SANTA MONICA BAY NATIONAL ESTUARY PROGRAM

Semi-Annual Report
1 October 2019 – 31 March 2020

Report Date: 30 April 2020

Prepared for the United States Environmental Protection Agency

Common Work Plan Acronyms

Army Corps	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
CVA	Clean Vessel Act
CWMW	California Wetland Monitoring Workgroup
DDT	Dichlorodiphenyltrichloroethane
EWMP	Enhanced Watershed Management Plans
FMP	Fishery Management Plan
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
JWPCP	Joint Water Pollution Control Plant (Carson)
LACDBH	Los Angeles County Department of Beaches and Harbors
LACDPH	Los Angeles County Department of Public Health
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LACSD	Sanitation Districts of Los Angeles County
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
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
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
WAC	Santa Monica Bay Restoration Commission Watershed Advisory Council
WBMWD	West Basin Municipal Water District
WMP	Watershed Management Plans

Semi-Annual Report Overview and Structure

This semi-annual report outlines and provides an update for each of the Fiscal Year 2020 (FY20) Work Plan tasks for the time period 1 October through 31 March 2020, the first semi-annual reporting period for FY20. The FY20 Work Plan builds off the 2018 CCMP Action Plan and is focused on a subset of the identified Actions and Next Steps in the Plan. The top priorities of SMBNEP from the CCMP included improving water quality, conserving and rehabilitating natural resources, and protecting the Bay's benefits and values to people. Given the cross-cutting and multi-benefit nature of most of the projects and programs listed in the FY20 Work Plan and this semi-annual report, they are not arbitrarily separated and categorized into one of those three priority areas. These three priority areas should be thought of as integrated and supported throughout the semi-annual report, along with a priority of understanding and adapting to climate change impacts. Many of the FY20 tasks continue past efforts.

Within these priority areas, seven goals were identified in the 2018 CCMP Action Plan and are listed below. All seven goals are to be addressed by the actions and next steps identified in the FY20 Work Plan and this semi-annual report. The goals are achieved through actions by many different entities, including public agencies 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

The main section of this semi-annual report follows the Work Plan structure, which is based on the CCMP Action Plan. Thus, it consists of a large table that is organized by Action number and next steps identified with that Action from the CCMP. The table is intended to provide current status and a synthesis of updates by next step or project on efforts undertaken during this reporting period. For some next steps that required more description, a narrative section follows the table. Narratives for individual steps are categorized by Action.

Note that the FY20 Work Plan and its semi-annual reports were based on the 2018 CCMP Action Plan. This is the first semi-annual report to reflect the new structure and is thus structured slightly differently than previous semi-annual reports of the SMBNEP. For additional links to SMBNEP products that informed this semi-annual report, click here.

The following table summarizes the primary work activities that occurred during this semi-annual reporting period. Additional information can be found on TBF or SMBRC's websites, the 2018 CCMP Action Plan, the FY20 Work Plan, and as part of individual products produced for each project. The table provides brief updates on each of the CCMP actions that were implemented during this reporting period. Some actions will have additional deliverables as well (identified in the table).

During this time period, the spread of the novel coronavirus required implementing social distancing 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. SMBNEP is responding to challenges and continues ongoing efforts to adapt to restrictions.

#	CCMP Action	CCMP Next Step(s) / Project Activity Name	Objective(s)	Status	Semi-Annual Report Update
1	Acquire open space for preservation of habitat and ecological services	Continued participation on resources agency Technical Advisory Committees	Acquire and/or protect high priority properties that are at risk of development, or provide high diversity, include wildlife corridors, and/or provide socio-economic benefits	Ongoing	No activities occurred during this semi-annual reporting period
		Bond funded acquisitions	To acquire and protect 91 acres of undeveloped land in Carbon Canyon to prevent development in a fire-prone area and expand recreational opportunities	Ongoing	Grant agreement for the Carbon Canyon Acquisition project was in development during this reporting period through Prop. 12
		Support partners in identification and prioritization of key acquisition or conservation easement properties	Acquire and/or protect high priority properties that are at risk of development, or provide high diversity, include wildlife corridors, and/or provide socio-economic benefits	Ongoing	No activities occurred during this semi-annual reporting period
2	Restore kelp forests in the Bay to improve the extent and condition of the habitat	Implement the rocky reef/kelp forest restoration project	To restore five 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	Ongoing	Partnered with fisherman to cull urchin densities within 3.26 acres of urchin barrens off White Point, Palos Verdes; see additional narrative below
		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 monitoring for the 3.26 acres cleared this project period; collected urchins for dissection in December 2019 to inform ongoing gonadosomatic index study; produced Year 6 annual report for CDFW in February 2020; annual biological response surveys will be conducted in late spring/early summer 2020

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3	Recover abalone populations in the Santa Monica Bay and region to support rare species and socioeconomic benefits to people	Establish abalone outplanting sites and conduct juvenile and larval outplanting	To reintroduce abalone and test effectiveness of outplanting methods	Ongoing	Inaugural white abalone outplant was conducted in October and November 2019; SAFEs were stocked with 927 white abalone and 728 were stocked into BARTs
		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	TBF and project partners monitored the outplant site nine times as required by the monitoring scheduled defined in the ESA permit; 91 live white abalone were observed in total, and 284 shells were collected during this reporting period
		Captive spawn abalone	To research captive spawning and larval culturing techniques, and raise abalone in aquaculture facility for outplanting	Ongoing	No activities occurred during this reporting period
		Maintain aquaculture facility for abalone	To facilitate captive spawning and rearing of red, green, and white abalone in support of future restoration activities for outplanting in the wild	Ongoing	TBF and SCMI staff continue to operate and maintain two abalone laboratory spaces at SCMI, housing red and endangered white abalone; all green abalone were transferred out of TBF's facility to The Cultured Abalone Farm in Goleta, CA in September 2019. In February 2020, 491 white abalone were transferred from partner facilities in preparation for the second outplant event scheduled for spring 2020.

