



Section VI

Water Quality

- **Beach Closures and Microbial Contamination Action Plan**
- **Cruise Ship Discharges Action Plan**
- **Water Quality Protection Program Action Plan**

Beach Closures and Microbial Contamination Action Plan

Goal

Eliminate beach closures by reducing microbial contamination in Monterey Bay National Marine Sanctuary (MBNMS) waters.

Introduction

The central coast of California is internationally known for its incomparable shoreline. Travelers come from around the world to enjoy outstanding recreational opportunities including swimming, surfing, diving and kayaking; to view the spectacular coastal scenery; to observe wildlife resources such as sea otters, whales, and seabirds; and to enjoy the seemingly pristine beauty of the ocean. Public concern over the conservation of this exceptional resource led Congress to designate the MBNMS for its ecological significance and singular beauty.

During the designation of the Sanctuary in 1992, eight key water quality agencies within the Sanctuary region entered into a Memorandum of Agreement (MOA) to provide an ecosystem-based water quality management process. The agreement led to the development of the Sanctuary's Water Quality Protection Program (WQPP), a partnership of twenty-five federal, state and local agencies, and public and private groups dedicated to protecting and enhancing water quality in the Sanctuary and its watersheds. This partnership of MOA signatories, additional public agencies, non-governmental and private organizations are working as members of the WQPP Committee, which oversaw the development of four action plans entitled: Implementing Solutions to Urban Runoff; Regional Monitoring, Data Access, and Interagency Coordination; Marinas and Boating; and Agriculture and Rural Lands. Since the designation in 1992, runoff and spills along the MBNMS's coastline have periodically resulted in high levels of coliform bacteria being detected in coastal waters, resulting in hundreds of beach closures or warnings annually. This plan was initiated to address the issue of beach closures and will constitute the fifth action plan as part of the WQPP.

Microbial Contamination

Coliform bacteria are used as indicator organisms, and while they may not cause disease in humans, their presence tells us that water may be contaminated with organisms that do cause health impacts ranging from fever, flu-like symptoms, ear infection, respiratory illness, gastroenteritis, cryptosporidiosis, and hepatitis. Not only can humans be affected, but research into the cause of an alarming rise in mortality among the threatened southern sea otter population shows that infectious agents have been implicated in nearly 40 percent of these deaths. Preliminary data suggest that many of these deaths are caused by protozoal parasites and bacteria that are spread by fecal contamination of nearshore marine waters by terrestrial animals or humans.

The local economies are also affected by beach closures. Tourism is the second largest industry in the Central California region after agriculture. Although definitive statistics are lacking, because much of the tourism is related to the coast, an image of closed or contaminated beaches

could be a multi-million dollar threat to the local economy. A significant aquaculture and kelp harvesting industry within the MBNMS is highly dependent upon unpolluted water, and beach closures cost local economies tourist dollars and jobs, and represent a loss to those who had planned beach visits.

Sources of contaminated water include runoff from urban, suburban and rural areas, an aging sewer infrastructure system pressed to meet increasing demands, contaminated flows from creeks and rivers and unidentified sources. Contributing factors that generate these sources include illicit storm drain connections, improper disposal of materials that clog pipes and cause overflows, cracked or damaged pipes, overflow of sewer systems during storm events, septic system leaching, nonpoint pollutant loading exposed to storm runoff, and various domestic and wildlife sources.

Beach Closures and Warnings

Beach closures or warnings result from a known discharge of sewage, or laboratory results that indicate that the probable number of indicator organisms contained in a water sample exceed water quality standards. Since the identification of pathogens such as viruses in ocean water is difficult, time consuming, and expensive, current water quality testing methodology relies on the usage of the more readily detected and quantified coliform and fecal streptococci bacteria as indicator organisms. These organisms include total coliform, fecal coliform and enterococcus.

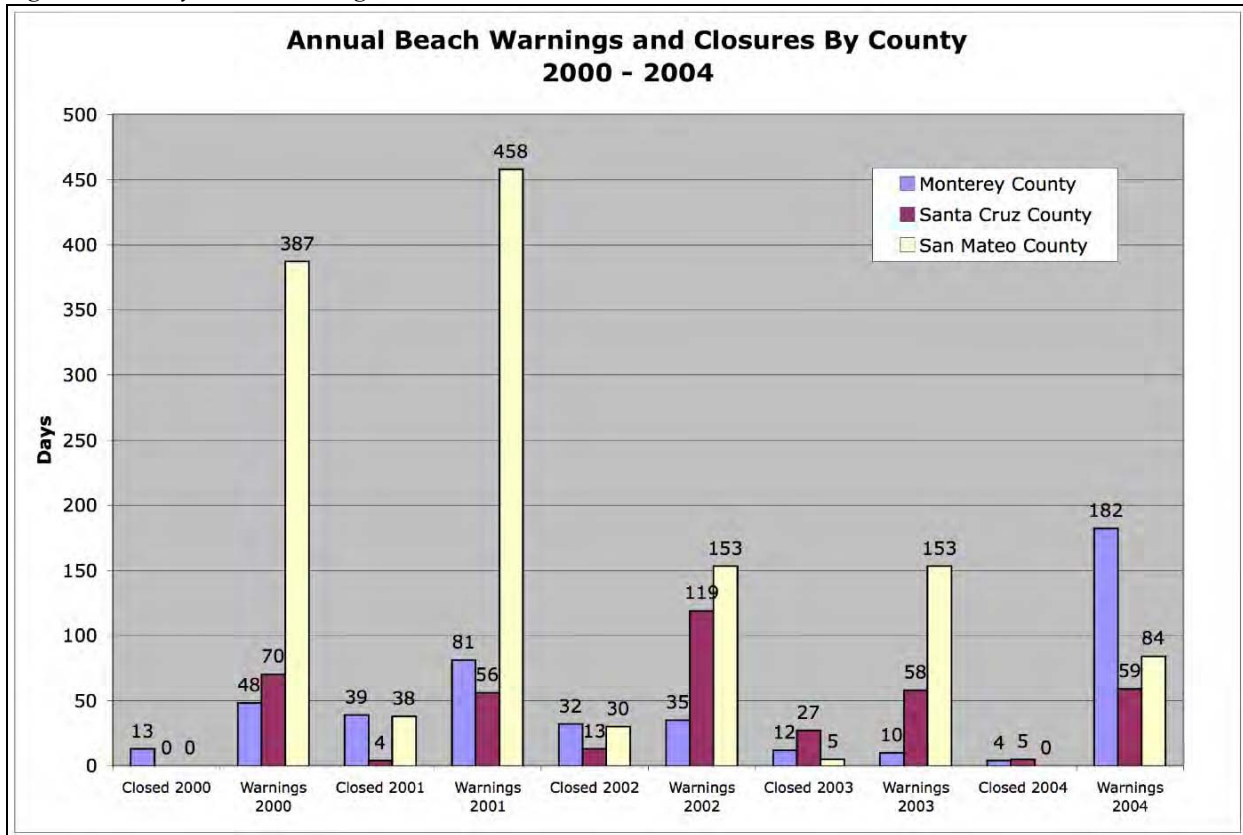
County Health Officers can take three discrete actions including closing a beach, issuing a warning, or announcing a rain advisory based on beach water quality monitoring data, sewage spills, and storm events.

- A. “Beach (ocean) Closure” occurs because of a known sewage spill or from repeated incidences of exceeding bacterial standards due to an unknown source. A closure is a notice to the public that the water is unsafe for contact and that there is a high risk of getting ill from swimming in the water. When a beach is closed, signs are posted alerting the public to stay out of the water.
- B. A “Beach Warning” sign means that at least one bacterial standard has been exceeded, but there is no known source of human sewage. The posting of warning signs alerts the public of a possible risk of illness associated with water contact. The placement of signs may be short-term, when a single bacterial indicator standard is exceeded, or more permanent where monitoring indicates repeated contamination (e.g., from a storm drain). Warnings may also be posted where sources of contamination are identifiable and can be explained as not of human origin (e.g., resident marine mammals or seabirds).
- C. A “Rain Advisory” is often issued when it rains because it is known from past experience that rainwater carries pollution to the beach. After a rain, bacteria counts usually exceed the state standards for recreational water use.

It is important to recognize that there is a fundamental difference between beach closures and beach warnings. Beach closures result from known sewage spills or repeated exceedances of standards from unknown sources, whereas beach warnings are a result of an exceedance of standards, but where there is no known source of human sewage. Domestic discharges account for a high percentage of beach closures, but closures occur less frequently than warnings.

Beginning in 1999, AB411 required local health officers to conduct weekly bacterial testing between April 1 and October 31, of waters adjacent to public beaches having more than 50,000 visitors annually and that are near storm drains flowing in the summer. This increased monitoring is responsible for a pronounced jump in the number of beach closures and postings between 1998 and 1999. Since this initial jump, MBNMS beaches have continued to suffer from hundreds of closures or postings annually.

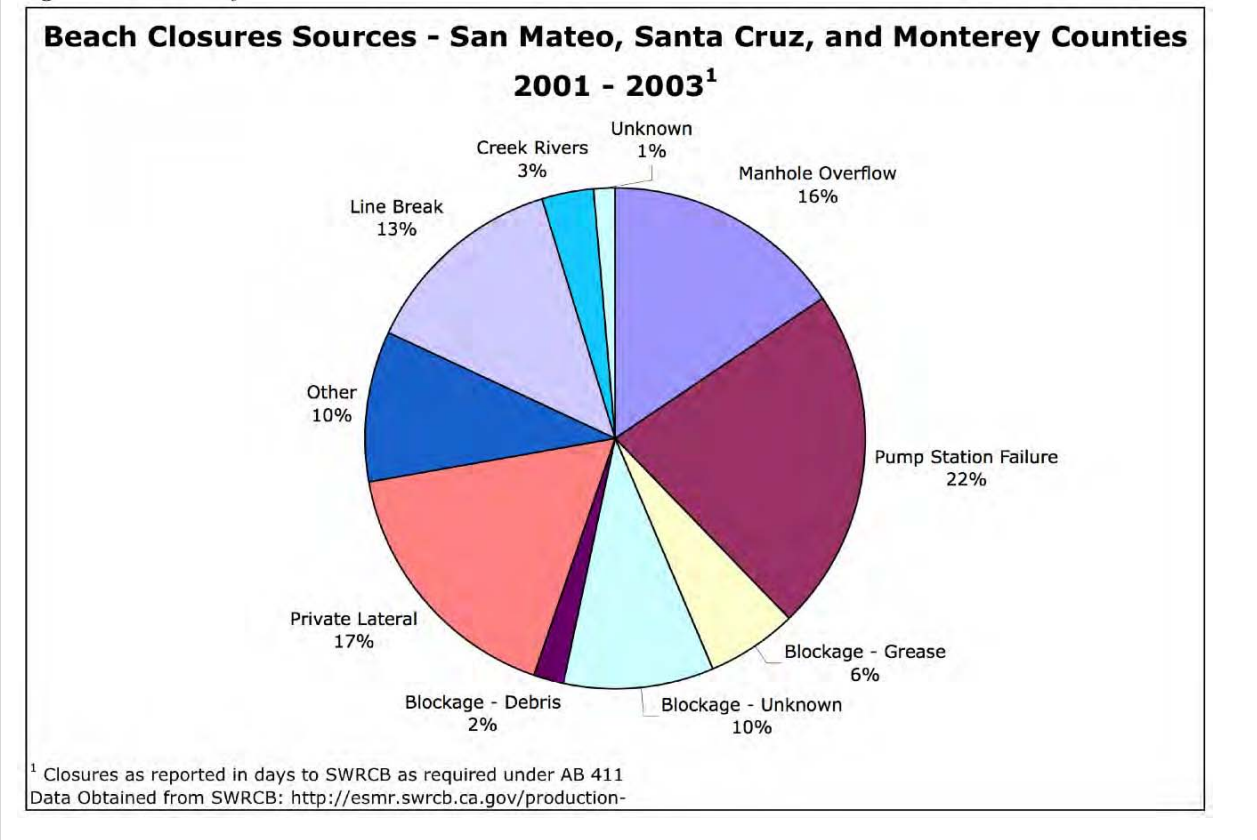
Figure 1. County Beach Warnings and Closures



