

Santa Monica Bay Restoration Commission
Bay Restoration Plan
2013 Update

November 21, 2013 Draft

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Introduction

Welcome to the Santa Monica Bay Restoration Commission's Bay Restoration Plan 2013 Update (BRP Update). It has been five years since the BRP was updated last time. During this period of time, we have achieved or made significant progress in achieving a substantial number of the BRP objectives and milestones including most notably, Malibu Lagoon restoration, TMDLs adoption for several impaired waterbodies in the Bay watershed, the Ballona Creek rain gardens construction, the Culver City rain barrel program, the Southern California Boater Education Program, and the South Bay restaurant certification program, just to name a few.

While we are confident that progress will continuously be made and the Bay's environmental health will continue to improve, we should also acknowledge that we have not met the desired objectives in many areas laid out in the BRP in 2008, and there are still many roadblocks, difficulties, and challenges ahead. Meanwhile, many new issues and challenges have emerged over the last five years that need to be recognized and addressed with new strategies and actions.

This Update was developed through a public process, with involvement of the Governing Board, the Watershed Advisory Council (WAC), the Technical Advisory Committee (TAC), and other interested stakeholders. In addition to revisions of existing objectives and milestones, many new milestones were added. We believe these approaches and strategies are the most effective in making substantial progress toward Bay restoration over the next ten to twenty years. Together, these newly updated goals and objectives will also guide SMBRC staff and our partners in daily decisions about what to work on, what projects to fund, and where to devote our time, energy and resources.

In the end, this document represents the hopes and aspirations of the many stakeholders in the Bay watershed to eventually achieve our mission: to restore and enhance the Santa Monica Bay through actions and partnerships that improve water quality, conserve and rehabilitate natural resources, and protect the Bay's benefits and values.

The Plan begins in Part I with a brief introduction on the setting of the Bay and its watershed, which places us in a geographic and human context from which to view the restoration potential of the Bay. In this introduction we also review the ecological functions that we wish to protect and restore and how they relate to the desired uses of our

resources and the types of actions that are needed to accomplish this. In Part II we specify the priority issues that we must address in order to protect and restore the Bay and its watershed, as well as the goals, objectives, and milestones that will get us there.

The Santa Monica Bay National Estuary Program

The Santa Monica Bay Restoration Commission is a National Estuary Program (NEP) of the EPA. The NEP was established by Congress in 1987 to improve the quality of estuaries of national importance and the Santa Monica Bay NEP was established in 1988. The Clean Water Act Section 320 directs the Environmental Protection Agency (EPA) to develop plans for attaining or maintaining water quality in an estuary. This includes protection and propagation of a balanced, indigenous population of shellfish, fish, and wildlife; protection of public water supplies; preservation of recreational activities in and on the water; and control of point and nonpoint sources of pollution to supplement existing controls as needed. Each NEP establishes a Comprehensive Conservation and Management Plan (our Bay Restoration Plan) to meet the goals of the Clean Water Act.

Background

Santa Monica Bay and its Watershed

Habitats and Living Resources

Santa Monica Bay is an integral part of the larger geographic region commonly known as the Southern California Bight. The Bay itself is the submerged portion of the Los Angeles Coastal Plain. It is bordered offshore by the Santa Monica Basin, on each end by the rocky headlands of Point Dume and the Palos Verdes Peninsula, and onshore by the Los Angeles Coastal Plain and the Santa Monica Mountains.

The 414 square mile area of land that drains naturally to the Bay, known as the Bay watershed, is bordered on the north by the Santa Monica Mountains from Ventura-Los Angeles County line to Griffith Park, extending south and west across the Los Angeles coastal plain to include the area east of Ballona Creek and north of Baldwin Hills. South of Ballona Creek, a narrow coastal strip between Playa del Rey and the Palos Verdes Peninsula forms the southern boundary of the watershed.

There are 28 separate sub-watersheds within the larger Santa Monica Bay watershed. The three largest are Ballona Creek, Malibu Creek, and Topanga Creek watershed. The northern portion is dominated by the Santa Monica Mountains, the central portion by the Los Angeles Coastal Plan, and southern portion by the Palos Verdes Peninsula.

The diverse ecosystems within the Santa Monica Bay watershed provide habitats for more than five thousand species of plants, fish, birds, mammals, and other wildlife. The Bay's terrestrial habitats include riparian woodlands, coastal sage scrub, oak woodlands, coastal sand dunes, salt and brackish marshes, lagoons, and mudflats. Marine habitats include soft and hard bottom, sandy and rocky intertidal, and kelp and seagrass beds.

Human Uses and Impacts

The ability of the Bay and its watershed to support a rich and diverse ecosystem has also made it a highly desirable environment for human habitation. Prior to the late 1700s, the Bay's watersheds were the province of Native American Venturaño, Chumash, Gabrieleño, and Fernandeño peoples. The Spanish occupation that began in 1769 with

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the Portola expedition marked the beginning of the end of native peoples in the Los Angeles area. In the following decades, Spanish and Mexican settlers carved the coastal plain into ranchos for cattle grazing and for crops like corn, beans, barley, and wheat and began the alteration of the region's watercourses through damming, diking and ditching. Over time, agriculture gave way to, oil drilling and the development of other industries, sea and land transportation, housing development and other human activities, which have also greatly changed the Bay's landscape.

Rapid development of the region began after the Southern Pacific Railroad reached Los Angeles in 1876. The discovery of oil also brought change to the region. Wetlands were drained and spills polluted and destroyed the freshwater wetlands. By 1879, commercial and sport fishing had begun in Santa Monica Bay. By the early 1900, Los Angeles had a population of 102,479 and included the newly established Port of Los Angeles, which would shortly become the hub of the tuna canning industry. Thanks to the development of a network of electric trolley cars, coastal areas also became desirable places to live. Developments sprang up in Playa del Rey, Santa Monica, and Venice.

The Los Angeles County Flood Control District was formed in 1915 to alleviate the flooding that plagued the residents of the coastal plain during wet years. This started the transformation of the first crude rancho ditches into the system of storm drains, concrete ditches, culverts, and pipes that today stretches over 5,000 miles and carries millions of gallons of water each day directly to the sea.

The speed and magnitude of change occurred in the Bay's watershed in less than 300 years is truly beyond any early settler's imagination. Today, the metropolitan area surrounding the Santa Monica Bay is one of the world's most populous urban areas. According to the 2010 U.S. Census, about 10.8 million people live in the two coastal counties that border Santa Monica Bay, Los Angeles and Ventura Counties. Of that number, almost 9 million people live in the Santa Monica Bay watershed (the area served by the three major wastewater treatment plants), and about 1.9 million live in the Bay's watershed. Approximately 48 percent of the watershed is characterized as developed. Most of the remaining undeveloped area within the watershed is located within the Santa Monica Mountains National Recreation Area.

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More people can mean more waste, and greater potential for pollutants to enter the Bay through sources like wastewater, urban and storm water runoff, and aerial fallout. More people can also mean more usage and seizure of the Bay's resources through encroaching, harvesting, or trampling. Projected population growth into the 21st century will continue to require substantial augmentations to infrastructure and will potentially result in increased pressures on the health of the Bay.

Ecological Functions and Resource Uses

Santa Monica Bay and its watershed naturally provide many ecological functions that humans depend upon. Major ecological functions include water purification (through absorption and filtration of contaminants), water and sediment transport, flood storage, and habitats for fish and wildlife. When the watershed is able to perform these functions, people benefit because we can then use the resources that we desire, including clean beaches for swimming, healthy seafood for nutrition, protection from flooding, parks to recreate in and abundant wildlife for observing both above and below the waters of the Bay.

Goals and Objectives

This section lists the Plan's Goals and Objectives for restoring the Bay. These goals and objectives are grouped under three priority issues following our mission to "improve water quality, conserve and rehabilitate natural resources, and protect the Bay's benefits and values". It is important to point out that these three priority issues crosscut in many ways: If we consider the Bay's benefits and values to be the uses that humans make of it, e.g. recreation, fish and seafood for eating, and flood mitigation, then it is clear that the last issue (protecting those uses) depends on the first two (improving water quality and conserving and rehabilitating natural resources).

The goals, objectives, and milestones described below reflect necessary steps we need to take together to fully restore and protect the ecosystem of the Bay and the Bay watershed. While some of the programs/projects described here are initiatives and responsibilities of the Bay Commission itself, most are ongoing or planned activities that are led or participated in by our partner agencies and organizations. For this reason, we often reiterate the goals and objectives of the lead

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and partner agencies if they are deemed essential components of a comprehensive plan to address major issues of concern for Bay restoration.

The Bay Restoration Commission serves as the focus point to ensure that steady progress be made toward achieving the objectives and milestones described in this plan. The Commission will do so through its annual work program in three primary ways: facilitation, implementation, and program management¹. For achieving each specific milestone described below, the role of the Commission varies and are defined as one or more of the following :

Lead: The Commission is the lead sponsor and oversees completion of projects for achieving the milestone, and/or the Commission staff carries out the projects directly under the Commission's annual work plan.

Participate: The Commission contributes staff and/or other resources and actively engages in project activities.

Facilitate: The Commission provides assistance in coordination, consensus and partnership-building, information exchange, fund raising, etc.

Promote: The Commission helps to accomplish the milestone by actively campaigning for, and/or helping to disseminate information, etc. for the associated activities.

¹ Facilitation: SMBRC is the only group in the diverse and densely-populated watershed of Santa Monica Bay whose main function is to bring together all stakeholders in an open and collaborative process wherein the goal is to improve the health of the Bay for all who depend on it. Although many agencies, industries, and nonprofit groups work on environmental issues in our watershed, only SMBRC has broad Governing Board representation and multi-level support (local, State, and Federal) to link these groups together and foster truly integrated solutions to habitat and pollution problems.

Implementation: SMBRC has expert technical and policy staff who conduct projects and programs ranging from education (e.g., the Clean Marinas program), to hands-on management of millions of dollars in grant funds, to designing wetlands restoration (e.g., the Ballona Science Advisory Panel).

Program Management: There are significant reporting requirements associated with the Federal and State funds received and/or distributed by SMBRC. In addition, we operate a nonprofit Foundation, as well as a Joint Powers Agreement with Los Angeles County. Both of these entities require bookkeeping and reporting tasks that fall under Program Management.

Support: The Commission advocates for the milestone by adopting policy statements, offering endorsements, providing supporting letters, testimony, etc.

Priority Issue: Water Quality

Water quality affects all other natural resources and uses in the Bay and watershed. Poor water quality impacts the ability of water bodies to serve as habitat for fish and the invertebrates they feed upon. Degraded water quality also impacts public health (see Section Three).

Santa Monica Bay is adjacent to one of the most populous, urbanized coastal metropolitan areas in the United States. With a population of nearly nine million people, Los Angeles County residents utilize the Bay for a wide variety of purposes including the discharge of treated municipal, commercial and industrial wastes. The Bay has received municipal and industrial wastewater discharges for over 100 years.

Municipal wastewater discharges, power plant cooling water discharges and industrial waste effluents are generally referred to as “point sources” of pollution because they discharge into the water at a specified point such as a pipe or conduit. There are seven major and over 160 smaller permitted point source facilities in the Santa Monica Bay watershed.

As the quality of sewage discharged has significantly improved, storm water and urban runoff have become the most significant source of pollution to Santa Monica Bay. Storm water and urban runoff are transported to the Bay through the region’s extensive (5,000 miles county-wide) storm drain system and discharged through more than 200 large and small discharge points without treatment. On its way to Santa Monica Bay, rain water washes, scours and intercepts pollutants from the air and ground; whether it is trash left on the streets or in catch basins, motor oil leaked on highways and parking lots, or heavy metals deposited on vegetation. This process is accelerated by the fact that development increases the imperviousness of the ground and, if not mitigated, increases the volume of runoff.

Nineteen pollutants of concern have been identified for Santa Monica Bay (Dichloro-Diphenyl-Trichloroethane (DDT), polychlorinated biphenyls (PCBs), polycyclic aromatic hydrocarbon (PAHs), Chlordane,

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Tributyltin (TBT), cadmium, chromium, copper, lead, nickel, silver, zinc, pathogens, TSS (sediment), nutrients, trash and debris, chlorine, oxygen demands, and oil and grease). Their impacts are varied - some, such as DDT and PCBs have bioaccumulated, contaminating seafood; some, such as pathogens, may cause potential health risks if their concentration is elevated above the level of concern. The sources or pathways of these pollutants vary as well. Heavy metals are found in both wastewater treatment plant and storm drain discharges while on the other hand, contaminated sediments are the only major source for pollutants such as DDT, PCBs and TBT that have been banned or restricted. Pathogens found in storm water and urban runoff is the primary contaminant of concern at swimming surf zones along Santa Monica Bay beaches. Atmospheric deposition, boating activities, on-site wastewater treatment (septic) system have also known to contribute loading of various pollutants to the Bay.

Significant progress has been made in improving water quality in Santa Monica Bay and the Bay watershed since adoption of the original Bay Restoration Plan in 1995. Major milestones accomplished during the last eighteen years include the completed upgrade to full secondary treatment by the City of LA's Hyperion treatment plant, and LA County's Joint Water Pollution Control Plant (JWPCP), the two largest wastewater treatment facilities in the region, the development and implementation of Total Maximum Daily Loads (TMDLs) for waterbodies impaired by poor water quality in the Bay watershed, installation of more than 30 dry-weather urban runoff diversion or treatment facilities, and adoption and implementation of low impact development (LID) approach under the municipal storm water (MS4) National Pollutant Discharge Elimination System (NPDES) permit.

Despite the significant progress, much remains to be done before water quality objectives can be met for all waterbodies in the Bay and its watershed. Significant amounts of pollutants such as trash, pathogens, and heavy metals continue to flow into the ocean through the storm drain system. New challenges such as the loading and impacts of nutrients and so-called emerging contaminants need to be addressed. Concerted efforts by regulatory and regulated communities are needed to overcome obstacles on further progress and address these new challenges.

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Goal # 1: Improve water quality through enhancement of current regulatory framework and collaborative, integrated watershed-wide planning and implementation

The current federal and state water quality regulatory framework has been credited as the primary force in bringing significant improvement in water quality over the last decades, and should be strengthened to ensure continuing progress. Under the mandate of the federal Clean Water Act (CWA) and the State Porter-Cologne Water Quality Act, major programs for control of point and nonpoint sources of pollution include the Ocean Plan, Basin Plan, TMDLs, the listing of impaired water bodies (303(d) listing), the National Pollutant Discharge Elimination System (NPDES), the coastal cooling water intake and discharge requirement (316(d) requirement), waste discharge requirement (WDR), etc. At the local level, the Los Angeles Regional Water Quality Control Board (LARWQCB) is the primary agency responsible for implementing these programs. Meanwhile, the ultimate attainment of water quality standards must rely on the joint efforts of the regulators and the regulated communities through collaborative, integrated watershed-wide planning and implementation activities.

Objective 1.1: Attain water quality goals in TMDLs adopted for 303(d) listed waterbodies in the Santa Monica Bay watershed.

The consent decree reached in 1999 for compliance with TMDL requirements in federal law was a major breakthrough and as a result, development of TMDLs had been scheduled for nearly all pollutants of concern identified in the BRP. Since 1999, LARWQCB has taken the leadership role in development and implementation of TMDLs in the region. As of October 2013, fourteen TMDLs have been adopted and become effective at targeting loading of trash, bacteria, metals, toxics, nutrients, sediment, and invasive vegetation for various waterbodies in the Bay watershed.

The newly TMDLs have also been integrated into the existing regulatory framework as they are incorporated into the Basin Plan and the NPDES permits. It is critical that the LARWQCB continues to lead and complete development and update of all TMDLs on schedule. It is

also critical that LA County and all watershed cities work together and cooperatively with the LARWQCB and other stakeholders to accomplish tasks laid out in the implementation plan of each TMDL and ultimately achieve the waste allocations specified in each TMDL (Appendix A).

To assist LARWQCB and implementation partners to achieve this objective, the SMBRC will facilitate discussion among its members on TMDL-related issues and conduct or support additional technical studies to better characterize pollutant loading including both natural and anthropogenic sources, understand pollutant impacts, and evaluate effectiveness of pollutant control measures, etc. The SMBRC will also play a supporting role in the attainment of water quality goals in adopted TMDL's by funding structural and non-structural Water Quality Best Management Practices and assisting with special studies.

Milestone 1.1a: Update existing TMDLs (Appendix A) and determine the need for development of TMDLs for the remaining 303(d) listed waterbodies in the Santa Monica Bay watershed by 2021.

Implementation Lead: LARWQCB, USEPA

Implementation Partners: LA County and watershed cities, park agencies

Role of the SMBRC: Facilitate and support

Milestone 1.1b: Facilitate achievement of TMDL waste load and load allocation targets through implementation of enhanced watershed management plans under the MS4 permit by 2023.

Implementation Lead: LARWQCB, LA County and watershed cities

Implementation Partners: Other permitted dischargers

Role of the SMBRC: (1).Facilitate and promote; (2). Provide technical support

Milestone 1.1c: Facilitate and support TMDL implementation through progress and achievement recognition and information sharing on effective and successful implementation approaches and tools by 2018.

Implementation Lead: SMBRC

Implementation Partners: LA County and watershed cities, LARWQCB

Role of the SMBRC: Lead

Milestone 1.1d: Facilitate research and assessment that inform more accurate waste load allocation and development of new water, sediment and biological objectives by 2018.

Implementation Lead: SMBRC

Implementation Partners: LARWQCB, SWRCB

Role of the SMBRC: Lead

Objective 1.2: Eliminate and prevent water and sediment quality impairments from both point and nonpoint sources from waterbodies in the Malibu Creek watershed.

The 109-square Malibu Creek watershed extends from the Santa Monica Mountains to the Pacific coast at Santa Monica Bay. Flows from the upper watershed drain into Malibu Creek and Malibu Lagoon, and ultimately into the Bay. The natural hydrology of the watershed has been modified by the creation of several dams and man-made lakes, and by imported water that is used by people and eventually discharged to the Creek as urban runoff or treated wastewater.

Malibu Creek and Lagoon are listed by EPA and the State Water Resources Control Board (SWRCB) as waterbodies impaired by high levels of nutrients and algal growth. High levels of nutrients in the creek and lagoon can cause increased algal and aquatic vegetation growth and high biological oxygen demand (eutrophic condition), which can result in fish kills and other ecological damages. Potential sources of nutrient loading include runoff from residential and commercial areas, runoff associated with agriculture and livestock, treated wastewater discharges, septic system, groundwater, aerial deposition, etc. As an initial step in controlling nutrient loading in the watershed, a nutrient TMDL was established and adopted by USEPA in 2003. The LARWQCB may develop and implement additional regulatory measures based on more updated and complete information.

Milestone 1.2a: Complete development of the Malibu Creek nutrient and benthic TMDLs and the TMDL implementation plan with enhanced stakeholder participation by 2014.

Implementation Lead: USEPA, LARWQCB

Implementation Partners: LVMWD, Malibu watershed cities, Park agencies in the Santa Monica Mountains area

Role of the SMBRC: Facilitate and provide technical assistance

Milestone 1.2b: Facilitate achievement of TMDL allocation targets through new nonpoint source control measures such as improved fertilizer management in the Malibu Creek watershed by 2020.

Implementation Lead: LVMWD, Malibu watershed cities, Park agencies in the Santa Monica Mountains area

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 1.2c: Conduct additional monitoring and studies to evaluate factors from both upper and lower watershed that affect algal growth and benthic macroinvertebrate impairments in Malibu Creek by 2015.

Implementation Lead: LVMWD, Malibu watershed cities, Park agencies in the Santa Monica Mountains area

Implementation Partners: LARWQCB, USEPA

Role of the SMBRC: Facilitate and support

Objective 1.3: Eliminate biological impacts of water intake and discharge from coastal power and desalination plants.

The three coastal power plants in Santa Monica Bay (El Segundo, Redondo, and Scattergood) have been and continue to use a once-

through cooling system that sucks in billions gallons of seawater through intake pipes each year. This cooling process negatively impacts the ocean environment on both the intake and discharge side in the form of impingement (the entrapment and death of large marine organisms on cooling system intake screens), entrainment (the death of small plants and animals that pass through the intake into the plant's heat exchanger), and the discharge of heated ocean water back into the Bay (thermal pollution).

Section 316(b) of the federal Clean Water Act requires that the location, design, construction, and capacity of cooling water intake structures reflect the best available technology (BAT) for minimizing adverse environmental impact. However, efforts made to date to minimize the impacts through technological retrofits or operational measures have been largely unsuccessful or deemed cost-prohibitive. The preferred BAT therefore is to replace the once-through cooling with other types such as a closed-cycle wet cooling system. Meanwhile, interim measures to reduce or remediate the impingement and entrainment impacts should be taken until once-through cooling is discontinued.