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4	Assess and restore seagrass habitats in the Santa Monica Bay and nearshore environments to benefit marine ecosystems and improve coastal resilience	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 R2Deep2, side-scan sonar, and SCUBA divers to inform the CMP and restoration activities	Ongoing	SCUBA-based surveys in two beds off Catalina Island in November 2019 quantified bed characteristics and were assessed as potential donor sites for restoration efforts
		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	Paua Marine Research Group has been contracted to assist with development of the eelgrass restoration portion of an Implementation and Monitoring plan for the pilot restoration project
		Conduct pilot restoration project(s) of offshore eelgrass in the Bay	To conduct a pilot restoration project of offshore eelgrass in the Bay within a one-acre footprint	Ongoing	Began planning for the permit application process; conducted genetics study; see additional narrative below
		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	Genetic collections of *Zostera pacifica* occurred from three sites within two eelgrass beds off Catalina Island and one collection of *Z. marina* occurred in Newport Bay Harbor as the control for the genetics study; samples were preliminarily genetically processed for two microsatellites and morphological image data were initiated

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5	Assess and implement offshore artificial reefs to benefit marine ecosystems and provide socioeconomic benefits to people	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	The Palos Verdes Restoration Reef project entered the implementation phase during this reporting period
		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	Ongoing	Opportunistic communications between TBF and Vantuna Research Group occurred during this report period reaffirming the need for this work; next step will be to seek funding
6	Restore coastal strand and foredune habitat to beaches and sandy shores to improve coastal resilience	Continue long-term monitoring of the Santa Monica Beach Restoration Pilot Project	Continue long-term monitoring to inform coastal resilience, ecosystem benefits, and adaptive management of the restoration area	Ongoing	Continued physical and biological surveys at the frequency described in the Implementation and Monitoring Plan; results will be summarized in the fourth annual report (Sept 2020); vegetation continues to expand and dunes continue forming
		Conduct Phase 1 (outreach and planning) and Phase 2 (implementation) of the Malibu Living Shoreline Project	Restore 3 acres of beach and dune habitat to improve coastal resilience and ecosystem benefits and improve public engagement	Ongoing	Work focused on finalizing planning and design tasks, including coordinating with the City of Malibu and LACDBH on permitting; a draft Implementation and Monitoring Plan was written and sent for external scientific review; outreach efforts continued; a permit fee waiver was approved by Malibu City Council on 27 January 2020; subcontractors completed work on restoration design, artistic renderings, and interpretive signs
		Find funding for and implement another beach and bluff restoration project	Restore 3.5 acres of bluff, beach, and eelgrass habitat as part of a living shoreline pilot project; restore dune habitats in Manhattan Beach through iceplant removal and revegetation with native plants	Ongoing	Finalized the Manhattan Beach Dune Restoration grant agreement and work plan; TBF continued outreach efforts and coordination with project partners; conducted two public outreach events in coordination with City of Manhattan Beach and USC Sea Grant; continued work on the Los Angeles Living Shoreline Project with release of an RFP for restoration design services, restoration planning meetings with partners, and stakeholder

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					communications; see additional narrative for both projects below
		Support efforts to standardize sandy beach monitoring and a regional approach to restoration	Continue efforts to standardize sandy beach monitoring and data collection for southern California through stakeholder partnerships and CMP implementation	Ongoing	Continued ongoing coordination with the Beach Ecology Coalition group; began planning for spring event (postponed due to the ongoing virus pandemic); continued stakeholder communications; continued the Site Suitability Index analysis project in partnership with CRI
7	Restore and maintain the entire LAX Dunes system to support native plants, wildlife, and rare species	Conduct community restoration events in the northern 48-acre dune area	Engage community through hands-on stewardship and habitat restoration through events held at the LAX Dunes	Ongoing	TBF recruited 329 volunteers across eight community restoration events at the LAX Dunes
		Support LAWA in long-term maintenance and adaptive management of the 48-acre northern dune area	Continue and strengthen partnership with LAWA to restore and maintain the LAX Dunes	Ongoing	Continued restoration activities through community-based events, coordination with LAWA, and initiated contract agreements with project partners: Rancho Santa Ana Botanic Garden, Coastal Restoration Consultants, Cooper Ecological Monitoring, IO Environmental and Infrastructure, and LA Conservation Corps
		Engage underserved students and volunteers and inland communities	Recruit underserved students and volunteers, particularly from inland communities, to participate in hand-on stewardship and restoration at the LAX Dunes	Ongoing	Continued volunteer recruitment efforts; during this period, volunteers were from nearly 100 unique zip codes; over 25% of volunteers were from disadvantaged communities; many student groups participated
		Initiate planning for areas within the adjacent dunes, including baseline monitoring	Conduct baseline monitoring and develop recommendations for habitat management	Ongoing	Initiated monitoring planning and conducted several site visits to assess opportunities in the adjacent 52-acre dune area

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8	Restore coastal bluff habitats in the Bay watershed to support ecosystem services	Use Beach Bluff Restoration Master Plan to explore bluff restoration and continue recovery of El Segundo Blue Butterfly	To provide habitat and ecological benefits in support of the recovery and eventual 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 the El Segundo Blue Butterfly Preserve (southern dunes)
		Identify partners and funding to support bluff restoration projects	To establish project partners, project sites, and identify potential funding sources in support of bluff restoration	Ongoing	Continued to identify and coordinate with project partners, agencies, and stakeholders to prioritize project locations; see also updates as part of the Los Angeles Living Shoreline Project
		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	The Abalone Cove Habitat Restoration project entered the implementation phase after the approval to start work in October 2019; see also the narrative for Action 6 for the Los Angeles Living Shoreline Project
9	Implement Malibu Creek Ecosystem Restoration Project (Rindge Dam and other barrier removals) to support ecosystem restoration	Support lead agencies in efforts to complete the design and engineering plans for the Malibu Creek Ecosystem Restoration Project	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	No activities occurred during this semi-annual reporting period

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10	Remove additional barriers to support fish migration and ecosystem services	Identify, prioritize, and acquire funding for barrier removal projects	To engage with partner entities to identify potential opportunities for fish barrier removal	Ongoing	Opportunistically participated in meetings and engaged in conversations to advance project prioritization and funding, especially with entities such as State Parks and Resource Conservation District of Santa Monica Mountains
11	Restore urban streams, including daylighting culverted streams, removing cement channels, and restoring riparian habitats	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 semi-annual reporting period
12	Restore smaller coastal lagoons and other wetland types to increase wetland habitat area and condition throughout the watershed	Complete the final post-restoration assessment of the Malibu Lagoon Restoration and Enhancement Project	To assess the condition of the restoration project for a five-year period and evaluate the data against set success criteria	Completed	Completed the collection, consolidation, and evaluation of six years of physical, chemical, and biological monitoring data and produced a Final Comprehensive Monitoring Report; the restoration project was found to have met all success criteria and project goals
		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	This project made significant progress led by RCD during this period; one public stakeholder meeting was convened; a Technical Advisory Committee met and provided guidance on restoration objectives; and baseline surveys commenced including a wetland delineation, plant surveys, and California Rapid Assessment Method surveys