While California has instituted the most comprehensive water quality monitoring programs in the nation, the program is compromised because current methods of enumerating indicator bacteria are too slow to provide full protection from exposure to waterborne pathogens. The methods used to monitor and post beaches are insufficient to accurately detect contamination and warn the public accordingly. Indicator bacteria assays take eighteen to thirty-six hours to complete, and during this time beachgoers may be exposed to harmful pathogens. By the time the beach is posted, the indicator bacteria may no longer be present in the nearshore waters. Thus, a beach may be open when it is contaminated, and posted when it is clean. In addition, this lag time makes it difficult to track sources of microbiological contamination as the source has often become dispersed over a wide area by the time investigators arrive on the scene. Beach water quality monitoring is also temporally and geographically limited. Resources preclude environmental health departments from monitoring entire stretches of beaches, and at most, these locations are monitored bi-weekly. Recently published data show that temporal changes in indicator bacteria levels in beach water occur much more rapidly.

Many types of animals produce the indicator organisms, and a high percentage of beach closures and warnings are the result of unknown or diffuse sources. Data contained in the 2000 California Beach Closure Report shows statewide sources of contamination.

Figure 2. Sources of Closures



Strategy BC-1: Enhance Use of Geographic Information System (GIS)

GIS can be a powerful tool that decision makers can use to define problems and allocate resources. Local jurisdictions are encouraged to utilize GIS when making decisions about infrastructure replacement or when performing upstream analysis. Project prioritization could be determined by their proximity to sensitive areas or heavily used beaches. For the purpose of this plan, GIS refers to any mapping or drawing package, whether or not data is externally referenced.

Activity 1.1: Map of Beach Sampling

The MBNMS will work with water quality program partners to produce a beach sampling database with maps indicating the sites and beaches in MBNMS that are sampled, the sampling stations, and a time series function to visually display an individual beach's record of closures or of being "clean." This data will be prepared and used by MBNMS staff.

Activity 1.2: Expand and Continue to Encourage Local Jurisdictions to Map Septic Sewer and Storm Drain Lines, and to Record Data on Reported Spills, Blockages, and Lateral Line Cleaning Work

MBNMS staff will continue to encourage increased data recordation for infrastructure problems and improvements. MBNMS will facilitate and work with partners to coordinate local and

regional efforts and methods with those developing Sewer System Management Plans and to encourage data and technology sharing between jurisdictions.

Activity 1.3: Encourage Local Jurisdictions to Map Problem Infrastructure Areas, Sensitive Habitats, Land Uses, Outfall Locations, and Critical Beaches

MBNMS staff will work with local jurisdictions to map infrastructure including sewer and storm drain information as well as the location, cause and receiving waters of sanitary sewer overflows. MBNMS will also work with researchers, SIMoN and others to characterize sensitive habitat or areas of high recreational use that could be impacted by sanitary sewer overflows.

Activity 1.4: Determine Proximity of Problems to Sensitive Areas and Heavily Used Beaches to Develop Priorities and Generate Funding

The information collected in Activity 1.3 will be compared against water quality data and areas of sensitive habitats and high recreational use in order to recruit resources, direct the implementation of management measures, and provide feedback on ongoing activities.

Strategy BC-2: Expand Pathogen and Contamination Research

Laboratory analysis of the three indicator organisms can take up to forty-eight hours during which beachgoers may be exposed to harmful pathogens. In addition, recent studies show that beach water quality can vary greatly on both a temporal and spatial scale. To address these problems, the Sanctuary will seek to assist, encourage, and monitor developments in rapid indicator assessment, explore other potential indicators or methods that detect the pathogens themselves, and perform upstream genetic source analysis studies.

Activity 2.1: Investigate and Implement Rapid Indicator Assessment

Current indicator analysis requires eighteen to twenty-four hour incubation times, and monitoring is geographically and temporally limited. Finding methods that can process samples in less time will reduce the risk to public health by ensuring that water quality is accurately evaluated and posted. The MBNMS will expand the Sanctuary Integrated Monitoring Network (SIMoN), and coordinate with research organizations with expertise in real-time monitoring such as the Monterey Bay Aquarium Research Institute (MBARI), and the Southern California Coastal Water Research Project (SCCWRP). The purpose of these efforts will be to implement methods that will result in quicker turn around times between sample and results (e.g., biosensors, enzymatic assays, Polymerase Chain Reactivity [PCR]) and to investigate and adopt real-time, continuous monitoring techniques.

Activity 2.2: Explore Other Potential Indicators

An ideal indicator organism would be found only when disease-causing agents were present at densities that could cause human health problems. Recognizing that current fecal indicators fall short of this goal, and are neither the most precise nor easily assayed, evaluate alternate indicators such as fecal sterols, caffeine, and long-chain alkylbenzenes (LABs – synthetic surfactant).

Activity 2.3: Explore the Potential to Analyze for Specific Pathogens

The MBNMS will coordinate with partners to facilitate research for techniques that allow for the direct measurement of agents suspected of affecting human and marine health. Indicator

organisms do not directly correspond to human health problems, and only indicate the potential presence of pathogens from untreated or partially treated sewage or contaminated runoff. Alternatively, waterborne pathogens are difficult to detect and quantify, and specific methodology to detect them in samples is only in the development stages.

Activity 2.4: Conduct Genetic Studies at Key Locations to Distinguish Bacteriological Sources

Information on the human or animal origin of fecal pollution gives an indication of the types of pathogens that may be expected, the risk of infection, and the treatment that may be required to control the transmission of disease. MBNMS will coordinate with agencies and scientists on appropriate techniques to distinguish between anthropogenic and animal sources of contamination, which will help to better assess health risks and allocate resources.

Strategy BC-3: Increase Monitoring Network

Resources and staffing among local, state, and federal agencies limit the frequency and number of beaches that can be monitored on a regular basis, which can potentially jeopardize public health. MBNMS staff will seek to develop scientifically justified monitoring protocols to ensure that contact with contaminated waters is reduced to the highest practicable extent. MBNMS will also coordinate and collaborate with existing monitoring programs, and utilize the best available indicators and analysis equipment developed through ongoing research.

Activity 3.1: Increase Number and Frequency of Beach Sampling

MBNMS will work with partners to expand monitoring to locations with reported incidences of illness or where physical features (e.g., proximity to runoff, enclosed waters) suggest high contamination levels.

Activity 3.2: Encourage Increased Upstream Monitoring by Local Agencies

The MBNMS will partner with local public works agencies, and when feasible, enlist volunteers to assist in increased upstream monitoring and assessment through collaboration with the Sanctuary Citizens Watershed Monitoring Network.

Activity 3.3: Incorporate Monitoring Network Data Into SIMoN

MBNMS will incorporate summarized water quality monitoring data, including contamination data, monitoring stations, and warning/closure data into SIMoN.

