army Corps, Final Environmental Impact Statement, and other documents are publicly available on the Army Corps website. In February 2022, WCB approved $12.5 million to complete the engineering plans and specifications to a 90 percent level of completion and the Notice of Exemption was filed. In May 2022, State Parks released a Request for Qualifications to select a contractor to lead the planning, engineering, and design phase. Project design will begin in October 2022 to be completed by Spring 2026.

CCMP Action #10

Remove additional barriers to support fish migration and ecosystem services

Long-term Environmental Results / Outcomes: Remove fish barriers to support endangered steelhead trout habitat expansion, increase resilience related to climate change, and provide ecosystem services

Action #10 Next Steps / Project Name	Objectives	Status	Annual Report Update
Identify, prioritize, and acquire funding for barrier removal projects	To engage with partner entities to identify potential opportunities for fish barrier removal	Ongoing	RCDSMM secured $125,000 from State Parks to continue three years of snorkel surveys to assess abundance and distribution of Southern California steelhead trout in Arroyo Sequit, Malibu, and Topanga Creeks and inform several restoration projects by monitoring before and after removal of natural and human-caused barriers to fish migration.

CCMP Action #11

Restore urban streams, including daylighting culverted streams, removing cement channels, and restoring riparian habitats

Long-term Environmental Results / Outcomes: Restore at least two priority stream areas as defined by guiding documents such as the Ballona Creek Greenway Plan

Action #11 Next Steps / Project Name	Objectives	Status	Annual Report Update
Identify additional urban streams for restoration and prioritize actions	To engage with partner entities to identify potential opportunities for urban stream restoration	Ongoing	No activities occurred during this reporting period.

CCMP Action #12

Restore smaller coastal lagoons and other wetland types to increase wetland habitat area and condition throughout the watershed

Long-term Environmental Results / Outcomes: Restore and increase wetland and transition habitat acreages for small lagoons such as Topanga Lagoon and other wetland systems to improve ecological functions

Action #12 Next Steps / Project Name	Objectives	Status	Annual Report Update
Finalize restoration planning and permitting for Topanga Lagoon restoration project and initiate project	To create a restored habitat that integrates fish passage barrier removal, wetland habitat restoration,visitor services, and recreational opportunities at Topanga Lagoon	Ongoing	Topanga Lagoon Restoration Planning project (funded by Prop 12) received additional funding and continued Phase 1 implementation, including filing the Notice of Preparation, holding a public scoping meeting, releasing a music video highlighting the importance of the project, and initiating coastal surveys; and TBF supported baseline assessment through deployment and management of a water quality sensor in partnership with RCDSMM (see additional narrative).

Action #12 Next Steps / Project Name	Objectives	Status	Annual Report Update
Complete land acquisition, feasibility analyses, and restoration designin coordination with bridge redevelopment for Trancas Lagoon	To restore habitats adjacent to Trancas Lagoon after CalTrans bridge expansion is completed	Ongoing	CalTrans initiated preliminary work to replace the Trancas Creek Bridge in March 2022, including fiber optic line relocation and vegetation clearing. LACPW continued feasibility analysis for the Trancas Canyon Channel Restoration project, which aims to improve flood protection and allow for fish passage where feasible in upper reaches of the channel that flows to Trancas Lagoon, and in June 2022 SMBRC staff participated in a stakeholder workshop to discuss findings of the project's hydrology, hydraulics, sediment transport, and debris yield analyses and provide feedback on concerns and constraints associated with the proposed debris flow protection.
Conduct comprehensive monitoring of small lagoons in northern Bay to inform CMP and seek funding to continue Malibu Lagoon monitoring	To conduct comprehensive monitoring of the northern Bay lagoons, inform the Comprehensive Monitoring Program (wetlands chapter), and acquire funding to continue long-term monitoring and data collection at Malibu Lagoon	Ongoing	Continued conversations with partners such as CSULB, SCCWRP, UCLA, and RCDSMM to gain information on bar-built estuaries; continued participation on the Estuarine MPA Technical Advisory Committee, which includesMalibu Lagoon as a study site; continued coordination with EMPA monitoring, including deployment, management, and maintenance of one water quality sonde in Malibu Lagoon; SCCWRP, TBF, and CSULB applied for Proposition 50 money to conduct monitoring of the small lagoons in northern Bay to fill CMP data gaps.

Action #12 Next Steps / Project Name	Objectives	Status	Annual Report Update
Assess restoration options and priorities for other wetland types (e.g., freshwater systems)	To complete acquisition and planning to restore wetlands associated with the AES Power Plant redevelopment in Redondo Beach	Ongoing	No activities occurred during this reporting period.

Action #12 Narrative:

SMBRC staff continued to coordinate with SCC in overseeing implementation of the Topanga Lagoon Restoration Planning project. The project aims to advance the planning effort for the restoration of Topanga Lagoon to improve habitat for the endangered steelhead trout and tidewater goby, be resilient to sea level rise and climate change, as well as improve visitor experience and enhance recreational opportunities. During this reporting period, the project was awarded $540,000 from State Parks to develop visitor services elements and $1.6 million from the State budget through a CDFW grant to further environmental review; submitted a Notice of Preparation to announce that State Parks is preparing a EIR for the project; held a public scoping meeting in June 2022 to gather input on what impacts the EIR should consider and analyze to assist in identifying the preferred alternative; and released a music video highlighting the importance of the project. Four coastal surveys occurred in August using side scan sonar and underwater video to survey the seafloor and map the habitat and SCUBA to document invertebrate and fish species, verify algal species observed during previous surveys, and identify any sensitive underwater resources. This information will be used as baseline documentation of nearshore conditions that will be included in the environmental document for the planning process and results will be made available to the public during the environmental review process.

TBF continued coordination with SCCWRP and Moss Landing Marine Laboratory for the Estuarine Marine Protected Area, (EMPA) monitoring program, which includes Malibu Lagoon as a study site. TBF partnered with CSULB to coordinate, deploy, and manage one water quality sensor in the lagoon. CSULB and partners implemented the first round of EMPA monitoring in the lagoon in March and April 2021 and another in fall 2021, including fish traps, nutrients, and other metrics. SCCWRP led a Proposition 50 proposal in partnership with TBF and CSULB to fill CMP data gaps for the small northern Bay wetland lagoon systems, which was approved.

Additionally, a proposal led by SCC to the EPA Wetland Program Development Grant (including TBF and many other

partners) to help take the next steps in standardizing regional wetland monitoring for southern California. This proposal was preliminarily accepted, with additional work towards a Scope of Work by SCC and partners.

CCMP Action #13

Restore Ballona Wetlands Ecological Reserve to enhance wetland habitats and benefits to people

Long-term Environmental Results / Outcomes: Restore 577-acre Ballona Wetlands Ecological Reserve to improve wetland, transition, and upland habitats, functions, and services; Create public access trails and bike paths and encourage recreation and stewardship at the Ballona Wetlands Ecological Reserve

Action #13 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support the lead agencies by contributing technical information to the Final Environmental Impact Statement and Report and permitting	To support the lead agencies in completing permitting and a federal environmental review document	Ongoing	A natural gas monitoring well was capped by SoCalGas, eliminating the need for further access to the well.

Action #13 Next Steps / Project Name	Objectives	Status	Annual Report Update
Continue community engagement and hand-restoration within the Reserve with FBW	To restore four acres of degraded wetland and transition habitat at the Ballona Wetlands Ecological Reserve through community restoration	Ongoing	Continued to conduct frequent restoration maintenance, small partner events, and biological monitoring in accordance with permits(TBF and FBW); public community events were halted as required by LA County Public Health due to COVID-19 in March 2020 through July 2022; community restoration events reconvened in August 2021 with COVID-19 safety guidelines in place; from August 2021 through September 2022, a total of 166 volunteers removed approximately 37,080 lbs. of non-native vegetation over the duration of 18 events; continued restoration activities and associated monitoring in permitted areas as part of a project funded by Prop 12; continued post-restoration site maintenance and monitoring (see additional narrative).
Support lead agencies to identify and obtain restoration funding	To support lead agencies in finding funding to implement the Ballona Wetlands Restoration Project	Ongoing	No activities occurred during this reporting period.