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		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	Additional outreach was undertaken to present results of the six years of surveys to scientific colleagues and to disseminate the Final Report completed in August 2019 to inform restoration objectives for other small coastal bar-built wetland systems; continued conversations with partners such as UCLA and RCD to gain information on bar-built estuaries
13	Restore Ballona Wetlands Ecological Reserve to enhance wetland habitats and benefits to people	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 and releasing the Final Environmental Impact Statement / Report and complete permitting	Ongoing	Continued to provide technical support and communicated with the lead agencies to restore Ballona Wetlands; the Final Environmental Impact Report for the Ballona Wetlands Restoration Project was released in December 2019
		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 community restoration events and biological monitoring in accordance with permits (TBF and FBW); expanded restoration activities and associated monitoring in new adjacent areas as part of a stewardship project funded by Prop. 12; see additional narrative below
14	Implement wildlife crossings and other innovative projects for benefits to wildlife and people	Support lead agencies to find funding for Phase 2 of the Liberty Canyon Wildlife Crossing project	To implement Phase 2 of the Liberty Canyon Wildlife Crossing Project in support of wildlife movement and safety and enhanced habitats	Ongoing	Significant outreach occurred by lead agencies and partners to solicit funding for the second phase of the project, including events through Save LA Cougars and National Wildlife Federation; an extensive outreach campaign through websites, social media, and events is ongoing
		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 support of wildlife movement and safety and enhanced habitats	Ongoing	The project entered the final design and engineering plan phase during this reporting period

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15	Implement projects that improve understanding and/or enhance endangered and threatened species populations (e.g. habitat improvements for Western Snowy Plover, genetic banking)	Support restoration and monitoring activities to benefit California red legged frog populations	Improve riparian and stream habitats to support populations of California red legged frog	Ongoing	Work continued on the reestablishment of California red-legged frogs project to finalize the grant agreement with all signatures
		Support projects within western snowy plover critical habitat	To provide habitat and ecological benefits in support of the threatened Western Snowy Plover and to restore critical habitat	Ongoing	Continued beach and dune restoration projects and continued to inform management actions in support of ecological benefits to plovers; ongoing communications with USFWS regarding habitat enhancement projects
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	Continue to support implementation of projects identified in EWMPs and WMPs	Allocate and oversee State Bond funding for implementation of projects identified in EWMPs and WMPs	Ongoing	Continued overseeing implementation of capital projects for storm water pollution reduction through multi-benefit solutions including three projects funded by Prop. 12 and four projects funded by Prop. 84 (see also Action #17)
		Continue implementation of LA IRWMP	Facilitate and support 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 IRWRP Leadership Committee
		Facilitate other sources of State funding	Facilitate and support allocation of funding from other State bond measures such as Prop. 1 and 65 for implementation of projects identified in EWMPs and WMPs in the watershed	Ongoing	No activities occurred during this semi-annual reporting period

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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	Complete rain garden metal fate study with CRI	To assess the fate of sequestered or retained heavy metals in the Culver City Rain Garden	Ongoing	No activities occurred during this semi-annual reporting period
		Complete additional LID projects throughout the watershed	Complete more LID projects throughout the watershed to improve flood protection and water quality, and provide additional benefits	Ongoing	Continued to work with grantees to implement previously funded Prop. 84 projects: Culver Boulevard Realignment and Stormwater Infiltration/Retention Regional Project, Westwood Neighborhood Greenway Project, Santa Monica Bay Catch Basin Insert Project, and Ladera Park Water Quality Enhancement Project; worked with grantees to implement three new Prop. 12 projects: Monteith Park Storm Water Capture, Beach Cities Green Streets, and Paramount Ranch Storm Flow and Sediment Reduction (see also narratives for Action #17, below)
18	Support installation and monitoring of additional sewage and bilge pumpout facilities in Southern California harbors	Continue quarterly monitoring of public sewage pumpout stations	To assess the condition of public sewage pumpout stations	Ongoing	Conducted two quarterly monitoring efforts of 73 public sewage pumpout stations in Southern California harbors; finalized quarterly monitoring reports; drafted 2019 annual Pumpout Report
		Update CA Vessel Waste Disposal Plan	To assess the existing sewage management infrastructure and need for additional sewage management resources in Southern California harbors for vessels	Completed	Finalized the CA Vessel Waste Disposal Plan document to be made available upon final approval from CA State Parks Division of Boating and Waterways
19	Support minimization of biological impacts of water intake and discharge	Educate and increase public support of the state-wide desalination requirements	Support efforts by state regulatory agencies to achieve full implementation of the state-wide desalination requirements	Ongoing	Monitored and informed SMBRC Governing Board, other stakeholders, and the general public on the implementation of the requirements in the California Ocean Plan desalination and Once-through Cooling Policy for facilities along the Santa Monica Bay coastline

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	from coastal power generation and seawater desalination facilities, including public engagement and education		in the California Ocean Plan and Once-Through Cooling Policy		
20	Support elimination of non-point pollution from onsite wastewater treatment systems	Continue the coordinated OWTS identification, permitting, and inspection system between the LARWQCB and the cities and counties in the watershed	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	Met with LARWQCB staff on status and planned next steps in implementation of state-wide policy and local efforts for addressing OWTS; informed SMBRC membership and other stakeholders through incorporation of the updated information into the CCMP Finance Plan (December 2019)
21	Support policies that promote reuse, recycling, and advanced wastewater treatment to reduce reliance on imported water sources	Support recycled wastewater efforts by JWPCP of LACSD	To support expansion of wastewater effluent recycling by JWPCP of LACSD	Ongoing	Communicated with LACSD Governing Board members and staff on JWPCP's effort in expansion of wastewater recycling; informed the SMBRC membership and other stakeholders through incorporation of the updated information into the CCMP Finance Plan (December 2019)
		Hyperion Treatment Plant to implement pilot project for recycled water	To support timely completion of Hyperion's pilot project	Ongoing	Attended workshop by LA City Sanitation and communicated with City Sanitation staff on progress of Hyperion's water recycling pilot project and long-term plan; informed the SMBRC membership and other stakeholders through incorporation of the update information into the CCMP Finance Plan (December 2019)

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		Support recycled wastewater efforts by Tapia Water Reclamation Facility and others through expansion of distribution system and regional partnerships	To support expansion of recycled wastewater distribution and reuse	Ongoing	Began and continued implementation for the indirect potable water reuse demonstration project for reservoir augmentation, i.e., the Las Virgenes-Triunfo Pure Water Project, funded by Prop. 12; communicated with LVMWD staff on wastewater recycling efforts by Tapia Water Reclamation Facility; informed the SMBRC membership and other stakeholders through incorporation of the update information into the CCMP Finance Plan (December 2019)
22	Support policies and implement projects that divert landfill waste and encourage composting to improve water quality and lower greenhouse gas emissions	Support continuation of Table to Farm compost hubs	Reduce food waste being sent to landfills, compost food waste, and apply compost to urban gardens to grow food	Ongoing	Applied for and received SoCalGas funding for Table to Farm compost and garden project; formalized partnership with Environmental Charter School Inglewood for community garden project, collected community input, met with Inglewood councilmember, and developed preliminary garden design plans; supported existing compost hubs and program partners
24	Support the inclusion of coastal resilience through natural means and softscape measures into local coastal plan updates	Attend stakeholder meetings for local cities LCP development / updates / implementation	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
		Opportunistically assist cities in the development of sea level rise vulnerability studies	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 sea level 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, and LACDBH