Figure BC.3 Water Quality Monitoring Stations in Northern MBNMS

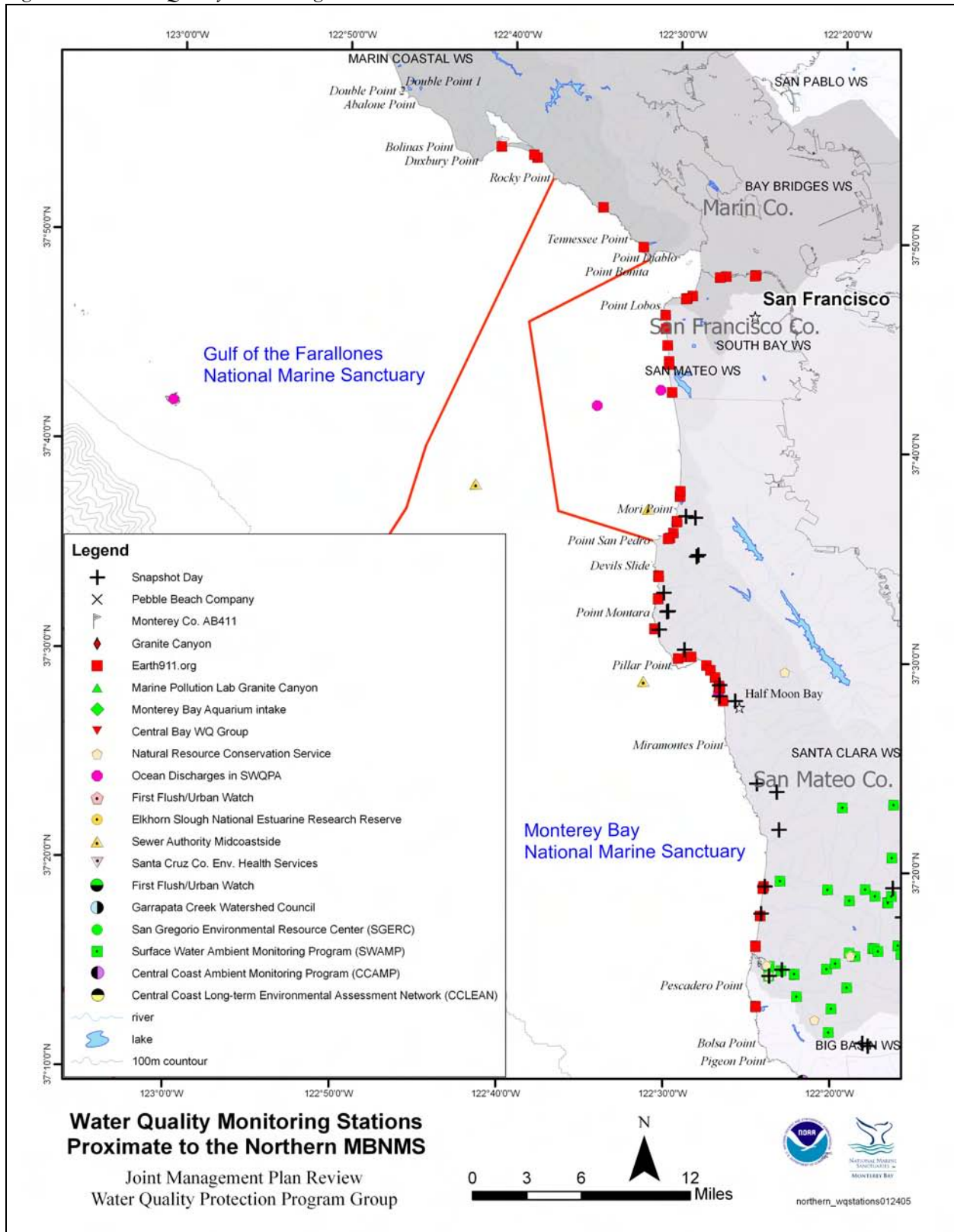


Figure BC.4 Water Quality Monitoring Stations in Central MBNMS

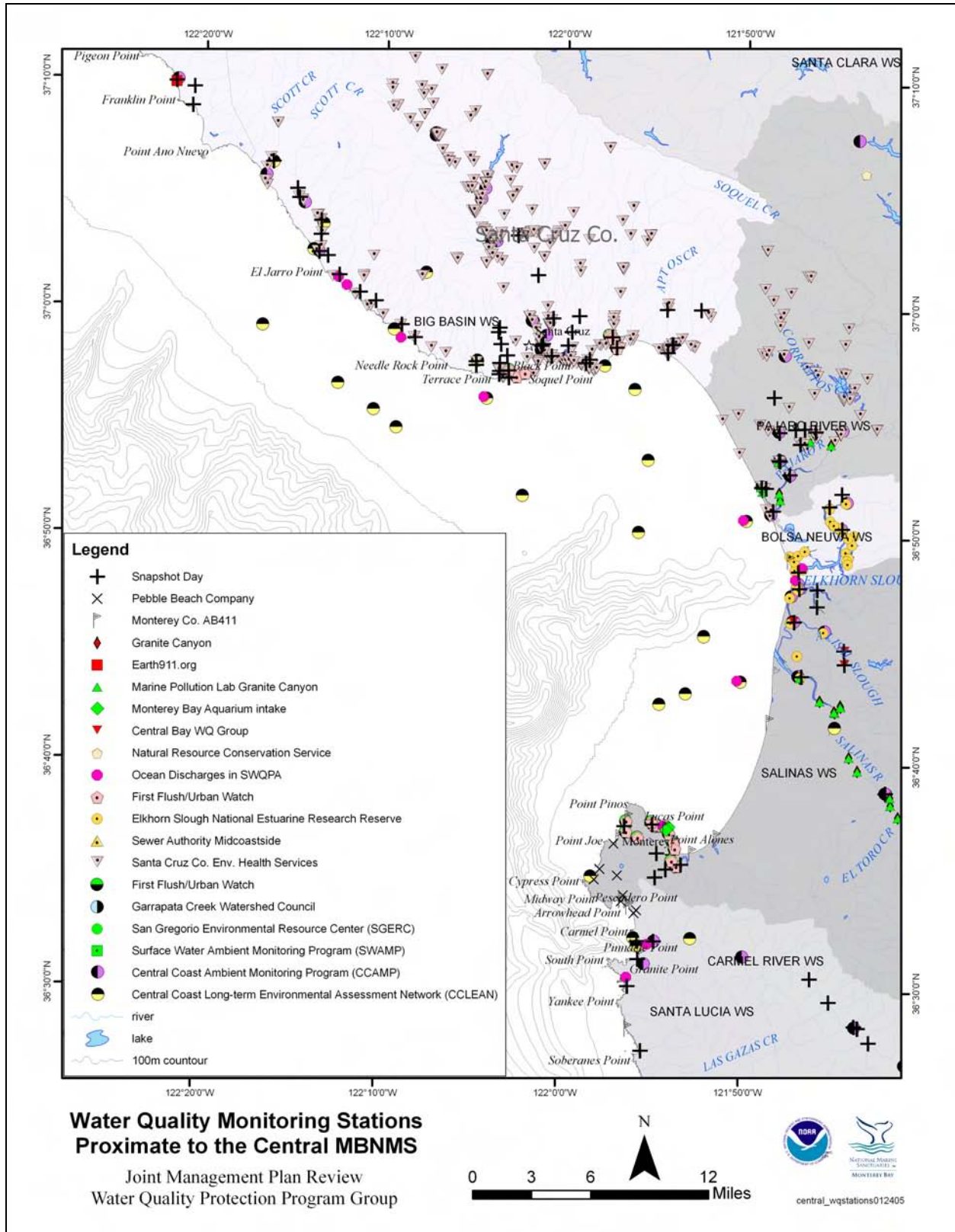
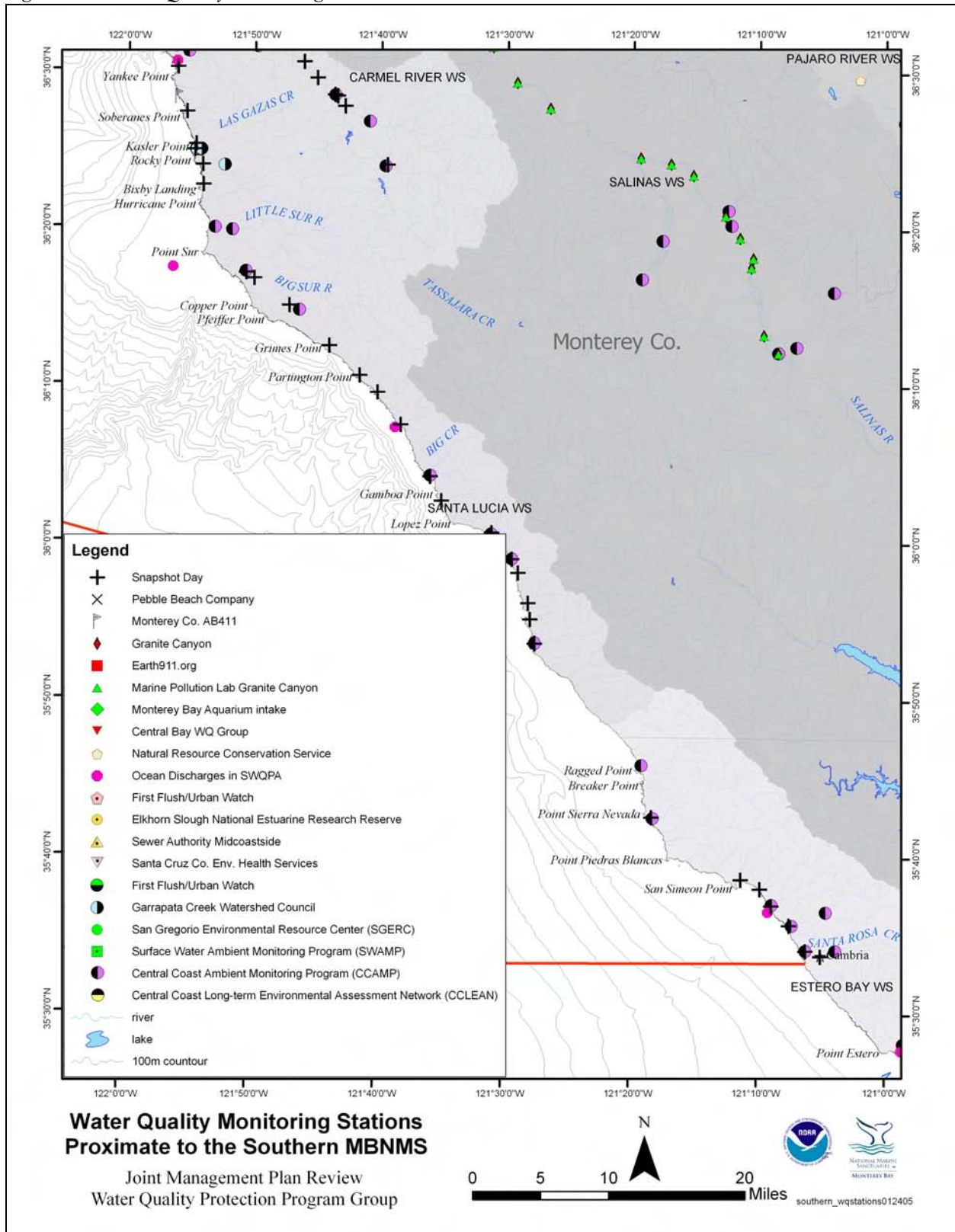


Figure BC.5 Water Quality Monitoring Stations in Southern MBNMS



Strategy BC-4: Enhance Notification Program

The MBNMS will seek to continue and expand upon existing notification systems in an effort to increase public access to water quality information before they depart for the beach.

Activity 4.1: Develop Improved Notification System for User Groups

The MBNMS will work with local agencies to ensure that user groups have the appropriate beach status information before departing for the beach and, if beaches are closed or warnings posted, provide the expected date of “open” status. Each beach closure or warning notification should indicate the cause of the closure or warning. Enhancement opportunities and activities include:

- Continue and expand recorded phone messages
- Continue and expand county websites and links to MBNMS and regional websites
- Evaluate additional links/programs to improve access to information
- Ensure that groups are aware of notification resources through public relations announcements
- Support and Enhance Surfrider Foundation’s fax notification system

Activity 4.2: Coordinate Notification Systems with Education and Outreach Efforts

Enhanced and rapid notification must be coordinated with education and outreach efforts to ensure that the public understands which beaches are closed and why the beach is closed. Increased public understanding of the cause of the spill, the effects of contamination, and which areas are closed will facilitate corrective action.

Strategy BC-5: Increase Source Control Program

Private and public sanitary sewer systems, septic systems, and urban runoff are a significant pathway of anthropogenic bacterial contamination.

Activity 5.1: Work with Local Jurisdictions to Enhance the Repair and Replacement of Sewer Mains

The MBNMS will coordinate with and encourage local agencies to prepare a regional database of main line repair and replacement projects drawing on those developed by local jurisdictions. The MBNMS will work to analyze this data in a GIS database and rank projects based on downstream closures and postings, proximity to sensitive resources, or high-use beaches. This information can then be used to identify the greatest needs for improvements and provide justification for resource expenditures.

Activity 5.2: Reduce Exfiltration and the Number of Sanitary System Overflows

The MBNMS will coordinate with entities developing Sewer System Management Plans required by Waste Discharge Requirements (WDR) to ensure adequate ongoing maintenance and promote community support through outreach and public awareness. The MBNMS will encourage partners to coordinate to:

- A. Utilize GIS and monitoring to improve identification, tracking, management, and follow up of main line obstructions, particularly locations with repeated incidences.

- B. Leverage resources and assist with the development of source control measures and public outreach and education focused on preventing sewer system overflows resulting from the introduction of fats, grease, and other materials that cause blockages. Expand these programs to a regional level.
- C. Ensure proper installation, testing, and inspection of sewers.
- D. Develop a local or regional approved vendor list, franchise, or program similar to the clean business certification program for grease haulers and line clearing vendors.
- E. Investigate alternative main line cleaning technologies.
- F. Assist local jurisdictions in funding line clearing and pump station maintenance/repair activities, and utilize the Sanctuary to develop public support for these activities.
- G. Encourage jurisdictions to require reporting of interceptor/trap cleaning and lateral cleaning.
- H. Conduct technical training/public education and outreach.
- I. Address illicit connections, and continue and expand the detection program under Phase 2 efforts.