The federal EPA and the SWRCB are key agencies responsible for ensuring the CWA Section 316(b) requirements are met. In California, the SWRCB has taken the lead in developing ed a state-wide policy for establishing requirements for implementing section 316(b) for existing coastal and estuarine power plants. The state-wide policy was adopted in May 2010 and became effective since Oct. 2010. Under the new state-wide policy, coastal power plants in SM Bay area are encouraged to phase out once-through cooling as early as 2019 and no later than 2021. However, the policy also leaves room open for a prolonged time period. All power generation facilities in the Bay has developed plan and timeline to implement the policy. In order to comply with the new state-wide policy, El Segundo Power, the owner of El Segundo Generation Station (ESGS) has submitted an Implementation Plan to shut down and/or replace all existing power generation units at ESGS, and eliminating all cooling water intake by the end of 2015. AES Southland, owner of the Redondo Beach Generating Station (RBGS) has submitted an Implementation Plan to permanently end all ocean water intake at RBGS by the end of 2020. The Los Angeles Department of Water and Power, owner of the Scattergood Generation Station submitted an implementation plan to achieve repowering for units 1 & 2 without once-through-cooling by the end of 2024.

Like coastal power plants, desalination plants also take up ocean water and may even use the intake water from adjacent coastal power plants. Since the intake pipes for desalination plants are not specifically covered under the CWA Section 316(b), policies to address potential impingement and entrainment impacts of ocean water intake by desalination plants should be developed under the purview of other existing and appropriate water quality policies. SWRCB is developing and scheduled for adoption in 2014 an amendment to the Ocean Plan that would address issues associated with desalinization facilities and the disposal of brine discharges from other sources.

As a result of completed repowering projects, LADWP has reduced the use of once through ocean water cooling by 17% from 1990 levels. The current plan calls for a complete phase-out of ocean water cooling by 2029.

Milestone 1.3a: Phase out the use of once-through cooling by 2021. Complete conversion of the existing facilities by the State-approved deadline for individual facilities no later than 2021.

Implementation Lead: LARWQCB, Coastal power plant owners (City of LA DWP, NRG, etc.)

Implementation Partners: SWRCB, State Energy Commission, NMFS

Role of the SMBRC: Facilitate and support

Milestone 1.3b: Develop and adopt policies to address potential impacts of water intake brine discharge from desalination facilities by 2014.

Implementation Lead: SWRCB

Implementation Partners: LARWQCB, Water Districts

Role of the SMBRC: Support

Objective 1.4: Eliminate all harmful discharges to Areas of Special Biological Significance (ASBS)

ASBS are coastal ocean areas with special status given over 30 years ago, under the California Ocean Plan to prohibit the discharge of any

waste in order to maintain natural water quality and protect the unique and sensitive biological species and communities they harbor. Called “AquaGems,” these ecosystems strung along the coastline are home to rich kelp forests and biologically diverse ocean canyons. The only ASBS in Santa Monica Bay, which stretches from Laguna Point to Latigo Point, is also by far the largest in the entire state of California.

A statewide survey conducted by the SWRCB in 2003 documented more than 1,600 discharges into the 34 ASBS along the state’s coastline, including many in the ASBS in northern Santa Monica Bay. Since then, the SWRCB in coordination with the Regional Boards and other stakeholders has developed and begun implementing a comprehensive strategy, including non-storm water discharge prohibition from municipal drains, to address these discharges. The SMBRC and its partners will cooperate with and participate in the SWRCB’s effort to achieve elimination of all harmful discharges to ASBS in the Bay.

Milestone 1.4a: Evaluate the effectiveness of non-storm water discharge prohibition from municipal drains and the effect of conditional Exceptions. update existing strategy and policy for eliminating all harmful discharge to ASBS by 2015.

Implementation Lead: SWRCB

Implementation Partners: LARWQCB, City of Malibu, LA County, CalTrans, State DPR

Role of the SMBRC: Support

Milestone: 1.4b: Eliminate all identified harmful discharges to ASBS in the Bay by 2018.

Implementation Lead: SWRCB

Implementation Partners: LARWQCB, City of Malibu, LA County, CalTrans, State DPR

Role of the SMBRC: Support

Objective 1.5: Develop a reliable regional funding mechanism for storm water quality improvement

Lack of stable funding resources is recognized as a substantial obstacle for carrying out storm water pollution control programs in the Region. While a few municipalities in the watershed have been successful in securing funding from voter-approved property assessment fees to meet the need for storm water pollution control, the County and most municipalities in the watershed have not made or succeeded in similar efforts. A feasibility study of a County-wide funding measure facilitated by the SMBRC was completed in 2011. A funding measure was drafted, but was not put on the Ballot in 2013 as originally planned. It will be reworked and set for vote in a future date.

Milestone 1.5a: Implement a reliable County-wide Clean Water and Clean Beach funding mechanism through a property assessment fee by 2014.

Implementation Lead: LA County

Implementation Partners: watershed cities

Role of the SMBRC: Facilitate and promote

Milestone 1.5b: Support Proposition 218 reform and implement other financing mechanisms to provide local governments with funds for storm water programs.

Implementation Lead: LA County

Implementation Partners: Watershed cities, MRCA

Role of the SMBRC: Participate, support

Objective 1.6: Reduce and prevent non-storm water non-storm water runoff from urban land uses.

Excessive landscape irrigation, sidewalk and driveway rinsing, fire hydrant rinsing, etc. by residential, industrial, and commercial properties in the watershed could be a major source of unnatural dry-weather runoff which contributes to pollutant loading to the Bay. The municipal storm water permit requires that permitted municipalities and industries investigate and determine the relative contribution of these sources to dry-weather runoff pollution and, based on the results of the investigation, enact prohibitions or other measures to address

these non-storm water discharges. While some municipalities have taken steps to identify and prohibit some of the discharges, others have not. More information exchange among municipalities can help to bring all permittees on board and address similar discharges in a more consistent manner. On the other hand, there is evidence that compliance of existing prohibitions has been lacking and should be enhanced through more outreach and enforcement.

Milestone 1.6a: Promote good practice and measures through information exchange for reducing or preventing non-storm water runoff.

Implementation Lead: Watershed cities, LA County

Implementation Partners: Local water districts

Role of the SMBRC: Support

Milestone 1.6b: Improve enforcement of local prohibitions and MS4 permit requirements on non-storm water runoff.

Implementation Lead: Watershed cities, LA County

Implementation Partners: LARWQCB

Role of the SMBRC: Promote

Objective 1.7: Eliminate nonpoint pollution from on-site wastewater disposal systems (OWDSs)

An onsite wastewater disposal system (OWDS), also commonly known as septic system, is the means by which an individual home or a cluster of homes cleans and disposes of its wastewater. It is prevalent throughout coastal areas of Malibu and Topanga Canyon in northern Santa Monica Bay, due to the lack of a connection to a centralized sewer system. A conventional OWDS comprises a septic tank for settling of solids and a drainage field for disposal of the liquid waste. Each system is designed according to site conditions to ensure proper treatment. However, inadequate design and/or maintenance can lead to wastewater leakage and contamination of groundwater or surface waters.

In response to a lack of oversight and control of septic contamination in the coastal zone, an OWDS Task Force was facilitated by the SMBRC

in 2001 to identify gaps in existing regulatory and management procedures, and to develop consensus on feasible solutions. A series of recommendations was developed, ranging from construction of a centralized wastewater treatment facility in Malibu to establishment of a local agency permit program and an OWDS maintenance district.

In response to the Task Force’s recommendations, the City of Malibu adopted an Integrated Wastewater Management Action Plan and signed a Memorandum of Understanding with the LARWQCB that clarified OWDS permitting responsibilities. Subsequently, the City has adopted a point-of-sale ordinance, and established programs for OWDS inspector registration, operating permits, and integrated wastewater information management. While this progress is laudable, more and bolder steps still need to be taken to achieve full implementation of the comprehensive program. One remaining challenge is the lack of resources by the LARWQCB to issue and enforce Waste Discharge Requirements (WDRs) to all restaurants and large (greater than 2,000 gpd) commercial and multi-family properties that the agency is responsible for in the Malibu area.

In November 2009, LARWQCB enacted Prohibition of OWDSs in the Malibu Civic Center Area. In July 2011, the LARWQCB and the City of Malibu signed a Memorandum of Understanding (MOU) which set the plan and schedule to construct one or more centralized wastewater treatment facilities (facility) in the Malibu Civic Center area and a comprehensive regulatory program with respect to OWDSs.

To allow the continued use of OWDSs, while protecting water quality and public health the State Water Resources Control Board adopted in June 2012 a statewide policy for siting design, operation, and maintenance of OWDSs. This Policy establishes a statewide, risk-based, tiered approach for the regulation and management of OWDS installations and replacements and sets the level of performance and protection expected from OWDS. Implementation of the OWDS Policy will be overseen by the State Water Board and the regional water quality control boards, and local agencies (e.g., county and city departments and independent districts) through local management programs.

Milestone 1.7a: Implement the septic prohibition regulation for the Malibu Civic Center area and complete construction of the centralized wastewater treatment facility(s) for civic center with advanced tertiary treatment and water recycling capability by 2019.

Implementation Lead: *City of Malibu*
Implementation Partners: *LARWQCB*

Role of the SMBRC: *Promote*

Milestone 1.7b: Achieve issuance of waste discharge requirements (WDRs) issued by the LARWQCB to all applicable multi-family and commercial establishments in northern Santa Monica Bay watershed by 2016.

Implementation Lead: *City of Malibu, City of LA, LA County LARWQCB*
Implementation Partners:

Role of the SMBRC: *Facilitate and promote*

Milestone 1.7c: Fully implement a permitting program by local agencies as laid out under the MOU between the LARWQCB and local agencies for operation, inspection, and monitoring of OWDS by 2016.

Implementation Lead: *City of Malibu, City of LA, LA County*
Implementation Partners: *LARWQCB*

Role of the SMBRC: *Promote*

Milestone 1.7d: Facilitate implementation of the State on-site wastewater treatment policy with more stringent requirements in environmentally sensitive areas and near impaired water bodies by 2018. by 2018.

Implementation Lead: *City of Malibu, City of LA, LA County, Park management agencies*
Implementation Partners: *SWRCB, LARWQCB*

Role of the SMBRC: *Promote*

Goal # 2: Improve water quality through pollution prevention and source control

Contaminants entering the Bay originate from many different sources, but ultimately they are the products of all the people who live, work, and play in the region. Everyday human activities -- the way we build our homes and roads, manage our households, care for our cars, manufacture and consume products -- directly influence the amounts and types of pollutants we generate and dispose.

Contaminants generated through these activities are transmitted to the Bay via numerous pathways. Major pathways include runoff to creeks and storm drains, sewer lines connected to municipal wastewater treatment facilities, industrial discharges, boating and shipping activities and aerial fallout. Although treatment and safe disposal of waste at the ends of major pathways (“the end of pipe”) will continue to be the primary waste management tool utilized, ultimate pollution control will require reduction and prevention of wastes at their sources, including changes to the ways that we live, work, and play.

Objective 2.1: Increase pervious surfaces and storm water infiltration where feasible by supporting green infrastructure.

Increase in pervious surfaces and storm water infiltration as geological condition permits can be an effective mean to prevent pollutants from transporting off-site while achieving green, sustainable growth at the same time. By capturing storm water and allowing it to seep into the ground, pervious surfaces are instrumental in recharging groundwater and reducing storm water runoff. As a Best Management Practice (BMP), the use of pervious surfaces can also help local agencies in meeting State and Federal storm water regulations.

Green infrastructure that can increase pervious surfaces and/or storm water infiltration may include rain gardens, bioretention areas, treatment wetlands, swales and porous parking lots, downspout disconnect, to name a few. To promote broader installation of similar devices in the watershed, green infrastructure elements should be incorporated into the policies, general plan, ordinances, and municipal codes, and become part of standard design and requirement for all future construction and maintenance practices associated with new or re-development.

In addition to on-site runoff retention and filtration, in hilly areas of the watershed municipalities should also be encouraged to incorporate into general plans and LID ordinances, etc. BMPs for preserving open, permeable space and preventing erosion and excessive sediment loading associated with new or re-development projects. These BMPs may include, but are not limited to, requirements on minimum buildable slopes, buffer zones from sensitive habitats and setback standards, native vegetation planting, etc.

The attainment of water quality objectives and resource protection through new green structure/LID practices may need to reconcile with other, possibly conflicting, public service goals such as fire protection, flood control, and geologic stability. New guidelines should be developed wherever necessary to preserve the maximum amount of water quality and habitat benefits while ensuring public safety. A good example is the flood control channel clearing guidelines established by the Los Angeles County Dept. of Public Works in coordination with the Resource Conservation District of the Santa Monica Mountains.

Milestone 2.1a: Adopt green street and LID ordinances by all watershed cities by 2015.

Implementation Lead: Watershed cities, LA County
Implementation Partners: LARWQCB

Role of the SMBRC: Promote

Milestone 2.1b: Incorporate green infrastructure elements, e.g. biofiltration and rain gardens, into the standard street design and maintenance practices of cities and LA County by 2015.

Implementation Lead: LA County, watershed cities, State DPR, State Conservancies, park agencies.
Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 2.1c: Establish municipal and/or state standards for use of green infrastructure. Ensure new LID standards are incorporated into local development plans and building codes by 2016.

Implementation Lead: LA County, Watershed cities, State agencies

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 2.1d: Implement and fund more LID projects such as new rain barrel program and rain gardens. Install 2 acres of rain gardens in the Santa Monica Bay Watersheds by 2016.

Implementation Lead: SMBRC

Implementation Partners: Watershed cities, LA County

Role of the SMBRC: Lead and provide funding support

Milestone 2.1e Expand the downspout disconnection and rain barrel projects throughout the watershed.

Implementation Lead: Watershed cities, LA County

Implementation Partners: N/A

Role of the SMBRC: Facilitate

Milestone 2.1f: Develop by 2015 and implement LID master plans for public-owned open space properties in the Santa Monica Mountains.

Implementation Lead: SMBRC

Implementation Partners: All park and open space management agencies

Role of the SMBRC: Lead and facilitate a working group for master plan development

Milestone 2.1g: Collect data to map and track LID implementation. Conduct analysis to determine the cumulative benefits and effectiveness of LID implementation and evaluate suitability of LIDs for different settings and conditions.

Implementation Lead: SMBRC

Implementation Partners: LA County and watershed cities, LARWQCB

Role of the SMBRC: Lead

Objective 2.2: Reduce generation of trash through restricting and reducing the use of disposable plastic and polystyrene products

Evidence indicates that quantities and impacts of plastic marine debris are significant and increasing. Investigation of plastic in the North Pacific Central Gyre of the Pacific Ocean showed that the mass of plastic pieces were six times greater than the mass of zooplankton floating on the water's surface.

The majority of marine debris is comprised of plastic materials. Most of this debris comes from land-based sources which are transported to oceans via storm water runoff. The main sources of plastic found in storm water runoff include litter (mostly plastic bags, packaging and single-use disposable products), garbage transportation, landfills, construction debris, and debris from commercial establishments and public venues. The most effective measure that can reverse the trend and ultimately prevent disposal of plastics into the ocean is to phase out and eventually stop using these plastic products.

Amid pressure from plastic manufactures, the state failed to pass the legislation to ban plastic bags statewide in recent years. However, seven municipalities² within the Santa Monica Bay watershed have adopted the ban locally. County of Los Angeles also passed ordinance banning free plastic bags in markets in the County's unincorporated areas.

Milestone 2.2a: Support State-wide bans or establish fees on plastic and polystyrene fast-food containers and plastic bags at all retail stores by 2015.

Implementation Lead: State Legislature

Implementation Partners: LA County, watershed cities

² As of October 2013, the following cities in the Santa Monica Bay watershed have adopted free plastic bag bans: Calabasas, Culver City, Los Angeles, Malibu, Manhattan Beach, Santa Monica, and West Hollywood. The city of Malibu, Hermosa Beach, and West Hollywood also enacted polystyrene ban.

Role of the SMBRC: Promote

Milestone 2.2b: Adopt bans or establish fees on plastic and polystyrene fast-food containers and plastic bags at all retail stores by all watershed cities by 2015.

Implementation Lead: Watershed cities

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 2.2c: 2.2c. Promote take back and packaging minimization programs.

Implementation Lead: CalEPA, LA County, Watershed cities

Implementation Partners: Private Businesses

Role of the SMBRC: Support

Objective 2.3: Reduce aerial deposition of storm water pollutants to the Bay and the Bay watershed

Aerial deposition refers to air-borne pollutants that fall back to the ground, such as pollutants found in dust, smog, fine particles emitted into the air from tailpipes of vehicles, wear and tear of tires, among other things. Those that settle on the earth's surface can later be washed into the storm drain system. Air deposition has been shown by the 2000 SMBRC study and other follow-up studies to be a major source of pollutant loading in storm water runoff. However, further studies are needed to identify the "hot spots" for airborne pollutants of concern. More importantly, because the current state regulatory framework does not provide either water quality or air quality regulators adequate authority and resources to address the air deposition issue, the SWRCB and State Air Resources Board (CARB) should coordinate and take solid steps in developing air deposition reduction policies. Some of these steps could include, but are not limited to, updating the list of regulated "air toxics" to include pollutants with known impacts on the marine ecosystem, and reviewing regional and local transportation and air quality plans to

ensure consistency with urban runoff and aerial fallout pollution prevention efforts.

Milestone 2.3a: Conduct further studies to estimate airborne pollutant loading from area-specific sources (e.g. Los Angeles International Airport (LAX)).

Implementation Lead: SWRCB, CARB

Implementation Partners: N/A

Role of the SMBRC: Facilitate and support, assist in develop needed studies

Milestone 2.3b: Improve coordination and collaboration between SWRCB and CARB to address specific sources of airborne pollutant loading such as brake pad.

Implementation Lead: SWRCB, CARB

Implementation Partners: LARWQCB

Role of the SMBRC: Promote

Objective 2.4: Reduce pollution from commercial and recreational boating activities

With approximately 7,500 berths in Marina del Rey and King Harbor, and many more boats launched on a day-use basis, the potential exists for discharge of a variety of contaminants to marinas and the Bay. Contaminants associated with marinas and recreational boating activities can include pathogens, debris, petroleum products and toxicants in anti-fouling paints, and aquatic invasive species.

Since 1996, the SMBRC has implemented a successful Southern California Boater Education Program with major accomplishments that include implementation of clean marina programs and development of a Clean Marina Guidebooks for the California Coastal Commission (CCC), and the Port of Los Angeles, regular training on proper fueling techniques at most fuel docks, among others. Also, more pumpout stations and household hazardous waste drop off facilities have been installed over the last decade. However, the on-going outreach effort needs to be sustained, improved, and expanded, for there is evidence

that a large proportion of boaters still do not dispose of their boating wastes properly, and remain unaware of some clean boating practices. Also, all marinas in the Bay should adopt a management plan to insure adequate installation and maintenance of pumpout facilities for vessel sewage. Current vessel sewage pumpouts need to be more consistently maintained and new vessel sewage pumpout facilities need to be installed in order to meet the one pumpout facility/300 boats ratio recommended under EPA guidance.

SMBRC's Boater Program has been, and will continue to be carried out by the Santa Monica Bay Restoration Foundation. Grant funding supporting the program will continuously managed by the Santa Monica Bay Restoration Authority.

Milestone 2.4a: Continue to support alternative boat sewage management strategies such as require mobile pumpout services as part of standard lease agreements, institute marina wide mobile pumpout program, install stationary pumpout facilities, etc.

Implementation Lead: Los Angeles County Dept. of Beaches and Harbors (LAC-DBH), City of Redondo Beach
Implementation Partners: Marina operators

Role of the SMBRC: Facilitate

Milestone 2.4b Increase amount of recycling and increase opportunities for recycling boat related household hazardous waste.

Implementation Lead: LAC-DBH, City of Redondo Beach

Implementation Partners: SMBRC and Marina operators

Role of the SMBRC: Participate through the Boater Program

Milestone 2.4c: Increase number of monofilament fishing line recycling and installation of collection units throughout Santa Monica Bay.

Implementation Lead: LAC-DBH, City of Redondo Beach

Implementation Partners: *California Coastal Commission, Division of Boating and Waterways, United States Coast Guard, SMBRC*

Role of the SMBRC: *Participate through Boater Program*

Milestone 2.4d: Increase outreach and education opportunities regarding sustainable boating on inland lakes.

Implementation Lead: *SMBRF*

Implementation Partners: *California Coastal Commission, Division of Boating and Waterways, United States Coast Guard*

Role of the SMBRC: *Lead through the Boater Program*

Objective 2.5: Reduce discharge of trash, oil and grease, and other pollutants from commercial and other high density areas

Activities in commercial and other high density areas in the watershed may contribute significantly to polluted storm water runoff because of the concentration of businesses such as restaurants and the large volume of vehicular and foot traffic. Potential sources of pollutant loading can range from improper waste disposal and cleaning practices by restaurants, littering on streets and sidewalks due to scarcity or misplacement of trash cans. Efforts should be made to reduce pollutant loading from these sources through outreach and also best management practices (BMPs) that can be rather simple but effective. These BMPs can range from installation of catch basin screening and filtration devices to bird-proofing trashcan lids in parks, or as simple as better placement of trash cans in high foot traffic areas.