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		Use data collected from beach restoration "soft-scape" projects to inform and assist LCP development	Provide science-based data to inform LCP development and support beach restoration	Ongoing	Continued ongoing communications regarding TBF's living shorelines projects with local municipalities, LACDBH, consulting firms, and other NGOs; continued outreach to universities and presentations to other scientists
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	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 conversations with LACDBH and other coastal municipalities about opportunities to implement nature-based adaptation solutions to sea level rise; see also the CRI Site Suitability Index study narrative in Action #6
		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, and USFWS to implement and provide recommendations for best management practices along beaches; conversations continued in conjunction with TBF's living shorelines projects
26	Participate in research, education, outreach, and policy on invasive species removal and control	Conduct New Zealand Mudsnail surveys	Track the spread of NZMS in the Santa Monica Mountains and develop management recommendations for control	Ongoing	No activities occurred during this semi-annual reporting period
		Attend and participate in Invasive Species Council of California (ISCC) and regional meetings focused on management of invasive species	Increase public and agency awareness of invasive species issues	Ongoing	No activities occurred during this semi-annual reporting period

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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)	Produce educational materials	To produce educational materials to increase awareness of boating best management practices to boaters	Ongoing	Produce and distributed Winter 2019 and Spring 2020 Changing Tide newsletter, 2020 tide calendar, and 3500 boater kits for 2020
		Conduct outreach	To conduct outreach to increase awareness of boating best management practices to boaters	Ongoing	Conducted direct outreach to boating community at two events, through two clean boating presentations, and conducted one Dockwalker training; conducted direct outreach virtually through digital media campaign for the Southern California Boater Guide which reached 48,704 people
		Manage Pumpout Nav app	Increase proper disposal of boater sewage	Ongoing	Continued to manage Pumpout Nav app, ensured pumpout status is accurate, and responded to problems reported; in partnership with San Francisco Estuary Partnership contributed to and supported app development and maintenance; awarded Outstanding Service Award from State Organizations for Boating Access
		Research public engagement metrics and specific engagement tools on reduction of pollutants to waterways	To optimize public engagement resources to increase impact of pollutant reduction strategies to waterways	Ongoing	No activities occurred during this semi-annual reporting period
28	Support efforts of disadvantaged communities to achieve healthy habitats, implement green infrastructure, and reduce pollution	Utilize the Ballona Creek Greenway Plan to identify parcels in disadvantaged communities for implementation	To identify opportunities for the creation of parks, parklets, and green corridors	Ongoing	A groundbreaking ceremony was held 19 February 2020 in Baldwin Hills for the final phase of the Park to Playa Trail system; the trail connects the Baldwin Hills Parklands to the Pacific Ocean; construction will begin soon on a pedestrian bridge and wildlife crossing over La Cienega Boulevard

#	CCMP Action	CCMP Next Step(s) / Project Activity Name	Objective(s)	Status	Semi-Annual Report Update
29	Reduce health risks of swimming in contaminated waters and consuming contaminated seafoods through more comprehensive source control and, advanced monitoring and public notification	Continue implementation and improvement of beach water quality monitoring and reporting system	To support Heal the Bay and others efforts to standardize beach water quality monitoring and effectively disseminate the information to the public	Ongoing	Communicated with Heal the Bay for updated information regarding the NowCast system and interactive website; informed the SMBRC membership and other stakeholders through incorporation of the update information into the CCMP Finance Plan (December 2019); continued development of a manuscript analyzing 30-year long-term trends of fecal indicator bacteria on SM Bay beaches
		Maintain and enhance the existing seafood contamination education and enforcement program	Support and facilitate the continuation and enhancement of the existing seafood contamination education and enforcement program	Ongoing	Continued participation with the Fish Contamination Education Collaborative (FCEC) by reviewing educational materials developed by the FCEC; communicated with US EPA Superfund staff on program status and next steps; informed the SMBRC membership and other stakeholders through incorporation of the update information into the CCMP Finance Plan (December 2019)
30	Conduct community engagement, education, and inform policies related to water conservation and reuse to reduce water demand and reliance on imported sources	Link water conservation with outreach events and social media	Opportunistically incorporate water conservation topics during outreach events and on social media	Ongoing	No activities occurred during this semi-annual reporting period
		Educate, engage communities, and provide resources that promote the importance of native plants	Promote the use of drought tolerant native plants	Ongoing	Continued to educate community and volunteers on the importance of using drought tolerant native plants in habitat restoration and residential landscaping during community restoration events
		Support efforts by water agencies to promote water conservation and reuse including dissemination of materials	Promote current information on water conservation and reuse efforts developed by water agencies	Ongoing	No activities occurred during this semi-annual reporting period

#	CCMP Action	CCMP Next Step(s) / Project Activity Name	Objective(s)	Status	Semi-Annual Report Update
		Develop funding to support the expansion of best management practices to incorporate other business sectors	To reduce pollution from businesses through implementation of best management practices	Ongoing	Applied for, but did not receive, 11th Hour Racing grant to incorporate oil and fuel spill prevention BMPs at fuel dock businesses
3.2	Reduce marine debris by supporting bans on single-use items, conducting outreach, and participating in trash reduction programs	Find funding for and continue ReThink Disposable LA	To contribute to source reduction of single-use disposable items from food service establishments	Ongoing	Formalized partnership with Clean Water Action to implement ReThink Disposable; collected new ReThink Disposable materials for program implementation; researched and created list of potential businesses to engage
		Support municipality bans of 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; attended Los Angeles County Single Use Plastics Ordinance Stakeholder Workshop to give input and support the development of ordinance; co-produced Restaurant Outreach Survey to help inform LA County single use plastic ban
3.3	Monitor microplastics (including microfibers) and other marine debris in the Bay and coastal environments to inform management actions	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
		Publish a manuscript on the results of the Bay studies	To publish a manuscript on the results of the Bay microplastics studies	Ongoing	CRI continued data collection, analyses, and evaluation to inform a future manuscript
		Conduct additional studies to inform the transport, accumulation, and fate of microplastics in our marine and nearshore environments	To continue to collect data to inform the regional fate and transport model of microplastics in the nearshore marine environment	Ongoing	CRI continued method testing for the nearshore microplastics in marine invertebrate fate and transport study