Activity 5.3: Work with Local Jurisdictions to Reduce the Number of System Upsets Caused by Private Laterals

The MBNMS will coordinate with partners to create mechanisms that identify and correct chronic problem areas. Public agencies cannot implement lateral maintenance because of the disruption that would occur on private property during rehabilitation, costs involved, and potential liability issues. Homeowners, for their part, are also reluctant to undertake repairs, as costs are typically \$3,000 or more. This strategy encourages cities to implement a method that will reduce the number of overflows from laterals.

- A. *Three-Strikes Ordinance*
If city crews are called to a site three times in a one-year period, encourage local jurisdictions to issue a cease and desist order to the homeowner to repair the problem within ten days. If the problem is classified as a nuisance, city crews can fix it immediately.
- B. *Sale/Transfer Inspection Program*
Work with local jurisdictions to develop an ordinance that requires the inspection of laterals prior to the sale or transfer of a property, which will require maintenance or repair of defective or damaged laterals.
- C. Develop an “approved” vendor list for the Sanctuary cities and counties, modeled after existing program such as the clean business program.
- D. Develop a voluntary lateral inspection and repair program.

Activity 5.4: Work with Local Jurisdictions to Reduce Input from Septic Systems

The MBNMS will encourage jurisdictions to develop a GIS layer of houses on septic systems and correlate this to problem areas based on data from citizens, city, county, and monitoring efforts. The MBNMS can then work with partners to:

- A. Target areas suspected of impacting water quality with educational materials.
- B. Inform citizens on proper use and maintenance.

- C. Ensure that pumpers are reporting system maintenance and require pumpers to submit logs.
- D. Encourage local jurisdictions to implement sale/transfer inspection program.
- E. Encourage local jurisdictions to utilize a clean business–type program for pumpers.
- F. Hold pumpers strictly accountable for improper disposal.

Activity 5.5: Work with Local Jurisdictions to Reduce Microbial Contamination from Urban Runoff/ Storm Drains

The MBNMS will work to coordinate efforts to prepare regional educational, outreach and technical materials that address the issue of beach closures and investigate cost effective measures to treat or divert urban runoff where source control measures prove ineffective. The MBNMS will also coordinate with partners and local jurisdictions to:

- A. Increase the number of RV pump-out stations and provide incentives for their use
- B. Remove sediments in catch basins and other areas prior to the first rains of the season
- C. Develop a mechanism to address waste from homeless camps
- D. Pet Droppings – Utilize existing materials and, as necessary, develop new methods, materials, or devices that will ensure that people clean up after their pets

Strategy BC-6: Increase Technical Training for Industry Professionals

There is a need to raise the level of awareness of professionals in the plumbing, sewer, and restaurant industry as to their potential impact on water quality via the sewer system.

Activity 6.1: Coordinate with Local Jurisdictions to Educate Plumbers, Grease Trap, and Sewer Industry on Proper Cleaning Techniques and Promote Reporting Program

The MBNMS will coordinate with local jurisdictions to raise the level of awareness of each of these industries to their impacts on the overall system and train restaurant personnel in the proper use and maintenance of grease equipment. The MBNMS should work with its partners to let plumbers know that line cleaning can move clogs into city mains, train restaurant personnel in the proper use and maintenance of grease equipment, and promote an interagency reporting program that will alert city staff to potential problems, e.g., problem laterals, behavioral problems, septic system malfunctions, improper grease disposal.

Activity 6.2: Working through Local Jurisdictions, Utilize Existing, or Adapt New Outreach/Training Modules for Targeted Public Servants

Activity 6.3: Develop Spill Response Training Module (See Emergency Response Strategy)

Strategy BC-7: Enhance Public Outreach of Contamination Sources and Solutions

MBNMS will work with partners to develop a comprehensive educational program that increases the public’s understanding of the issue, the sources of contamination, and the solutions. Because funding is critical to source control, the education strategy will also seek to develop support for local funding initiatives.

Activity 7.1: Enhance Public’s Understanding of the Importance of Reducing Microbial Contamination, the Sources of Contamination

The MBNMS will work with local agencies, the Regional Water Quality Control Board (RWQCB), and other partners to increase the public’s understanding of beach closures. This includes coordination with the enhanced notification system, so that the public has a real-time understanding of the health of the beaches as well as increasing awareness of the causes of a beach closure when it occurs, the cause of the closure and warning, and work to identify and implement the solution.

Activity 7.2: Develop Coordinated Regional Outreach Program Building and Expanding on Existing Materials and Efforts

The MBNMS will coordinate with regional Phase I and Phase II efforts, existing MBNMS outreach material, including Multicultural Education for Resource Issues Threatening Oceans (MERITO), to ensure consistent messages, facilitate collaboration with various groups, and leverage resources regarding contamination sources and solutions such as proper septic tank maintenance, pet care, and grease disposal.

Strategy BC-8: Increase and Coordinate Enforcement

The MBNMS will seek to collaborate and leverage resources with the RWQCBs to ensure efficient enforcement of sewage spills in line with the authorities and protocols established in the Portor-Cologne Water Quality Act, the State Water Resources Control Board’s (SWRCB’s) enforcement policy, and Sanctuary regulations and enforcement policy.

Activity 8.1: Review Past Oversight and Sanctuary Notification of Spills, and Use this Information to Develop Effective Protocol for Collaboration Between Agencies

The MBNMS will work with partners to review past enforcement efforts by the RWQCBs and National Oceanic and Atmospheric Administration (NOAA) to identify gaps, inconsistencies and opportunities for collaboration. The MBNMS and RWQCBs will develop a system to track spills and communicate on enforcement actions.

Activity 8.2: Coordinate and Strengthen Enforcement Actions with the RWQCBs

Develop adequate means to investigate and pursue necessary enforcement actions and leverage limited enforcement resources through interagency coordination. The MBNMS will develop a suite of legal response options for addressing violations.

Strategy BC-9: Improve Emergency Response Program

The MBNMS, in collaboration with local agencies and the RWQCB, will seek to track spills and ensure that a rapid, 24-hour-a-day spill response is available and that proper containment, disinfection and source control policies are developed and implemented.

Activity 9.1: Improve Reporting and Tracking of Spills

The MBNMS will work with partners to develop a single telephone number that, when called by local governments or sewage districts, business, or the public, will alert all appropriate agencies, including the Sanctuary, to the presence of a spill to ensure rapid containment response. This activity must include a system to adequately log spills and track follow-up actions.

Activity 9.2: Encourage Local Governments to Develop Cross-Departmental, On-Call Systems, that Will Ensure Rapid, 24-Hour-a-Day Spill Response

Activity 9.3: Encourage Local Governments to Develop Model Spill Response Program that Ensures Proper Techniques for Containment and Source Control

Activity 9.4: Provide Sanctuary Enforcement Presence in the Field to address Reported Spills and Assess Injury

Action Plan Partners: Public Works agencies, Coastal Conservancy, Central Coast Joint Data Committee, Southern California Coastal Watershed Research Project, State Water Resources Control Board’s Beach Water Quality Workgroup, Counties, Monterey Bay Aquarium Research Institute, Moss Landing Marine Labs, universities, Sanctuary Integrated Monitoring Network (SIMoN), private sector research laboratories/firms, Water Environmental Research Foundation, UC Davis, County’s Department of Environmental Health, Central Coast Long-term Environmental Assessment Network, Sanctuary Citizens Watershed Monitoring Network, State and County parks, TV and radio news media, Coastal Commission, Surfrider Foundation, regional dive and surf shops, individual haulers, Monterey Regional Water Pollution Control Agency, Local public works agencies, Regional Water Quality Control Boards, Environmental Protection Agency.

Table BC.1: Measuring Performance of the Beach Closures and Microbial Contamination Action Plan

Desired Outcome(s) For This Action Plan:	
Reduce beach closures and postings by reducing anthropogenic microbial contamination in MBNMS waters.	
Performance Measures	Explanation
By 2012, eliminate beach closures and reduce the number of beach postings by 30% due to anthropogenic microbial contamination in the MBNMS.	Beach closures and warnings due to microbial contamination are tracked through postings of the County Environmental Health Departments. Measuring the number of beach closures and warnings in the MBNMS can be calculated by aggregating the monthly or seasonal reports from the county health department’s various reporting mechanisms. These will be reported annually. This performance measure relies on the success of partners yet reflects the importance of not having any beach closures in the MBNMS.

Table BC.2: Estimated Timelines for the Beach Closures and Microbial Contamination Action Plan

Beach Closures and Contamination Action Plan	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy BC-1: Enhance Use of Geographic Information System (GIS)	●	●	▶
Strategy BC-2: Expand Pathogen and Contamination Research	●	▶
Strategy BC-3: Increase Monitoring Network	●	●	▶
Strategy BC-4: Enhance Notification Program	●	●	▶
Strategy BC-5: Increase Source Control Program	●	●	▶
Strategy BC-6: Increase Technical Training for Industry Professionals	●	●	▶
Strategy BC-7: Enhance Public Outreach of Contamination Sources and Solutions	●	●	▶
Strategy BC-8: Increase and Coordinate Enforcement	●	●	▶
Strategy BC-9: Improve Emergency Response Program	●	▶
Legend					
Year Beginning/Ending	: ● — ●	Major Level of Implementation: —			
Ongoing Strategy	: ● —▶	Minor Level of Implementation:			

Table BC.3: Estimated Costs for the Beach Closures and Microbial Contamination Action Plan

Strategy	Estimated Annual Cost (in thousands)*				
	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy BC-1: Enhance Use of Geographic Information System (GIS)	\$124	\$32	\$24	\$20	\$20
Strategy BC-2: Expand Pathogen and Contamination Research	\$524	\$24	\$24	\$0	\$24
Strategy BC-3: Increase Monitoring Network	\$191	\$191	\$569	\$219	\$219
Strategy BC-4: Enhance Notification Program	\$29	\$22.5	\$12	\$48	\$48
Strategy BC-5: Increase Source Control Program	\$211	\$211	\$211	\$211	\$211
Strategy BC-6: Increase Technical Training for Industry Professionals	\$51	\$76	\$76	\$76	\$76
Strategy BC-7: Enhance Public Outreach of Contamination Sources and Solutions	\$70	\$60	\$60	\$50	\$50
Strategy BC-8: Increase and Coordinate Enforcement	\$28	\$24	\$24	\$24	\$24
Strategy BC-9: Improve Emergency Response Program	\$28	\$28	\$20	\$12	\$12
Total Estimated Annual Cost	<i>\$1,256</i>	<i>\$668.5</i>	<i>\$1,020</i>	<i>\$660</i>	<i>\$684</i>

* Cost estimates are for both “programmatic” and “base” (salaries and overhead) expenses.