Action #13 Narrative:

Ballona Reserve Community Stewardship Project: TBF, in partnership with California Department of Fish and Wildlife (CDFW), Friends of Ballona Wetlands (FBW),and community volunteers are conducting a project to remove invasive vegetation whilebroadening public involvement and stewardship at the Ballona Wetlands Ecological Reserve (Reserve), in Area B, south of Culver Boulevard. During this period, TBF continued maintaining and expanding the community restoration site at the Reserve. TBF staff, partners, and interns continued restoration efforts through frequent site maintenance days.

Community events were halted starting in March 2020 through July 2021 as required by LA County Public Health due to COVID-19; however, events reconvened in August 2021 with COVID safety measures in place. From August 2021 through September 2022, a total of 166 volunteers removed approximately 37,080 lbs. of non-native vegetation over the duration of 18 events. Ongoing scientific monitoring and maintenance continued in accordance with the Implementation and Monitoring Plan.

CCMP Action #14

Implement wildlife crossings and other innovative projects for benefits to wildlife and people

Long-term Environmental Results / Outcomes: Complete construction and implementation of two major freeway wildlife crossing projects to benefit wildlife, genetic diversity, and people

Action #14 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support lead agencies to find funding for Phase2 of the Liberty Canyon Wildlife Crossing project	To implement Phase 2 of the Liberty Canyon Wildlife Crossing Project (Final/ 100% Design) in support ofwildlife movement and safety and enhanced habitats	Ongoing	Governor's 2022-2023 budget allocated $10 million, and the Boeing Company donated $1 million to Liberty Canyon Wildlife Crossing Project (also known as the Wallis Annenberg Wildlife Crossing). Construction initiated in April 2022 including grazing hillsides at the site of the future crossing, relocating of utilities, and preparing native plants to install along the crossing.
Support lead agencies in permitting and environmental review of Liberty Canyon Wildlife Crossing project	To complete implementation of the Liberty Canyon Wildlife Crossing Project in supportof wildlife movement and safety and enhanced habitats	Ongoing	The project continued the final design and engineering phase during this reporting period; CalTrans held a virtual prebid conference on 14 February 2022; the groundbreaking ceremony was announced to take place on Earth Day (22 April 2022) to celebrate the start of construction, with project completion anticipated in 2023.

CCMP Action #15

Implement projects that improve understanding and/or enhance endangered and threatened species populations (e.g., habitat improvements for Western Snowy Plover, genetic banking)

Long-term Environmental Results / Outcomes: Improved extent and condition of habitats for rare species throughout the Bay and its watershed

Action #15 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support Southern California Steelhead Trout genetic banking study	To conduct the Southern California Steelhead Trout genetic banking study to inform population recovery	Ongoing	RCDSMM received $340,000 from the State budget to develop an action plan that identifies priority watersheds and potential tools for recovering fish during acute disturbances while continuing efforts to restore habitat, fish passage, and instream flows.
Support restoration and monitoring activities to benefit California red legged frog populations	To improve riparian and stream habitats to supportpopulations of California red legged frog	Ongoing	Implementation of the California Red-leggedFrogs Project (funded by Prop 12) continued egg mass surveys in the source population and reintroduction sites (see additional narrative).

Action #15 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support projects within western snowy plover critical habitat	To provide habitat and ecological benefits in support of the threatened Western Snowy Plover andto restore critical habitat	Ongoing	Continued beach and dune restoration projectsand continued to inform management actions insupport of ecological benefits to plovers; ongoing communications with USFWS regarding habitat enhancement projects; continued conversations with Audubon Society and plover monitoring teams and received summary plover reports monthly; ongoing communications with City of Santa Monica and PV Audubon about an additional beach restoration project in Santa Monica to support plovers; the project footprint for the recently approved Santa Monica Dune Restoration project encompasses an existing plover enclosure, which would be expanded and enhanced as part of the scope of the project (see Action #6) (see additional narrative).

Action #15 Narrative:

SMBRC staff continued to coordinate with SCC in overseeing implementation of the reestablishment of California red-legged frogs (CRLF) project. The project builds on an earlier effort by National Park Service (NPS) to reintroduce the CRLF to the Santa Monica Mountains and consists of actions to establish self-sustaining populations of CRLF in Santa Monica Mountain streams and to address impacts from the Woolsey fire. During this reporting period, daytime egg mass surveys continued at three of the four reintroduction sites. Adult and larval CRLF were observed at all survey sites and froglets were observed in two survey sites. Night surveys were conducted at the source site and one of the reintroduction sites which involved capturing, tagging, and swabbing adult and juvenile frogs for chytrid fungus. In October 2021, NPS staff was interviewed about the project.

See also Action #3 in support of white abalone enhancement, Action #6 in support of western snowy plover habitat enhancement, and other Actions throughout this document.

CCMP Action #16

Support the implementation of activities and projects such as those in Enhanced Watershed Management Plans (EWMPs) and activities identified in the TMDL implementation schedule to help achieve TMDL goals for 303d listed waterbodies in the Bay and its watershed

Long-term Environmental Results / Outcomes: Assist in achieving constituent percentage load reduction targets for waterbodies in the Santa Monica Bay according to TMDL compliance timeline

Action #16 Next Steps / Project Name	Objectives	Status	Annual Report Update
Continue to support implementation of projects identifiedin EWMPs and WMPs	To allocate and oversee State Bond funding for implementation of projects identified in EWMPs and WMPs; support implementation of projects made available under the Safe Clean Water Program	Ongoing	Continued overseeing implementation of capital projects for storm water pollution reduction through multi-benefit solutions including two projects funded by Prop 12 and four projects funded by Prop 84 (see also Action #17); see Action #43 for efforts related to Measure W support.

Action #16 Next Steps / Project Name	Objectives	Status	Annual Report Update
Continue implementation ofLA IRWMP	To facilitate and support coordination and allocation of IRWMP funding and implementation of projects identified in EWMPs and WMPs in the watershed	Ongoing	Continued to participate in activities of the Greater Los Angeles County IRWM Leadership Committee and IRWMP South Bay Steering Committee. In March 2022, Leadership Committee approved $5 million in drought funds set-aside for Disadvantaged Community Involvement Program Projects. In October 2021 Sub-region Steering Committees held two public stakeholder workshops for input on development of the LA County Water Plan, which establishes targets, strategies, and actions to increase water resilience in LA County; additional workshops were held in April 2022 to collect feedback on preliminary strategies and actions and brainstorm near-term steps to accomplish these actions. SMBRC staff participated in review and selection of project proposals for the second round of Prop 1 funding including projects that provide primary benefits directly to disadvantaged communities. The IRWM Sub-Region Committees will submit recommendations to the IRWM Leadership Committee for consideration in November 2022.
Facilitate other sources of State funding	To facilitate and support allocation of funding from other State bond measuressuch as Prop 1 and 65 for implementation of projects identified in EWMPs and WMPs in the watershed	Ongoing	No activities occurred during this reporting period.

CCMP Action #17

Infiltrate, capture, and reuse stormwater and dry-weather runoff through green infrastructure, LID, and other multi-benefit projects and improve understanding of ecosystem services provided

Long-term Environmental Results / Outcomes: Assist in achieving constituent percentage load reduction targets for waterbodies in the Santa Monica Bay according to TMDL compliance timeline

Action #17 Next Steps / Project Name	Objectives	Status	Annual Report Update
Complete rain garden metal fate study with CRI	To assess the fate of sequestered or retained heavy metals in the CulverCity Rain Garden	Ongoing	No activities occurred during this reporting period.
Complete additional LID projects throughout the watershed	To complete more LID projects throughout the watershed to improve floodprotection and water quality, and provide additional benefits	Ongoing	Continued to work with grantees to implement four previously funded Prop 84 projects: Culver Boulevard Urban Stormwater Project, Westwood Neighborhood Greenway Project, Santa Monica Bay Catch Basin Insert Project, and Ladera Park Water Quality Enhancement Project; Continued to coordinate with SCC to oversee two Prop 12 projects: Monteith Park and View Park Green Alley Stormwater Improvements Project and Beach Cities Green Streets (see additional narratives).
Seek funding and partnerships to conduct a cost-benefit analysis of LID projects	To continue to inform regional assessments ofLID projects and water quality benefits	Ongoing	No activities occurred during this reporting period.