#	CCMP Action	CCMP Next Step(s) / Project Activity Name	Objective(s)	Status	Semi-Annual Report Update
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	Improve analytical methodology and standardize monitoring of more emerging contaminants	To update and implement State-wide recommendations for monitoring of emerging contaminants in aquatic ecosystems	Ongoing	No activities occurred during this semi-annual reporting period
35	Monitor and inform management actions for Harmful Algal Blooms (HABs)	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	Ongoing	CRI hired a Visiting Assistant Professor / Researcher through Loyola Marymount University to assist in filling harmful algal bloom research gaps for our region; completed a Masters thesis on the connection between wildfire occurrence and water quality indicator response through remote sensing (MODIS) data; initiated a manuscript
		Conduct monthly maintenance of SCCOOS shore station at Santa Monica Pier and seek support for additional sensors	To inform long-term water quality trends in the Bay's nearshore environment and contribute data to the Comprehensive Monitoring Program	Ongoing	SCCOOS, TBF, and LA Waterkeeper continued maintenance of the SCCOOS Santa Monica Pier Shore Station; this included monthly maintenance, calibration, and water sampling to support an interactive data web portal for the SCCOOS Santa Monica Pier Shore Station
36	Monitor chemical, physical, and biological characteristics	Implement the Kelp Forest Hydrodynamic Study	To assess sediment transport, alteration of advective currents, and wave attenuation within kelp forests	Ongoing	CSUN, UC Davis, and TBF deployed instruments in Sept 2019 (oxygen sensors, temperature loggers, current meters / ADCPs) at both sites; four kelp surveys (two at each site) and water quality surveys were also conducted. All instruments were removed from sites in October due to

#	CCMP Action	CCMP Next Step(s) / Project Activity Name	Objective(s)	Status	Semi-Annual Report Update
	in the Bay to inform climate change impacts such as ocean acidification				damage and/or loss of sensors from commercial fishing activity
		Support OA sensor array maintenance, calibration, and data downloads in accordance with SOP	Continue using high-frequency, high-resolution OA sensors to characterize OAH conditions in Santa Monica Bay	Ongoing	Developed and obtained approval by LARWQCB for the special study for redeployment of the OA sensors in collaboration with LACSD wire-walker mooring to accurately collect real-time data at high-resolution, both temporally and vertically through the water column, and characterize OAH levels and variability in the upper 100m of the Santa Monica Bay; deployment was temporarily delayed due to the need for replacing instrument sensors
		Support inclusion of climate change impacts into CMP, especially through new models and data	To include climate change into the Comprehensive Monitoring Program including new models and data	Ongoing	Continued initial drafting of the Comprehensive Monitoring Program for each major habitat in the Bay and its watershed; worked with UCLA student group to identify public data sources for next State of the Bay Report; continued work on the CRI climate modeling project for sea surface temperature
		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	No activities occurred during this semi-annual reporting period
37	Increase understanding of deep water habitats such as submarine canyons, deep reefs, and outfall pipes	Conduct ROV surveys to collect physical, chemical, and visual data	Use the ROV to conduct underwater surveys to supplement monitoring	Ongoing	CRI graduate student began work on a literature review to support the building of a nearshore Remotely Operated Vehicle to conduct single-scan sonar surveys as well as help fill other data gaps
		Identify and apply emerging technology and techniques to better characterize Bay habitats, including recommendations	Utilize cutting edge advancements in remote sensing, and remote platforms to better characterize the condition of the Bay's habitats	Ongoing	No activities occurred during this semi-annual reporting period

#	CCMP Action	CCMP Next Step(s) / Project Activity Name	Objective(s)	Status	Semi-Annual Report Update
38	Monitor and improve understanding of rocky intertidal habitats to inform restoration actions	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	Continued work on CRI marine invertebrate mussel study assessing physiological impacts of temperature and other climate stressors
39	Monitor and inform effective management of Marine Protected Areas, Fishery Management Plans, and local fisheries for recreational and commercially important species	Support MDRA in their implementation of the youth and veteran fishing program	Provide disadvantaged youth and veterans the opportunity to experience nature, boating, and fishing and encourage sustainable lifestyles	Ongoing	Supported MDRA by soliciting volunteers for boat trips as needed
		Support MDRA in the completion of a halibut FMP	To provide technical and outreach support to MDRA in the development of a halibut FMP	Ongoing	Communications between TBF and MDRA continued during this reporting period
		Continue opportunistic aerial surveys to track boating and vessel activity	Continue to track ocean vessels and fishing trends within the South Coast MPA Network	Ongoing	No aerial surveys conducted during this reporting period; TBF staff attended LightHawk's annual Fly-In meeting in Santa Fe, New Mexico in October 2019; TBF received an award from LightHawk for the long-standing partnership between these two organizations
		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	Heal the Bay conducted trainings for MPA Watch volunteers, conduct shore-based surveys, and shared data with local enforcement agencies

#	CCMP Action	CCMP Next Step(s) / Project Activity Name	Objective(s)	Status	Semi-Annual Report Update
40	Research and inform best management and pollution reduction practices to address non-point source pollution and facilitate reduction	Identify partners and identify funding sources for long-term monitoring efforts for LID and water conservation efforts	Implement the SMB Comprehensive Monitoring Program	Ongoing	No activities occurred during this semi-annual reporting period
		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	Ongoing	Continued work on a CRI manuscript to assess the effectiveness of the Culver City Rain Gardens for stormwater pollution retention; continued coordination of TAC review of Prop. 84 project monitoring plans and TAC recommendation on enhanced monitoring of stormwater improvement projects funded under Measure W
42	Inform strategies to reduce greenhouse gas emissions and increase carbon sequestration in support of existing state actions and policies	Conduct research to establish rate of carbon sequestration associated with key habitats in the Santa Monica Bay and its watershed	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	Initiated a CRI literature review on carbon sequestration of coastal marine and beach / dune habitats; additional efforts between TBF and Sustainable Surf focused on carbon sequestration rates and pathways for giant kelp forests
43	Implement the County-wide Safe Clean Water Program to support stormwater pollution control projects (if approved by voters in 2018)	Participate in advisory board and support implementation of projects from the new funding mechanism	To improve stormwater management in urban areas and reduce stormwater pollution through attainment of water quality objectives, increased stormwater retention, and increased service to disadvantaged communities	Ongoing	Supported the efforts of agencies to utilize funds made available under Measure W for stormwater improvement and LID projects throughout the watershed by serving as member of the Measure W South Santa Monica Bay area Steering Committee; coordinated with LACDPW staff and presented Measure W funding priorities, guidelines, and timeline at the December 2019 Governing Board meeting; compiled and presented information on proposed projects by municipalities in the Santa Monica Bay watershed to the Executive Committee

#	CCMP Action	CCMP Next Step(s) / Project Activity Name	Objective(s)	Status	Semi-Annual Report Update
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	Develop plans and/or update existing plans to promote sediment transport and deposition along the coast based on hydrodynamic modeling and analyses	Protection of public and private infrastructure, and ecosystem services by increasing the Los Angeles County coastline's resilience to sea level rise, and increased wave run up	Ongoing	Initial communications and a meeting between TBF and LADWP staff occurred to initiate a dialogue on sediment transport and regional coastal sediment management

Semi-Annual Report Narratives

The following section contains summary supplemental narratives for programs or projects within a subset of CCMP Actions. No additional narrative was determined to be needed for the following Actions during this reporting period, as the necessary detail was contained in the table preceding this section: Actions 9-12, 14, 19, 20, 23, 25, 26, 28-31, 34, 35, 37, and 39-44.