Cruise Ship Discharges Action Plan

Goal

Prevent impacts to Monterey Bay National Marine Sanctuary (MBNMS) resources from cruise ship discharges.

Introduction

Worldwide, cruise ships constitute a large and rapidly growing industry. Although partly constrained by the lack of local docking facilities, cruise ship visits to Monterey are likely to continue to grow as the fleet is shifting from international to more domestic cruises, and due to a new cruise ship docking

facility planned for San Francisco Bay. Due to their sheer size, capacity for passengers and crew (between 1,000 and 5,000 people), and environmental practices, cruise ships can cause serious impacts to the marine environment. The main pollutants generated by a cruise ship are: sewage, also referred to as black water; gray water; oily bilge water; hazardous wastes; and solid wastes. Cruise ship discharges include such harmful matter as sewage, gray water, bilge water, ballast water, solid waste and other hazardous materials.

Figure CS-1: E/V *Sharkcat* and M/V *Crystal Harmony*



- A. Sewage includes vessel sewage and wastewater from medical facilities. Sewage from ships is generally more concentrated than that from land based sources, as it is diluted with less water when flushed (three quarts versus three to five gallons). Sewage discharge can contain bacteria or viruses that cause disease in humans and other wildlife. It can present a public health concern, if discharged in the vicinity of marine life harvested for human consumption, or in or near waters used for recreational activities such as swimming, diving, or boating. Volumes of sewage for a typical cruise ship have been estimated at between five to ten gallons per person per day, or up to 280,000 gallons per week.
- B. Gray water consists of wastewater from sinks, showers, laundry, and galleys. It can contain a number of pollutants including: suspended solids, oil, grease, ammonia, nitrogen, phosphates, copper, lead, mercury, nickel, silver and zinc, detergents, cleaners, oil and grease, metals, and pesticides. A typical cruise ship produces an estimated 1,000,000 gallons of gray water per week.
- C. Bilge water consists of fuel, oil, and wastewater from engines and machinery that collects, along with fresh water and seawater in the area at the bottom of the ship's hull, because of spills, leaks, and routine operations. It may also contain other materials such as rags, cleaning agents, paint, and metal shavings.
- D. Hazardous wastes produced on cruise ships include by-products of dry cleaning and photo processing operations, paints and solvents, batteries, fluorescent light bulbs containing mercury, and wastes from print shops. A typical ship produces an estimated

110 gallons of photo processing chemicals, five gallons of dry-cleaning wastes, and ten gallons of used paints per week. These substances can be toxic to marine life if discharged into the marine environment.

- E. Solid wastes generated by cruise ships include large volumes of food waste, cans, glass, wood, cardboard, paper, and plastic. Plastic debris can be ingested or cause entanglement to marine life including marine mammals, seabirds, and sea turtles. In some cases the wastes are incinerated on the vessel and the ash is discharged at sea; other wastes are disposed of on shore or recycled. A typical cruise ship generates eight tons of solid waste per week.
- F. Cruise ships take in millions of gallons of ballast water, in order to stabilize the vessel for safe and efficient operation. During the process, they take in thousands of species of marine organisms, including various types of larvae, fish eggs, and microorganisms. The water is often drawn in from coastal waters in one area, and discharged at another location. This process has led to the introduction of invasive species, which disrupt marine ecosystems and cost the U.S. billions of dollars per year.

The California Clean Coast Act, which became effective on January 1, 2006, prohibits the release from large passenger vessels (cruise ships) and other oceangoing ships (300 gross tons or more) of hazardous waste, oily bilgewater, other waste, and sewage sludge into the marine waters of the state and marine sanctuaries. The Clean Coast Act also prohibits the release of graywater from cruise ships and oceangoing ships with sufficient holding capacity into the marine waters of the state. Furthermore, the Clean Coast Act requires the State Water Resources Control Board to request the appropriate federal agencies to prohibit the release of wastes from cruise ships and oceangoing ships into state marine waters and the four National Marine Sanctuaries in California.

MBNMS regulations now prohibit discharging or depositing from within or into the Sanctuary any material or other matter from a cruise ship except clean vessel engine cooling water, vessel generator cooling water, or anchor wash..

Strategy CS-1: Increase Outreach and Coordination

MBNMS staff will develop a system to ensure that cruise line industry representatives, cruise ship operators and crew, regulatory agencies, and other relevant parties are cognizant of the Sanctuary's policies regarding cruise ship discharges. Staff will also conduct outreach, aimed at educating cruise ship operators and crew about the MBNMS and its resources, potential impacts from vessel operations, and measures that can be taken to minimize these impacts.

Activity 1.1: Develop and Implement an Outreach Plan About the Sanctuary's Regulation to Address Cruise Line Industry, Regulatory Agencies, and General Public

MBNMS will develop an outreach plan for the public as well as the cruise ship industry to increase understanding and awareness of MBNMS regulations. The Cruise Ship Outreach Plan should address proper stewardship guidelines and use of best management practices (BMPs). MBNMS will also extend its current education and outreach efforts to the Cruise Line Industry.

Activity 1.2: Develop Protocols for MBNMS Communication with Cruise Line Companies

MBNMS will develop a checklist of items to discuss with cruise ship companies to include discharges, anchoring guidelines, adherence to vessel traffic lanes, and sanctuary boundaries. MBNMS will also develop a contact list for cruise line industry representatives and regulatory agencies while ensuring communication of information to cruise lines, ship operators, and all levels of crew.

Activity 1.3: Partner with Cruise Line Industry to Develop MBNMS Outreach Materials and Opportunities

MBNMS will work with the cruise line industry in the production and distribution of customized materials, in both print and video, and develop an onboard presentation about the MBNMS and its resources.

Activity 1.4: Collaborate with Sightseeing Tour Operators to Incorporate Sanctuary Information and Messages to Shore Based Tourists

Strategy CS-2: Develop Enforcement and Monitoring Program

MBNMS staff, in collaboration with partners, will develop and implement enforcement and monitoring programs, and protocols for reporting by cruise ships.

Activity 2.1: Develop and Implement a Tracking Plan for a Cruise Ship Visitation in MBNMS

Activity 2.2: Develop Standard Requirements and Protocols for Reporting

MBNMS will develop a list of emergency contacts for reporting in the event of a discharge. Standard reporting requirements will include standard documents for all cruise ships visiting MBNMS (vessel logs, printouts from holding tanks, etc.).

Activity 2.3: Develop and Implement an Enforcement Program

MBNMS will work with enforcement partners to evaluate and establish effective enforcement practices to ensure compliance. MBNMS and partners should provide sufficient enforcement resources to investigate potential violations and develop collaborative inspection programs with the United States Coast Guard (USCG) to inspect onboard discharge records and ship's systems for compliance. MBNMS will investigate monitoring feasibility and develop and implement monitoring protocols. MBNMS will also identify partners and potential funding sources for monitoring, including industry fees.

Action Plan Partners: State Water Resources Control Board, Regional Water Quality Control Board, State Lands Commission, United States Coast Guard, Ocean Conservancy, City of Monterey, cruise ship industry, City of Monterey, tourism industry, environmental organizations.

Table CS.1: Measuring Performance of the Cruise Ship Discharges Action Plan

Desired Outcome(s) For This Action Plan:	
Prevent impacts to MBNMS resources from cruise ship discharges through enforcement of regulations and outreach to the cruise ship industries.	
Performance Measures	Explanation
No discharges from cruise ships in the MBNMS.	The MBNMS prohibits discharges (with some exceptions for engine cooling water, generator cooling water, and anchor wash) from cruise ships. Performance in implementation of this plan can be evaluated by reviewing the discharge logs and reports submitted by the cruise ships to determine if any discharges have occurred. This will be supplemented by occasional interagency shipboard inspections.

Table CS.2: Estimated Timelines for the Cruise Ship Discharges Action Plan

Cruise Ship Discharges Action Plan	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy CS-1: Increase Outreach and Coordination	●————●	●		▶
Strategy CS-2: Develop Enforcement and Monitoring Program	●————●	●		▶
Legend					
Year Beginning/Ending	: ●————●		Major Level of Implementation: _____		
Ongoing Strategy	: ●————▶		Minor Level of Implementation:		

Table CS.3: Estimated Costs for the Cruise Ship Discharges Action Plan

Strategy	Estimated Annual Cost (in thousands)*				
	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy CS-1: Outreach and Coordination	\$23.5	\$21	\$11.5	\$9	\$9
Strategy CS-2: Enforcement and Monitoring Program	\$160	\$82	\$53	\$42.5	\$42.5
Total Estimated Annual Cost	<i>\$183.5</i>	<i>\$103</i>	<i>\$64.5</i>	<i>\$51.5</i>	<i>\$51.5</i>

* Cost estimates are for both “programmatic” and “base” (salaries and overhead) expenses.

Water Quality Protection Program Implementation Action Plan

Goal

Reduce contamination from nonpoint source pollution in the Monterey Bay National Marine Sanctuary (MBNMS) and its watersheds.

Introduction

The Sanctuary is adjacent to nearly 300 miles of California’s coastline and receives runoff from eleven major watershed areas. The 7,000 square miles of land uses in the adjacent watersheds range from forest and grazing lands to heavily agricultural and urbanized areas. As rainfall or irrigation water passes over the different land uses within the watershed, it can pick up a variety of pollutants, which find their way into streams, rivers, wetlands, harbors, and eventually into the Sanctuary. Offshore areas of the Sanctuary are in relatively good condition, but nearshore coastal areas, harbors, lagoons, estuaries and tributaries show a number of problems, including elevated levels of nitrates, sediments, persistent pesticides, metals, bacteria, pathogens, detergents, and oils. These contaminants can have a variety of biological impacts including bioaccumulation, reduced recruitment of anadromous species, algal blooms, mortality due to toxicity, transfer of pathogens, and interference with recreational uses of the Sanctuary.

During the designation of the Sanctuary in 1992, eight key water quality agencies within the Sanctuary region entered into a Memorandum of Agreement (MOA). This MOA provided an ecosystem-based water quality management process that integrates the mandates and expertise of existing coastal and ocean resource managers and protects the nationally significant resources, qualities and compatible uses of the Sanctuary. The agreement led to the development of the Sanctuary’s Water Quality Protection Program (WQPP). Today, the WQPP is a partnership of twenty-five federal, state and local agencies, public and private groups dedicated to protecting and enhancing water quality in the Sanctuary and its watersheds.

This partnership of MOA signatories, additional public agencies, non-governmental and private organizations are working as members of the WQPP Committee. This committee oversaw the development of four action plans entitled Implementing Solutions to Urban Runoff; Regional Monitoring, Data Access, and Interagency Coordination; Marinas and Boating; and Agriculture and Rural Lands. Many committee members have been partners in initial implementation efforts along with a wide variety of stakeholders in the community including federal, state, and local agencies, businesses, landowners, environmental groups, and the public.