The SMBRC will play a leading role in carry out the restaurant certification program with support of the Bay Foundation. The Bay Foundation staff will conduct outreach and coordinate with participating cities to achieve the milestone.

Milestone 2.5a: Promote and expand the restaurant certification program, and achieve participation by all watershed cities by 2016

Implementation Lead: SMBRC

Implementation Partners: Watershed cities

Role of the SMBRC: Lead

Milestone 2.5b: Install more catchbasin screening and filtration devices at high trash generating areas by 2018.

Implementation Lead: Watershed cities, LA County, Park and beach agencies, Caltrans

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 2.5c: Install more energy-efficient, overflow-safe trash cans such as solar-powered trash and recycling compactors in selected high-trash areas of the watershed, by 2018.

Implementation Lead: Watershed cities, LA County, Park agencies, Caltrans

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 2.5d: Reduce disposal of cigarette butt through installation of more receptacles and educational message at all smoke-permitted outdoor areas.

Implementation Lead: Watershed cities, LA County, Park and beach agencies, Caltrans

Implementation Partners: N/A

Role of the SMBRC: Promote

Objective 2.6: Sustain and expand annual Coastal Cleanup

The annual Coastal Cleanup Day has been an extremely successful event through which the public has become more involved in beach litter and marine debris issues. The volunteer base and number of participating organizations have also increased over the years. The SMBRC has been a long-time participant, and has played an active

role over the last ten years by serving as the coordinator of annual cleanup activities in the Marina del Rey area. Between 2008 and 2013, 839 volunteers participated in Marina del Rey cleanup and collected 1,358 pounds of trash and recyclables. It is important to ensure that the annual Coastal Cleanup activity will not only continue but expand in the foreseeable future.

Milestone 2.6a Sustain the annual Coastal Cleanup Day in Santa Monica Bay and the coordination of Marina del Rey Cleanup event by SMBRC.

Implementation Lead: *SMBRC, Heal the Bay*

Implementation Partners: *N/A*

Role of the SMBRC: *Lead coordination of cleanup in Marina del Rey*

Milestone 2.6b: Sustain inland cleanups as part of Coastal Cleanup Day efforts.

Implementation Lead: *Heal the Bay*

Implementation Partners: *N/A*

Role of the SMBRC: *Facilitate*

Objective 2.7: Increase public awareness through the Public Involvement and Education (PIE) mini-grant program

The Santa Monica Bay Restoration Commission’s Public Involvement and Education (PIE) program is a mini-grant program established in 1994 to provide seed monies to agencies, organizations, businesses, schools and individuals throughout Los Angeles County to design and implement innovative outreach projects focusing on the restoration and protection of Santa Monica Bay and its watershed. Target audiences include K-12 students, residents, industry and small businesses, city personnel, multi-cultural/environmental justice communities, and others. The PIE program has been a highly successful vehicle for reaching new and varied audiences with the opportunity to be involved in, learn about, and take action that promotes improved water quality, stewardship of the marine environment and protection of the region's watersheds. It has also been the catalyst for the development of innovative programs

undertaken in schools, by community groups, the business community and local governments.

Between 1993 and 2011, the Commission has launched and overseen nine rounds of PIE programs with great success. A total of \$746,560 was awarded and with the funding support, 93 PIE projects were successfully completed. The PIE program owes its success partially to having the LARWQCB's Supplemental Environmental Project (SEP) program as its funding source. Building on its success to date, the Commission plans to solicit more funding support from a broader range of venues and continue and possibly expand the PIE program in the future.

Milestone 2.7a: Initiate a new round of PIE program at least every three years.

Implementation Lead: SMBRC

Implementation Partners: LARWQCB, private businesses

Role of the SMBRC: Lead

Goal #3: Address Potential Impacts of Emerging Contaminants

While implementation of the existing water quality improvement programs, especially the program for controlling point source pollution from POTWs, has achieved significant reduction of loading for pollutants such as DDT, PCBs, and heavy metals, many new contaminants are emerging and causing concern due to their potential detrimental impacts on the marine ecosystem and human health. The so-called emerging contaminants include, but are not limited to, polybrominated diphenyl ethers (PBDEs), which are used primarily as flame retardants, perfluorinated chemicals that are used as non-stick or stain-resistant coatings, and various pharmaceutical chemicals. Studies conducted in Santa Monica Bay have provided early evidence that some chemicals that are believed to disrupt endocrine disruptor-type chemicals found in wastewater discharge are harmful to marine life.

A comprehensive strategy should be developed and implemented to address the issues of emerging contaminants. First, more monitoring and studies need to be conducted to estimate the scale of the contamination and determine the environmental risk of many of these and other compounds. For emerging contaminants known to pose high environmental risk, standard and routine monitoring should be conducted. Meanwhile, actions such as outreach and education should be taken to reduce the loading of emerging contaminants for which the risk are better known. Finally, new technology and methodology need to be developed to identify new, potential emerging contaminants and verify their damaging effects.

Objective 3.1: Institutionalize monitoring of emerging contaminants

Under the current NPDES permits issued by the LARWQCB for major POTWs in the watershed, routine monitoring and special studies on the biological effects are already being conducted for a short list of emerging contaminants. However, more studies are needed to further understand the extent of the biological impacts and to develop standard analytical methods for more emerging contaminants.

Milestone 3.1a: Compile an inventory of relevant research and conduct studies to assess the effects of emerging contaminants (e.g. bioaccumulation in locally caught fish).

Implementation Lead: USEPA, SWRCB

Implementation Partners: LARWQCB, LACSD, City of LA B. of Sanitation, the Southern California Coastal Water Research Project (SCCWRP)

Role of the SMBRC: Facilitate

Milestone 3.1b: Standardize analysis methods for emerging contaminants.

Implementation Lead: USEPA, SWRCB, State Public Health Dept., SCCWRP

Implementation Partners: LARWQCB, LACSD, City of LA Bureau of Sanitation, water districts

Role of the SMBRC: Promote

Milestone 3.1c: Add emerging contaminants to monitoring plans required under NPDES permits

Implementation Lead: LARWQCB

Implementation Partners: LACSD, City of LA Bureau of Sanitation, storm water monitoring agencies

Role of the SMBRC: Promote

Objective 3.2: Reduce loading of emerging contaminants in waterways

Major sanitation districts in the watershed have already launched education programs on proper household disposal of pharmaceutical products. These programs should continue and expand with participation of other local agencies as well as the private sector. In addition to education, more focus should be placed on restricting or banning the use of, or requiring the use of alternatives for certain contaminants.

Milestone 3.2a: Enhance existing education programs to reduce household disposal of pharmaceutical products into the sewer system (e.g. no drug down the drain), and promote an extended producer responsibility (e.g. pharmaceuticals take-back) program.

Implementation Lead: LACSD, City of LA Bureau of Sanitation, water districts

Implementation Partners: Private business (pharmacies)

Role of the SMBRC: Promote

Milestone 3.2b: Identify a list of emerging contaminants of concern. Enact state legislation to ban, or replace with alternatives, the use of certain contaminants.

Implementation Lead: EPA, SWRCB, State Public Health Dept.(SDPH)

Implementation Partners: LARWQCB, SCCWRP, POTWs.

Water Quality – Goal 3

Role of the SMBRC: Promote

Priority Issue: Natural Resources

Natural resources are valuable to the health of the ecosystem in which they thrive. Santa Monica Bay, once abundant in many natural resources such as its free flowing waters and wild steelhead runs, has dramatically changed over the past 300 years. As a result, the natural resources that survive today are more valuable to the ecology of Santa Monica Bay than ever before. Without clean water and productive wetlands, for example, the ocean and the species that thrive within them ultimately suffer. The rehabilitation and conservation of Santa Monica Bay's natural resources is essential to its recovery and future health.

The abundance and diversity of the Bay's natural resources are defined by the habitats of the natural resources. Santa Monica Bay and its watershed are comprised of unique and interrelated habitats which make up the marine, freshwater, or terrestrial ecosystem. Among major types of habitats found in and around the Bay are rocky reefs, kelp forests, rocky and sandy beaches, beach bluffs and dunes, soft bottom, open ocean, deep canyon, coastal wetlands and lagoons, creeks and streams, and coastal scrubs.

Habitats and natural resources have been either lost or significantly altered and degraded as a result of intensified human activities starting approximately 300 years ago. Urbanization and associated human activities including, but are not limited to, stream channelization, building of dams, port and industrial development, filling and dredging, fishing, trampling, and pollution, have all contributed to the decline and degradation.

The trend of decline and degradation finally started to reverse in the late 1970s. Marine communities, especially soft-bottom animal communities around POTW outfalls began to recover as a result of improvements in wastewater treatment and source control. There was a wave of remarkable public acquisition of open spaces in the Bay watershed in the late 1900s, most noticeably the acquisition of Ballona Wetland complex, Ahmanson Ranch, Soka, and lower Topanga Creek and Lagoon, owing largely to the infusion of funds from voter-approved state bond measures (Prop. 12, 40 and 50). Restoration of many remaining but degraded habitats have been completed or started, with at least 15 restoration projects carried out by the Bay Restoration Commission over the last ten years. Standing out most prominently among these projects is the successful restoration of

Malibu lagoon completed in May 2013. Other significant achievements include the restoration of Topanga Lagoon through berm removal, restoration of beach bluffs in several locations along the Bay, and restoration of kelp habitats in the Bay through repair of sea urchin barrens.

Repairing all of the man-made damage over the last 300 years and returning the Bay to its pristine condition is a daunting and long-term, if not an impossible task. Placing several wetland properties under public ownership is only the first step, substantial amounts of funding and efforts still need to be secured in order to restore and maintain long-term health of these wetlands. While much attention has been paid on acquisition and restoration of the region's wetlands, stream restoration is still at an early stage in raising awareness among agencies and the general public. While some progress has been made in restoring some of the beach bluff and dune habitats and bringing back populations of some of the endangered species, these efforts need to be expanded significantly to more areas and more species.

Protection of marine habitats and living resources also poses significant challenges. While the creation of Marine Protected Areas in 2012 affords protection to some marine life, the decline of fishery resources in and around the Bay will remain a risk until more effective management measures are implemented, such as state fishery management plans. More attention and resources should be devoted to protection of rocky and sandy habitats in the intertidal zone of the Bay after decades of neglect. Meanwhile, new or potential new threats to the Bay's already fragile and battered ecosystem need to be addressed. Such threats include invasive species and climate change, among others.

Goals and Objectives

Goal # 4: Create and support policies and programs to protect natural resources

The lack of enforceable regulations and/or conservation policies is a major cause of the loss of land-based habitats, such as riparian corridors and wetlands, due primarily to land encroachment, and the decline of ocean fishery resources due to overharvesting. Therefore, new regulations and policies should be developed and executed to prevent further loss of the remaining habitat areas and living resources within the watershed and Bay. New regulations and policies may include stream protection ordinances and hydromodification policies, or fishery management plans to allow recovery and replenishment of declining resources.

Adoption of regulations and policies must be supported by information on the geological, hydrological, and ecological characterization of the subject area. Therefore, it is important to ensure that studies and assessments are carried out to provide information on historical ecology, water budget, fish population density, etc. Collection and compilation of existing information is also usually a necessary first step in development of strategies and policies to address emerging issues such as climate change.

Objective 4.1: Facilitate development and adoption of natural stream protection ordinances and/or policies.

Rivers, creeks, and streams are an integral part of the watershed and provide multiple benefits including water supply, pollutant removal, flood water drainage, wildlife habitat, as well as beautification of the neighborhood. However, it is estimated that as much as 80 percent of the natural streams in the watershed have been either paved over or channelized. Many of the remaining natural streams are also at risk from encroachment of urbanization. The fact that most existing municipal codes of watershed cities do not provide sufficient protections to streams only exacerbates the situation.

In order to protect these benefits, it is vital that a buffer zone adjacent to a stream system be preserved. This aquatic buffer not only serves as a natural boundary between the waterway and existing

development, but is essential for protecting water and habitat quality by filtering pollutants, sediments, and nutrients from runoff, maintaining base flow, and stabilizing stream banks. Other benefits of the buffer include groundwater recharge, wild life habitat, and migration corridors, and flood control by providing room for lateral movement of the stream channel.

To preserve the natural quality of the remaining stream systems in the region and maintain the native vegetation in riparian and wetland areas, the LARWQCB should develop and implement a hydromodification policy and other regulatory tools such as municipal storm water permit requirements to control adverse impacts from hydromodification. Local governments should adopt and enforce stream protection ordinances that establish minimal acceptable requirements for stream buffers and prohibit development and other activities injurious to the natural qualities of the streams. Some of these prohibitions could include, but are not limited to, dumping, construction activities resulting in erosion and undercutting of existing property and degradation of stream habitat, culverting and/or the installation of in-stream structures that endanger downstream property and stream habitat, construction of retaining walls and/or stream bank armoring that endanger downstream property and stream habitat, improper maintenance of retaining walls, culverts, in-stream structures, and/or bank armoring, grazing, and the removal of stream bank (riparian) vegetation.

the LARWQCB is undertaking a two-step process to evaluate and consider further actions to control adverse impacts from hydromodification. Following completion of the evaluation process, the LARWQCB will develop and adopt, if necessary, new policy or additional regulatory or non-regulatory tools to control adverse impacts from hydromodification, which may include educational campaigns, memoranda of understanding, guidelines, additional municipal storm water permit requirements and amendments to the Basin Plan.

Milestone 4.1a: Adopt stream protection ordinances or policies by affected Santa Monica Bay watershed cities by 2016.

Implementation Lead: Watershed cities, LA County
Implementation Partners: Park agencies.

Role of the SMBRC: Facilitate.

Milestone 4.1b: Conduct education and outreach on the multiple benefits of natural streams in urban environments

Implementation Lead: SMBRC

Implementation Partners: Watershed cities, Water Districts

Role of the SMBRC: Lead

Milestone 4.1c: Adopt and implement a hydromodification policy through the renewed municipal storm water permits by 2015.

Implementation Lead: LARWQCB

Implementation Partners: SWRCB, LA County

Role of the SMBRC: Promote

Objective 4.2: Enhance assessment and effective management of Marine Protected Areas in the Bay

Declines in fisheries and degradation of vital marine habitats have led to a growing demand for ecosystem-based and spatially-based approaches to fisheries management, including marine protected areas (MPAs). MPAs are discrete geographic marine or estuarine areas designed to protect or conserve marine life and habitat. When designed and managed effectively, MPAs can help to preserve biological diversity, protect habitats, aid in the recovery of depleted fisheries, and promote recreational, scientific, and educational opportunities.

In 1999, the California State Legislature adopted the Marine Life Protection Act (MLPA), which directs the state to design and manage a network of MPAs. After undergoing a one-year stakeholder-participated planning process in the South Coast Region, that SMBRC staff actively participated in, the State Fish and Game Commission adopted a MLPA network for Southern California in December 2010, which took effect starting January 1, 2012. The network includes four MPAs in the Santa Monica Bay, two along the north coast (Point Dume State Marine Conservation Area, Point Dume State Marine Reserve), and two along

the Palos Verdes Peninsula (Point Vicente State Marine Conservation Area (No-Take), Abalone Cove State Marine Conservation Area).

The designation of MPAs statewide is the most far-reaching effort ever undertaken by the State to provide lasting protection of our treasured marine habitats. To ensure that the established MPAs are truly effective in protecting the region's critical habitats and living resources, an adaptive management approach should be taken to provide adequate outreach, monitoring, and enforcement. Monitoring data should be collected to periodically evaluate the need for improvement, and to make adjustments to the network if sufficient data warrant the change.

Milestone 4.2a: Promote an adaptive MPA management strategy. Develop and implement MPA Master Plan, management guidance, and enforcement plans by 2015.

Implementation Lead: DFW

Implementation Partners: N/A

Role of the SMBRC: Facilitate

Milestone 4.2b: Participate in the development of MPA community collaborative for the LA area by 2015.

Implementation Lead: Natural Resources Agency

Implementation Partners: DFW

Role of the SMBRC: Participate and facilitate

Milestone 4.2c: Participate in MPA monitoring including long-term habitat surveys, and future MPA assessment by 2017.

Implementation Lead: MPA Monitoring Enterprise

Implementation Partners: Ocean Science Trust (OST), OPC (funding)DFW

Role of the SMBRC: Participate

Milestone 4.2d: Conduct aerial surveys of fishing activities inside and outside of MPAs.

Implementation Lead: SMBRC
Implementation Partners: DFW

Role of the SMBRC: Lead

Objective 4.3: Evaluate and establish additional management measures to improve protection of fishery resources.

The Southern California Bight, in particular Santa Monica Bay, has been subjected to great amounts of fishing pressure over the past 100 years, through both commercial and recreational efforts. Populations of many once abundant fish and invertebrate species have become locally depleted, such as California halibut, black seabass, and abalone.

The California Legislature passed the Marine Life Management Act (MLMA) in 1998. This law transferred the authority of fisheries management from the legislature to the Fish and Game Commission so that management action could be more responsive to changing circumstances. The law also required the DFW to develop fisheries management plans for the white seabass and nearshore finfish fisheries, and to identify and potentially regulate emerging fisheries and other priority fisheries identified in the MLMA Master Plan.

As part of the MPA data gap analysis project, the SMBRC conducted a review and assessment of current recreational and commercial fishing regulations on species of concern in consideration for the establishment of MPAs in the South Coast Region. The analysis found that reliable information that is critical for effectively managing fish stocks for developing fisheries management plans, such as estimates on population size, total take, as well as knowledge of life-history information, is lacking for several fish and invertebrate species of concern.

Finally, the analysis raised particular concern on the impact of over-exploitation of several native species for other, non-fishing purposes, such as collection for biomedical research or the aquarium trade..

Milestone 4.3a: Develop reliable streams of data to support effective fishery management. Conduct stock assessment for fish and invertebrate species with heavy fishing pressures (e.g.

California halibut, rock fish spp., thornyheads, red sea urchin, market squid) by 2020.

Implementation Lead: DFW, NMFS

Implementation Partners: OPC

Role of the SMBRC: Promote

Milestone 4.3b: Develop and conduct assessment on localized impacts of recreational fishing compared to commercial fishing, inside and outside the Santa Monica Bay commercial fishing closure (especially for spiny lobster, sandbass/kelp bass, CA halibut, rockfish) by 2018.

Implementation Lead: DFW, NMFS

Implementation Partners:

Role of the SMBRC: Promote

Milestone 4.3c: Develop and implement fishery management plans (FMPs) for high priority fisheries especially spiny lobster and California halibut. Identify additional fish stocks for FMP development by 2015.

Implementation Lead: DFW, FG Commission

Implementation Partners: PSMFC

Role of the SMBRC: Promote

Milestone 4.3d: Assess the habitat impacts of bycatch and trawl, set gillnet, and set longline gear (especially in thornyheads, white seabass, and California halibut fisheries) by 2020).

Implementation Lead: SMBRC

Implementation Partners: DFW, FW Commission, National Park Service, NMFS

Role of the SMBRC: Lead

Milestone 4.3e: Implement studies to evaluate effectiveness of Santa Monica Bay commercial fishing closure by 2015.

Implementation Lead: SMBRC
Implementation Partners: N/A

Role of the SMBRC: Lead

Milestone 4.3f: Promote outreach to and involvement by fishermen regarding fishery management issues by 2015.

Implementation Lead: SMBRC
Implementation Partners: DFW, FG Commission, Marina del Rey Anglers and local fisherman groups

Role of the SMBRC: Lead

Milestone 4.3g: Increase presence and effectiveness of local wardens by 2015.

Implementation Lead: DFW
Implementation Partners: FG Commission

Role of the SMBRC: Facilitate

Milestone 4.3h: Develop and improve labeling requirements for seafood species identification and implement program to attain compliance (esp. for rockfish).

Implementation Lead: LA County Public Health Department, California Department of Public Health, FDA
Implementation Partners: USDA, private business

Role of the SMBRC: Promote

Milestone 4.3i: Improve and streamline scientific collection permitting process. Establish more stringent restrictions on collection of native species, such as giant keyhole limpet, that are exploited for non-fishery purposes (e.g. pharmaceutical and aquarium trade).

Implementation Lead: DFW, CFGC

Implementation Partners: *Aquariums, cities and counties with protected tidepools*

Role of the SMBRC: *Promote*

Objective 4.4: Promote and create programs to increase the supply of healthy local sustainable seafood.”

Locally caught seafood is one important way that coastal communities connect with their offshore resources. In the early 1900’s, Los Angeles was well known for its tuna fishing and canning industries. Over time, Fish Harbor became overshadowed by the container ships. Knowledge that some fish had become contaminated with mercury, DDT and PCBs from industrial activities, scared some consumers away. As Los Angelinos stopped consuming local seafood, we began to lose that connection with our local marine resources, and consequently the awareness that these resources need to be protected for future use and enjoyment.