Action #17 Narrative:
SMBRC staff continued overseeing implementation for the following previously fundedProp 84 projects:

Culver Boulevard Realignment and Urban Stormwater Project: SMBRC staff continued to coordinate with SWRCB staff in overseeing implementation of this stormwater pollution reduction project. This project, carried out by the City of Culver City, consists of capturing and treating dry-weather runoff and storm runoff from a drainage area of 800 acres for local irrigation and using a belowground infiltration basinto recharge groundwater. During this reporting period, construction was completed in May 2022 and the project held a celebration in June 2022.

***Westwood Neighborhood Greenway Project*:** SMBRC staff worked with the grantee,City of Los Angeles, to continue to implement the Westwood Neighborhood Greenway Project, which will clean and conserve water while providing native habitat for wildlife and opportunities for public engagement. This project aims to improve water quality by diverting and capturing runoff from 2,400 acres of drainage area into two bioswales. Construction was completed in September 2020. During this reporting period, requested to extend the work completion date to June 2023 to conduct required wet weather monitoring and assess project performance. In October 2022, SMBRC staff conducted a final site visit to view the project components. Project leads are anticipated to present an overview of the project to the SMBRC Governing Board at its February 2023 meeting.

***Santa Monica Bay Catch Basin Insert Project*:** $589,386 in Prop 84 funds were allocated to this project. SMBRC staff worked with the grantee, City of Rancho Palos Verdes, to finalize remaining deliverables for this project, which retrofitted and installed 1,112 connector pipe screen (CPS) units in all suitable catch basins across the Palos Verdes Peninsula (PVP) watershed draining to Santa Monica Bay, spanning approximately 14 sq. miles. This project aims to help mitigate trash and marine debris and assist cities in the PVP watershed in implementing the requirements for stormwater permits. During this reporting period, the grantee continued development of the final project report and SMBRC staff conducted a final site visit in September 2022 to view a selection of catch basins with CPS units installed. Project leads are anticipated to present an overview of the project to the SMBRC Governing Board at its 15 December 2022 meeting.

***Ladera Park Water Quality Enhancement Project*:** SMBRC staff continued to coordinate with SWRCB staff in overseeing implementation of the Ladera Park Water Quality Enhancement Project by the Los Angeles County Department of Public Works.This project aims to treat, store, and infiltrate runoff from a 110-acre tributary area through a combination of pre-treatment, retention, and infiltration facilities. A one-year time extension for the project was approved to allow completion of construction and monitoring, which were delayed due to contractor issues. The grantee is exploring the need for another time extension to account for these delays.

SMBRC staff continued to coordinate with SCC in overseeing implementation of previously funded Prop 12 projects:

***Monteith Park and View Park Green Alley Stormwater Capture*:** The project consists of constructing an infiltration system and recreational and aesthetic improvements at Monteith Park and at View Park alley. Stormwater will be diverted into the infiltration system and be allowed to percolate into the ground. The project will prevent potentially polluted runoff from being discharged downstream thus improving the water quality in the Ballona Creek Watershed. During this reporting period, delays due to easement and utility coordination issues were resolved and development of design plans was initiated. In October 2022, a construction bid was advertised and will close in November 2022. Construction award is anticipated in December 2022 and construction initiation and completion in March 2023 and mid-2024, respectively. The grant agreement was amended to extend the project completion date to 2025.

***Beach Cities Green Streets Project*:** This project consists of designing and constructing Green Street infrastructure to help meet water quality objectives set for the Santa Monica Bay beaches. The Beach Cities will retrofit existing impervious areas within the public parkways and right-of-ways using green infrastructure technologies such as porous pavement, catch basin trash screens, bio-filtration / bio-retention systems and dry wells. During this reporting period, the second round of public outreach efforts were completed and the concepts for El Nido Park and Kingsdale Street modifications were finalized; the 65% designs were completed which map existing utilities and estimated pothole locations, establish best management practices locations, and assessed all conflicts and required modifications to existing infrastructure; and the project lead started work on a grant application for the SCW Program to obtain additional construction funding. The project completion date was extended from February 2022 to February 2025.

***Paramount Ranch Storm Flow and Sediment Reduction*:** The proposed project wascanceled due to Woolsey Fire impacts and the Prop 12 funds were reallocated to the Topanga Lagoon Restoration Planning project and the Palos Verdes Restoration Reef project.

CCMP Action #18

Support installation and monitoring of additional sewage and bilge pumpout facilities in Southern California harbors

Long-term Environmental Results / Outcomes: Meet 86-100% annual average usability percentage (based on analysis of equipment performance) for all publicly funded sewage pumpout stations throughout Southern California

Action #18 Next Steps / Project Name	Objectives	Status	Annual Report Update
Continue quarterly monitoring of public sewage pumpout stations	To assess the condition of public sewage pumpout and dump stations	Ongoing	Per statewide directive, monitoring is now occurring on a triannual basis and includes dump stations; conducted three triannual monitoring efforts of 71 public sewage pumpout and seven dump stations in Southern California harbors; finalized two triannual monitoring reports; finalized Clean Vessel Act (CVA) Pumpout and Dump Station Performance Report 2021; initiated phase one of a CVA pumpout station sewage volume study with SFEP via planning a methodology.
Support installation of sewage pumpoutsin Marina del Rey or King Harbor	To provide the boating community with additional pollution prevention resources	Ongoing	City of Redondo Beach (King Harbor) submitted one CVA application for two new pumpout units and was awarded a CVA grant for their installation.
Support installation of bilgepumpouts in Marina del Rey or King Harbor	To support installation ofbilge pumpouts	Ongoing	No activities occurred during this reporting period.

Action #18 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support efforts of neighboring harbors in installation of bilgeand sewage pumpouts in southern California	To provide the boating community with additional pollution prevention resources	Ongoing	Communicated with Port of San Diego, Huntington Harbor, City of Long Beach, Ventura Harbor, and Port of Los Angeles staff to promote and champion CVA sewage management grants; Morro Bay Yacht Club applied for a CVA installation grant and is moving forward with its execution.

Action #18 Narrative:

TBF's Boater Education Program works to enhance stewardship and reduce ocean pollution generated by recreational boating activities. A key pollutant of focus is boat sewage. Discharging sewage overboard causes severe environmental and human health problems, especially in a state with more than four million recreational boaters. To reduce the negative impacts of discharging sewage overboard, all boaters are encouraged to use sewage management facilities including pumpout stations, mobile pumpout services, marine composting toilets, dump stations and floating restrooms. To decrease potential sewage discharged into waterways, TBF's Boater Education Program monitors public boat sewage disposal facilities to ensure southern California's pumpout and dump station network is operational, well-maintained, and accessibly to recreational boaters. Monitoring utilizes the Pumpout Nav app for surveying and additionally provides technical assistance to facility managers that supports maintenance and equipment replacements such as nozzles and banjo valves. This collaborative approach to pumpout and dump station monitoring is conducted in partnership with San Francisco Estuary Partnership and Morro Bay National Estuary Program which yields statewide consistency. It is supported by the federal Clean Vessel Act Education and Outreach grant administered through California State Parks Division of Boating and Waterways. Pumpout Nav's data is maintained by monitoring agencies and app updates are developed and published regularly. During this reporting period, monitoring of pumpout units found an average 73% usability (based on analysis of equipment performance), and 97% of the pumpout units tested with biodegradable dye tablets were leak-free.