Program Updates

Rather than addressing new topics, this action plan incorporates recommendations of the existing WQPP plans that have been created since the Sanctuary was designated, and recommends ongoing or additional steps for implementation. Existing WQPP plans include:

Implementing Solutions to Urban Runoff
Regional Monitoring, Data Access, and Interagency Coordination

Marinas and Boating

Agriculture and Rural Lands

These original action plans are organized in a format similar to the other Joint Management Plan Review (JMPR) action plans, i.e., by strategy and steps (here called activities), with each activity containing multiple components. Despite limitations on funding dedicated to implementation and staff vacancies during recent years, there has been substantial implementation of a number of strategies, as well as many strategies only partially implemented. In many of these cases of partial implementation, implementation has occurred in some geographic areas or at some times, but has not been widespread or regular throughout the region. A few of the strategies have already been completed or are fully implemented and ongoing, and a few strategies have not been initiated at all.

The program has been successful in leveraging the plans into funding from outside sources, often through grant proposals, and in the case of the Agriculture and Rural Lands plan, through a Congressional allocation to the United States Department of Agriculture (USDA) Natural Resource Conservation Service (NRCS), one of our key partner agencies. Although this outside funding has been essential for program implementation, a disadvantage of this approach has been that it is time consuming to pursue, obtain and administer such outside funding. Grants are generally limited in scope and duration and so can lead to a rather fragmented approach.

A general overview of the number of strategies and activities and the level of implementation is provided in the table below.

Water Quality Protection Program: Action Plan Implementation (as of 2004)

Action Plan	Number of Strategies in Full WQPP Plans	Total Number of Activities in Full WQPP Plans	Number of Strategies Implemented			
			Completed or Ongoing	Substantially Implemented	Partially Implemented	Not Initiated
I. Implementing Solutions to Urban Runoff	7	37	0	3	4	0
II. Regional Monitoring, Data Access, and Interagency Coordination	3	25	0	2	1	0
III. Marinas and Boating	7	50	1	1	2	3
IV. Agriculture and Rural Lands	24	90	1	3	14	6
Total WQPP	41	202	2	9	21	9

The WQPP Committee used the JMPR process to review the WQPP and its individual action plans, to determine what has been implemented, what the barriers to full implementation have been, and what should be priorities as the program moves forward. Following below are each of the four existing action plans broken down into their component strategies. The implementation of the steps in the original plans is briefly summarized here in the table and text under each

strategy. The strategies and activities described here are short summaries of the detailed recommendations in the four original WQPP action plans that total 250 pages.

ACTION PLAN I: IMPLEMENTING SOLUTIONS TO URBAN RUNOFF

Urban runoff is a significant problem in the Sanctuary’s watersheds that can be addressed by a coordinated regional approach towards education, training, and management. The pollutants of concern associated with urban runoff include petroleum hydrocarbons, metals, sediments, detergents, nutrients, pesticides, and organics. The Water Quality Protection Plan (WQPP) Urban Runoff Plan was developed in 1996 in collaboration with the WQPP committee, many of the region’s public works representatives and other stakeholders. It describes seven priority strategies for addressing the problems associated with urban runoff in the region.

Strategy WQPP-1: Increase Public Education and Outreach

The objective of this strategy in the original plan was to review existing educational programs and materials, and to build a framework that would develop a comprehensive regional education and outreach program focused on urban runoff, water quality, and watershed issues. This was to be accomplished by coordinating and building on education efforts that address the causes of urban runoff problems, its effects on habitats and resources, and promotion of measures that reduce pollutants in runoff.

Implementation of WQPP Steps as of 2007

<i>Steps</i>	<i>Implementation Status</i>
Review Existing Programs and Materials to Identify Best Tools	Initial review completed, needs update
Establish a Framework for the Program	Substantial implementation, but intermittent
Develop Supporting Materials	Substantial implementation
Establish Methods for Distributing Information	Partial implementation

The MBNMS developed an initial framework that identified specific target audiences, prioritized geographic areas, and identified the tools, distribution methods, and existing outreach programs to incorporate into the program. Numerous high quality educational materials and programs have been developed or modified to implement this strategy. Many of these materials are available in bilingual formats. They include:

- A. “Dirty Word” TM radio spots – focus on urban runoff, targeting the public
- B. “Dirty Word” TM Public Service Announcements (PSA’s) for television – focus on urban runoff targeting general public
- C. “Storm Drains to Sanctuaries” – PSA for television
- D. Bus ad/movie slide – addressing storm drains
- E. Roving watershed and storm drain models
- F. Storm drain poster
- G. Monterey Bay Begins on Your Street brochure
- H. *Urban Watch* program brochure
- I. *Be Kind to Animals* – Coloring book for children
- J. WQPP Brochure
- K. A Citizen’s Guide to Clean Water

Written materials have been distributed through a variety of venues, including businesses, schools, at public events, and teacher training workshops. Radio ad campaigns have provided multiple exposures in past years, but now lack funding for ongoing presentations. Outreach programs have included a door-to-door campaign in the City of Watsonville, incorporation of water quality lessons into teacher training workshops, and hands-on models, which are used to demonstrate polluted runoff at public events. Outreach has also included water quality presentations to local and state governments, and to various conferences, workshops and classes. Although radio and TV reaches audiences throughout the region, much of the focus of the other types of outreach has been in a few key cities that have been initial partners in the effort, including Monterey, Pacific Grove, and Watsonville.

Although much has been implemented under this strategy, there has not been a consistent program over time or across the cities in the region due to the variable grant-funded nature of activities and staff turnover. Stable implementation of the framework is needed for an educational program that continuously evaluates and expands outreach and addresses the many geographic areas and populations that have not been a focus of the program to date.

Activity 1.1: Update and Reprint Existing Educational Materials

Activity 1.2: Broaden Distribution of Existing Outreach Materials and Programs

Develop outreach distribution mechanisms and programs that are more consistent over time and throughout the region, repeating outreach as needed in existing pilot areas and expanding to coastal cities and constituents not yet reached and inland cities like Salinas.

Activity 1.3: Develop a Stable Funding Source and Infrastructure with Partners to Facilitate Ongoing Distribution and Programs

This should include coordinating and pooling resources with cities required to develop education programs under their National Pollutant Discharge Elimination System (NPDES) Phase II permits.

Activity 1.4: Expand Outreach to the Latino Population in Coordination with Multicultural Education for Resource Issues Threatening Oceans (MERITO)

Strategy WQPP-2: Increase Technical Training

The main objective of this strategy in the original plan was to develop voluntary technical training material and programs for public works and planning staff, small businesses/trades, and construction companies on methods to prevent urban runoff pollution.

Implementation of WQPP Steps as of 2007

<i>Steps</i>	<i>Implementation Status</i>
Evaluate Existing Training Programs, Which Could Be Adopted or Modified	Completed, Needs Updating
Assemble Materials/Enlist Instructors	Completed, Needs Updating

Advertise/Conduct Training in Two Cities	Completed
Conduct Regional Training Program	Substantial Implementation
Evaluate Effectiveness of Training	Partial Implementation
Schedule Ongoing Series of Workshops	Partial Implementation
Establish a Technical Support Network	Not Initiated

Substantial implementation of the technical training strategy occurred in the initial years after plan completion, although activity has reduced in recent years. Implementation on a regional level included co-hosting of five training workshops for public works and planning staff focused on various technical elements of a Model Urban Runoff Program (see below). The Sanctuary also conducted technical training on-site with seven public works departments of individual municipalities via a contractor who addressed specific best management practices (BMPs) related to urban runoff and coliform contamination.

Training for the business community has been partly implemented through development and partial distribution of a variety of technical training materials, including:

- A. Restaurant outreach survey to assess understanding of issue and current practices
- B. Restaurant outreach training video on BMPs called “Make The Connection”
- C. Restaurant “Best Management Practices” poster
- D. Automotive “Best Management Practices” poster

These materials for businesses have been distributed primarily through outreach programs in the cities of Monterey and Pacific Grove, utilizing funding from the cities.

Similar to the education strategy, although substantial implementation has occurred, the trainings have not been consistent in time or covered sufficient geographic areas or target audiences. The training program should be an ongoing one due to staff turnover in target organizations, the need to remind and provide updates to ongoing staff, and to reach new audiences.

Activity 2.1: Update and Expand Training Materials

This should include reviewing past training materials for public works departments to summarize new management measures and regulations. Additional training modules should be included to address planning department staff, supervisors of construction and maintenance crews, businesses, and trades and agency personnel handling hazardous materials.

Activity 2.2: Continue Regional and On-site Urban Training Workshops

This should include contacting municipal and county department heads and trade associations to develop target audiences. The Sanctuary should also continue to perform on-site municipal training sessions and modules to reach those staff who are actually implementing the work and who generally are not reached by regional workshops.

Activity 2.3: Develop and Conduct Training Workshops with Developers

Local planning department staff are often overburdened and do not have the time to thoroughly review development plans for inclusion of stormwater/urban runoff controls. To assist them in

reducing water quality impacts, workshops and trainings should be conducted with the developers and project designers to raise their awareness of stormwater/urban runoff controls that can be included at the onset of the project, rather than relying solely on planners.

Strategy WQPP-3: Collaborate with Regional Urban Runoff Management Efforts

The objective of this strategy in the original plan was to initiate a collaborative effort among municipal, county, and Regional Water Quality Control Board (RWQCB) staff to develop and implement area-wide urban runoff management programs.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Develop a Model Municipal Program, Which Provides a Comprehensive Guide to Urban Runoff Management	Completed
Evaluate Existing Regional Urban Runoff Programs for Lessons Learned	Completed
Modify Stormwater Task Force Goals	Not Initiated
Select a Pilot Area For an Urban Runoff Program	Complete
Develop a Formal Program Structure For Regional Effort	Partial Implementation
Develop a Plan For Area-Wide Program	Partial Implementation
Implement the Pilot Program	Completed
Modify Program and Implement in Other Areas	Partial Implementation

Initial implementation of this strategy involved the development of a Model Urban Runoff Program (MURP), in collaboration with the cities of Monterey and Santa Cruz, the Sanctuary, California Coastal Commission (CCC) and the RWQCB. The MURP is a comprehensive guidebook that includes model ordinance revisions, municipal BMPs, illicit discharge detection programs, and recommendations for organizing, funding and monitoring the program. In addition to development of the guidebook, initial implementation of MURP was accomplished in Monterey, Santa Cruz and the City of Watsonville via grant funding. The guidebook has been distributed to all local jurisdictions and numerous trainings have been conducted. Several additional cities have begun adopting the recommendations.

A second key element of this strategy, the development of a formal regional approach to urban runoff, has been partly initiated by local jurisdictions. In Monterey County, the Monterey Regional Water Pollution Control Agency (MRWPCA) is serving as a regional coordinator and permit holder for a coalition of municipalities on the Monterey Peninsula to address urban runoff under NPDES Phase II regulations. A regional approach is also being considered in Santa Cruz County but has not yet been formalized.

The strategies contained in the MURP are directly transferable to jurisdictions developing their stormwater management programs required under their new Phase II permits. Given the fiscal situation of many jurisdictions, there will be a need to reduce development costs and to utilize existing programs and materials. In addition, there is an ongoing need to encourage coordination among jurisdictions to develop regional programs in additional areas.