Seafood produced in and around the Santa Monica Bay includes, but may not be limited to calamari (squid), uni (sea urchin), spot prawn, spiny lobster, and channel rockfish (thornyhead). Many of these products are believed to contain low levels of contamination and would be safe to consume. In addition, many of these products are on the Monterey Bay Aquarium’s yellow, “Good Alternative” list of sustainable seafood. Despite the good quality and quantity of these products, most of them are not available locally at this time. By increasing the availability of locally caught seafood, we will regain our community’s lost connection with the sea and support local fishing communities, efforts should be made to increase the availability of locally caught seafood. To further create long term support for locally caught seafood and the fishermen that supply it, it is also essential that steps be taken to ensure locally caught seafood is safe to eat and harvested sustainably.

Milestone 4.4a: Build markets for contaminant free, local, sustainable seafood products. Bring important local fisheries (e.g. market squid, sardine, spot prawn, sea urchin, thornyhead) up to "best choice" ratings.

Implementation Lead: MB Seafood Watch Ecotrust, local fisherman groups in Port of LA

Implementation Partners: DFW, FW Commission, LB AoP, LA Food Policy Working Group, respective commercial fishing groups, Heal the Bay, LAW, USC Sea Grant

Role of the SMBRC: Facilitate

Milestone 4.4b: Assess contamination loads in locally caught and farmed seafood products.

Implementation Lead: USEPA

Implementation Partners: MSRP, LACSD, SCCWRP

Role of the SMBRC: Facilitate

Milestone 4.4c: Evaluate and create programs to develop sustainable healthy aquaculture options for seafood while protecting local, sustainable, wild capture fisheries. Develop local policy on aquaculture practices, site selection, and species selection by 2020.

Implementation Lead: DFW, NMFS, FW Commission

Implementation Partners: N/A

Role of the SMBRC: Facilitate

Objective 4.5: Evaluate and address potential impacts of climate change on Santa Monica Bay.

Climate change has become the defining environmental issue of our time. Compelling evidence shows that climate change will have significant impacts to ocean and coastal resources, resulting from sea level rise, ocean acidification, and ocean regime shifts, among other changes. Locally, impacts of climate change in Santa Monica Bay may include extreme weather patterns in the form of either increased storm intensity or severe drought, inundation of wetlands, sandy beaches and harbors, loss of kelp beds and/or kelp production due to rising in ocean temperature, shift in habitat transition zones and fish population distribution. In an effort to make Santa Monica Bay “climate ready,” efforts should be made to further evaluate the severity of these impacts and assess the vulnerability of coastal habitats and

infrastructures. Adaptive strategy should then be developed and implemented based on the results of vulnerability assessments.

Milestone 4.5a: Expand the pilot Climate Ready Estuary project and conduct additional vulnerability assessment.

Implementation Lead: Coastal cities, LA County, DPR
Implementation Partners: OPC, California Coastal Commission, California Coastal Conservancy

Role of the SMBRC: Facilitate

Milestone 4.5b: Participate in and facilitate regional collaboration such as LARC. Facilitate development of climate change adaptation plans. Facilitate coordination among coastal jurisdictions for integration of adaptation plans in the Bay coastal watershed

Implementation Lead: Coastal cities, LA County, DPR
Implementation Partners: OPC, CCC, SCC

Role of the SMBRC: Facilitate

Milestone 4.5c: Promote adaptation strategies using environmental friendly “soft” solutions or other solutions with minimum negative environmental impacts. Promote establishment of buffer zones.

Implementation Lead: Coastal cities, LA County, DPR
Implementation Partners: OPC, CCC, SCC

Role of the SMBRC: Facilitate

Objective 4.6: Facilitate and coordinate water quality improvement and habitat restoration programs in key sub-watersheds

Ballona Creek and Malibu Creek are the two largest sub-watersheds in the Santa Monica Bay watershed, each with distinctive land use characterization and corresponding water quality and habitat issues. Considerable progress has been made in these two sub-watersheds, including comprehensive management plans and coordinated stakeholder efforts such as those carried out under the IRWMP,

passage of TMDL regulations with implementation plans for meeting water quality standards, and millions of dollars invested in water quality and habitat improvement projects. Many past and existing coordination mechanisms, including the watershed coordinator program funded by the state Department of Conservation have been important to the success of many of these efforts in both watersheds.

The water quality and habitat condition in both subwatersheds have been comparatively well-characterized thanks to monitoring by citizen environmental groups, municipalities and the state. These information should be disseminated to more stakeholders and more stakeholder outreach activities be conducted to demonstrate benefits of water quality improvement, values of natural habitats, and watershed connectivity. These efforts will help to achieve more stakeholder involvement in comprehensive watershed management and more investment in watershed enhancement projects.

Milestone 4.6a: Facilitate coordination of activities for Ballona Creek & Malibu Watersheds through IRWMP, TAC and other stakeholders' planning and project development efforts.

Implementation Lead: SMBRC, the Resource Conservation District of the Santa Monica Mountains (RCDSMM), LA County

Implementation Partners: Dept. of Conservation

Role of the SMBRC: Facilitate

Milestone 4.6b: Facilitate or conduct more research on assessment of habitat impacts and effects of various watershed attributes (Also see Milestone 1.1d, 1.2c).

Implementation Lead: LA County, watershed cities, LARWQCB, SCCWRP, local universities

Implementation Partners: N/A

Role of the SMBRC: Facilitate

Milestone 4.6c: Promote or conduct more citizen monitoring and variety of public events to demonstrate benefits of water

quality improvement, values of natural habitats, and watershed connectivity.

Implementation Lead: SMBRC

Implementation Partners: LA County, watershed cities, RCDSMM, CBOs, environmental organizations

Role of the SMBRC: Lead and coordinate

Objective 4.7: Implement a Comprehensive Bay Monitoring Program

A Santa Monica Bay Comprehensive Bay Monitoring Program was completed in 2007. This program lays out a blueprint for implementing coordinated monitoring to provide a regional, long-term picture of the status of the various ecosystems in Santa Monica Bay. Data collected under this plan will be information crucial for informing environmental policy development and for evaluating the effectiveness of restoration programs.

The program specifies detailed monitoring designs for broad ecosystem components. These designs coordinate both existing and new monitoring and explicitly link indicator selection, sampling design, and intended data products that focus on specific scientific and management questions. In addition, the program includes an implementation plan that suggests how each element of the Bay Comprehensive Monitoring Program could be funded through a combination of cooperative agreements, offsets to current compliance monitoring programs, and the pursuit of grant funding from a range of sources.

Several specific steps should be taken to facilitate implementation of the program. The Commission will continue to seek the opportunity to participate in and contribute to the on-going and planned regional monitoring efforts which fulfill many key recommendations of the Program such as the Southern California Bight-wide regional surveys coordinated by the Southern California Coastal Water Research Project (SCCWRP), and the MPA monitoring network. At the same time, the Commission should continue to work closely with the LARWQCB to incorporate implementation of the comprehensive monitoring program into dischargers' NPDES permit, and facilitate the establishment of a management structure to oversee and coordinate implementation of the new program.

Milestone 4.7.a: Participate in regional monitoring programs including Bight-wide regional surveys and regional wetland monitoring program development and implementation.

Implementation Lead: *SMBRC*

Implementation Partners: *LARWQCB, USEPA, SCCWRP, DFW, CSUCI*

Role of the SMBRC: *Lead*

Milestone 4.7b: Incorporate Bay comprehensive monitoring designs into monitoring requirements under NPDES permits.

Implementation Lead: *LARWQCB*

Implementation Partners: *USEPA, NPDES permittees*

Role of the SMBRC: *Facilitate*

Milestone 4.7c: Establish a coordination structure, including a stable “funding pool” to ensure long-term implementation of the monitoring program.

Implementation Lead: *SMBRC*

Implementation Partners: *USEPA, NPDES permittees, SCCWRP*

Role of the SMBRC: *Lead*

Milestone 4.7d: Update the Comprehensive Monitoring Program with monitoring designs for habitats in the Bay watershed. Facilitate development of habitat health condition indices, including the application of biological and sediment quality objectives.

Implementation Lead: *SWRCB, USEPA*

Implementation Partners: *SCCWRP*

Role of the SMBRC: *Participate and facilitate*

Milestone 4.7e: Facilitate and support research and special studies on remaining or emerging issues (e.g. impacts of fracking, ocean acidification).

Implementation Lead: SMBRC

Implementation Partners: LARWQCB, USEPA, SCCWRP, NPDES permittees, DFW

Role of the SMBRC: Facilitate and support

Goal # 5: Acquire land for preservation of habitat and ecological services

Land acquisition is an integral part of habitat conservation planning and often the most critical and important component of a comprehensive strategy for habitat preservation and restoration. A greater public ownership of land within the Santa Monica Bay watershed will ensure more land uses contribute to the overall health of the Bay and less ecologically harmful uses of the watershed, such as further commercial and residential development. For the purposes of this Plan, open space is defined as land which is not intensively developed for residential, commercial, industrial or institutional use.

Objective 5.1: Acquire 2000 acres of priority open space in the Santa Monica Mountains

Public ownership of private lands in the Santa Monica Mountains will enable better maintenance of coastal water quality by preventing conversion to impervious surfaces and provide habitat and recreational connectivity from the headwaters to Santa Monica Bay. Public ownership will also help to protect habitat areas that are home to sensitive plant and wildlife species. Acquisition of habitat should be focused on lands that are at risk of conversion to some other land use such as intensive agriculture or urban development.

Milestone 5.1a: Acquire other priority private parcels in the Santa Monica Mountains as they become available.

Implementation Lead: SMMC, SCC

Implementation Partners: SCWRP

Role of the SMBRC: Participate and support

Objective 5.2: Acquire priority parcels in urbanized areas of the watershed.

The acquisition of private land (through purchase or conservation easement) in urbanized areas of the Santa Monica Bay watershed will ensure that stream and habitat restoration is done in the most important locales in order to restore the Bay and increase proper land use practices in key areas of the watershed. Private land acquisition will better enable local agencies to advance watershed recovery initiatives.

In addition to preserving and restoring habitats, the acquired lands may provide multiple benefits if conditions permit, such as new land for parks, playing fields, infiltration basins, and constructed wetlands, etc. (Also see Objective 12.1)

Milestone 5.2a: Compile information and prioritize parcels for acquisition.

Implementation Lead: SMBRC

Implementation Partners: Mountains Recreation and Conservation Authority (MRCA), SCC, Community Conservancy International (CCI)

Role of the SMBRC: Lead

Milestone 5.2b: Acquire priority parcels for preservation or habitat restoration

Implementation Lead: MRCA, SCC, City and County parks and recreation departments, other land conservancies

Implementation Partners: N/A

Role of the SMBRC: Facilitate

Goal # 6: Manage invasive species

Invasive plants and animals have become recognized in recent years as a major threat to the integrity of natural resources in the Bay watershed. These species have the ability to invade natural systems

and proliferate, often dominating a community to the detriment and sometimes the exclusion of native species. Introduced species may also compete directly with native species for nutrients, sunlight, and space, and indirectly by altering the food web or physical environment. Invasive species may also prey on or hybridize with natives. Native species with limited population size or ecological range are particularly susceptible to displacement by aggressive exotic or translocated species.

Major invasive species of concern in the Bay watershed include plant species such as *Arundo donax*, pampas grass, ice plant, and animal species such as crayfish, bullfrogs and New Zealand mudsnails. Many invasive species are extremely difficult to control and may be impossible to eradicate. We have learned from the experiences of SMBRC stakeholders who have made serious efforts to remove invasive plants and animals. One effective approach is to remove invasives repeatedly over many years, while at the same time restoring native communities which are then more resilient and able to resist invasion by exotic species.

The most effective strategy against invasive species is to prevent them from ever being introduced and established. An adequate prevention strategy must rely on a diverse set of tools and methods including regulations and policies banning import, use, and disposal of invasive species, and public outreach that increases the awareness of the issue and reduce the chance of unintentional introduction and spread of invasive species. For areas already infested by non-native species, ongoing removal and control projects should continue and/or be expanded in order to achieve the goal of ultimate eradication.

Objective 6.1: Achieve 303d listing for aquatic invasive species.

Under section 303(d) of the Clean Water Act, states, territories, and tribes are required to develop lists of impaired water bodies. These impaired waters do not meet water quality standards that states, territories, and authorized tribes have set for them, even after point sources of pollution have installed the minimum required levels of pollution control technology. The law requires that these jurisdictions establish priority rankings for waters on the 303(d) list and develop TMDLs for these waters.

The LARWQCB is the lead agency in conducting triennial review and updating the 303(d) list for water bodies under its jurisdiction and will consider listing water bodies as impaired by invasive species if there is sufficient information demonstrating the adverse impacts to beneficial uses described in the Los Angeles Regional Water Quality Control Board’s Basin Plan. The SMBRC will lead in compiling and providing this information to the LARWQCB.

Milestone 6.1a: Compile and provide data to LARWQCB for their 303(d) listing review of existing invasive species and their impacts to beneficial uses in the Santa Monica Bay watershed.

Implementation Lead: SMBRC

Implementation Partners: LARWQCB

Role of the SMBRC: Lead

Objective 6.2: Coordinate and fund public education and outreach on invasive species.

Public awareness of the invasive species issue is critically important in preventing introduction and spread of invasive species. The discovery of New Zealand mudsnails (NZMS) in the Malibu Creek watershed and the outreach efforts implemented to control its spread provides a good model and tools for similar efforts elsewhere. NZMS is an insidious exotic invasive species that can wreak havoc on the watershed's native organisms, spread by attaching themselves to waders, fishing gear, shoes, monitoring equipment, and animals — easily "hitchhiking" to other locations.

Outreach material to prevent such “hitchhiking” using tools such as signs, videos, and websites were developed. These efforts should be used as a model for similar efforts to control introduction and spread of other nonnative species.

Milestone 6.2a: Continue to support research, education, and outreach on the control of New Zealand mudsnails, including potential biocontrols currently being evaluated mudsnail signs.

Implementation Lead: SMBRC

Implementation Partners: DPR, SMMC, National Park Service (NPS)

Role of the SMBRC: Lead

Milestone 6.2b: Expand the education and outreach to control other invasive species.

Implementation Lead: DPR, NPS

Implementation Partners: SCC, MRT, RCDSMM

Role of the SMBRC: Participate

Objective 6.3: Develop and adopt plans and policies for invasive species control and prevention.

Invasive species management activities spread across multiple state and local agencies. In the Santa Monica Mountains area, for example, the DFG, Santa Monica Mountains Conservancy, National Parks Service, and the SCC are all involved through a variety of venues. However, despite everyone's best efforts, the current program has not been as effective as it should be due to lack of adequate long-term funding, difficulty in coordinating diverse state activities, agencies and programs, insufficient communication, and lack of high-level priority setting to optimize limited management resources, among other challenges.

Development and implementation of a watershed-specific comprehensive management plan is an important step in addressing these issues. The plan should adopt the general strategies proposed in the State Aquatic Invasive Species Management Plan and develop management actions targeted to specific watersheds such as Malibu Creek. Issues to be addressed by the plan may include, but are not limited to, coordination and collaboration, prevention, early detection and monitoring, rapid response, education and outreach, and research.

Invasive species can be introduced and spread through many mechanisms, sometimes unintentionally by relocation of people and equipment during public work and monitoring projects. To prevent such "hitchhiking," public agencies should adopt policies that require development and implementation of invasive species prevention plans in landscaping and other public work projects.

Milestone 6.3a: Develop and adopt watershed-specific comprehensive plans for control and prevention of invasive species by 2016.

Implementation Lead: SCC, SWRCB, SMMC, DFW
Implementation Partners: Watershed cities, LA County

Role of the SMBRC: Facilitate

Milestone 6.3b: Encourage adoption of policies that prevent introduction and planting of invasive species in landscaping and other public work projects.

Implementation Lead: Watershed cities, LA County, DFW
Implementation Partners: METRO

Role of the SMBRC: Facilitate

Milestone 6.3b: Update and strengthen existing plan and policies for preventing marine invasive species

Implementation Lead: DFW, NMFS
Implementation Partners: LARWQCB

Role of the SMBRC: Promote

Objective 6.4: Ban importation and sale of known invasive species.

Enacting regulations to restrict or ban the sale of certain plant and animal species is critical for an effective program. It is especially imperative to establish importation and sale bans for species such as crayfish, *arundo donax*, pampas grass, fountain grass, and ice plant to prevent their re-introduction from squandering the existing control efforts.

Milestone 6.4a: Coordinate with DFW, California Department of Food and Agriculture, local agencies, and private businesses to prohibit the sale of known invasive species such as for crayfish, *arundo donax*, pampas grass, fountain grass, and ice plant.

Implementation Lead: DFW, CDFA

Implementation Partners: Local Agencies, NGOs, private business

Role of the SMBRC: Facilitate

Objective 6.5: Fund and conduct invasive species removal programs and projects

Once introduced, invasive species should be removed as early and as thoroughly as possible to prevent the infestation from becoming out of control. The SMBRC in partnership with other public agencies has funded and achieved preliminary success in reducing patches of Arundo and the population of crayfish in the Malibu Creek watershed and removing ice plant on beach bluff and dune habitats. However, longer term commitment and additional funding are needed to achieve the goal of complete eradication.

Milestone 6.5a: Conduct and complete invasive species removal and native revegetation on 20 acres in the Santa Monica Mountains by 2020.

Implementation Lead: NPS, Coastal Conservancy, DPR

Implementation Partners: Caltrans, RCDSMM, MRT

Role of the SMBRC: Facilitate

Milestone 6.5b: Conduct and complete invasive species removal and revegetation on 20 acres of coastal bluffs and dunes by 2020.

Implementation Lead: Coastal Conservancy, SCWRP, NMFS, PVPLC, LAC-DBH, LACC, LAX

Implementation Partners: Coastal cities and private business

Role of the SMBRC: Facilitate

Milestone 6.5c: Continue crayfish removal activities in Trancas and Malibu Creeks, and other infested areas.

Implementation Lead: SMBRC

Implementation Partners: *Pepperdine University, US Santa Barbara, MRT, RCDSMM*

Role of the SMBRC: *Lead*

Goal # 7: Restore wetlands, streams and riparian zones

Wetlands, streams and riparian zones are the lifeline of the Bay watershed ecosystem and their preservation and restoration is a high priority of the Bay Restoration Commission. Wetlands are areas of transition between land and water, where soils, plants, and animals are adapted to periods of inundation and saturation. Wetlands are one of the most productive ecosystems in nature, providing essential habitat for a variety of species, including birds, fish, reptiles, invertebrates, and mammals. Wetlands act as natural filters which are able to absorb and remove pollutants from the water. They are also valuable in providing flood protection, groundwater recharge, recreational use, and aesthetic value. New research indicates that wetlands store massive amounts of carbon that is released to the atmosphere when wetlands are converted to other uses.

The largest coastal wetland in Santa Monica Bay is Ballona, once a 2,100-acre coastal estuary (near present-day Marina del Rey) rich in biological diversity and abundance. Most of Ballona has been destroyed by urban development, now reduced to approximately 200 acres of degraded wetlands. Other major wetlands in the Bay watershed include Malibu Lagoon, Ballona Lagoon, Del Rey Lagoon, Lower Zuma Creek and Lagoon, Upper Medea Creek, Lower Topanga Canyon, Trancas Lagoon, Arroyo Sequit Canyon, and La Sierra Canyon.

Santa Monica Bay watersheds were at one time covered with a web of streams that were fed by natural springs and seasonal rains. Freshwater wetlands, once expansive, were interspersed throughout the watershed. Riparian zones, or the interface between land and flowing surface water, were once abundant along the banks of streams that flow into Santa Monica Bay. These vital natural areas, like that of wetlands, act as biofilters that protect bodies of water from runoff and erosion. Today most of those streams, wetlands, and riparian zones have been paved or channelized, which has resulted in the loss of their natural ability to cleanse water, recharge water supplies and store floodwater.

After completing the acquisition of major remaining wetland properties, the focus has shifted to develop restoration plans and secure funding for actual restoration and long-term monitoring and maintenance. On the other hand, restoration of streams and riparian zones is still at an early stage with the focus on increasing agency and public awareness and seeking opportunities for stream daylighting and restoration demonstration projects. All these efforts need to continue and be expanded significantly to more areas and locations.

Objective 7.1: Restore Ballona Wetlands.

The Ballona Wetlands complex (including Ballona Creek & Lagoon, Oxford Lagoon, Del Rey Lagoon, as well as salt marsh, mudflat, dune and bluff habitats) has been reduced to less than ten percent of its historic dimensions. Oil and gas exploration, urban sprawl, the development of the marina, and the channelization of Ballona Creek have all reduced what was once a 2,100-acre coastal estuary to approximately 200 degraded acres today. Poor tidal exchange, polluted runoff, and invasive plants and animals also impact the wetlands.