CCMP Action #20

Support elimination of non-point pollution from onsite wastewater treatment systems

Long-term Environmental Results / Outcomes: Achieve level of performance and water quality protection set by state policy for all OWDS in the Santa Monica Bay watershed

Action #20 Next Steps / Project Name	Objectives	Status	Annual Report Update
Complete sewer connections of residential properties to the centralized wastewater treatment facility in the Malibu Civic Center area	To improve water quality and reduce nutrient pollution through connecting residential properties to the centralized wastewater treatment facility	Ongoing	City of Malibu continued Phase 2 design and planning, including development of funding agreements, development of designs for wastewater collection and recycled water distribution systems. In March 2022, the City requested an extension to resolve cultural resource issues and have more time to obtain additional project grants.
Continue the coordinated OWTS identification, permitting, and inspection system between the LARWQCB and the cities and counties in the watershed	To continue to support efforts by the LARWQCB and cities and counties to achieve full implementation of the statewide policy for siting design, operation, and maintenance of OWTSs	Ongoing	LARWQCB staff continued inspections at municipal and industrial facilities prior to issuing waste discharge permits and during construction, treatment system startup, installation of wells for groundwater monitoring, and monitoring events.

CCMP Action #21

Support policies that promote reuse, recycling, and advanced wastewater treatment to reduce reliance on imported water sources

Long-term Environmental Results / Outcomes: Help reduce dependence of the Los Angeles region on imported water and lower the percentage of imported water use by water agencies; work towards meeting the State's goals for recycled water in the Recycled Water Policy

Action #21 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support recycled wastewater efforts by JWPCP of LACSD	To support expansion of wastewater effluent recycling by JWPCP of LACSD	Ongoing	The project was renamed to Pure Water Southern California; the environmental review process was initiated with a Notice of Preparation released in September and public scoping meetings scheduled for October and November 2022; the Environmental Impact Report is anticipated to be released in 2023; and virtual and in person tours of the facility were also held.
Hyperion Treatment Plant toimplement pilot project for recycled water	To support timely completion of Hyperion'spilot project	Ongoing	At the February 2022 SMBRC Governing Board meeting, LASAN staff presented on the Hyperion 2035 Program and LA City's vision for 100% water recycling; a third-party assessment report of the 11 July 2021 Hyperion Water Reclamation Plant sewage discharge incident was presented to the LA City Board of Public Works to identify the causes of the incident and other conclusions regarding recovery, communications, costs, and recommendations to avoid recurrence of similar future incidents.

Action #21 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support recycled wastewater efforts by Tapia Water Reclamation Facility and othersthrough expansionof distribution system and regional partnerships	To support expansion of recycled wastewater distribution and reuse	Ongoing	The Pure Water Project (funded by Prop12) completed in September 2020 (see additional narrative);) and at the 21 April 2022 SMBRC Governing Board meeting, SWRCB staff presented on the statewide perspective on recycled water including water resilience strategies; recycled water policies, programs, partnerships, and research; funding opportunities; and upcoming regulatory developments related to on-site treatment and reuse, non-potable reuse, and direct potable reuse.

Action #21 Narrative:

SMBRC staff continued to coordinate with SCC in overseeing implementation of the Pure Water Project Las Virgenes-Triunfo (Pure Water Project), which received $925,720 in Prop 12 funds. The project involves constructing a 100 gallon-per-minute, indirect potable water reuse demonstration project for reservoir augmentation that will produce up to six million gallons of local, drought resistant water supply per day, while improving in-stream habitat. The demonstration facility is needed to test the advanced microfiltration, reverse osmosis, ultraviolet light disinfection, and oxidation components of a Pure Water advanced treatment facility prior to implementation of a full-scale project. Construction of the demonstration facility was completed. LVMWD staff provided a presentation and hosted an in-person tour of the demonstration facility accompanying the June 2022 SMBRC Governing Board meeting.

CCMP Action #22

Support policies and implement projects that divert landfill waste and encourage composting to improve water quality and lower greenhouse gas emissions

Long-term Environmental Results / Outcomes: Establish 10 local community-based compost hubs and divert food waste from 20 food service establishments; distribute compost among community support agriculture, gardens, and restoration projects

Action #22 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support continuation of Table to Farm compost hubs	To reduce food waste being sent to landfills, compost food waste, and apply compost to urban gardens to grow food	Ongoing	Continued Table to Farm community garden maintenance by co-leading monthly volunteer events at Environmental Charter School (ECS) Inglewood; engaged over 100 community members at ECS Inglewood's November 2021 Harvest Festival; implemented a student-led presentation on composting, community gardens, and food access at a fall 2021 Governing Board meeting; established a project case study and; applied for private funding to support Table to Farm continuation; acquired funding via US EPA Environmental Justice Small Grants Program 2021 to revitalize three Table to Farm compost hubs at ECS Gardena, Lawndale, and Inglewood campuses, retrofit ECS Inglewood's greenhouse and co-develop a new aspect of their Green Ambassador curriculum; initiated Table to Farm Revitalization project by rebuilding ECS Inglewood compost bin and updating ECS in September 2022. Lawndale's

Action #22 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support expansion, outreach and implementation for residential and commercial organics collection and recycling	To support greenhouse gas reduction by way of residential and commercial organics recycling implementation by city and state regulatory agencies	Ongoing	No activities occurred during this reporting period.

Action #22 Narrative:

The Table to Farm program, initiated in 2016, is a partnership between Environmental Charter Schools (ECS), TBF, and the community at large working collaboratively to reduce greenhouse gas emissions by recycling organic food waste and growing local produce. Between 2016 and 2019, three compost hubs were established at ECS Inglewood, Gardena, and Lawndale. In 2020, a community garden was established outside of ECS Inglewood's gates. The garden continues to thrive and has monthly volunteer events to support the upkeep of planting, harvesting, and maintenance. During this period, a case study flyer was produced that snapshots the community garden's development, funding was awarded to revitalize ECS's community composting and curriculum development, and the revitalization project was initiated by updating ECS Inglewood and ECS Lawndale compost bins.

CCMP Action #24

Support the inclusion of coastal resilience through natural means and softscape measures into local coastal plan updates

Long-term Environmental Results / Outcomes: Inclusion of climate change adaptation measures in at least half of the 12 local coastal jurisdictions general plans (or equivalent) amendments

Action #24 Next Steps / Project Name	Objectives	Status	Annual Report Update
Attend stakeholder meetings for local cities LCP development / updates / implementation	To continue involvement in stakeholder meetings for local cities LCP development and implementation	Ongoing	Attended and participated in stakeholder meetings and workshops related to LCPs to encourage inclusions of nature-based adaptation and living shoreline measures as coastal resilience strategies; supported AdaptLA in efforts to incorporated SLR resiliency into policy.
Opportunistically assist cities in the development of sea level rise vulnerability studies	To identify and partner with cities to develop sea level rise vulnerability studies to strategically recommend coastal resilience strategies	Ongoing	Partnered with cities in the development of sealevel rise vulnerability studies and recommend nature-based living shoreline measures be included as adaptation strategies; communicated with City of Manhattan Beach, City of Malibu, City of Hermosa Beach, City of Los Angeles, and others; explored ideas for LACDBH and other coastal management agencies need for a Beach Climate Adaptation Plan.

Action #24 Next Steps / Project Name	Objectives	Status	Annual Report Update
Use data collected from beach restoration “soft-scape” projects to inform and assist LCP development	To provide science-baseddata to inform LCP development and supportbeach restoration	Ongoing	TBF staff presented the results of five years of post-restoration monitoring of the Santa Monica Beach Restoration Pilot Project at the American Shore and Beach Preservation Association meeting in September 2022. The Presentation was titled *Five-Year Post-Restoration Evaluation of the Santa Monica Beach Restoration Pilot Project*. A signature highlight of this project is its vertical gain accreting a meter of sand across many features of the project site.

Action #24 Narrative:

TBF continued to work with coastal municipalities such as LACDBH, City of Malibu, City of Santa Monica, City of Manhattan Beach, City of Hermosa Beach, City of Los Angeles (Venice Beach) and others to incorporate coastal resilience planning into Local Coastal Program updates / revisions and other policies and actions. TBF continued to support and inform City of Manhattan Beach’s and other cities’ climate resilience efforts, participate on stakeholder committees, and support inclusion of dune restoration into other multi-benefit projects. TBF continues conversations with Coastal Commission and other state agencies about their inclusion of coastal resilience into state documents and reports. A TBF staff member was also elected to the American Shore and Beach Preservation Association Board of Directors and participated in several meetings, including a focus on incorporation of nature-based resilience planning at a national level.