Activity 3.1: Coordinate with Individual Jurisdictions to Implement Local Stormwater Programs

The Sanctuary should coordinate with individual local jurisdictions in the development and implementation of their stormwater management programs to provide materials developed under the MURP, and assist in implementation of the technical training, monitoring and educational elements of addressing urban runoff management.

Activity 3.2: Facilitate the Development of Regional Stormwater Programs

The Sanctuary should coordinate with additional jurisdictions to encourage their development of coordinated regional approaches to stormwater and pooling of their resources to address urban runoff issues. This should include encouraging the development of multijurisdictional NPDES permit programs such as those developed for the Monterey Peninsula. The Sanctuary should also continue to collaborate with the Stormwater Task Force as a platform for information sharing and coordination of Phase II NPDES programs around Monterey Bay, and with other entities such as the MRWPCA in their regional stormwater programs.

Strategy WQPP-4: Promote Structural/Non-structural Controls

The objective of this strategy in the original plan was to develop demonstration projects and conduct briefings with municipalities, counties and special districts to promote the use of BMPs. Additional activities sought to initiate regional cooperation for prioritizing sites and adopting such practices. By promoting low impact development and more permeable surfaces the efforts will help to recharge groundwater and improve the quality of water flowing to the sanctuary.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Select Pilot Project/Solicit Participation	Completed
Plan, Implement, and Evaluate Pilot Project	Completed
Develop/Distribute BMP Guidelines	Partial Implementation
Expand Implementation	Partial Implementation

Direct Sanctuary involvement in implementation of this strategy has been limited to a pilot project and study conducted jointly with the City of Monterey to test the utility of oil and sediment/water separators for treating runoff from parking lots, which uncovered numerous technical challenges in the use of such devices. Identification of alternative types and locations for demonstration projects and briefings to local government has not been conducted. However, the CCC has initiated numerous structural control projects through its permits.

The use of BMPs should be promoted, including structural and nonstructural controls to improve water quality.

Activity 4.1: Promote Structural and Nonstructural Controls via Technical Training

Activity 4.2: Track and Comment on Major Local Projects and Plans to Encourage Inclusion of Structural and Nonstructural Controls

Activity 4.3: Compile and Report Results of Structural/Nonstructural Control Effectiveness

Compile information on previous structural/nonstructural implementation projects that highlight water quality results and identify limitations of the various technologies. Identify additional information or studies needed to better select and design structural/nonstructural BMPs for central coast development projects and initiate research/studies.

Activity 4.4: Pursue Additional Pilot Projects with Local Jurisdictions and Incorporate Monitoring to Establish Benefits

Strategy WQPP-5: Promote Sedimentation/Erosion Controls

The objective of this strategy in the original plan was to initiate a collaborative effort among cities, counties, special districts, and state agencies to develop and implement an erosion/sedimentation source control program for non-agricultural areas, including urban, suburban, and rural residential developments. The strategy sought to identify and evaluate erosion control measures and standards for effectiveness and consistency across counties and municipalities, develop proposed language revisions for “model” ordinances and programs, and implement programs in pilot areas.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Identify Measure and Standards	Partial Implementation
Develop Model Programs/Schedule Revisions	Not Initiated
Identify Pilot Area/Conduct Briefings	Not Initiated
Implement in Pilot Area/Evaluate Success	Not Initiated
Implement in Remaining Non-Agricultural Areas	Not Initiated

The CCC compiled an initial listing of standards found in existing ordinances from a number of counties and cities in the Sanctuary region, outlining minimal grading amounts that trigger permits, areas and types of grading where seasonal restrictions may apply, erosion control plan criteria, etc. The WQPP committee has not yet reviewed this data or developed related recommendations on standardization of ordinances or development of model programs and pilot projects.

A regional evaluation of erosion control standards should be conducted to identify and address gaps and inconsistencies.

Activity 5.1: Evaluate Erosion Control Measures and Standards in County and City Ordinances

Activity 5.2: Develop Recommendations for Revisions and Work with Local Jurisdictions to Implement

Strategy WQPP-6: Increase Storm Drain Inspection

The objective of this strategy in the original plan was to work with public works departments to develop a monitoring, mapping, and management system in coastal cities for critical storm drains and outfalls with a history of contaminated flows or that drain to critical habitat.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Prepare Monitoring System in Two Priority Cities	Substantial Implementation
Implement System in Two Priority Cities	Substantial Implementation
Conduct Training in Coastal Cities	Partial Implementation
Conduct Evaluation	Not Initiated
Implement Additional Systems	Partial Implementation

Monitoring of the storm drain system has been initiated in several cities via the Urban Watch Program and the First Flush programs coordinated by the Sanctuary Citizen Watershed Monitoring Network (SCWMN). These programs are collaborative efforts between the Sanctuary, the cities, Coastal Watershed Council (CWC), and trained volunteers to take samples at selected locations monthly during the dry season and during the first large rain event of the year. These volunteer programs have been operating in Monterey, Pacific Grove, Capitola and Santa Cruz, and have successfully identified numerous sub-watersheds with high levels of coliform, metals or detergent contamination. Mapping and evaluation of the storm drain system was conducted under MURP grants with the cities of Monterey, Santa Cruz and Watsonville. Training on storm drain mapping and diagnostics, monitoring, and illicit discharge detection has been included in the MURP guidebook and in the regional urban runoff trainings.

Efforts to monitor, map, diagnose and manage storm drains should be continued and expanded in partnership with local jurisdictions.

Activity 6.1: Continue and Expand First Flush and Urban Watch Monitoring Programs

Monitoring efforts for storm drain contaminants should continue and be expanded to additional jurisdictions through the SCWMN's First Flush and Urban Watch programs. This should be coordinated closely with local jurisdictions to select appropriate sampling sites.

Activity 6.2: Conduct Follow-up with Public Works Departments

The Sanctuary should follow up with the city public works departments to evaluate the contaminant hot spots identified by these monitoring programs and encourage them to conduct follow up assessments or targeted source control efforts.

Activity 6.3: Expand Mapping, Diagnostic Capabilities and Illicit Discharge Programs

MBNMS should coordinate with local jurisdictions to promote expansion of their mapping and diagnostic capabilities and illicit discharge detection efforts, as part of their Phase 2 programs. Mapping, illicit detection, and monitoring should also be addressed in new technical training sessions.

Strategy WQPP-7: Produce and Promote CEQA Additions

The objective of this strategy in the original plan was to provide local planners and elected officials with additional analytical tools to assess and reduce the potential changes in the quantity and quality of urban runoff resulting from proposed new development. This tool was to involve the incorporation and use of several questions related to urban runoff in the California Environmental Quality Assessment (CEQA) checklist that local planning departments use to evaluate impacts and target appropriate mitigation recommendations. The checklist was to be accompanied by a training module that would highlight how to conduct the assessment and outline potential BMPs that could be recommended to reduce water quality impacts.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Produce and Distribute Training Packet for Local Planners to Accompany Checklist	Completed, Needs Update
Complete Pilot Project of CEQA Checklist Revisions in Monterey County	Completed
Identify and Initiate Project in Remaining Jurisdictions	Partial Implementation
Adoption of CEQA Changes	Partial Implementation
Evaluate Effectiveness of Changes	Not Initiated

A revised CEQA checklist was developed in collaboration with the Monterey County Planning Department, along with a guidebook to assist in training local planners to more thoroughly consider water quality issues related to new developments. The revised CEQA checklist was distributed to all the cities and counties in the Sanctuary region. The checklist was adopted by Monterey County and Santa Cruz County, and it is unknown which cities also adopted it.

There is an ongoing need to work with additional local jurisdictions to revise their checklists and provide accompanying training guidelines on practices that could be included in new redevelopment projects.

Activity 7.1: Encourage the Adoption of the CEQA Checklist Revisions in Additional Jurisdictions

This should include an assessment of which jurisdictions still have not adopted the CEQA checklist, likely to be most cities, and redistributions and outreach to those jurisdictions to encourage its adoption.

Activity 7.2: Provide Accompanying Training Materials and Workshops

The CEQA additions training manual should be updated to incorporate new BMPs and distributed with the checklist. Regional training workshops should be conducted for planners to familiarize them in more detail with the issue. These trainings should include on-the-ground demonstrations to gain an understanding that may be lacking when plan-checking in the office. BMPs are often very simple, both structurally and functionally, and with an improved understanding of them, planners can ensure that they are included in new or redevelopment projects.

Activity 7.3: Conduct Follow Up Evaluations

Follow-ups should be conducted with planning department management to ensure that the checklist revisions are incorporated into their review process. Evaluations should also include an assessment of whether the revisions are leading to the inclusion of additional BMPs in projects.

Activity 7.4: Planning and Policy Working Group

Host a set of working group meetings among those responsible for regulating new development for the protection of water quality. The working group should discuss how their permitting activities can be consistent with Urban Runoff Action Plan strategies and how required updates to various ordinances (Phase II requirements, Local Coastal Program [LCP] updates) can support the implementation of these activities.

ACTION PLAN II: REGIONAL MONITORING, DATA ACCESS, AND INTERAGENCY COORDINATION

The second Water Quality Protection Program (WQPP) plan developed in 1996 addresses the need for a continuous and coordinated strategy for regional monitoring of water quality and compilation of water quality data on a regional level. It also addresses the need for a continuous regional framework for coordinating ways to address water quality, implement and update the WQPP plans and develop new ones where needed.

Strategy WQPP-8: Increase Regional Monitoring

The objective of this strategy in the original plan was to coordinate and strengthen existing monitoring activities within the Sanctuary and its adjacent watersheds, and to develop a cost-effective, comprehensive approach to providing managers, local agencies, and the public with information they need to protect aquatic resources.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Conduct Preliminary Assessment of Monitoring Programs in Sanctuary Region	Completed, Update in Progress
Expand Assessment and Conduct Workshop to Develop Initial Recommendations	Completed
Evaluate Other Existing Regional Monitoring Approaches for Lessons Learned	Ongoing
Identify Specific Questions and Parameters To Be Monitored	Completed
Analyze Existing Monitoring Station Locations	Ongoing
Produce Regional Monitoring Plan	Partial Implementation
Develop Program Infrastructure To Sustain Long-Term Effort	Partial Implementation
Implement Monitoring Program	Substantial Implementation
Review, Interpret, and Communicate Results	Partial Implementation

Significant implementation has been initiated on regional coordination and strengthening of government-collected data and volunteer data, and on the development of a regional monitoring program. As recommended in the plan, the Central Coast Regional Water Quality Control Board (CCRWQCB) has led the formation of a regional monitoring program called the Central Coast Ambient Monitoring Program (CCAMP). CCAMP collects long-term data on a rotational basis in several Sanctuary watersheds as well as monitoring of critical river mouths. It has also coordinated a regional monitoring effort, the Central Coast Long-term Environmental Assessment Network (CCLEAN), with the sewage treatment plants within the Sanctuary to develop ambient water quality data in addition to effluent monitoring. The variable nature of state funding and budget cuts has unfortunately led to monitoring program reductions in some of these programs.