In 2004, the State of California took title to 600 acres of the former Ballona Wetlands in Los Angeles. The property, the Ballona Wetlands Ecological Reserve (BWER), is now owned by two state agencies, the Department of Fish and Wildlife (DFW) and the State Lands Commission (CSLC). DFW took title to approximately 540 acres of the former wetlands. DFW also holds title to an estuarine section of Ballona Creek. The State Lands Commission owns approximately 60 acres, including the Freshwater Marsh and the Expanded Wetlands parcel. The State Coastal Conservancy (SCC) is taking the lead in funding for planning and restoring the property. Together, the three agencies are working with stakeholders, scientific experts and other agencies to develop a plan for restoration of this extraordinary resource. Their goals are to:

- Restore and enhance salt-water influenced wetland habitats to benefit endangered and threatened species, migratory shorebirds, waterfowl, seabirds, and coastal fish and aquatic species. Restoration of seasonal ponds, riparian and freshwater wetlands, and upland habitats will be considered where beneficial to other project goals or biological and habitat diversity;

- Provide for wildlife-dependent public access and recreation opportunities compatible with the habitats, fish, and wildlife conservation;
- Identify and implement a cost-effective, ecologically beneficial, and sustainable (low maintenance) habitat restoration alternative.

Specific steps of the restoration planning process involves baseline monitoring and characterization of current wetland conditions; a feasibility analysis of different restoration alternatives, and selection of the preferred alternative through a public EIR/EIS process.

After completion of the restoration plan, securing funding for implementing the preferred alternative will be a major challenge. Also challenging but critical are development and implementation of a long-term monitoring program.

Milestone 7.1a: Complete the EIR/EIS process for Ballona Wetlands restoration by 2014.

Implementation Lead: DFW

Implementation Partners: CSLC, SCC, SPR, NMFS, ACOE

Role of the SMBRC: Participate

Milestone 7.1b: Develop and implement a long-term monitoring program for Ballona Wetlands.

Implementation Lead: SCC, SMBRC

Implementation Partners: DFW

Role of the SMBRC: Co-lead

Milestone 7.1c: Secure funding source (approximately \$50 M, total project cost \$100–200 M) sufficient to complete the first phase implementation of the preferred restoration alternative by 2016.

Implementation Lead: SCC

Implementation Partners: State Parks, SCWRP, NMFS, Port of LA

Role of the SMBRC: Participate

Objective 7.2: Restore Malibu Lagoon.

Malibu Lagoon is a 31-acre shallow water estuarine embayment occurring at the terminus of the 110-square-mile Malibu Creek watershed, the second largest watershed draining into Santa Monica Bay. The Creek itself is the largest unchannelized stream in the Santa Monica Bay watershed. The Lagoon is a remnant of what was once a much larger system, but most of the natural lagoons have been filled for commercial and residential development in the City of Malibu. Together, the remaining creek and lagoon complex support many terrestrial and aquatic species, some of which, for example tidewater goby and southern steelhead trout, are threatened or endangered. The area is also home to several threatened and endangered birds, including the Brown Pelican, California Least Tern, and the Willow Flycatcher. This area represents a vital stopover for migratory birds along the Pacific Flyway.

Issues of concern in the lagoon and creek include excessive freshwater inputs from urban runoff and imported water; high nutrient, pathogen, and bacteria levels; sedimentation and erosion issues; contaminated runoff; loss of habitat; and invasive species.

Excessive freshwater inputs from both the Tapia wastewater treatment plant and urban runoff, along with the occasional facilitated breaching of the lagoon/ocean barrier beach, disrupt the natural hydrologic cycle and subject the lagoon to sudden, drastic changes in salinity. Such sudden changes place enormous stress on the biotic community. High nutrient concentrations in the creek can create eutrophic conditions in the lagoon. Elevated levels of bacteria and pathogens from a variety of potential sources (including malfunctioning septic systems, animal waste, storm drains and treatment plant discharges) adversely affect human health, increasing the risk of illness for swimmers and surfers at an extremely popular beach.

Initiated by Heal the Bay and the California Department of Parks and Recreation through a California State Coastal Conservancy grant, a comprehensive lagoon habitat enhancement plan was developed and

implemented. Phase I of the project was completed in fall 2008. The Phase I enhancement project primarily involved the redesign and construction of the parking lot at the Malibu Lagoon State Park. The new parking lot slopes storm water away from the Lagoon to drain toward Pacific Coast Highway (PCH), with permeable pavement and vegetated swales with levels of crushed shale.

Phase II of the project was completed in early 2013. The Phase II project, which was partially funded by the SMBRC, removed nonnative vegetation and stagnant “dead zones” in the Lagoon and restored ecosystem functions through reintroduction of native species and better tidal flushing.

The long-term lagoon restoration objective is to acquire and restore more areas surrounding the current lagoon footprint as well as the riparian corridor along the lower Malibu Creek.

Milestone 7.2a: Conduct post-restoration monitoring & maintenance for Malibu Lagoon.

Implementation Lead: DPR, SMBRC, RCDSMM

Implementation Partners: SCC, Audubon Society and other non-profit groups

Role of the SMBRC: Co-lead

Milestone 7.2b: Acquire and restore additional lands surrounding the current lagoon footprint and along the lower Malibu Creek.

Implementation Lead: DPR

Implementation Partners: N/A

Role of the SMBRC: Promote

Objective 7.3: Remove fish barriers and open 20 miles of stream habitat to migrating steelhead trout.

Blocked access to steelhead spawning and rearing habitat is a major obstacle to the recovery of endangered steelhead trout in the northern Santa Monica Bay watershed. It has been estimated that more than 80 percent of the spawning habitat and 60 percent of the rearing habitat has been made inaccessible to steelhead trout in Malibu Creek as a result of passage barriers such as dams, culverts, and Arizona crossings. Restoration of steelhead trout to its historic range could serve as a key indicator of ecosystem health for the Bay and region at large. Steelhead populations in major creeks in the Santa Monica Mountains should be restored, via removal of barriers to fish migration barriers and restoration of spawning and riparian habitat and associated buffer habitat.

The Santa Monica Mountains Steelhead Habitat Assessment study completed by the Bay Commission in 2006 identified all migration barriers in the region and recommended major barriers that should be targeted for removal should funds become available. Several migration barrier removal projects have also been successfully carried out, including most notably the replacement of the Arizona Crossing with a bridge on lower Malibu Creek. However, many more barriers identified by the SMBRC study need to be removed. Meanwhile, the Rindge Dam removal feasibility study conducted by the Army Corps of Engineering with funding support of the Bay Commission must be completed without further delay.

Although the return of steelhead trout to streams that are now channelized rivers may not be feasible during the planning horizon, this Plan recognizes restoration of steelhead trout as a long-term goal (e.g. 25 to 50 years) for the rivers and major tributaries in the urbanized portions of the watershed that were the species' historic range.

Milestone 7.3a: Remove priority barriers identified by the SMBRC, including barriers in Malibu Creek watershed (Rindge Dam, Century Dam, Cold Canyon, Las Virgenes Creek), Solstice Creek (PCH Bridge Replacement), and Zuma Creek (at grade road) by 2018.

Implementation Lead: SMBRC, SCC, DPR, DBH, CalTrans

Implementation Partners: NMFS,DFW

Role of the SMBRC: Co-lead

Milestone 7.3b: Complete Army Corps of Engineers (ACOE) feasibility study for Rindge Dam removal by 2014.

Implementation Lead: ACOE, SMBRC, Multiple Federal, State, local agencies, NGOs

Implementation Partners: DPR, SMMC, NMFS

Role of the SMBRC: Participate

Milestone 7.3c: Complete removal of Arroyo Sequit barriers by 2014.

Implementation Lead: SMBRC, DPR

Implementation Partners: NMFS, Caltrans, NGOs

Role of the SMBRC: Co-lead

Milestone 7.3d: Restore stream habitat in Topanga Narrows by 2016.

Implementation Lead: DPR, RCDSMM, Caltrans

Implementation Partners: N/A

Role of the SMBRC: Facilitate

Objective 7.4: Restore urban streams, including daylighting culverted streams and removing cement channels.

Channelization and paving of most of the once abundant natural streams and associated riparian habitats have resulted in the loss and severe degradation of streams' ecological functions in the Bay watershed including, wildlife habitats, water filtration and cleansing, erosion control, water supply recharge, and floodwater storage. Restoring many of these lost streams will aid in the recovery of Santa Monica Bay and is the ultimate goal of the Bay Restoration Plan. As an

initial step in achieving this long-term goal, a multi-faceted approach should be taken. Various components should include studying feasibility of unpaving and daylighting streams or segments of streams, carrying out restoration projects wherever feasible without compromising flooding protection, conducting greenway planning and implementation to improve access and habitat value along existing waterways, and identifying and preserving remnant natural streams, riparian corridors, and natural sub-watersheds through acquisition, easement, zoning restriction, or other tools. (See Objective 4.1)

Milestone 7.4a: Secure funding and implement priority projects identified in the Ballona Creek Greenway Plan by 2018.

Implementation Lead: SMBRC

Implementation Partners: MRCA, Baldwin Hills Conservancy, Culver City, City of LA

Role of the SMBRC: Lead

Milestone 7.4b: Promote stream daylighting in Lafayette Park.

Implementation Lead: SMBRC

Implementation Partners: City of LA, MRCA, SCC, private businesses

Role of the SMBRC: Lead

Milestone 7.4c: Implement more stream restoration projects in the Malibu Creek watershed.

Implementation Lead: Malibu Watershed Cities, SMMC, NPS, SCC

Implementation Partners: N/A

Role of the SMBRC: Facilitate

Milestone 7.4d: Complete stream restoration in more areas and continue ongoing maintenance of restored Stone Canyon Creek at UCLA.

Implementation Lead: SMBRC

Implementation Partners: UCLA

Role of the SMBRC: Lead

Milestone 7.4e: Identify stream restoration alternatives within Baldwin Hills and nearby areas draining the Conservancy project area.

Implementation Lead: *Baldwin Hills Conservancy*

Implementation Partners: *DPR, LA County, City of LA*

Role of the SMBRC: *Participate*

Milestone 7.4f: Protect/acquire remaining undeveloped lands, especially stream corridors, e.g. Hoag Canyon and remaining Corral Canyon properties.

Implementation Lead: *MRCA, SCC*

Implementation Partners: *N/A*

Role of the SMBRC: *Facilitate*

Objective 7.5: Restore Topanga Lagoon.

Topanga Creek Watershed encompasses 18 square miles (12,400 acres) of the Santa Monica Mountains. It is the third largest watershed in the Santa Monica Bay. Topanga Creek, which runs through Topanga Canyon, is one of the few remaining undammed waterways in the area and provides spawning ground for the endangered southern steelhead trout.

At the mouth of the Topanga Canyon is Topanga Lagoon. At one time, Topanga Lagoon covered approximately 30 acres. In the 1930s the State Division of Highways (now Caltrans) rebuilt and realigned Pacific Coast Highway over the Lagoon. Over 800,000 cubic yards of fill material was used to raise the roadway, reducing the size of the lagoon to its current two-acre area.

The Resource Conservation District of the Santa Monica Mountains (RCDSMM, along with the State Dept. of Parks and Recreation with support from the SMBRC, State Coastal Conservancy, and several other agencies, have been leading efforts to plan for the restoration of Topanga Lagoon and the Topanga Creek watershed. Early efforts resulted in the completion of the *Topanga Creek Watershed and Lagoon Restoration Feasibility Study*. The study, funded in part by the

Commission, provided detailed information regarding watershed conditions, critical problems, and potential solutions. Concurrent with the study, State Parks acquired the 1600-acre Lower Topanga property, including the Lagoon, as an addition to Topanga State Park.

The feasibility study resulted in several recommended actions that the Commission and its partners are currently supporting. The top priorities among the recommended actions are removal of fill material and construction of a new bridge at the Lagoon, which together can restore as much as 15 acres of lagoon habitat. Removal of the 1,000-foot long Rodeo Grounds berm with approximately 26,000 tons of fill material was partially funded by the SMBRC and was completed in 2008. It has improved floodplain connectivity, water and sediment quality, and passage for steelhead trout and other fish to four miles of in-stream habitat.

After completion of the Topanga State Park General Plan, additional steps need to be taken including the development of preferred restoration alternatives and an EIR process for realigning the PCH Bridge. Additionally, there is also need for reestablishing native riparian plant communities where there are currently numerous invasive exotic species.

Milestone 7.5a: Develop preferred restoration alternative for Topanga Lagoon by 2015.

Implementation Lead: DPR

Implementation Partners: N/A

Role of the SMBRC: Participate

Milestone 7.5b: Complete the environmental impact report (EIR) for realigning the PCH Bridge over Topanga Lagoon by 2017.

Implementation Lead: DPR, Caltrans ***Implementation Partners:*** N/A

Role of the SMBRC: Participate

Milestone 7.5c: Complete full Lagoon restoration by 2020.

Implementation Lead: DPR

Implementation Partners: CalTrans

Role of the SMBRC: Participate

Objective 7.6: Restore Oxford Lagoon to provide native species habitat, improved water quality, improved flood storage, and greater public access.

Oxford Lagoon is located adjacent to Marina del Rey Harbor one block north of the Marina's Basin E. It is part of the original Ballona wetlands but over the years, the lagoon has been used primarily as a flood control facility for the surrounding area and has lost most of the ecological functions associated with a natural coastal lagoon. The basin is inundated year round with urban and storm water runoff, high groundwater, and tidal inflows from the marina. Water in the lagoon has had some of the highest levels of bacteria and other contaminants. A chain-link fence encloses the facility and there are a variety of non-native trees and shrubs along the basin's banks.

In 1998, modifications were made to the two flap gates to prevent the Marina water from backing into the basin during high tide. More recently, two upstream low-flow diversions (LFDs) were proposed and as of 2007, one LFD has been constructed which diverts urban runoff from storm drain Project No. 5243 to the City of Los Angeles' Hyperion Wastewater Treatment Plant. This project also included the installation of five bioretention catch basin units upstream of the basin and downstream of the LFD. However, installation of the LFDs alone will not achieve the required water quality improvement, especially during wet-weather conditions. Nor will they achieve restoration of the lagoon's habitat value.

A comprehensive restoration plan was developed by the Los Angeles County Flood Control District with stakeholder input. The plan is designed to achieve multiple objectives including enhancement of native species habitat, improved water quality, improved flood storage, and greater public access and passive recreational opportunities. Specifically, the planned restoration project will achieve these multiple objectives through the following activities: Improving water circulation with the construction of a circulation berm, and replacing and reprogramming the existing tide gates, Installation of a bioswale to capture runoff, removal of non-native vegetation and legacy-polluted contaminated soil and replacement with appropriate soil and native, site appropriate vegetation, excavate sediment and

construct a parapet wall to restore the facility’s flood protection capacity, new fencing, and additional amenities to enhance passive recreation, public education and safety.

Milestone 7.6a: Complete implementation of the lagoon restoration plan by 2015.

Implementation Lead: County of LA

Implementation Partners: NA

Role of the SMBRC: Participate with funding support

Objective 7.7: Restore Del Rey Lagoon to improve water quality and increase wetlands habitat and public access.

Del Rey Lagoon is located south of Ballona channel between Dockweiler Beach and the Ballona Wetlands Ecological Reserve. Like Grand Canal and Oxford Lagoon, Del Rey Lagoon is a remnant of the original much larger Ballona Wetlands complex. Major issues include the restricted connection and the loss of habitat value as a result. Addressing these issues requires acquisition of property between creek and lagoon to create a larger or open connection. The new connection will improve tidal exchange, improve mudflat/intertidal channel habitats as well as allow for restoration of intertidal wetlands and adjacent habitats around the perimeter of the lagoon.

Milestone 7.7a: Acquire private parcels immediately adjacent to the lagoon by 2018.

Implementation Lead: City of LA

Implementation Partners: N/A

Role of the SMBRC: Participate

Milestone 7.7b: Conduct a feasibility study, develop a restoration plan and complete CEQA process by 2020.

Implementation Lead: City of LA

Implementation Partners: N/A

Role of the SMBRC: Participate

Milestone 7.7c: Complete restoration by 2022.

Implementation Lead: City of LA

Implementation Partners: N/A

Role of the SMBRC: Participate

Objective 7.8: Restore Trancas Lagoon .

Trancas Lagoon, located three miles west of Point Dume in the City of Malibu, is fed by Trancas Creek. The mouth of the creek is often blocked by a sand berm which prevents tidal exchange and causes the creek water to pond during seasonal high flows. Immediately to the west of Trancas Lagoon near the mouth, are private homes, and a commercial nursery and shopping center. Zuma State Beach, including a parking lot and boat storage area, lie immediately to the southeast. Residential development occupies the eastern portion of the floodplain and lines the bank tops on the west. Trash and pollutants from the nearby parking lot are reportedly deposited into the lagoon. The creek was not evaluated for inclusion in the 303(d) list. However ocean waters adjacent to the beach exceeded selected criteria for fish consumption; there is an advisory regarding PCBs and DDT; and recreation, coliform counts have led to beach closures.

Milestone 7.8a: Complete a feasibility analysis and land acquisition by 2015.

Implementation Lead: NPS

Implementation Partners: Landowner

Role of the SMBRC: Participate

Milestone 7.8b: Develop a restoration plan and complete Trancas Lagoon restoration by 2020.

Implementation Lead: NPS, SMMRCD
Implementation Partners: N/A

Role of the SMBRC: Participate

Goal # 8: Restore coastal bluffs, dunes, and sandy beaches

The coastal dune system in Santa Monica Bay extends southward from the mouth of Ballona Creek to the Palos Verdes Peninsula. The airport's construction, oil refining, sand mining and urban development have all claimed most of the historical dune habitat. Remnant dunes and bluffs (part of the dune system with consolidated sandy soil formations exposed near the beach) still exist. These remnants can be found near Los Angeles International Airport (LAX), in Ballona Wetlands, on the property of Hyperion Treatment Plant, at the Chevron refinery sand dune park, and along a narrow strip on the beach (from the existing bicycle path on the seaward side to the first road, house, or parking lot). These areas are in the South Bay defined by Ballona Creek to the north and the end of the Los Angeles County beach in Torrance to the south.

Sandy beaches in Santa Monica Bay extend more than 50 miles, making it probably the most prominent feature and the most dominant habitat type in terms of length and acreage. Santa Monica Bay beaches have changed dramatically, as several beach nourishment projects have added about 23 million cubic meters of sand to the shore, resulting in a beach which is wider over much of its length than previously.

The coastal dunes, bluffs, and sandy beaches are important habitats that support a variety of plant and animal species, including several rare native plants that are uniquely adapted to this environment. They also provide the only remaining habitat for the El Segundo blue butterfly, the California least tern, and the Western snowy plover, all of which are federally listed endangered species. Many sandy beaches in the Bay are also important sites for grunion runs during their annual spawning season.

Most of the remaining habitats have been severely degraded by erosion and invasive species. Progress has been made in protecting and restoring these habitats. The colony of the California Least Tern at Venice Beach has been expanded and the terns continue to breed

successfully at the site. The population of El Segundo blue butterfly also continues to thrive on the remaining, protected coastal dunes near LAX and has re-colonized in recent years at the newly restored beach bluff site in the South Bay and at the restored dune system in the Ballona Wetlands. However, considerable effort is needed to ensure the recovery of these species and achieve their downlisting and eventual removal from the endangered list. The most important step to take to ensure recovery of these species is to prevent damaging the remaining habitats. At the same time, restoration of degraded habitats and control of invasive exotic plants are also of utmost importance.

As a vital part of our coastline, dunes and sandy beaches also offer our homes, roads, and infrastructure a protective buffer from sea level rise, as well as from tidal and wave action from the ocean. By restoring natural processes to our impacted beach systems, we will improve these functions while creating a diverse native ecosystem that manages sand transport in a way that will help to combat the impacts of climate change.

Objective 8.1: Restore native coastal bluff and upland scrub habitats

The El Segundo blue butterfly was first placed on the endangered species list in 1976. Once relegated to a few small and fragile reserves, the nearly extinct butterfly with bright blue wings has expanded its territory to include the bluffs along Redondo Beach, thanks to a pilot beach bluff restoration project funded by the SMBRC. As part of the restoration project completed in 2005, a Master Plan was developed which lays out a vision for the restoration of dune and bluff scrub along the southern portion of the Santa Monica Bay, from Ballona Creek to the Palos Verdes (PV) Peninsula.

As laid out in the Master Plan, the objective of the SMBRC's restoration effort is to increase the ecological values of the bluffs and dunes, such that the restored areas 1) contribute to the recovery of the El Segundo blue butterfly, 2) provide habitat for unique and rare plants of the El Segundo dunes, 3) increase biological connectivity between remnant populations of dune species, and 4) support more diverse bird, reptile, and arthropod communities.