CCMP Action #25

Support best management practices, increased public access, and improved public facilities for beaches and other public trail systems to support both enhanced natural resources values and benefits to people

Long-term Environmental Results / Outcomes: Improve access to the coast and enhance coastal experiences through linking and expanding the California Coastal Trail; develop and build partnerships that support the implementation of natural infrastructure throughout the Bay watersheds

Action #25 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support implementation of identified actions within plans such as the LACDBH Sea Level Rise Vulnerability Assessment	To implement adaptation projects that will improve coastal resilience	Ongoing	Continued ongoing partnership with LACDBH and other coastal municipalities about opportunities to implement nature-based adaptation solutions to sea level rise; LACDBHand TBF continued discussions to prioritize infrastructure protection and reduce beach erosion through nature-based adaptation; continued ongoing conversations with City of Santa Monica and executed grant agreement for the Santa Monica Dune Restoration project (see also Action's #6 and #24)

Action #25 Next Steps / Project Name	Objectives	Status	Annual Report Update
Continue to advise BMPs for beaches that promote habitat condition improvements and support for unique species	To build upon and continue partnerships with groups and agencies to benefit beach habitat conditions	Ongoing	Continued partnerships and active participation with groups and agencies such as LACDBH, Audubon Society, Pepperdine, Beach Ecology Coalition, State Parks, USC Sea Grant, UCSB, Cal SeaGrant, Scripps, and USFWS to implement and provide recommendations for best management practices along beaches; conversations continued in conjunction with TBF's living shorelines projects; supported Beach Ecology Coalition in developing an agenda and presenting at the January meeting. SMBNEP approved the Bipartisan Infrastructure Law Work Plan in August 2023. Three of these projects are expected to make noteworthy advances in the coming years, towards Action #25 and this Objective specifically.

CCMP Action #27

Produce educational resources and materials and conduct outreach to improve best management practices for Southern California boaters (e.g., fuel, sewage, and hazardous waste management)

Long-term Environmental Results / Outcomes: Increase understanding and adoption of sustainable boating habits to reduce boating related pollutants entering waterways (e.g., boat sewage, used oil, antifreeze, bilge water, batteries, copper, trash, and aquatic invasive species)

Action #27 Next Steps / Project Name	Objectives	Status	Annual Report Update
Produce educational materials	To produce educational materials to increase awareness of boating best management practices to boaters	Ongoing	Produced and distributed Winter 2021, Spring 2022, and Summer 2022 Changing Tide newsletters; produced 2022 Tide Calendarsin Spanish and English; finalized "Marine Protected Area Boater Education Project Report"; finalized production of the "California Vessel Waste Disposal Plan" per CA State Parks Division of Boating and Waterways approval; assembled 2,300 Boater Kits for 2022.

Action #27 Next Steps / Project Name	Objectives	Status	Annual Report Update
Conduct outreach	To conduct outreach to increase awareness of boating best management practices to boaters	Ongoing	Produced and implemented an interactive Clean Boating Questionnaire for 2022 virtual engagement and Boater Kit distribution; Distributed 3,000 California Boater Kits in 2022 to southern California Dockwalkers and individual recreational boaters; co-produced the 2021 Boater Kit Feedback Survey Report regarding boaters input on the pollution prevention toolkit and its materials; conducted outreach to the boating community via co-hosting eight virtual events with California State Parks and California Coastal Commission, two Clean Boating Webinars with 37 total attendees, and six Dockwalker Trainings with 109 total attendees; attended one in-person outreach event in Port of Los Angeles; participated in the Dockside podcast's episode on Marine Sanitation DevicesMarine Sanitation Devices; promoted Dana Point and Port of Los Angeles expired marine flare collection events.
Manage Pumpout Nav app	Increase proper disposal of boater sewage	Ongoing	Continued to manage the Pumpout Nav app via ensuring pumpout and dump station status are accurate and responding to ad hoc problems reported by southern California boaters; contributed to and supported app development and maintenance in partnership with SFEP.

Action #27 Next Steps / Project Name	Objectives	Status	Annual Report Update
Research public engagement metrics and specific engagement toolson reduction of pollutants to waterways	To optimize public engagement resources to increase impact of pollutantreduction strategies to waterways	Ongoing	Submitted Boater Sewage Disposal Survey Report draft to DBW, this report shares findings and insights from surveying over 400 recreational boaters on their sewage disposal habits; finalized the Boater Sewage Disposal Survey Report; conducted community-based social marketing research in Marina del Rey to collect data on the barriers and motivations around the behavior properly disposing of boat sewage via sewage pumpout stations.
Find funding and implement fuel spill prevention tools and outreach	To reduce fuel and oil pollution from the boating community	Ongoing	Assembled and distributed 3,000 Boater Kits, each with a fuel bib and two oil absorbent sheets for southern California boaters in partnership with California Boating Clean and Green Program; co-hosted two Clean Boating Webinars and six Dockwalker Trainings conducted in partnership with California State Parks and California Coastal Commission which includes information on oil recycling and oil pollution best management practices.
Support and develop marine debris reductionand cleanup efforts	To reduce fishing line marine debris from theangling community	Ongoing	Promoted instruction collateral for do-it-yourself fishing line recycling instructions; produced 2022 Tide Calendars in English and Spanish which features fishing line recycling station locations within southern California harbors.

CCMP Action #28

Support efforts of disadvantaged communities to achieve healthy habitats, implement green infrastructure, and reduce pollution

Long-term Environmental Results / Outcomes: Help disadvantaged communities to achieve healthy habitats through restoration and pollution reduction projects

Action #28 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support IRWMP and similar programs to preferentially invest in disadvantaged communities	To support green infrastructure projects for IRWMP and Measure W funding in disadvantaged communities	Ongoing	The SMBNEP FY22-23 Bipartisan Infrastructure Law Work Plan approved by the SMBRC Governing Board and Executive Committee includes funding for the Black Surfers Collective: Diversity in the Lineup project and Coastal Access and Beach Visitor User Data Study. See Action #16 for efforts related to IRWMP and Action #43 for efforts related to Measure W.

CCMP Action #29

Reduce health risks of swimming in contaminated waters and consuming contaminated seafoods through more comprehensive source control and, advanced monitoring and public notification

Long-term Environmental Results / Outcomes: Achieve no elevated health risks associated with swimming and seafood consumption through source control, monitoring, and public notification

Action #29 Next Steps / Project Name	Objectives	Status	Annual Report Update
Continue implementation and improvement of beach water quality monitoring and reporting system	To support SWRCB's collection and coordination of bacterial sampling results for beach water quality monitoring required under AB 411; to support Heal the Bay's efforts to standardize beach water quality monitoring and effectively disseminate the information to the public	Ongoing	HtB continued to provide public beach water quality grades for over 500 beaches across the state via NowCast system; evaluated grading methodology for the River Report Card based on expert input, with the updated methodology anticipated to be finalized in summer 2023; released the 2021-2022 Beach Report Card and 2021 River Report Card in June 2022; In October 2021, AB1066 (introduced by Assemblymember Bloom in partnership with HtB) was signed into law, which aims to protect public health at freshwater swimming and recreation sites statewide, in part, through water quality monitoring using standardized protocols and metrics and public notification; and the California Water Quality Monitoring Council solicited volunteers for the AB1066-required workgroup to study water recreation hazards at priority water-contact recreation sites.