SMBNEP Program Activity Updates

During this reporting period, SMBNEP completed the Finance Plan component of the CCMP in December 2019. Extensive review and input was received and incorporated from the Management Conference as well as interested stakeholders and members of the public. Additionally, progress continued drafting the Comprehensive Monitoring Program, in partnership with the Technical Advisory Committee, and drafting the Memorandum of Understanding, led by SMBRC. A Fiscal Year 2021 Work Plan was drafted and released to the Management Conference in February 2020, and comments from SMBRC Governing Board members, Watershed Advisory Council members, and interested stakeholders / members of the public were incorporated. The final Work Plan will be completed in May and posted to SMBNEP's webpage.

ACTION #1 – Acquire Open Space

SMBRC staff continued to coordinate with SCC in overseeing implementation of the Carbon Canyon Acquisition Project funded by Prop. 12. The project entails the acquisition in fee of 91 acres of undeveloped land in Carbon Canyon, outside of Malibu. MRCA will own and operate the land in perpetuity. The project will permanently protect 91 acres of open space and habitat in the Santa Monica Mountains, preserving habitat and wildlife corridors, preventing development, preserving the scenic viewshed, and increasing public access to recreation. Development of the grant agreement continued during this reporting period.

ACTION #2 – Restore Kelp Forests

Teams of restoration divers (via SCUBA) have been clearing the ocean floor of excess purple 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 2019 through 31 March 2020, 3.26 acres of reef were cleared of excess urchins off White Point. This site continues to contain very high urchin densities in the eastern portion of the cove and little to no macroalgae. In addition, the topography of this site consists of high relief, deep crevices, and stacked boulder complexes making restoration activities challenging. Pre-restoration *Strongylocentrotus purpuratus* (purple urchin) densities for White Point during this reporting period were 15.55 per square meter and were reduced to 1.77 per square meter post-restoration.

A total of 52.63 acres of reef have been restored 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 and other fish species within restoration sites, increased density of CA spiny lobster, 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. The Central Region and Region Nine Kelp Survey Consortium reported percent *M. pyrifera* canopy increased in Hawthorne, Honeymoon Cove, Marguerite, Point Fermin, Resort Point, and Underwater Arch by 119%, 349%, 524%, 159%, 14%, and 631% respectively from 2011 to 2018. During the same timeframe, White Point averaged 7.5% canopy cover, highlighting the necessity for restoration activities.

ACTION #3 – Recover Abalone Populations

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 aquaculturist and has been certified as “sabellid free” by CDFW. In August 2019, 3,200 juvenile white abalone were selected for outplanting and transferred from the Bodega Marine Lab to southern California. 1,600 animals each were transported to TBF’s facility at SCMI and to NOAA’s Southwest Fishery Science Center in San Diego. Abalone were tagged to assist with tracking their parentage information and outplanting method. Animals were outplanted using two methods within the same site, SAFE (Short-term Abalone Fixed Enclosures) modules and BARTs (Baby Abalone Recruitment Traps) used by CDFW. White Abalone were stocked into SAFEs on 10/22/2019 and BARTs on 11/22/2019 at the Palos Verdes site. Nineteen SAFEs were stocked with a total of 927 abalone and two BARTs were stocked with 728 abalone in total. Site monitoring follows this schedule after SAFEs have been vaulted allowing abalone to crawl onto the reef: 1 week, 2 weeks, 1 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 diver will survey that area in approximately 40 minutes (1 dive). 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, and any other notes are recorded. The site can be monitored in a single day with a minimum of four divers. TBF has monitored the site nine times since the start of the outplant and a total of 91 live abalone have been observed and 284 shells have been collected.

ACTION #4 – Assess and Restore Seagrass Habitats

Los Angeles Living Shoreline Project: This innovative project incorporates the experimental establishment of offshore eelgrass within a one-acre footprint offshore of Dockweiler Beach (see also Action #6). During this time period, TBF started work on the grant funded by California State Coastal Conservancy, continued partnership development, and began baseline monitoring at potential eelgrass donor beds. Additionally, TBF was awarded and initiated a grant through the Honda Marine Science Foundation to supplement project monitoring and implementation.

On November 11, 2019, TBF and PMRG conducted baseline surveys in two eelgrass bed sites, Palisades and East End, off Catalina Island (Figure 6). These eelgrass beds are expansive, covering 68.6 acres off Palisades and 25.9 acres off East End and are good candidates as donor sites. Blade length, width, and density of the emergent eelgrass turions were quantified on SCUBA. In addition, divers collected data on fish abundance. These data are valuable both in establishing a baseline for quantifying bed characteristics for compatibility as a donor bed, as well as being used in a large-scale investigation of open coast eelgrass habitat.

Progress was also made on the application requirements for permitting the eelgrass restoration through CDFW by securing a permit for Eelgrass Genetics Research in September 2019 (Permit ID: S-191500002-19150-001). This project to evaluate population genetics of eelgrass is being led by Dr. Demian Willette of Loyola Marymount University's Coastal Research Institute (CRI). Genetic collections of *Zostera pacifica* occurred from three sites within two eelgrass beds off Catalina Island (Figure 1), and one collection of *Z. marina* occurred in Newport Bay Harbor. Samples were processed for genetics, and work continues on morphological assessments. Summary results will be shared once available. This project will help inform eelgrass restoration planning and permitting.

ACTION #5 – Assess and Implement Offshore Artificial Reefs

SMBRC staff continued to coordinate with SCC in overseeing implementation of the Palos Verdes Restoration Reef funded by Prop. 12. This project will restore 69-acres of rocky reef/kelp habitat near Bunker Point off the Palos Verdes Peninsula by constructing an artificial reef. The Project will restore the nearshore ecological rocky-reef community, support approximately six tons of reef fishes and a proportional amount of invertebrates, and increase the abundance of commercial and recreational species, offsetting historical losses to ecosystem services. During this reporting period, the project entered the implementation/construction phase.