Priority sites for restoration are those that meet the above objective the best, but are also technically feasible, cost-effective, and provide educational opportunities as well as potential associated infrastructure improvements Site selection should also consider to connect the dunes

to nearby sandy beach restoration so that connectivity is restored between these habitats for animals that may migrate between them.

Remnant bluff habitats located on PV Peninsula have also been subject to erosion and invasive plants. The Bay Commission has worked with the Palos Verdes Peninsula Land Conservancy to restore some of the habitats. Additional restoration sites may be identified to expand the existing efforts.

The LAX Coastal Dune Preserve is located at the west end of Los Angeles International Airport. The approximately 307 -acre preserve is the largest remaining coastal dune area in Southern California, and the largest remnant of the El Segundo Dunes. Restoration effort over the last two decades involved removing of invasive and non-native plants in over 140 acres of the preserve. As a result, population of El Segundo Blue Butterfly is thriving again at the site. Los Angeles World Airport, which is the owner and responsible for managing the preserve, has planned to continue and expand the restoration efforts in the future.

Milestone 8.1a: Complete restoration of four top priority sites (19.5 acres) identified in the Beach Bluff Restoration Master Plan by 2015.

Implementation Lead: South Bay cities, LAC-DBH
Implementation Partners: SCC, DFW, NOAA

Role of the SMBRC: Participate

Milestone 8.1b: Enhance and expand restoration of LAX and El Segundo Dunes.

Implementation Lead: LAX
Implementation Partners: Chevron

Role of the SMBRC: Support

Milestone 8.1c: Complete more bluffs restoration projects on PV Peninsula.

Implementation Lead: Palos Verdes Peninsula Land Conservancy (PVPLC), PV Peninsula cities
Implementation Partners: NOAA

Role of the SMBRC: Participate

Milestone 8.1d: Restore the LMU Bluffs adjacent to the riparian corridor and connecting to the BWER by 2016.

Implementation Lead: LMU, SMBRC

Implementation Partners: N/A

Role of the SMBRC: Co-lead

Milestone 8.1e: Restore the Cabora Drive bluff system adjacent to the BWER by 2016.

Implementation Lead:

Implementation Partners:

Role of the SMBRC: Participate

Objective 8.2: Protect and manage sandy intertidal habitats.

Sandy beaches are important foraging and nesting grounds for many shore bird, fish, and marine invertebrate species. The protection of this habitat is essential to the population recovery of two endangered species, the California least tern and Western snowy plover. Although the snowy plover no longer nests along Santa Monica Bay beaches due to habitat loss and degradation as well as human disturbance, the plover still winters on Bay beaches and is therefore still vulnerable.

The Bay's sandy beaches are heavily used as a recreational resource by residents of Los Angeles County and visitors from around the world. As a result, beaches are primarily managed for their recreational value rather than for their value as habitat for coastal and marine species. Some progress has been made in recent years to improve the habitat value and lessen the impacts of the intense recreational use on associated species, such as the expansion and improved fencing of the least tern colony at Venice Beach and establishment of a beach cleaning protocol during grunion run season to protect the spawning population. However, a more comprehensive management plan aimed at protecting and restoring the beach habitats and environment needs to be developed and adopted. The plan should describe healthy beach habitat, promote environment-friendly beach management practices, establish a beach habitat monitoring program, and implement beach

habitat restoration projects wherever feasible. It may also be worth considering a designation of certain areas for natural habitat, while allowing continued recreational use of appropriate types, similar to the national park system.

The Beach Ecology Coalition, a stakeholder group coordinated by the Pepperdine University has helped to increase public and agency awareness of beach habitat and management issues through its activities. A workgroup of beach ecology researchers and agency beach managers have made progress in developing beach habitat monitoring protocols and mechanism for public participation. These efforts need to be further expanded but have faced many challenges especially the shortage of funding support.

Milestone 8.2a: Develop sandy beach restoration and management plans that encourage protection of natural resources and human recreational opportunities by 2016.

Implementation Lead: LAC-DBH, DPR, coastal cities and private businesses with beach management responsibilities

Implementation Partners: DFW, CCC, NOAA

Role of the SMBRC: Facilitate

Milestone 8.2b: Develop best practices for beach management for sandy beach habitat conservation. Establish formal procedures/certification program for beach management practice training and certification by 2018.

Implementation Lead: LAC-DBH, DPRS, coastal cities and private businesses with beach management responsibilities

Implementation Partners: DFW, CCC, NOAA

Role of the SMBRC: Facilitate

Milestone 8.2c: Establish and implement a program to monitor beach animals, plants, and physical conditions in cooperation with scientists and community members by 2016.

Implementation Lead: SMBRC, University researchers (Pepperdine, UC Santa Barbara)

Implementation Partners: LAC-DBH, DPR, DFW, NOAA, CCC, Surfrider Foundation

Role of the SMBRC: Co-lead

Milestone 8.2d: Develop and implement a public education program about the importance/benefits of natural, ungroomed beaches.

Implementation Lead: SMBRC, University researchers (Pepperdine, UC Santa Barbara)

Implementation Partners: DPR, DFW, NOAA, CCC, Surfrider Foundation, Heal the Bay

Role of the SMBRC: Co-lead

Milestone 8.2e: Develop and implement beach habitat designation, conservation, and/or restoration projects by 2018.

Implementation Lead: LAC-DBH, DPR

Implementation Partners: DFW, NOAA

Role of the SMBRC: Participate

Goal # 9: Restore rocky intertidal and subtidal habitats

Intertidal zones are those areas of land which is exposed during low tides and submerged during high tides. Subtidal habitats are part of the nearshore ocean environment that are relatively shallow but submerged by water.

Like wetlands, the intertidal zones are areas of transition between land and water. The intertidal zone in Santa Monica Bay is characterized by wide sandy beaches (approximately 50 miles of coastline, with 22 separate public beaches), but also consists of cliffs and rocky outcrops mostly found at the far northern and southern ends of the Bay. Traveling north to south along the Bay, the coast from Point Dume to Santa Monica consists of cliffs and narrow, sandy beaches interrupted by rocky outcrops or short stretches of rocky shore. Along the Palos Verdes Peninsula, the shoreline is mostly rocky cliffs or boulder fields,

with some stretches of beach that consist of coarse sand and cobble stones.

The subtidal zone in Santa Monica Bay is characterized by hard-bottom rocky reefs and outcrops along the Malibu and Palos Verdes coasts and soft bottoms in mid-Bay. This subtidal hard-bottom habitat is often characterized by kelp and seaweeds which grow there. This environment also provides habitat for many invertebrates of which abalone, lobster, rock scallops and crab are important to sport fishing interests. Most nektonic species are fish, although shrimp and octopi may be present.

The rocky intertidal habitats are home to hundreds of species of birds, fish, mammals and other wildlife. Organisms living in the rocky intertidal habitats are important links in the aquatic food web and serve as indicators of the overall health of the marine habitat. They are also often the first organisms to encounter land-based pollution (urban runoff, trash, sedimentation, etc.); protecting them is a high priority of this Plan.

The impacts to rocky intertidal and subtidal zones result from the presence of human beings and their activities, as well as natural processes. With nearly nine million people, Los Angeles County is one of the world's most populous coastal areas. This concentration of people has had a profound effect on the coastal environment, as habitat loss, pollution and tide pool scavenging have taken their toll.

Rocky intertidal and subtidal zones are also affected by contamination from nonpoint sources that discharge into the nearshore zone. Beach litter and marine debris are two of the biggest problems (see also Section One, Water Quality). Trash is hazardous to wildlife as well as to humans. Trash and other debris discarded at the beach or washed ashore (from boats, storm drain outfalls, etc.) kill marine wildlife and poses serious health and safety problems for coastal residents and tourists.

Objective 9.1: Restore and monitor sixty acres of kelp forest

The kelp forests of Santa Monica Bay are one of the most biodiverse, productive communities in existence. Like tropical coral reefs, kelp beds are highly productive ecosystems that support a plethora of aquatic life. The health of underwater kelp forests is vital for the survival of many threatened animal species including black sea bass

and sea otters. Acreage of kelp forests in Santa Monica Bay has declined from historical highs for many years. Potential contributors to this decline include pollution, change in ocean temperature and current (e.g. El Nino), and sedimentation (excessive erosion or deposition from landslides). Also contributing to the destabilizing of the kelp forest ecosystem is the over harvesting of key sea urchin predators like the spiny lobster and California sheephead. As a result sea urchins now dominate many of the rock beds where kelp was once plentiful.

Sea urchin removal and relocation have shown to be effective in restoring kelp forest in the affected areas. Such effort should continue and expand as much as feasible. Mechanisms to restore kelp beds that are damaged by sedimentation should also be investigated and tested. Preliminary investigation has shown that a fair amount of material behind Rindge dam could be used for nearshore reef restoration and possibly also for introducing cobbles back to beaches to protect against storm events and sea level rise. The development and implementation of a plan for the beneficial use of this natural sediment values should be further pursued.

Milestone 9.1a: Implement the MSRP kelp restoration program and restore 60 acres of kelp habitat by 2018.

Implementation Lead: SMBRC, MSRP

Implementation Partners: DFW

Role of the SMBRC: Co-lead

Milestone 9.1b: Develop and implement plan for reusing natural materials from Rindge Dam removal for reef restoration and beach protection, if deemed feasible, by 2018.

Implementation Lead: SMBRC, ACOE

Implementation Partners: DFW, CCC

Role of the SMBRC: Co-lead

Objective 9.2: Protect and manage rocky intertidal habitat

A continuing threat to rocky intertidal habitats and the associated biological communities is direct human disturbance in the form of

trampling, rock turning, and collecting by the many visitors to these areas. Two protected areas have been established on the PV Peninsula to help save rocky intertidal habitat from these visitor impacts. The two areas, one at Abalone Cove and the other at Point Fermin, are designated as Ecological Reserves by the DFG. Restrictions in these areas include: no taking or disturbing of any plant or animal; no commercial fishing; no pets without a leash; and no fires. However, without active enforcement, the protection afforded by these areas is limited.

In 2005, the Bay Commission completed a feasibility study for the restoration of natural resources in rocky intertidal habitats in the Bay. The study shows that high levels of human use have negatively impacted many intertidal species and current management practices are not effective in protecting the intertidal communities. In response to the study findings, the Bay Commission recommended, and have been supporting a set of management measures including installation of signs and/or information displays at rocky intertidal habitats, development and distribution of brochures at parking lot entrances, development and/or enhancement of existing docent programs, implementation of educational programs for park rangers and lifeguards, and expansion of existing exclusion zones to include additional rocky intertidal areas in the Bay. All of these recommended measures should be tested through pilot projects.

Milestone 9.2a: Conduct a pilot project to test three different methods of intertidal protection by 2015.

Implementation Lead: SCC, DPR

Implementation Partners: LAC-DBH

Role of the SMBRC: Participate

Milestone 9.2b: Propose adoption of optimal management measures by responsible agencies by 2015.

Implementation Lead: SCC, DPR

Implementation Partners: LAC-DBH

Role of the SMBRC: Participate

Milestone 9.2C: Promote public and school education and adoption of measures for protecting sensitive habitats during tidepool fieldtrips.

Implementation Lead: SCC, DPR
Implementation Partners: LAC-DBH
Role of the SMBRC: Promote

Objective 9.3: Re-introduce and restore an abalone population

Once abundant in the Bay, especially in the rocky intertidal zone on the PV Peninsula, abalone (black, white, pink, and green) populations have declined rapidly and some of the species are now federally endangered. The causes of the decline are suspected to be a combination of overharvesting, disease, and other environmental factors. As a result of the population's precipitous decline, the fishery was closed throughout Southern California since 1996. However, the populations have not since recovered.

Re-introduction and re-population of abalone may not only be feasible but necessary to restore the local abalone population. Abalones are broadcast spawners who release both eggs and sperm into the water during a synchronized event. Due to the so-called "Allee Effect,"³ a minimum density of spawners is essential for successful reproduction.

A pilot project was conceived to develop reliable and cost effective technologies to aid in the recovery of green abalone (*Haliotis fulgens*) for population enhancement along the PV Peninsula. While green abalone, a species of concern, will be targeted in the pilot study, the result of the pilot project will inform similar efforts for endangered white abalone. Hopefully, this pilot study will also lead to the establishment of a sustainable and healthy population of green abalone, and the long-term potential to support commercial and recreational fisheries. In addition, repopulation of abalone will further the kelp restoration efforts by providing competition for sea urchins. The pilot project will take place in the rocky intertidal and kelp forests. The pilot will support the objective of the Abalone Recovery and Management Plan (ARMP) published by DFW which identifies the PV Peninsula as a priority restoration site that historically once supported a thriving abalone fishery.

³ When populations drop below the minimum spawning density (also called minimum viable population size, or MVP), individuals are often too far apart to ensure successful reproduction (mixing of eggs and sperm). This phenomenon is referred to as the "Allee effect", and results in population declines and sometimes local extinction.

Milestone 9.3a: Complete a pilot project to re-introduce abalone to local native habitat by 2015.

Implementation Lead: SMBRC

Implementation Partners: DFW, NOAA, Sealab

Role of the SMBRC: Lead

Objective 9.4: Assess and protect seagrass habitat

Surfgrass is an important seagrass species that occurs on rocky substrates in the high-energy, low intertidal and shallow subtidal reef habitats. Surfgrass forms dense beds to rocks by short roots that form a mat frequently covered by sand. Since surfgrass growth appears to be enhanced by sand accumulation, when it occurs it tends to dominate on sand-influenced shores. Composition of biological communities in surfgrass beds is typical of low rocky intertidal habitats except for some species specialized to live on surfgrass leaves. Many shallow subtidal habitat fish species as well as spiny lobster like to seek shelter under the surfgrass canopy.

Substrates suitable for surfgrass growth exist in the Bay, primarily along several segments of the North Bay coast. However, only small patches of surfgrass beds were found near Malibu recently. There is evidence that surfgrass beds may be more abundant in the Bay historically. Further assessment needs to be conducted in order to better manage the existing habitat and possibly restore historical habitats in the future.

Eelgrass is also an important seagrass species that warrants additional attention in the Santa Monica Bay region. Eelgrass is recognized as an important ecological community in shallow bays and estuaries because of its multiple biological and physical values. Eelgrass habitat functions as an important structural environment for resident bay and estuarine species, and as a nursery area for many commercially and recreational important finfish and shellfish species, including those that are resident within bays and estuaries, as well as oceanic species that enter estuaries to breed or spawn. Eelgrass is also a major food source in nearshore marine systems, contributing to the system at multiple trophic levels. In addition to habitat and resource attributes, eelgrass serves beneficial physical roles in bays and estuaries through dampening wave and current action, trapping suspended particulates, and reducing erosion by stabilizing the sediment. They also improve

water clarity, cycle nutrients, and generate oxygen during daylight hours.

The distribution and abundance of eelgrass is not well documented in the Santa Monica Bay region. Eelgrass is typically found in protected bays and estuaries from the low intertidal to a depth of approximately 20 meters. In addition, eelgrass has also been known to occur outside bays in the nearshore environment. For instance, nearshore eelgrass beds have been documented off the coastlines of Santa Barbara, Malibu, and the Channel Islands. As is the case with surfgrass, further assessment of eelgrass is warranted in order to better manage any existing habitat and to identify potential restoration opportunities.

Milestone 9.4a: Conduct an assessment on the status of historical and existing seagrass habitats and develop management and funding recommendations by 2015.

Implementation Lead: NOAA, NMFS

Implementation Partners: DFW

Role of the SMBRC: Participate

Milestone 9.4b: Assess, protect and restore offshore eel grass habitat in the North Bay by 2020.

Implementation Lead: NOAA, NMFS

Implementation Partners: Vantuna Research Group, Southern California Marine Institute, DFW

Role of the SMBRC: Participate

Goal # 10: Protect and restore open ocean and deep water habitats

The 306 square miles of open ocean in Santa Monica Bay provides three types of marine habitats: pelagic, soft-bottom, and hard-bottom. The pelagic habitat, or open waters community, is the most obvious habitat in the Bay, extending from the surface to depths of 1,640 feet and having a total water volume of about 6,840 billion gallons. The pelagic environment supports a wide range of organisms of all trophic levels including planktonic (e.g., bacteria, phytoplankton, and zooplankton) or nektonic (e.g., fish, sharks, and whales). The pelagic environment also supports pinnipeds (seals and sea lions) and

cetaceans (e.g., whales, porpoises, and dolphins). Major threats to the health of the pelagic habitats include overfishing, pollutant loading, impingement and entrainment, climate change, and harmful algal bloom. Strategies to deal with most of these threats are laid out in other sections of this plan. Steps for addressing the issue of harmful algal bloom is described in this section.

Except for Short Bank, which is the only naturally occurring deep rocky area in the Bay, most of the deep seafloor in Santa Monica Bay consists of soft sediments, which are a mixture of sand, silt and clay. Over 100 species of bottom-dwelling (demersal) fish utilize this habitat, including Pacific sanddab, rockfish, white croaker, surfperches, and California halibut. Over the last 70 years, a large part of this habitat (as much as 10 percent to 20 percent of the Bay's seafloor) has been degraded by wastewater discharges from the two ocean wastewater outfalls operated by the Hyperion Treatment Plant and JWPCP. One of the most severely damaged areas is around the JWPCP outfall where deposits of sludge and contaminated sediments with high levels of DDTs, PCBs, and other contaminants had at one time created a dead zone, and resulted in contamination of sportfish, marine birds and mammals through bioaccumulation and biomagnifications.

In recent years, however, there has been evidence from POTW receiving water monitoring that marine habitats surrounding the outfalls have improved significantly, especially after both POTWs achieved full upgrading to secondary level for their wastewater treatment. Besides recovery of the benthic communities near the outfall, the recovery of kelp forests and rocky intertidal plant and animal communities of Palos Verdes can also be attributed to the incremental improvement in source control and level of wastewater treatment. However, less are known about the condition of many Bay areas not covered under regular POTW receiving water monitoring program, despite several areas are habitats unique to Santa Monica Bay which may warrant special protection.

Objective 10.2: Update and expand knowledge of unique habitats within Santa Monica Bay.

There are several unique habitats within Santa Monica Bay including Torrance Beach, Short Bank, and deep submarine canyons (Santa Monica and Redondo Canyons). The shallow nearshore protected areas of the Bay (e.g., Torrance Beach, Redondo Beach) serve as important

nurseries for local marine fish (e.g. juvenile California halibut, juvenile white seabass). Short Bank is the only naturally occurring deep rocky area in Santa Monica Bay with a thriving population of several rockfish species and invertebrates.

Milestone 10.1a: Update information of deep canyon and deep reef habitats including Short Bank from previous assessment and conduct new reconnaissance study if necessary by 2016.

Implementation Lead: LACSD

SMBRC, SCCWRP

Implementation Partners: N/A

Role of the SMBRC: Co-lead

Milestone 10.1b: Assess Torrance Beach and other shallow nearshore habitats and develop protection measures if necessary.

Implementation Lead: SMBRC

Implementation Partners: LACSD, City of LA Bureau of Sanitation, DFW

Role of the SMBRC: Lead

Objective 10.2: Assess harmful algal bloom and its causes and impacts on the Bay's ecosystem.

Harmful Algal Bloom (HAB) can occur when certain types of microscopic algae grow quickly in water, forming visible patches that may harm the health of the environment, plants, or animals. Some species of these algae can produce the potent neurotoxins domoic acid and saxitoxin. While these toxins cause no direct harm to shellfish, the shellfish serve as vectors that transfer the toxins to humans. Bioaccumulation of algal toxins through vector organisms (such as krill and filter feeding fish) in the food web has been linked to erratic behavior in birds and marine mammals, as well as marine animal mortality events.

Awareness of the occurrence of harmful algal blooms along the coastline of the greater Los Angeles area of the Southern California Bight has increased significantly in recent years. There is also evidence that HAB occurs more often and are more widely spread. The documented fish kills caused by HAB in King Harbor in recent years has further heightened public concern. There have also been more research efforts to characterize the occurrence of HAB conducted by regional universities and research institutes.

However, many basic questions regarding the causes and impacts of HABs remain to be answered. Are harmful algal blooms increasing in frequency or are we just paying more attention? Are the causes of HAB natural or related to human activities? Which actions cause HABs? Are they related to agricultural runoff, storm runoff and sewage discharges?

More research is needed to understand the timing, geographical distributions and types of harmful blooms, the environmental forcing factors leading to toxic blooms and toxin production, and to link harmful/toxic events with impacts on populations of marine organisms and potential threats to human health. These are important information needed by public health managers, resource managers, and water quality managers for decision-making purposes.

Milestone 10.2a: Conduct and coordinate research on the status, causes and impacts of harmful algal blooms (HABs) including hypoxia in deep water in Santa Monica Bay.