Action #29 Next Steps / Project Name	Objectives	Status	Annual Report Update
Maintain and enhance the existing seafood contamination education and enforcement program	To support and facilitate the continuation and enhancement of the existing seafood contamination education and enforcement program	Ongoing	At the 21 October 2021 SMBRC Governing Board meeting, USEPA presented an update on the Palos Verdes Shelf Superfund Site and the separate Ocean DDT Disposal Site; At the December 2021 Palos Verdes Shelf Technical Information Exchange Group meeting, partners discussed remediation alternatives and additional monitoring needs; At the March 2022 Fish Contamination Education Collaborative meeting, partners discussed pier angler outreach, community outreach, and enforcement and results and recommendations from the 2020-2021 Annual Report; USEPA resumed full community and angler outreach and enforcement activities following COVID safety precautions; Due to the workload imposed by COVID, LACDPH was unable to conduct market and restaurant inspections or renew its market inspection grant with USEPA; USEPA started collecting samples to support the upcoming Feasibility Study and the Second Monitored Natural Recovery Study with anticipated completion in December 2022; and fish sample collection started in May 2022 and sediment and water sample collections started in September 2022.and additional monitoring needs;

CCMP Action #30

Conduct community engagement, education, and inform policies related to water conservation and reuse to reduce water demand and reliance on imported sources

Long-term Environmental Results / Outcomes: Help reduce dependence of the Los Angeles region on imported water and lower the percentage of imported water use by water agencies

Action #30 Next Steps / Project Name	Objectives	Status	Annual Report Update
Link water conservation with outreach events and social media	To opportunistically incorporate water conservation topics during outreach events and on social media	Ongoing	SMBRC staff updated the SMBRC website with water conservation information and drought resources including water-saving tips, rebate programs, and state and local restrictions; TBF initiated a #waterconservationwednesday social media campaign showcasing relevant rebates and partners to over 1,000 individuals on Instagram, Facebook, and Twitter.
Educate, engage communities, and provide resources that promote the importance of native plants	To promote the use ofdrought tolerant nativeplants	Ongoing	Continued to educate community and volunteers on the importance of using drought tolerant native plants in habitat restoration and residential landscaping through online communications such as social media; communicated and developed partnerships withlocal native plant nurseries; applied for grant opportunity to fund outreach to educate the community in water conservation (see above), including through use of drought tolerant plants.

Action #30 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support efforts by water agencies to promote water conservation and reuse including dissemination of materials	To promote current information on water conservation and reuse efforts developed by wateragencies	Ongoing	No activities occurred during this reporting period.

CCMP Action #31

Achieve water quality benefits by businesses through community engagement and implementation of best management practices

Long-term Environmental Results / Outcomes: Achieve Clean Bay Certified adoption by 100% of Bay watershed cities; develop and distribute BMP materials to food service establishments and marine fuel docks

Action #31 Next Steps / Project Name	Objectives	Status	Annual Report Update
Research contaminants, environmental laws, sustainability, pollution prevention standards, and BMPs for commercial businesses such as nurseries, landscapers, restaurants, and horse stables	To assess contaminants and pollution prevention impact from commercial businesses	Ongoing	No activities occurred during this reporting period.
Distribute restaurant engagement tools	To reduce pollution from restaurants	Ongoing	See Action #32 for efforts related to restaurant source reduction.

Action #31 Next Steps / Project Name	Objectives	Status	Annual Report Update
Develop funding to support the expansion of best management practices to incorporate other business sectors	To contribute to source reduction of single-use disposable items from food service establishments	Ongoing	Conducted ReThink Disposable program at three LA yacht clubs with food service.

CCMP Action #32

Reduce marine debris by supporting bans on single-use items, conducting outreach, and participating in trash reduction programs

Long-term Environmental Results / Outcomes: Implement ban on single-use disposable plastics in Los Angeles County and 100% of cities throughout watershed; engage 30 food service establishments as ReThink Disposable participants

Action #32 Next Steps / Project Name	Objectives	Status	Annual Report Update
Find funding forand continue ReThink Disposable LA	To contribute to source reduction of single-use disposable items from food service establishments	Ongoing	Worked with California Boating Clean and Green Program and Clean Water Action to implement ReThink Disposable at three LA County yacht clubs; produced a case study on the project and its results; applied for and secured additional program funding for 2023-2024 ReThink Disposable implementation.

Action #32 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support municipality bansof polystyrene, non-recyclable plastics, and single use items	To contribute to source reduction of polystyrene,non-recyclable plastics, and single use items	Ongoing	Participated in Reusable LA Coalition and continued to co-lead its restaurant engagement committee; contributed signatory to letters to LA County Board of Supervisors urging support for the LA County Reduction of Waste from Single-Use Articles and Expanded Polystyrene Products Ordinance, to Senator Padilla to support the Break Free from Plastic Pollution Act, and to Los Angeles City Council's Energy, Climate Change, Environmental Justice & River Committee to express support for the LA Sanitation March 2022 Report on Various Motions on the Reduction of Single-use Plastics and Zero Waste Events and Facilities (CF 21-0064); partnered on 5 Gyre Institutes Plastic-Free Parks campaign to mobilize volunteers around the country to document plastic pollution in U.S. National Parks, the results will be used to support and inform legislation to keep single-use items out of Parks.

CCMP Action #33

Monitor microplastics (including microfibers) and other marine debris in the Bay and coastal environments to inform management actions

Long-term Environmental Results / Outcomes: Use microplastics data analyses and identified trends to inform source reduction management strategies in the Bay

Action #33 Next Steps / Project Name	Objectives	Status	Annual Report Update
Complete the development of a microplastics in sediment extraction and analysis method	To complete the development of a microplastics in sediment extraction and analysis method	Ongoing	CRI continued work refining and drafting the microplastics extraction protocol with recovery studies, including development of a new component of the protocol with recommendation for spectroscopy mapping to reduce effort and assess type of plastic.
Publish a manuscript on the results of the Bay studies	To assist in characterizing microplastics in the Bay and nearshore environment and disseminate results	Ongoing	CRI continued analyses and drafting to inform a future manuscript.

Action #33 Next Steps / Project Name	Objectives	Status	Annual Report Update
Conduct additional studies to inform the transport, accumulation, and fate of microplastics in our marine and nearshore environments	To continue to collect datato inform the regional fate and transport model of microplastics in the nearshore marine environment	Ongoing	CRI continued analyses and drafting to inform a future manuscript, including assessments of intertidal invertebrate microplastic densities and types. At the August 2022 Governing Board meeting, Dr. Alvina Mehinto presented on microplastics pollution including managing pollution and developing tools for effective monitoring, SCCWRP's 2020-2021 Microplastics Health Effects workshop, development of a tiered decision framework for actions based on the concentration of microplastics, and recommendations for future research.

Action #33 Narrative:

LMU's Coastal Research Institute and Dr. James Landry's laboratory continued work on microplastics research in support of this action. Dr. Landry's lab is completing a protocol to extract microplastics effectively from sediments (especially sand), analyzing them using infrared spectroscopy, and quantifying results. Dr. Landry's lab, through CRI, is also working on initiating methods and studies to identify microplastics in nearshore marine invertebrates such as sand crabs, amphipods, and mussels. CRI microplastics research processing sediment and invertebrates for microplastics was halted in March 2020 due to COVID-19 and LMU access restrictions but resumed work again in December 2020 once on campus activities were allowed to continue in a restricted manner by LA County Department of Public Health. Work on this project continues, including planning for a manuscript.

CCMP Action #34

Improve understanding of emerging contaminants through monitoring and research to inform source control and reduce loading (e.g., fire retardants), especially in the context of climate change

Long-term Environmental Results / Outcomes: Reduce impacts of emerging contaminants on key habitats in the Bay and its watersheds

Action #34 Next Steps / Project Name	Objectives	Status	Annual Report Update
Improve analytical methodology and standardize monitoring of more emerging contaminants	To improve availability, sensitivity, and repeatability of analytical methods for emerging contaminants to improve data quality for monitoring emerging contaminants in aquatic ecosystems	Ongoing	No activities occurred during this reporting period.