ACTION #6 – Restore Healthy Beaches

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 three acres of sandy beach and dune habitats at Zuma Beach and Point Dume Beach to improve coastal resiliency and increase the health of the beach systems through a living shoreline approach. During this time period, work focused on coordination with project partners to finalize tasks associated with planning, design, and permitting. This included the development of a draft Implementation and Monitoring Plan currently being finalized with input from external scientists, drafting a baseline characterization report that will be part of the permit application, finalizing four interpretive signs with input and review by project partners, frequent meetings and communications with project partners and stakeholders, completion of a Coastal Development Permit (CDP), and approval for a CDP fee waiver exemption by City of Malibu. Additionally, multiple outreach events and site visits were conducted with members of the community and project partners.

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 along the coast of Los Angeles County. It also incorporates the experimental establishment of offshore eelgrass within a one-acre footprint (see also Action #4 – eelgrass). During this time period, TBF started work on the grant funded by California State Coastal Conservancy; continued partnership development through restoration planning calls with partners; began baseline monitoring in the beach habitat, potential eelgrass transplant site, and at potential eelgrass donor beds; collaborated with external scientific advisors; and advanced stakeholder engagement through announcements at several public meetings. Additionally, TBF delineated an updated restoration area in accordance with the recommendations expressed by LA County Department of Beaches and Harbors and conducted a preliminary bioassessment based on baseline vegetation data.

Manhattan Beach Dune Restoration: This project aims to restore approximately three acres of foredune habitat along beaches in City of Manhattan Beach to provide infrastructure protection and increase coastal resilience, while improving habitat quality through invasive plant removal and native plant establishment. In this time period, TBF continued partnership and concept development with LACDBH, City of Manhattan Beach, and USGS, and continued conversations with the Manhattan Beach City Council and Sustainability Task Force. Additionally, TBF, along with the City of Manhattan Beach and USC Sea Grant, engaged stakeholders through two outreach events that also included a site visit from State Coastal Conservancy (funders) and discussions with members of the community. TBF also finalized the grant agreement and work plan with the California State Coastal Conservancy.

Beach Monitoring: In partnership with Loyola Marymount University's Coastal Research Institute (CRI), this research program is conducting a site-suitability index 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 the Comprehensive Monitoring Program. This project serves to 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. Summary results from this work were presented at the CA Beach Water Quality Monitoring Council, McNair Scholars Conference (September), and at several events at LMU. Work continued on evaluating and combining GIS layers for the site suitability analysis and discussions with coastal municipalities will serve to inform its future use. The model will eventually be analyzed against the ongoing in situ data collection along beaches of the SM Bay as part of this research program.

ACTION #7 – Restore LAX Dunes

During this period, TBF continued habitat restoration and maintenance work at the LAX Dunes. TBF held eight community restoration events and recruited over 300 volunteers from nearly 100 unique zip codes. Twenty-six percent of the volunteers during the reporting period came from disadvantaged communities, as designated by the California

EPA's CalEnviroScreen tool (accessed 14 April 2020). Disadvantaged communities are defined as "the top 25% scoring areas from CalEnviroScreen along with other areas with high amounts of pollution and low populations." Volunteers also included students from UCLA and LMU, as well as groups from AT&T's El Segundo facilities. Additionally, TBF initiated contract agreements with project partners, including: Los Angeles Conservation Corps, Rancho Santa Ana Botanic Garden, Coastal Restoration Consultants, Cooper Ecological Monitoring, and IO Environmental and Infrastructure. Habitat monitoring is ongoing and includes vegetation cover and mapping assessments. Work began on drafting the Annual Report.

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. Bacteria strains were isolated from roots of native California plant species. Preliminary analysis showed a number of these isolates are Plant Growth Promoting Bacteria and appear to enhance the germination and/or growth of native plant species.

ACTION #8 – Restore Coastal Bluffs

SMBRC staff continued to coordinate with SCC in overseeing implementation of the Abalone Cove Habitat Restoration funded by Prop. 12. This project will implement an existing habitat restoration plan on 13-acres at Abalone Cove Reserve. The restoration includes the removal of invasive trees, shrubs, and herbaceous plants; the propagation of native plant species and desired quantities; irrigation and planting specifications; maintenance schedule; and monitoring and reporting protocols. During this reporting period, the project entered the implementation phase after the approval to start work in October 2019.

ACTION #13 – Restore Ballona Wetlands Ecological Reserve

Ballona Reserve Community Stewardship Project: During this period, TBF continued maintaining and expanding the community restoration site at the Reserve. A total of 16 community restoration events were held in the Reserve. Additionally, ongoing scientific monitoring continued in accordance with the Implementation and Monitoring Plan. In the Prop. 12 grant area specifically, TBF and project partner, FBW, began project implementation through community-based restoration events in wetland and upland dune habitats. These restoration events allow both partners to work with youth and community participants to remove iceplant and other invasive, non-native plants from two acres of unique wetland and dune/upland habitat within the Reserve.

Ballona Wetlands Restoration Project: The California Department of Fish and Wildlife (CDFW) as the lead agency under the California Environmental Quality Act, prepared a Final Environmental Impact Report (EIR) for the Ballona Wetlands Restoration Project and released it to the public in December 2019. CDFW has spent years working with the public and envisioning a plan for the revitalization of 566 acres of the Ballona Wetlands Ecological Reserve (Reserve). Nearly 8,000 postcards, emails, and letters with input on the Draft EIS/EIR were received by CDFW. The responses to public comments are included in the Final EIR, which can be found on CDFW's website: https://wildlife.ca.gov/Regions/5/Ballona-EIR.

ACTION #15 – Enhance Populations of Rare Species

SMBRC staff continued to coordinate with SCC in overseeing implementation of the reestablishment of California red-legged frogs (CRLF) project funded by Prop. 12. 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 recent Woolsey fire. During this reporting period, work continued to finalize the grant agreement.

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.

ACTION #16 – Support Activities to Achieve TMDLs

No additional narrative needed for activities regarding implementation of LA IRWMP and facilitation of other sources of State funding. For activities regarding support of implementation of projects identified in EWMPs and WMPs, see narrative for Action #17.

ACTION #17 – Implement and Study Runoff Capture Projects

SMBRC staff continued overseeing implementation for the following previously funded Prop. 84 projects:

Culver Boulevard Realignment and Stormwater Infiltration/Retention Regional 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 basin to recharge groundwater. The project entered phase I of construction early 2020 and is expected to be completed within 18 months.

***Westwood Neighborhood Greenway Project*:** SMBRC staff worked with 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 began in October 2019 and is anticipated to be complete by late 2020.

***Santa Monica Bay Catch Basin Insert Project*:** SMBRC staff worked with grantee, City of Rancho Palos Verdes, to continue to implement this project, which will retrofit and install over 1,200 connector pipe screen (CPS) units in existing catch basins across the Palos Verdes Peninsula (PVP) watershed draining to Santa Monica Bay, spanning approximately 14 sq. miles. This project will help mitigate trash and marine debris and assist cities in the PVP watershed in implementing the requirements for stormwater permits. During this reporting period, 45 CPS units were installed, and several are pending permits.