Implementation Lead: SMBRC

Implementation Partners: SCCWRP, Southern California Coastal Ocean Observing System (SCCOOS), Regional Universities

Role of the SMBRC: Lead

Milestone 10.2b: Maintain and enhance the coordinated HAB alert network.

Implementation Lead: State OPC

Implementation Partners: SCCWRP, SCCOOS, Regional Universities

Role of the SMBRC: Promote

Priority Issue: Benefits and Values to Humans

With its natural beauty and rich resources, Santa Monica Bay is one of Southern California's most popular recreation destinations. Nearly 10 million people live within an hour's drive of the Bay. The Bay attracts approximately 40 million visitors each year, including 5.5 million sport fishing trips. Besides its 22 public beaches, the Bay also boasts the world's largest man-made small craft harbor, the 6,000 ship Marina del Rey. Popular recreational activities include swimming, surfing, sunbathing, biking, sport fishing, diving, boating, kayaking, tidepooling, and whale and bird watching, etc. The adjacent Santa Monica Mountains and waterways are also popular for activities such as hiking, biking, fishing, wildlife viewing, and general sightseeing. By one estimate, the Bay on average generates \$1.08 billion annually for the economy of Southern California. The protection of the valuable recreational uses of the Bay is a high priority for public agencies and local communities.

Public health and access are the two most important issues that affect the recreational uses of the Bay. Pathogen contamination of swimming beaches and contamination of several seafood species by DDT and PCB have been known to increase health risks to users and consumers. Measures to reduce people's exposures to these risks such as beach closure and fishing restrictions have resulted in the loss of the associated recreational opportunities. Significant progress has been made over the last 15 years in reducing these health risks through source reduction and better public outreach. Most notable are the improvements in dry-weather beach grades for beaches in Santa Monica Bay and the implementation of the seafood risk communication program. However, eliminating the sources of the contamination, which are the main cause of the health risks, remains a great and intricate challenge. It will require many more years of concerted, steadfast efforts by public agencies and environmental communities.

Public access to Santa Monica Bay's beaches as well as inland parks is essential to provide the indispensable recreational opportunities and therefore, the strength of local economy. Public access has been improved in recent years through new land acquisition, the Offer to Dedicate (OTD) public access easement program, and new trail improvement projects. These efforts should continue and be expanded wherever possible to fill gaps and provide more public access. It should be recognized that some recreational uses may have negative impacts on the Bay's natural resources and ecosystem. Management of the Bay's recreational uses should strive to find a balance between

recreational activities, resource and habitat protection, and promoting environmental stewardship.

Among all natural resources that provide benefits to humans, none is more vital than water itself. The well-being of the region's more than ten million residents must rely on adequate water supply, which, over the last century in the semi-arid region of Southern California has meant more and more import of water from hundreds of miles away, and at the expense of natural habitats in other parts of the world. At the same time, there is greater and more demand for flood protection as more land surfaces are hardened with the spread of urbanization and less storm water percolation into the ground. Instead of bringing more benefits to people, these strategies and practices have not only exacerbated the water shortage and flooding problems, but also resulted in more environmental damage in other areas including deteriorating water quality and habitat destruction and degradation.

It is encouraging that the trends have begun to reverse,, partly because the lingering drought condition in recent years has changed people's attitude about water resources and consumption. New approaches and strategies have been proposed and put into practice that promote water conservation, recycling, and increases to the local water supply. They should all be further promoted and applied broadly for the multiple benefits they bring. By un-paving and creating more permeable surfaces to allow more storm water infiltration, for example, we can both replenish local water storage and reduce flooding hazards, a win-win situation that provides greater environmental benefits for all.

Goals and Objectives

Goal #11: Protect public health

Health risks associated with swimming in the surfzone can be traced to many sources. Dry weather urban runoff can carry pathogens (pathogenic bacteria and viruses) and other contaminants (human- and animal-caused) to the beaches and surfzone. Rain storms, and the increased runoff through storm drains that result, also contribute to these pollutants.

The first large-scale epidemiological study in the nation completed by the SMBRP in 1995 established linkage between increased illnesses in swimmers and surfers and proximity to areas with contaminated runoff. In response to findings of the study, the State has developed statewide standards for beach water quality and protocols for monitoring contamination and notifying the public of potential risks. Dry and wet weather TMDLs have been adopted by the Los Angeles Regional Board. State and local agencies have taken actions to minimize the health risks primarily through diverting runoff to wastewater treatment facilities during the dry season (April to October). Local agencies have also retrofitted many aging sewer lines and improved sewage spill control and response. In areas where problems continue, signs are posted to warn swimmers of potential health risks, and lifeguards actively encourage swimmers to steer clear.

Several important steps have been taken to address the seafood contamination issues. The main cause of contamination to locally caught seafood is the historical dumping and deposition of DDT and PCBs through the JWPCP on Palos Verdes Shelf. Although the use of DDT was banned in 1971, residue of this pesticide still accumulates in the tissues of invertebrates, fish, birds, and marine mammal species occurring throughout the Southern California Bight and Santa Monica Bay in particular. Risk assessment conducted in the late 1990s indicated that significant health risks are associated with consuming large quantities of contaminated seafood over a long period of time. As a result, sportfish consumption advisories were issued, and the white croaker commercial fishery off Palos Verdes Peninsula has been closed.

Since 1989, the USEPA has been investigating engineering options to remediate the DDT and PCB contamination on the Palos Verdes shelf. In 2001, a consent decree was reached between the government's natural resources trustees and the polluting chemical company (Montrose Chemical Corporation and other defendants) resulting in the largest settlement amount (more than \$70 million) in U.S. history. While evaluation of remediation alternatives continues, the USEPA has been implementing an institutional controls program to limit the public's exposure to the contamination through public outreach and education and enforcement efforts.

Major challenges lay ahead despite the progress made. Federal, state, and local agencies need to work collaboratively in finding and implementing cost-effective solutions for controlling or remediating the sources of contamination which has so far been deemed as extremely difficult, whether it is for storm water contaminated with pathogens or sediment contaminated with organic pesticides. As eliminating the sources of contamination will likely be a long-term effort, a comprehensive approach should be undertaken that builds and improves upon existing efforts in risk assessment, risk communication, risk reduction BMPs, monitoring, and enforcement.

Objective 11.1: Achieve minimum beach closures and postings at Santa Monica Bay beaches

The Santa Monica Bay Beaches Bacteria (SMBBB) TMDL during dry and wet weather conditions became effective in July 2003. Both the dry-weather and wet-weather SMBBB TMDLs have their own compliance schedule, which could serve as targets to achieve minimum closures and postings under this plan.

Several steps should be taken to ensure achievement of the stated objective. As a short-term, but effective mechanism to reduce incidences of bacterial indicator thresholds during dry-weather, runoff diversions should be installed at all remaining un-diverted locations. Meanwhile, more coordinated effort should be made to ensure that the approach for addressing contaminated storm runoff during wet-weather is truly integrated across jurisdictional boundaries within each sub-watershed. In addition, more technical investigation and evaluation need to be conducted to identify the sources of contamination and alternative control measures for the few remaining chronically affected areas.

Milestone 11.1a: Evaluate the need for and implement additional dry weather (summer and winter dry periods) diversions for achieving compliance with Santa Monica Bay dry-weather bacterial TMDL by 2015.

Implementation Lead: SWRCB (Clean Beach Initiative, CBI)

Implementation Partners: LA County, beach cities

Role of the SMBRC: Participate

Milestone 11.1b: Enhance collaboration among local agencies through the Enhanced Watershed Management Plan groups in Santa Monica Bay. Develop and implement an integrated approach to reduce wet-weather pathogen contamination.

Implementation Lead: LA County, watershed cities, park agencies, Caltrans

Implementation Partners: LARWQCB

Role of the SMBRC: Participate

Objective 11.2: Develop and adopt new pathogen indicators and source identification tools

Current beach water quality monitoring still relies on bacterial indicators, which may not accurately measure the concentration of pathogens and the true level of the health risks. On the other hand, current monitoring techniques are, in general, ineffective in identifying the sources and origin of the contamination, especially in distinguishing human waste from that of natural sources such as soil, domestic animals, or wildlife.

Recent advances in microbiology, molecular biology, and analytical chemistry make it possible to solve the long-standing paradigm of relying primarily on traditional microbial (predominantly bacterial) indicators for waterborne pathogens in order to make public health decisions. Results from recent research of rapid and human-specific indicators carried out with grant support from the state Clean Beach Initiative (CBI) program are promising and the work should continue

to improve their reliability and applicability. The new recreational water quality criteria issued by the federal EPA in 2012 has also provided certain level of flexibility fo application testing methods for beach water quality.

Milestone 11.2a: Conduct more research on new rapid and pathogen-specific indicators.

Implementation Lead: SWRCB (CBI), USEPA
Implementation Partners: SCCWRP

Role of the SMBRC: Promote

Milestone 11.2b: Incorporate new effective indicators into water quality objectives and monitoring programs by 2018.

Implementation Lead: SWRCB, State Public Health, USEPA, LARWQCB
Implementation Partners: SCCWRP

Role of the SMBRC: Support

Objective 11.3: Update seafood consumption advisories and risk communication messages

The current Health Advisory and Safe Eating Guidelines for fish from Santa Monica Bay and San Pedro Bay were issued in June 2009 by the state Office of Environmental Health Hazard Assessment (OEHHA), which is mandated to conduct risk assessment and issue guidelines for reducing human exposure to contaminated sportfish. The advisories were based on the risk assessment conducted by OEHHA, utilizing the data collected by SMBRP in the 1992 seafood consumption study and fish contamination data collected from the 2005 USEPA-MSRP survey. Since 2009, new educational materials including signs, brochures, and fact sheet have been developed and distributed along with the new advisory and such materials are tailored to the diverse audiences identified under the current risk communication efforts. As new data are collected on seafood consumption and contamination, new risk assessment should be conducted, and the advisories and educational

materials should be updated accordingly. Meanwhile, although past surveys indicates that high level of contamination seem to occur only in a limited number of fish species, collection and report of data from of more fish species at locations may be warranted to meet the information need by the public.

Milestone 11.3a: Expand area, location, and species of fish and invertebrate contamination surveys and develop and issue new fish consumption advisory if necessary.

Implementation Lead: *OEHHA, USEPA*

Implementation Partners: *State Public Health*

Role of the SMBRC: *Promote*

Milestone 11.3b: Update fish advisory signage and develop and distribute new educational materials if necessary.

Implementation Lead: *OEHHA, USEPA*

Implementation Partners: *State Public Health, LA County Health, other Fish Contamination Education Collaborative (FCEC) partners*

Role of the SMBRC: *Participate*

Objective 11.4: Maintain and enhance institutional control measures (enforcement, monitoring, and education) through coordination with partner agencies to reduce the risk of consumption of contaminated fish in high risk ethnic communities

An institutional controls (IC) program was initiated by the USEPA in 1999 under the PV Shelf Superfund program. It was implemented first with a pilot outreach and education project which involved local community-based organizations (CBOs) to increase awareness of fish contamination in LA and Orange counties. More progress was made with the establishment of the FCEC, which brought together federal, state, and local governments as well as local communities. Since 2003, the FCEC has been coordinating or carrying out projects aimed at protecting the most vulnerable population affected through targeted outreach to communities, anglers, and businesses. Meanwhile, the IC program has expanded to include enforcement and monitoring activities, and increased the local capacities in these areas.

Milestone 11.4a: Reestablish catch-ban area to correspond with commercial catch-blocks in order to increase understanding of regulations and enforce adherence to regulations by 2015.

Implementation Lead: DFW, USEPA

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 11.4b: Utilize community organizations and health professionals to educate at-risk families by 2018.

Implementation Lead: LA County Health Dept., USEPA

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 11.4c: Enhance the health inspectors' program to educate markets on "best practices" in purchasing uncontaminated fish by 2018.

Implementation Lead: LA County Health Dept., USEPA

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 11.5d: Continue to reach out to recreational anglers with FCEC messaging and increase angler awareness of local fish advisory by 2018..

Implementation Lead: USEPA

Implementation Partners: Heal the Bay, Cabrillo Aquarium

Role of the SMBRC: Promote

Milestone 11.4e: Increase enforcement of existing bag limit for white croaker by 2018.

Implementation Lead: DFW

Implementation Partners: USEPA

Role of the SMBRC: Promote

Objective 11.6: Remediate contaminated sediments

There are two major on-going programs aimed at controlling and remediating damages caused by the contaminated sediment. The USEPA Superfund program focuses on investigation and implementation of measures to reduce human exposure to the contamination, while the MSRP focuses on restoration of natural resources (animal species and habitats). Many of MRSP's efforts contribute to restoration of fisheries and subtidal and intertidal habitats, which are discussed in the Resources Section. Under the Superfund program and in addition to institutional controls measures discussed above, USEPA continues development of a remediation plan which will select and implement a best engineering alternative.

Milestone 11.6a: Evaluate, update, and revise the remediation strategy for contaminated sediments on Palos Verdes shelf based on new monitoring data by 2015.

Implementation Lead: USEPA (Superfund)

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 11.6b: Finalize and implement a remediation plan by 2015.

Implementation Lead: USEPA (Superfund)

Implementation Partners: N/A

Role of the SMBRC: Promote

Goal # 12: Maintain/increase natural flood protection through ecologically functioning floodplains and wetlands

Natural floodplains not only provide buffer zones that attenuate the flood damage but also bear habitat value typically associated with a riparian corridor. Similarly, besides their well-known habitat value, wetlands work as a sponge that absorbs and releases flood water

during a storm. However, the standard practice that has been applied throughout the urbanization of the region has been to making more space for development even if it results in encroachment of floodplains and wetlands. Additionally, flood control has been achieved by directing and sending storm water to the ocean in the fastest and shortest route through channelization. Such practices have contributed to the loss of natural streams, riparian corridors, and wetlands in our region. The practice may also lead to a vicious cycle: more new urban development will create more impervious land surfaces which results in more runoff from storms. The solution to this is more channelization (or raising the height of the levees) which in turn encourages more development.

The meaningful, and perhaps the only way to break this vicious cycle is to reverse the trend by restoring the ecologically functioning floodplains and wetlands wherever possible, and by increasing permeable surfaces at existing and new developments. As a first step, existing policies and hydrological standards should be reexamined and new policy/standards should be developed and adopted if necessary. Also, a long-term plan should be developed to identify and prioritize areas and parcels with potential for ground surface and floodplain/wetland conversion.

Objective 12.1: Acquire and restore priority parcels to increase acreage of ecologically functioning floodplains and wetlands

Milestone 12.1a: Develop a prioritized property list and acquire priority parcels for floodplain and wetland restoration in coordination with milestones under Objective 5.1 and 5.2.

Implementation Lead: MRCA, SCC

Implementation Partners: N/A

Role of the SMBRC: Co-Lead

Objective 12.2: Develop and implement a comprehensive regional sediment management plan for restoring natural hydrological functions of river systems.

Milestone 12.2a: Work with LA County FCD to develop sediment transport strategy and mechanisms that optimize habitat, water quality and flood control purposes by 2015.

Implementation Lead: LA County, SMBRC
Implementation Partners: ACOE

Role of the SMBRC: Co-Lead

Milestone 12.2b: Fund and implement pilot projects to test of transport sediment down stream with natural storm flows by 2018.

Implementation Lead: LA County, SMBRC
Implementation Partners: ACOE

Role of the SMBRC: Co-Lead

Goal # 13: Increase public access to beaches and open space

Parks, public beaches and preserves can provide the opportunity for escape and relaxation for residents and others. Outdoor experiences can provide important social values and are an important and inexpensive form of relaxation. Open space, in and of itself, provides perceptible benefits by its simplicity, quiet, and freedom from roads, traffic, buildings or human made structures. It provides the visual and sensory “breathing room” that people need to feel comfortable, as well as in touch with natural surroundings. Open space and parkland also have the potential to enhance groundwater resources (by preserving or expanding the area available for natural groundwater exchange), improve surface water quality (to the extent that these open spaces filter, retain, or detain storm water runoff), and provide opportunities to reuse treated runoff or recycled water for irrigation (thereby reducing the demand for potable water).

Objective 13.1: Increase public access to Santa Monica Mountains through purchase and enhancement of open space

The Santa Monica Mountains rise up from the Malibu shoreline, and provide a rugged wilderness escape from the urbanized Los Angeles area. The Santa Monica Mountains National Recreation Area, which encompasses more than 150,050 acres of public parkland and lands in other private or other government ownership, is the largest urban park

in the United States and provides many recreational opportunities including hiking, biking, birding, camping, and horseback riding. Public access to the area and its recreational facilities is made possible primarily by more than 25 years of continuous land acquisition by federal, state, and local public agencies, but also through required access easements to mitigate the impacts of development on public access.

The areas open to public access and the extent of public trail networks has grown significantly. However, more land acquisitions and utilization of access easement are needed to complete an extensive wilderness trail system for a seamless recreational experience for the public. In the long-term, these and other strategic buy-back efforts will help form an interlinking system of urban, rural and river parks, open space, trails, and wildlife habitats that are easily accessible to the general public.

Milestone 13.1a: Acquire available private parcels and easements (including those specified under Objective 5.1) and open them to the public to increase access and recreational opportunities by 2018.

Implementation Lead: SMMC, CCC

Implementation Partners: SCC, State DPR, NPS

Role of the SMBRC: Participate

Objective 13.2: Increase acreage and access to parks and open space in urbanized areas through acquisition and conversion of private parcels

Public and neighborhood parks provide recreation opportunities for all residents. When designed and maintained properly, parks can also support natural habitats, and help to improve water quality by providing much needed permeable surfaces for storm water infiltration. The urbanized part of the Bay watershed is known to be park and open space poor, and the scarcity is even more severe in relatively low income, underserved communities. There have been several success stories in acquiring existing parcels and converting them to parks, natural reserves, or the combination of the two in the urban areas of the Bay and adjacent watersheds. Some of these conversions include the establishment of the Los Angeles State Historic Park (Cornfield), the Rio de Los Angeles State Park, the 2008 opening

of the Vista Hermosa Park in western downtown Los Angeles, and the construction of the Augustus Hawkins Natural Park in South Los Angeles. More similar acquisitions and conversions should be promoted and achieved throughout the watershed.

Milestone 13.2a: Acquire and convert 30 acres of parks/open space in urban areas, focused on the needs of underserved communities, by 2020.

Implementation Lead: *MRCA, watershed cities*

Implementation Partners: *SCC*

Role of the SMBRC: *Participate*

Milestone 13.2b: Acquire parcel adjacent to Lafayette Park for public ownership to convert to pervious surfaces and increase recreational opportunities.

Implementation Lead: *City of LA, SMBRC*

Implementation Partners: *City of LA, MRCA, SCC*

Role of the SMBRC: *Co-lead and fund in collaboration with partners*

Milestone 13.2c: Acquire parcel at north end of Del Rey Lagoon for City of LA ownership as identified under Objective 7.9 to improve connectivity to Ballona Creek estuary by 2018.

Implementation Lead: *City of LA*

Implementation Partners: *N/A*

Role of the SMBRC: *Facilitate*

Objective 13.3: Increase public access points to Ballona Creek and wetlands

Enhancing access to the Ballona ecosystem, including the Ballona Creek and Wetlands, will create opportunities for aesthetic, cultural, recreational, research and educational use of the local watershed that are compatible with the environmentally sensitive resources of the area. Access design should be consistent with preservation and restoration values in a safe, coherent, and functional manner.

Currently, public access to the Ballona wetlands is managed in accordance with the goals and guiding principle laid out in the Ballona Wetlands Interim Stewardship and Access Management Plan. The Interim Plan is intended to serve as a guide to manage short-term access as well as restoration and educational opportunities now through the completion of the Wetland Restoration Plan. The goal of both the short- and long-term plans is to provide public access and recreation opportunities compatible with habitat, fish and wildlife conservation. In principle and strategically, this goal should be achieved through development of common gateway entrances with clear signage, while decreasing and eliminating inappropriate or uncontrolled access points. These efforts will minimize habitat degradation and species harassment.

Located along the maintenance road along the north bank of Ballona Creek, the eight-mile Ballona Creek Trail and Bike Path was one of the first bicycle paths in the region. The path extends through the cities of Los Angeles and Culver City, and connects to the beach bike path at its terminus at Playa del Rey. The two cities and the County of Los Angeles maintain it. The trail is popular with cyclists, runners, strollers, and skaters—especially on weekends. The Mountains Recreation and Conservation Authority (MRCA), in partnership with federal, state, county and nonprofit partners, is working to improve and upgrade this popular resource.

Milestone 13.3a: Open additional public access point to Ballona Wetlands including the Fiji Gateway by 2014.

Implementation Lead: MRCA, DFW, SCC

Implementation Partners: Ballona Wetlands Restoration Working Group

Role of the SMBRC: Facilitate

Milestone 13.3b: Implement selected Ballona Creek Greenway Plan projects (including those specified under Objective #7.4) to increase recreational opportunities and connectivity along Ballona Creek.