CCMP Action #35

Monitor and inform management actions for Harmful Algal Blooms (HABs)

Long-term Environmental Results / Outcomes: Reduce prevalence of HABs in the Bay and its waterbodies as measured by the Comprehensive Monitoring Program

Action #35 Next Steps / Project Name	Objectives	Status	Annual Report Update
Continue to support research and monitoring efforts for HABs, especially in context of climate change and CMP implementation	To support research and monitoring efforts that fill data gaps in our region for HAB occurrences, frequencies, causes, and impacts, especially in the context of climate change	Ongoing	CRI continued work to assist in filling harmful algal bloom research gaps for our region; water samples collected last year were analyzed for phytoplankton species identification and quantification using a FlowCam; analyses of samples are ongoing with additional analysis conducted in June and July 2022 with a draft manuscript in progress.
Conduct monthly maintenance of SCCOOS shore station at Santa Monica Pier and seek support for additional sensors	To collect data on oceanographic conditions in the nearshore environment and potentially inform long-term changes related to environmental factors, including climate change	Ongoing	SCCOOS and California State University North Ridge, Professor Kerry Nichols continued maintenance of the SCCOOS Santa Monica Pier Shore Station; this included approximately monthly maintenance, calibration, and water sampling to support an interactive data web portal for the SCCOOS Santa Monica Pier Shore Station.
Improve public outreach and education on HABs	To improve public understanding of harmful algal blooms, causes, and impacts	Ongoing	No activities occurred during this reporting period.

Action #35 Narrative:

CRI and Dr. Amber Bratcher-Covino continued research on Harmful Algal Blooms (HABs) to fill data gaps in the Santa Monica Bay region. Dr. Bratcher-Covino conducted three survey fieldwork days in October 2020, March 2021, and June 2021, including the collection and processing of ocean surface water samples from 12 stations throughout Santa Monica Bay. Additional work on modeling OAH and HABs continues by SCCWRP, with efforts to expand the model. Dr. Bratcher-Covino also completed efforts to use equipment to better facilitate algae speciation and quantification. A FlowCam microscope made by Yokogawa Fluid Imaging Technologies was used to analyze samples by Dr. Bratcher-Covino and student interns through July 2021 and a database of species was produced. Further analyses using these data are ongoing and Dr. Bratcher-Covino aims to submit a manuscript based on her research during the next reporting period.

CCMP Action #36

Monitor chemical, physical, and biological characteristics in the Bay to inform climate change impacts such as ocean acidification

Long-term Environmental Results / Outcomes: Development and implementation of adaptation strategy addressing impacts of ocean acidification in the Bay

Action #36 Next Steps / Project Name	Objectives	Status	Annual Report Update
Implement the Kelp Forest Hydrodynamic Study	To assess sediment transport, alteration of advective currents, and wave attenuation within kelp forests	Completed	A paper was published on August 11, 2022, in the journal Marine Progress Series. Lead author is Dr. Kristen Elsmore. Citation for the article is the following: Elsmore, K.E., K. Nichols, T. Ford, K.C. Cavanaugh, K. Cavanaugh, B. Gaylord 2022. *Macrocystis pyrifera forest development shapes the physical environment through current velocity reduction.* Marine Ecology Progress Series 694: 45-59. doi: 10.3354/meps14107 The abstract for this article has been appended to the narrative below.

Action #36 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support OA sensor array maintenance, calibration, and data downloads in accordance with SOP	To continue using high-frequency, high-resolution OA sensors to characterize OAH conditions in Santa Monica Bay	Ongoing	Wirewalker and stationary OA sensors were deployed into the water off Palos Verdes in March 2022 after repairs; on 28 March 2022, the telemetry system stopped functioning during a storm event; data collection without the telemetry system continued until 23 June 2022 when the Wirewalker mooring was retrieved; no additional deployments are planned through the end of the project in November 2022; LACSD is scheduled to present on OA monitoring efforts including lessons learned from the Wirewalker monitoring and other OA studies at the 20 October 2022 Governing Board meeting.
Support inclusion of climate change impacts into CMP, especially through new models and data	To implement monitoring associated with new climate change indicators in the CMP; to seek funding and implement the CMP; to complete and release the State of the Bay Report	Ongoing	TBF released a call for proposals for a State of the Bay Report consultant team and through a competitive process hired 3Lane Marketing to work with the TAC to draft a State of the Bay Report; 3Lane contract was finalized in this reporting period.

Action #36 Next Steps / Project Name	Objectives	Status	Annual Report Update
Convene technical advisors to prioritize actions based on information from CMP	To prioritize monitoring and data collection needs based on the revised CMP for major habitats in the Bay and implement the prioritized monitoring protocols	Ongoing	At its December 2021 meeting, the SMBRC Governing Board approved seven projects recommended for funding and one standby project for the Prop 50 grant program, which prioritizes projects that fulfill monitoring needs identified in the CMP; on 3 February 2022, DFA approved the projects for about $3.2 million in Prop 50 grant funding, initiating grant agreement negotiations for the projects on the Project List; In August 2022, SMBRC staff was notified that one project would not proceed and declined the award; In October 2022, DFA approved a Revised Project List reallocating the remaining funds to two existing projects (see additional narrative).

Action #36 Narrative:

Next Step: Implement the Kelp Forest Hydrodynamic Study

Objective: To assess sediment transport, alteration of advective currents, and wave attenuation within kelp forests

***Macrocystis pyrifera* forest development shapes the physical environment through current velocity reduction**

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ABSTRACT: Marine forests of the giant kelp *Macrocystis pyrifera* create biogenic habitat spanning the water column, within which hydrodynamic conditions can differ strongly from those outside. Such flow alteration has implications for physical, chemical, and ecological processes across multiple spatial scales. At the forest-wide scale, *M. pyrifera* has been shown to decrease alongshore current velocities, but relatively little is known about how the attenuation of such currents evolves as new kelp forests emerge and mature. Here, we quantified alongshore current velocities outside and within a temperate rocky reef environment that twice underwent a transition from a barren state to one in which a thick surface canopy was present. We identified a threshold density during forest emergence at which much of the attenuation of alongshore depth-averaged velocity occurs—3 stipes m^{-2} with a surface canopy present. Incremental increases in damping occur as the forest matures, highlighting that relatively young, thin forests can induce substantially reduced flows. Additionally, the presence of a young forest's subsurface canopy and its subsequent increase in height create a seasonally changing profile of varying velocities through the water column. These results indicate greater complexity in how canopy-forming kelp influence nearshore flow properties than has often been recognized. Importantly, emerging forests can alter the nearshore environment through modulation of current speeds shortly following initial recruitment, with consequences for the transport of larvae, nutrients, and sediment throughout the forest and adjacent habitats

SMBRC Proposition 50 Grant Program: These projects fill many data gaps identified in the CMP covering a range of habitats in the Santa Monica Bay and its watersheds, including chaparral, riparian, wetlands, rocky reefs, rocky intertidal, and soft bottom. SMBRC staff continue to coordinate with DFA and awardees for drafting project scopes of work. The grant agreements are anticipated to be executed in early 2023. The six projects on the Revised Project List are:

- *Support of CMP Wetlands Evaluation through Monitoring and Assessment of Santa Monica Bay Estuaries* (SCCWRP)
- *Monitoring rocky intertidal habitats in the Santa Monica Bay to support habitat assessments* (CSU Fullerton Auxiliary Services Corporation)
- *Establishing a baseline census and ecological monitoring program for Zostera pacifica habitats in coastal Southern California* (TBF)
- *Assessment of the Nearshore Rocky Reef Resources of Santa Monica Bay* (Occidental College)
- *Looking Back to See Ahead: Using long-term monitoring data to predict species persistence across the NSMBW* (Pepperdine University)
- *Citywide Bioretention Basin Project* (City of Culver City)

CCMP Action #37

Increase understanding of deep-water habitats such as submarine canyons, deep reefs, and outfall pipes

Long-term Environmental Results / Outcomes: Enhance functions and conditions of deep marine environments (e.g., deep reefs) in the Bay

Action #37 Next Steps / Project Name	Objectives	Status	Annual Report Update
Conduct ROV surveys to collect physical, chemical, and visual data	To use the ROV to conduct underwater surveys to supplement monitoring	Ongoing	CRI graduate student continued work on a literature review and completed building a nearshore Remotely Operated Vehicle to conduct single-scan sonar surveys as well as help fill other data gaps; TBF's ROV, R2Deep2, was updated for use by VRG to help fill CMP data gaps. VRG staff deployed the ROV on 8 April 2022 to collect video and stereo camera video at 160' depth. On 13 September 2022, VRG deployed the ROV to collect stereo video data at the Redondo Pier's artificial reefs at 60' depth.
Identify and apply emerging technology and techniques to better characterizeBay habitats, including recommendations	To utilize cutting edge advancements in remote sensing, and remote platforms to better characterize the condition of the Bay's habitats	Ongoing	TBF is working with NOAA and Marauder Robotics to advance design of remote sensing and remote platforms to collect data in nearshore coastal environments.