***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. The grant agreement was executed late 2019 and construction is planned to be completed by late 2020.

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

***Monteith Park Storm Water 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, work continued to finalize and approve the grant agreement.

***Beach Cities Green Streets*:** 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, work continued with the City of Torrance to finalize the grant agreement and MOU between Beach Cities.

***Paramount Ranch Storm Flow and Sediment Reduction*:** The proposed project aimed to reduce sediment, capture and re-use stormwater, restore riparian habitat, increase natural flood attenuation, and protect historic structures at NPS's Paramount Ranch on Medea Creek, a tributary to Malibu Creek. Unfortunately, the project was cancelled due to Woolsey Fire impacts.

ACTION #18 – Install and Monitor Pumpout Facilities

TBF's Boater Education and Outreach Program was initiated in 1996 with a Clean Vessel Act grant. The program works to provide the boating community with the tools and resources they need to prevent pollution, including sewage and bilge pumpouts. The program also monitors these resources to ensure they are operating at peak efficiency. Monitoring efforts allow staff to provide facility managers support including technical expertise and parts such as nozzles and banjo valves. A collaborative approach to pumpout monitoring allows statewide consistency and is conducted in partnership with San Francisco Estuary Partnership and Morro Bay National Estuary Program supported by the federal Clean Vessel Act grant administered through California State Parks Division of Boating and Waterways. Pumpout monitoring is conducted statewide through the Pumpout Nav app. The app was published in 2017 and has developed to include additional sewage management facilities such as sewage dump stations and floating restrooms. The app data is maintained by monitoring agencies and app updates are developed and published regularly.

ACTION #21 – Support Policies to Reduce Reliance on Imported Water

SMBRC staff continued to coordinate with SCC in overseeing implementation of the Pure Water Project Las Virgenes-Triunfo (Pure Water Project) funded by Prop. 12. 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. The project was in the construction phase during this reporting period.

ACTION #22 – Implement Composting and Landfill Diversion Projects

The Table to Farm Composting for Clean Air project, initiated in 2016, is a collaborative network of schools, students, food service establishments, local non-profit organizations, and the community at large working to create local solutions to reduce air pollution and greenhouse gas emissions. This project connects food service establishments with local compost hubs for diversion of pre-consumer food waste from the landfill. Nutrient rich compost is then used in gardens that grow fresh local produce for the community. This hyper-localized project is focused in a disadvantaged community to reduce air pollution associated with transportation of food and food waste. Additionally, compost hubs and community gardens are located at schools to teach students about food equity, air pollution, carbon sequestrations, food waste, composting, and gardening.

ACTION #24 – Include Coastal Resilience into LCP Updates

TBF continues to work with coastal municipalities such as LACDBH, City of Malibu, City of Santa Monica, City of Manhattan Beach, City of Hermosa Beach, and others to incorporate coastal resiliency planning into Local Coastal Program updates/revisions and other policies. City of Hermosa Beach partnered with United States Geological Survey (USGS), Climate Access, and WhiteSpace VR to launch "Look Ahead Hermosa Beach" and release virtual reality interactive videos about what will happen with sea level rise and how we can use nature-based solutions to help. City of Manhattan Beach is also exploring visualizations that will help engage the public in incorporating coastal resiliency and nature-based solutions into coastal policies.

ACTION #27 – Conduct Boater Outreach to improve BMPs

TBF's Boater Education and Outreach Program was initiated in 1996 with a Clean Vessel Act grant and has since worked with the Southern California coastal boating communities on public engagement campaigns that decrease boat related pollution. The program evolves each year with new and innovative ways to promote clean boating. Over the last two decades, TBF has successfully worked to support a clean boating community in Southern California, engaging hundreds of thousands of boaters using a multi-faceted strategy based on: 1) creation of tools like the Southern California Boater's Guide, When Nature Calls sewage guide, Boater Kits, and educational videos; 2) direct outreach to the boating community through presentations, events, social

media, and an email listserv; 3) a partnership approach that galvanizes statewide clean boating messages in part with San Francisco Estuary Partnership, Morro Bay National Estuary Program, and California's Boating Clean and Green Program via projects like the Pumpout Nav app, Dockwalker Program, and California Clean Boating Network (CCBN); and 4) strong relationships with the boating industry, boating public, marinas, yacht clubs, and other organizations throughout the State.

ACTION #32 – Reduce Marine Debris

Most marine debris comes from land-based sources which are transported to oceans via storm water runoff. The main sources of plastic found in stormwater runoff include litter (mostly cigarette butts, food wrappers, lids, bags, cups/plates/utensils, straws, beverage bottles). Much of this debris is a result of disposable products, the result of convenient 'to go' items that have a short useful life span and then are quickly disposed. The most effective measure that can reverse the trend and ultimately prevent disposal of plastics into the ocean is through source control, to reduce the amount or availability of single-use disposable plastic products. TBF supports efforts of cities to adopt plastic reduction ordinances which has been increasing in recent years. Additionally, in 2018, TBF in partnership with Clean Water Action, implemented ReThink Disposable LA: a technical assistance program for food service businesses targeting the reduction of single-use disposable items used on-site.

ACTION #33 – Monitor Microplastics and Other Marine Debris

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. Student results will be presented at the Undergraduate Research Symposium at LMU in April.

ACTION #36 – Monitor Climate Change Impacts and Ocean Acidification

LMU's Coastal Research Institute and Dr. Jeremy Pal's research team continued work on modeling coastal climate stressors (such as temperature) and predicted effects or impacts on various species. Both present, 1986-2005, and future, 2011-2050, were considered and modeled. Habitat suitability models (HSMs) depicted the frequency of suitable days per year in which sea surface temperature fell in a specified temperature range with the use of data from the National Oceanic and Atmospheric Administration. Additionally, the data were used to verify the accuracy of projected data from eight of the eleven climate change projection models from the Intergovernmental Panel on Climate Change. Preliminary results will be presented at the Undergraduate Research Symposium at LMU in April.

Ongoing efforts by Los Angeles County Sanitation Districts, US EPA, and TBF continue to service, calibrate, maintain, deploy, download, and analyze data collected by an array of sensors collecting data on temperature, pH, dissolved oxygen, and carbon dioxide. The data collected by this effort are being used in conjunction with other similar studies

to generate a report on best practices and the usability of these data to inform monitoring related to ocean acidification.

ACTION #38 – Monitor Rocky Intertidal Habitats

LMU's Coastal Research Institute 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. Though her research was impacted by the virus pandemic, preliminary student results will be presented at the Undergraduate Research Symposium at LMU in April.