Implementation Lead: MRCA, Baldwin Hills Conservancy, Culver City, City of LA

Implementation Partners: SCC

Role of the SMBRC: Facilitate

Objective 13.4: Increase public access to Santa Monica Bay beaches

The beaches in Santa Monica Bay are one of the most populous and the most visited in the state. The California beach scene is typified in Malibu and Venice and tourists flock to these areas to get a look. While there are miles of coastline which have been protected by public purchase and are open to the public in the Bay year round, access to the beach in several locales is still impossible. Currently, a little over half the approximately 75-mile-long Los Angeles County coastline is in public ownership. However, in areas such as Malibu, the public is still precluded from beach use in many locations due to intervening private development. Some residents employ a variety of methods to discourage and intimidate visitors' beach use, including locked gates, use of private security guards, and use of misleading and/or non-permitted signs.

Public use of beaches is also hindered by the remaining gaps in the coastal trail system. The California Coastal Trail is envisioned as a continuous passage along the entire length of the State's shoreline. It is intended not only to provide a trail system for a variety of coastal users (i.e. pedestrians, bicyclists, and the mobility impaired), but also to connect to other existing coastal and inland trail networks. This laudable work-in-progress, however, is only 65 percent complete after 25 years of effort. In the Santa Monica Bay areas, gaps in the trail include approximately 17 miles along the Malibu Coast and some five miles at the Portuguese Bend due to private development. Heightened recognition of the trail and secure financial support is needed to span these gaps.

Moreover, public information regarding the availability of coastal public access facilities may be inadequate. Visitors are often confused about which local roads lead to the coast, where to park, the physical nature of the beach/shoreline, etc. This inadequacy may be corrected by providing additional directional and informational signs along roadways and access points, along with preparing and distributing regional coastal guides and maps. Completion and improvements of the coastal trail system and improved dissemination of public education are both priorities of the California Commission's coastal access program.

The California Coastal Commission has established partnerships with the State Coastal Conservancy, other state agencies including the State Lands Commission and the Dept. of Parks and Recreation, as well as the nonprofit land trust community. These partnerships help to fund, acquire, develop and manage access sites in concert with the Commission's authorities to plan and regulate development that affects coastal access. A top priority of the Commission's coastal access program is the Offer to Dedicate (OTD) public access easement program, which requires a private landowner to allow for a future open access point across his or her property as mitigation of the individual and cumulative impacts of private development upon public access. The Santa Monica Bay area is known to have the greatest number of outstanding OTDs statewide. All these existing/potential public areas need to be opened.

Milestone 13.4a: Improve dissemination of information on public beach access.

Implementation Lead: CCC

Implementation Partners: SCC, State Lands Commission (CSLC). DPR

Role of the SMBRC: Participate

Milestone 13.4b: Complete Santa Monica Bay section of the California Coastal Trail by 2020.

Implementation Lead: CCC

Implementation Partners: SCC, CSLC, DPR

Role of the SMBRC: Promote

Milestone 13.4c: Open more Offer to Dedicate (OTD) public access easements along Santa Monica Bay that are currently closed to the public.

Implementation Lead: CCC

Implementation Partners: SCC, CSLC. DPR

Role of the SMBRC: Promote

Milestone 13.4d: Support beach replenishment that both increase beach use opportunity and protect beach ecology..

Implementation Lead: Coastal cities, LAC-DBH, ACOE, CCC

Implementation Partners: N/A

Role of the SMBRC: Promote

Milestone 13.4e: Support land acquisition for providing more beach access.

Implementation Lead: CCC

Implementation Partners: SCC, CSLC. DPR

Role of the SMBRC: Promote

Goal # 14: Conserve water and increase local water supply

The importance of adequate water supply to local residents in the arid Southern California locale cannot be overstated, and has gained more urgency recently amid one of the worst drought period in the state's recent history. The drought condition, potential threat of climate change, and the need and requirement for environmental damage mitigation mean that the region can and should no longer rely on imported water as its major source of water supply. Instead, local public agencies should rethink, devise, and implement a new strategy to secure a locally sustainable water supply through a combination of water conservation, water recycling, runoff capture and underground storage.

In addition to its primary benefit of reducing water imports and preserving freshwater flows for the ecological health of headwater regions, water conservation, recycling, and storage measures help to improve water quality by reducing the volume of wastewater flow for treatment, and the amount of surface runoff in urbanized areas, and lessening the loading of pollutants such as nutrients. Recognizing these multiple benefits, local water supply and water quality management agencies have worked together to develop and implement an integrated regional water management plan (IRWMP). The objectives of IRWMP are adopted based on a logical and intuitively appealing concept that the many different uses of finite water resources are interdependent. For example, less irrigation demands and generation of polluted runoff flows means more freshwater for drinking or other beneficial uses; if water has to be left in a river to protect fisheries and ecosystems, less can be diverted for

other needs. Achieving objectives and implementing priority projects recommended by the IRWMP over the next twenty years will significantly improve both the water supply and water quality in the region.

Objective 14.1: Increase local water supplies

During most years, the San Gabriel Mountains receive substantial rainfall and existing dams and natural storage slowly release runoff, providing an important source of high-quality and low-cost water that can be treated for direct use or recharged into groundwater basins for later use. At several locations, recharge is limited by capacity of existing recharge facilities. Rehabilitation and expansion of recharge facilities, modified operations of existing storage facilities, and rehabilitation and enlargement of operational practices could improve the utilization of this local water source.

Recharge or direct reuse of runoff from urbanized areas is generally limited by concerns about the presence of contamination. To increase the utilization of this local resource, runoff capture and infiltration could be expanded (where appropriate), the quality of surface runoff improved, and projects implemented to capture, treat, and utilize storm water for either non-potable direct use or recharge.

Milestone 14.1a: Capture, treat, and reuse dry weather and storm water runoff consistent with the numeric target set by the regional IRWMP.

Implementation Lead: Watershed cities, LA County, local water districts

Implementation Partners: LARWQCB

Role of the SMBRC: Facilitate

Milestone 14.1b: Treat and reuse contaminated ground water consistent with the numeric target set by the regional IRWMP.

Implementation Lead: Watershed cities, LA County, local municipal water districts.

Implementation Partners: LARWQCB

Role of the SMBRC: Promote

Milestone 14.1c: Develop standards for rain water use. Develop and implement financial incentives for storm water recharge projects that produce new water and offset reliance on imported potable water supply.

Implementation Lead: Watershed cities, LA County
Implementation Partners: LARWQCB

Role of the SMBRC: Promote and participate

Objective 14.2: Enhance water conservation

The region has long relied on imported water from sources located hundreds of miles away. But environmental commitments in the source regions, sustained drought conditions and the onset of climate change mean that we can and should no longer rely on the distant sources. The alternative is to look closer to home and set a new course for meeting water demands through conservation and recycling. Besides helping to address the region's water supply issue, water conservation can bring additional environmental benefits including less pollution from water and sewage treatment and consequently improved habitat quality in Santa Monica Bay, as well as avoiding the negative impacts of new dam and pipeline construction.

To address the urgent need to reduce water consumption, all public water supply agencies and many local municipalities have established short- and long-term strategies and implemented conservation measures. Some of these measures include expansion and enforcement of prohibited water use, outreach efforts, installation of water-saving hardware, conservation rebate and incentives, planting with California native drought tolerant plants, and expansion of gray water reuse systems, etc. All these conservation measures and programs should be enhanced and further expanded throughout the region.

Among all water conservation measures, it is worth singling out the additional benefits and value of native planting for restoring the ecological health of the Bay watershed. In addition to conserving water, planting of native vegetation that are adaptive to local soil and climate will help to reduce erosion and runoff, and improve water quality by reduced use of pesticides and fertilizers. Most important,

native plant landscaping can help return the area to a healthy natural ecosystem with diverse varieties of birds, insects, and other animal species re-colonizing in their native habitats. The Bay Commission has promoted and funded several native planting projects in the urbanized part of the watershed including the South Bay beach bluff restoration and the Stone Creek restoration project on the University of California, Los Angeles (UCLA) campus. The Commission will continue to work with its partners to promote adoption of new requirements in landscaping on public properties and to carry out more native planting projects in the watershed.

Milestone 14.2a: Reduce water demand by enhancing existing water conservation measures/programs.

Implementation Lead: *Regional and local water districts, watershed cities, LA County*

Implementation Partners: *N/A*

Role of the SMBRC: *Promote*

Milestone 14.2b: Develop and adopt new requirements for planting of native vegetation in landscaping on public properties.

Implementation Lead: *Regional and local water districts, watershed cities, LA County*

Implementation Partners: *N/A*

Role of the SMBRC: *Participate*

Milestone 14.2c: Provide financial incentives for water conservation.

Implementation Lead: *Regional and local water districts, watershed cities, LA County*

Implementation Partners: *N/A*

Role of the SMBRC: *Promote*

Objective 14.3: Further increase wastewater recycling and reuse (Also see Objective 1.3)

Much of the water consumed in Southern California is imported from hundreds of miles away. While billions of dollars are spent to build systems to keep pace with the growing demand for water, increasingly stringent environmental regulations have led to construction of equally costly facilities to treat and dispose of municipal wastewaters.

With the significant upgrading in the level of wastewater treatment, reclamation and recycling of the treated wastewater has become more feasible and an important alternative source of water supply for non-potable uses. Recycled water, which has undergone tertiary treatment, is currently used for a variety of purposes: landscape and agricultural irrigation, industrial uses such as cooling water supply, recreational and landscape impoundments, and environmental benefits such as re-establishing water-related habitat areas. Groundwater recharge is potentially the most important use of reclaimed water. It involves injecting highly treated reclaimed water into a groundwater basin to replenish water that has been removed through pumping or to create a seawater intrusion barrier. All allowable uses of reclaimed/recycled water are subject to strict water quality regulations overseen by the LARWQCB and the California Dept. of Public Health (CDPH).

Wastewater recycling can substantially reduce demand for imported water even where it is limited to non-potable uses. While of modest size, the Tapia Wastewater Reclamation Facility in the Malibu Creek watershed achieved 100 percent recycling – zero discharge - of its effluent in the summer by focusing its efforts on irrigated landscape at public parks, schools and road medians in this important watershed in north Santa Monica Bay. All biosolids from Tapia are also recycled locally at the Rancho Las Virgenes Composting Facility.

The two major POTWs with ocean outfalls in Santa Monica Bay now also have ambitious programs and have teamed-up with local water districts to significantly increase the amount of wastewater reclamation and recycling. and have plans in place to do so. The LADWP is developing a Recycled Water Master Plan that will be completed in 2010 that will identify uses and projects to achieve the goal of recycling 50,000 ac-ft/Year of water by 2019 as stated in the City of Los Angeles Water Plan unveiled by the Mayor in May 2008. In addition, the Master Plan will identify additional uses and projects beyond 2019 that will allow Los Angeles to further expand and maximize recycled water use from available Hyperion Treatment Plant effluent.

The City of LA and LACSD helped to formulate the ambitious targets in this Plan in order to gain broader stakeholder support for their recycling efforts. Additionally the SWRCB has developed a new recycled water policy to clarify regulatory issues of concern as we increasingly look toward recycled water as the best “new” source of water supply in our region.

Milestone 14.3a: Recycle sufficient wastewater to replace current imported water supplies in the area served by JWPCP of the LACSD (230,000 acre-feet per year) by 2020.

Implementation Lead: LACSD (JWPCP), West Basin Municipal Water District

Implementation Partners: MWD, SWRCB

Role of the SMBRC: Support

Milestone 14.3b: Increase use of recycled water recharge volume from the Hyperion Treatment Plant, including the City of LA’s planned delivery of 14,300 ac-ft/year in stages, in addition to the potential to supply WBMWD with up to 67,000 ac-ft/year by 2020.

Implementation Lead: LADWP, City of LA B. of Sanitation (Hyperion), West Basin Municipal Water District, City of LA DWP

Implementation Partners: MWD, SWRCB

Role of the SMBRC: Support

Milestone 14.3c: Increase the use of recycled water from the Tapia Water Reclamation Facility through expansion of the distribution and transmission system, regional partnerships for the sale of recycled water, and construction of a seasonal storage facility for recycled water by 2030.

Implementation Lead: LVMWD

Implementation Partners: LADWP

Role of the SMBRC: Support

Milestone 14.3b: Support investigation and study of opportunities for direct and indirect potable reuse by 2020.

Implementation Lead: Regional and local water districts.

Implementation Partners: CADPH, SWRCB, LARWQCB

Role of the SMBRC: Support

Appendix A. Summary of Santa Monica Bay Watershed TMDL Targets and Milestones

| Waterbody(s) | Pollutant | Effective Date | Compliance Target | Milestones |
|--------------------------------|---------------|------------------------|--|---|
| Santa Monica Bay - Dry Weather | Bacteria | July-15-2003 | Allowable exceedance days and rolling 30-day geometric mean targets during summer dry weather (April. 1 to Oct. 31) and winter dry weather (Nov. 1 to March. 31) | <ul style="list-style-type: none"> - Comply with summer dry-weather target by 7/15/06 - Comply with winter dry weather target by 7/15/09 |
| Santa Monica Bay - Wet Weather | Bacteria | July-15-2003 | <ul style="list-style-type: none"> - Cumulative percentage reduction from the total exceedance-day reductions required for each jurisdictional group - Final implementation targets in terms of allowable wet-weather exceedance days at each individual beach. In addition, geometric mean targets for each individual beach location [1] | <ul style="list-style-type: none"> - Achieve 25% reduction by 7/15/13 - Achieve a 50% reductions by 7/15/18 - Achieve final implementation target by 7/15/21 |
| Santa Monica Bay | DDTs and PCBs | Mar-26-2012 (EPA) | | |
| Santa Monica Bay | Marine Debris | March-20-2012 | | |
| Santa Monica Bay | Chlordane | Targeted for 2010-2011 | | |
| Santa Monica Bay | Metals | Targeted for 2011-2012 | | |
| Ballona Creek and wetland | Trash | Aug-8-2002 | Percent reduction from baseline load | <ul style="list-style-type: none"> - Achieve 50% reduction by 9/30/09 - Achieve zero trash by 9/30/15 |
| Ballona Creek Estuary | Toxics | Jan-11-2006 | Total percentage of drainage area meets waste load allocation (WLA) for sediment [2] | <ul style="list-style-type: none"> - Finalize implementation plan by 7/11/11 - 25% of area meets WLA by 1/11/13 - 50% of area meets WLA by 1/11/15 - 75% of area meets WLA by 1/11/17 - 100% of area meets WLA by 1/11/21 |
| Ballona Creek | Metals | Oct-29-2008 | Percentage of total drainage area meets waste load allocation (WLA) for sediment [2] | <ul style="list-style-type: none"> - Finalize implementation plan by 7/11/10 - 50% of area meets dry-weather WLA and 25% area meets wet-weather WLA by 1/11/12 - 100% area meets dry-weather WLA and 50% meets wet-weather WLA by 1/11/16 - 100% of area meets both dry and wet-weather WLAs by 1/11/21 |

Appendix

| | | | | |
|--|---|--|---|--|
| Ballona Creek, Estuary, Sepulveda Channel | Bacteria | April-27-2007 | Allowable exceedance days and rolling 30-day geometric mean targets for summer dry-weather, winter dry-weather, and wet weather | <ul style="list-style-type: none"> - Comply with the summer and winter dry-weather targets by 2013 - Comply with the wet-weather targets by 2017. |
| Ballona Creek Wetlands | Sediment and Invasive Exotic Vegetation | Mar-26-2012 (EPA) | | |
| Marina del Rey Harbor, Mother's Beach, and Back Basins | Bacteria | Mar-18-2004 | Allowable exceedance days and rolling 30-day geometric mean targets during summer (Apr 1 to Oct 31), winter dry-weather (Nov 1 to Mar 31), and wet-weather. | <ul style="list-style-type: none"> - Comply with summer and winter dry-weather targets by 3/18/07 - Comply with wet-weather target by 3/18/14, no later than 3/24/22 if an Integrated Water Resources Approach is implemented |
| Marina del Rey | Toxics | Mar-22-2006 | Percentage of total drainage areas meets WLA for sediment [1][2]. | <ul style="list-style-type: none"> - Finalize implementation plan by 9/22/11 - 25% area meets WLA by 3/22/13 - 50% area meets WLA by 3/22/15 - 75% area meets WLA by 3/22/17 - 100 % area meets WLA by 3/22/21 |
| Malibu Creek | Bacteria | Jan-24-2006 | Allowable days of exceedances of the single sample bacteria limits and the 30-day geometric mean limit during the summer dry-weather (Apr. 1 — Oct. 31), winter dry-weather (Nov. 1 — Mar. 31) and wet weather. | <ul style="list-style-type: none"> - Comply with summer dry-weather targets by 1/24/09 - Comply with winter dry-weather targets by 1/24/12 - Comply with wet weather targets by 1/24/16. |
| Malibu Creek | Trash | July-07-2009 | Percentage reduction from baseline WLA | <ul style="list-style-type: none"> - Achieve 20% reduction in 4 years - Achieve 40% reduction in 5 years - Achieve 60% reduction in 6 years; - Achieve 80% reduction in 7 years; - Achieve 100% reduction in 8 years. |
| Malibu Creek | Metals | Targeted for 2008-2009 | | |
| Malibu Creek | Nutrients | March-21-03 (EPA); under development (LARWQCB) | | |
| Malibu Lagoon | Benthic Community Effects | Targeted for 2010-2011 | | |

[1] If implementing an integrated approach.

[2] Milestones apply to MS4 and Caltrans only.

List of Acronyms:

ACOE: Army Corps of Engineers
AFY: Acre-Feet per Year
ARMP: Abalone Recovery and Management Plan
BMP: Best Management Practice
BRP: Bay Restoration Plan
CCC: California Coastal Commission
CCI: Community Conservancy International
CBI: Clean Beach Initiative
CBO: Community-Based Organization
CDPH: California Department of Public Health
CEQA: California Environmental Quality Act
CSLC: California State Lands Commission
CSUCI: California State University at Channel Islands
DDT: Dichloro-Diphenyl-Trichloroethane
DFW: California Department of Fish and Wildlife
DPR: California Department of Parks and Recreation
DWP: City of Los Angeles Department of Water and Power
EIR: Environmental Impact Report
EPA: U.S. Environmental Protection Agency
ESGS: El Segundo Generation Station
FCEC: Fish Contamination Education Collaborative
FMP: Fishery Management Plans
H&H: Hydrology and Hydraulic
HAB: Harmful Algal Bloom
IC: Institutional Controls
IRWMP: Integrated Regional Water Management Plan
JWPCP: Joint Water Pollution Control Plant
LA: Los Angeles
LACC: Los Angeles Conservation Corp.
LAC-DBH: Los Angeles County Dept. of Beaches and Harbors
LACSD: Los Angeles County Sanitation Districts
LARWQCB: Los Angeles Regional Water Quality Control Board
LAX: Los Angeles World Airports
LFD: Low-Flow Diversion
LVMWD: Las Virgenes Municipal Water District
MGD: Million Gallons per Day
MLPA: Marine Life Protection Act
MMS: Minerals Management Service
MPA: Marine Protected Areas
MRCA: Mountains Recreation and Conservation Authority

Appendix

MSRP: Montrose Settlements Restoration Program
MTAC: Marine Protected Areas Technical Advisory Committee
MVP: Minimum Viable Population
MWD: Southern California Metropolitan Water District
NEP: National Estuary Program
NMFS: National Marine Fisheries Service
NOAA: National Oceanic and Atmospheric Administration
NPS : National Park Service
NPDES: National Pollutant Discharge Elimination System
NRDC: Natural Resources Defense Council
NZMS: New Zealand Mudsnails
OPC: Ocean Protection Council
OTD: Offer to Dedicate
OEHHA: California Office of Environmental Health Hazard Assessment
PAH: polycyclic aromatic hydrocarbon
PCB: Polychlorinated biphenyls
PCH: Pacific Coast Highway
PFMC: Pacific Fisheries Management Council
POTW: Publicly Owned Treatment Works
PSMFC: Pacific States Marine Fisheries Commission
PV: Palos Verdes
PVPLC: Palos Verdes Peninsula Land Conservancy
RCDSMM: Resource Conservation District of the Santa Monica Mountains
SMBBB: Santa Monica Bay Beaches Bacteria
SCCWRP: Southern California Coastal Water Research Project
SCWRP: Southern California Wetlands Recovery Project
SCC: State Coastal Conservancy
SCCOOS: Southern California Coastal Ocean Observing System
SMBRC: Santa Monica Bay Restoration Commission
SMBRP: Santa Monica Bay Restoration Project
SMMC: Santa Monica Mountains Conservancy
SWRCB: California State Water Resources Control Board
TBT: Tributyltin
TMDL: Total Maximum Daily Load
UCLA: University of California, Los Angeles
WDR: Water Discharge Requirement
WLA: Waste Load Allocation
WRF: Water Reclamation Facilities