CCMP Action #38

Monitor and improve understanding of rocky intertidal habitats to inform restoration actions

Long-term Environmental Results / Outcomes: Implementation of the Comprehensive Monitoring Program to achieve a better understanding of the extent and condition of habitats in the Santa Monica Bay and its watershed

Action #38 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support study recommendations and outreach efforts for improved protection	To improve understanding of rocky intertidal habitats to fill CMP data gaps and inform restoration activities	Ongoing	CRI marine invertebrate mussel study assessing physiological impacts of temperature and other climate stressors was temporarily halted due to COVID-19 and lack of access to LMU's campus; study resumed remotely in spring 2021 collecting mussels throughout the West Coast to assess potential range shifts associated with temperature and climate change, the study will have regional implications for Santa Monica Bay and the CMP; study resumed in person laboratory experiments in summer 2021 and completed and submitted a manuscript for review by a scientific journal in January 2022.

Action #38 Narrative:

CRI and Dr. M. Christina Vasquez's laboratory continued research on physiological stress in rocky intertidal marine invertebrates, particularly mussels. Her research seeks to inform physiological reactions in mussels to stressors such as temperature and oxygen change. Dr. Vasquez's research was significantly impacted by the virus pandemic, and her experiments were halted due to the closure of LMU's campus in compliance with LA County Public Health policies regarding COVID-19. Once campus restrictions were lifted, Dr. Vasquez redirected her research to inform temperature stress on mussels and to support filling a data gap in the CMP. Dr. Vasquez and several students submitted a manuscript in January 2022 based on the CRI research.

CCMP Action #39

Monitor and inform effective management of Marine Protected Areas (MPAs), Fishery Management Plans, and local fisheries for recreational and commercially important species

Long-term Environmental Results / Outcomes: Inform agency enforcement plans and long-term adaptive management of MPAs, assist with fishery related public health advisories

Action #39 Next Steps / Project Name	Objectives	Status	Annual Report Update
Support MDRA in their implementation of the youth and veteran fishing program	To provide disadvantaged youth and veterans the opportunity to experience nature, boating, fishing, and healthy lifestyles	Ongoing	MDRA held 16 trips for the summer Youth Fishing Program with 571 participants; two trips were held for the Veterans Fishing Programs and two more are planned.
Support MDRA in the completion of a halibut FMP	To provide technical and outreach support to MDRA in participating and tracking the development of a halibut FMP by CDFW and promotion of sustainable fisheries	Ongoing	Communications between TBF and MDRA continued during this reporting period.
Continue opportunistic aerial surveys to track boating and vessel activity	To continue to track ocean vessels and fishing trends within the South Coast MPA Network	Ongoing	No aerial surveys conducted during this reporting some communications occurred between TBF and LightHawk to determine need a readiness for future surveys.

Action #39 Next Steps / Project Name	Objectives	Status	Annual Report Update
Conduct MPA Watch to monitor and inform use of MPAs in the Bay	To implement a community-science based program to monitor activities in MPAs and encourage appropriate enforcement and regulation activities	Ongoing	HtB conducted trainings for MPA Watch volunteers, conduct shore-based surveys, and shared data with local enforcement agencies and contributed to a report to CDFW for the MPA Decadal Management Review, which is anticipated to be presented to the Fish and Game Commission in February 2023; SMBRC, TBF, and HtB staff participated in LA MPA Collaborative meetings including discussions on broadening awareness of MPAs and increasing equity and inclusion; see Action #27 for additional MPA outreach efforts.

CCMP Action #40

Research and inform best management and pollution reduction practices to address non- point source pollution and facilitate reduction

Long-term Environmental Results / Outcomes: Assist in achieving constituent percentage load reduction targets for waterbodies in the Santa Monica Bay according to TMDL compliance timeline

Action #40 Next Steps / Project Name	Objectives	Status	Annual Report Update
Identify partners and identify funding sources for long-term monitoring efforts for LID and water conservation efforts	To establish project partners and identify potential funding sources in support of long-term monitoring for LID and water conservation efforts	Ongoing	See Action #36 for efforts related to CMP implementation.
Implement monitoring programs for long-term monitoring and to inform effectiveness of LID/BMP implementation projects	To fill data gaps and inform LID/BMP effectiveness in reducing non-point source pollution, especially nutrient pollution	Ongoing	No activities occurred during this reporting period.

CCMP Action #42

Inform strategies to reduce greenhouse gas emissions and increase carbon sequestration in support of existing state actions and policies

Long-term Environmental Results / Outcomes: Implement and support carbon sequestration/cycle monitoring, research, and quantification as part of projects to inform or prioritize efforts

Action #42 Next Steps / Project Name	Objectives	Status	Annual Report Update
Research landfill diversion's reduction on greenhouse gas emissions and carbon sequestration due to compost application	To conduct research on landfill diversion to obtain quantifiable GHG reduction metrics	Ongoing	No activities occurred during this reporting period.
Conduct research to establish rate of carbon sequestration associated with key habitats in the Santa Monica Bay and its watershed	To conduct research to identify processes and metrics to further understand rates of carbon sequestration within key habitats in Santa Monica Bay and its watershed	Ongoing	No activities occurred during this reporting period.

CCMP Action #43

Implement the County-wide Safe Clean Water Program to support stormwater pollution control projects

Long-term Environmental Results / Outcomes: Assist in achieving constituent percentage load reduction targets for waterbodies in the Santa Monica Bay according to TMDL compliance timeline

Action #43 Next Steps / Project Name	Objectives	Status	Annual Report Update
Participate in advisory board and support implementation of projects from the new funding mechanism	To improve stormwater management in urban areas, protect water quality within our communities, provide new sources of water for current and future generations, and reduce stormwater pollution through attainment of water quality objectives, increased stormwater retention, increased service to disadvantaged communities, and coordination of efforts across the County	Ongoing	SMBRC staff continued to serve as a member of the SCW Program's South Santa Monica Bay WASC; LACFCD developed the 2022 Interim Guidance to clarify issues raised through SCW Program implementation to date regarding community engagement, water supply benefits, prioritization of nature-based solutions, and disadvantaged communities benefits and policies; the call for projects for FY23-24 Stormwater Investment Plans closed 31 July 2022; the SMBRC Governing Board adopted a resolution at its 18 August 2022 meeting and SMBRC staff conveyed a letter to the LA County Board of Supervisors and various SCW Program committees expressing support of SCW Program funding for eight projects in the FY22-23 Stormwater Investment Plans within the Santa Monica Bay watershed; at its 4 October 2022 meeting, the Los Angeles County Board of Supervisors approved the Stormwater Investment Plans for the nine Watershed Areas, including over $4.8 million in FY22-23 SCW Program funding for projects in the Santa Monica Bay watershed; and the Watershed Coordinators for the North, Central, and South Santa Monica Bay WASCs are scheduled to present on their roles and opportunities for future applicants at the 20 October 2022 Governing Board meeting.

CCMP Action #44

Support the development and implementation of a comprehensive regional sediment management plan for restoring natural hydrological functions of river systems and mitigating impacts from climate change

Long-term Environmental Results / Outcomes: Complete and implement a comprehensive regional sediment management plan to restore natural functions where possible and mitigate impacts of climate change

Action #44 Next Steps / Project Name	Objectives	Status	Annual Report Update
Build capacity and conduct pilot projects to inform future actions and advance program development / design	To utilize pilot level projects to test assumptions and develop preferred methods for sediment transport and/or placement	Ongoing	No activities occurred during this reporting period.