For volunteer monitoring, the Sanctuary Citizen Watershed Monitoring Network (SCWMN) has been established to coordinate volunteer monitoring groups in the Sanctuary watersheds. The Network provides standardized training and equipment, a regional website, guidance on data entry, media publicity to inform the public, and coordination and outreach to resource managers on monitoring results. It is also implementing a certification program that can be used to rank the quality of data collected by volunteers. The program also coordinates and sponsors several regional monitoring programs, including an Urban Watch program focused on dry weather storm drain sampling, a First Flush program focused on sampling of the first heavy rain of the season, and a Sanctuary-wide Snapshot Day event that samples urban and rural water quality on the first Saturday of May each year. These volunteer monitoring efforts are a partnership between the Sanctuary Foundation (SF), Coastal Watershed Council (CWC), the Regional Water Quality Control Board (RWQCB), California Coastal Commission (CCC), local cities, and volunteers.

Although considerable progress has been made on development and implementation for both government and volunteer monitoring programs, much work remains to continue and improve the efforts.

Activity 8.1: Develop a Core Set of Data for Long-term Assessments

A core set of data sufficient for long-term assessment and trend analysis should be identified, which can be continuous over many years, and monitoring programs to collect these data should be continued or initiated. This core set of data would be the focus during budget cutbacks.

Activity 8.2: Integrate Regional Monitoring Across Agencies

The Sanctuary should work with the CCRWQCB to integrate monitoring efforts with additional programs throughout the Sanctuary, including the San Francisco Bay Regional Water Quality Control Board (SFBRWQCB)

Activity 8.3: Enhance Training Assistance and Certification of Volunteer Monitoring Groups and Coordination of Annual Events

Year-round coordination, training and assistance should be enhanced for existing and new volunteer groups to improve their effectiveness and longevity. MBNMS should also continue coordination of large annual volunteer events such as Urban Watch, First Flush, and Snapshot Day.

Activity 8.4: Improve Public Awareness of Monitoring Efforts

Additional work is needed to improve public awareness of monitoring efforts, particularly of volunteer groups, including efforts with print, radio and TV media.

Strategy WQPP-9: Increase Access to Monitoring Data

The objective of this strategy in the original plan was to develop a digital data access system to link water quality data and related parameters for the Sanctuary's watersheds and ocean areas. This database was to provide environmental scientists and resources managers with the tools to evaluate problems and make environmental management decisions.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Identify Existing Monitoring Data Sets	Substantial Implementation
Form Interagency Data Task Force	Completed
Identify Specific Questions To Be Answered by Data	Substantial Implementation
Identify and Evaluate Existing Database Systems and Networks	Substantial Implementation
Identify Relevant Data, Standard Format and Access System Design	Partial Implementation
Develop Quality Assurance/Quality Control (QA/QC) Protocols and MOAs	Partial Implementation
Develop Metadata and Summary Data for Each Program	Partial Implementation
Conduct Annual Performance Review	Partial Implementation

The Sanctuary and Environmental Protection Agency (EPA) conducted an initial summary of data sets available. The RWQCB has developed a regional database and Geographic Information Systems (GIS) mapping system for CCAMP to display water quality data collected by the RWQCB. The SCWMN has also been working with the RWQCB to allow display of its data in a volunteer version of the CCAMP system. CCAMP and the SCWMN have been working to develop QA/QC protocols and work with watershed groups to adopt these procedures. The Central Coast Joint Data Committee (CCJDC) administered by the Association of Monterey Bay Area Governments (AMBAG) has also made progress in compiling and sharing GIS information on the region's watersheds including topography, land use, parcels, etc. CCAMP and the SCWMN have produced annual or event-related summary data reports (e.g., First Flush, Snapshot Day, and Urban Watch). However, additional work remains to be done by these groups and others to facilitate the display and ready access to water quality data and related information from a variety of sources.

Although significant progress has been made on this strategy, additional work remains to be conducted to integrate information from a number of sources into the Sanctuary Integrated Monitoring Network (SIMoN), and package it in a user-friendly way as a decision-making tool.

Activity 9.1: Integrate Water Quality Data with SIMoN

Water quality monitoring should be integrated with the SIMoN program, and coordinated with biological monitoring efforts. Additional evaluation should be conducted to determine if the CCAMP database can meet Sanctuary needs, and either move to expand this system or develop alternative approaches to link with federal, state, county and university data.

Activity 9.2: Certify Data Quality for Volunteer Groups and Incorporate into Database

The version of the database for volunteer data should be expanded. This will require certification of the data quality of additional watershed groups, including developing QA/QC protocols for their data.

Activity 9.3: Improve Packaging and Distribution of Data to Decision Makers and the Public

Additional focus needs to be directed to packaging and distributing both government and volunteer data to decision makers in an understandable way, and working with them to conduct follow up to track and reduce sources of contamination. This should include an annual report of water quality trends in the Sanctuary that integrates data from a number of programs.

Strategy WQPP-10: Increase Interagency Coordination

The objective of this strategy in the original plan was to develop a continuous regional framework for coordinating ways to address water quality, implement and update the WQPP plans and develop new ones where needed.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Establish a WQPP Committee	Completed
Establish Linkages with Other Groups	Substantial Implementation
Coordinate Implementation of WQPP Strategies	Substantial Implementation
Prioritize Funding Goals	Substantial Implementation
Coordinate Permit Review	Substantial Implementation
Coordinate Enforcement Activities	Substantial Implementation
Evaluate New Problems and Develop New Strategies	Ongoing

The WQPP committee served as a coordinated regional framework during the development of the first four plans and assists in coordinating their implementation. Various subgroups and members of the committee work together with Sanctuary staff to pursue specific implementation projects, pursue funding, etc. A charter for a more formal Water Quality Council (WQC) was developed several years ago, but has not been implemented. As part to the Joint Management Plan Review (JMPPR) review, the WQPP committee indicated that the basic format of the existing committee meets the needs of the WQPP and can serve to address the major steps in this strategy, and that a more formal WQC is not necessary. Regarding evaluating new problems and issues, many committee members assisted with the development of the Beach Closures Action Plan, and implementation of this plan will eventually be overseen by the committee.

Activity 10.1: Review and Update Committee Membership and Structure

Committee membership should be reviewed and potentially expanded to incorporate new issues and activities. Establishment of ongoing subcommittees that oversee implementation of individual plans should also be considered, as this approach has been very effective in implementing the Agriculture and Rural Lands Plan.

Activity 10.2: Continue Regular Committee Meetings and Coordination to Oversee Implementation and Address New Issues

The committee needs to reestablish a regular quarterly meeting schedule that has been interrupted by a staff vacancy, as well as coordinate between meetings on a regular basis. Committee meetings and other communications should focus on overseeing and enhancing joint implementation of the plans, evaluating progress, and addressing new issues as they arise.

Activity 10.3: Coordinate WQPP Funding

The committee’s efforts should include coordinating grant applications with partners, working with MOA signatory agencies to highlight WQPP plans in their grant Request for Proposals (RFPs), and strengthening fundraising efforts through the Sanctuary Foundation (SF).

Activity 10.4: Summarize WQPP Implementation

The MBNMS and its water quality partners will periodically develop reports and host workshops on implementation, and assess next steps, identify partnerships and water quality trends.

ACTION PLAN III: MARINAS AND BOATING

This action plan developed in 1997 describes strategies designed to reduce water pollution from certain activities associated with marinas and boating within the Sanctuary. Boater-generated impacts on water quality generally fall into four categories: toxic metals primarily from anti-fouling paints, hydrocarbons from motor operation and maintenance procedures, solid waste and marine debris from overboard disposal, and bacteria and nutrients from boat sewage. This plan took the approach that much of this pollution can be reduced through education and training programs, application of new technologies and on-site facilities.

Strategy WQPP-11: Increase Public Education, Outreach, and Enforcement

The objective of this strategy in the original plan was to expand and build upon existing efforts conducted by individual harbors to develop a coordinated regional education and outreach program. These programs sought to communicate to boaters the environmental, recreational and economic impacts of pollution.

The recommendations listed under the following activities generally consist of similar actions that can be generalized as:

- A. Compiling existing materials for each topic;
- B. Defining programs and target audiences;
- C. Preparing materials and developing distribution networks and programs; and,
- D. Contacting the targeted audiences with the materials/implementing programs.

Implementation of Water Quality Protection Program (WQPP) Steps as of 2007

Steps	Implementation Status
Review Existing Materials, Define Audience/Topics	Completed
Bilge Wastes and Waste Oil Education	Substantial
Product Information/Toxics Disposal Education	Partial Implementation
Marine Debris Education	Partial Implementation
Vessel Fueling Education	Not Initiated
Sewage Discharge Education	Partial Implementation
Underwater Hull Cleaning Education	Not Initiated
Education on Existing Laws	Substantial Implementation
Develop an Ongoing Distribution Program	Partial Implementation
Encourage Community Use/Stewardship of Harbor	Not Initiated

There are several active partners that have been developing and distributing informational and educational products for over five years, including Save Our Shores' (SOS) Clean Boating Network and the California Coastal Commission's (CCC) Boating Clean and Green Program. Grant funded educational efforts developed by the Sanctuary and/or SOS includes a harbor water-quality poster, water quality signage put in place at all the harbors, signage at bilge pumpout facilities, and a bilge pumpout brochure. SOS also has developed a Dockwalker program that conducts one-on-one outreach and distributes educational materials to boaters at the

harbors. Education and promotional activities have also accompanied the installation of new bilge pumpout facilities at all of the harbors.

This strategy will build upon and expand existing materials and programs and make outreach a regular occurrence.

Activity 11.1: Sustain and Develop One-on-one Boater Outreach Programs

The WQPP should work with various organizations to sustain and develop one-on-one programs with boaters such as Dockwalkers, including recruitment of volunteers and obtaining funding. This should include efforts to distribute materials and discuss with boaters the above list of water quality issues, with special emphasis on use of the bilge water and sewage disposal stations, and on hull cleaning practices that can affect both water quality and introduced species problems.

Activity 11.2: Vessel Fueling Education

Work with the Office of Oil Spill Protection and Response (OSPR) Outreach Program to educate small craft refueling docks as to their responsibility to prevent spills, liability for damage caused by oil spills, and spill notification requirements. Work with the Department of Fish and Game (CDFG) Outreach program to educate small craft refueling docks regarding applying to be registered and certified as “exempt” fuel docks (exempt from Certificates of Financial Responsibility and formal Oil Spill Contingency Plan requirements).

Activity 11.3: Enforcement

As a supplement to educational efforts, MBNMS will conduct general enforcement patrols and follow up on reported violations to address discharges of sewage, oily bilgewater and trash. MBNMS will also inspect MSDs to ensure that they are in compliance with Sanctuary regulations that prohibit the discharge of untreated sewage.

Strategy WQPP-12: Develop and Implement Technical Training Program

The objective of this strategy in the original plan was to develop and implement a regional technical training program for harbor, marina, and boatyard employees within the Sanctuary.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Identify Subject Areas	Completed
Compile Training Materials	Completed
Identify Instructors, Trainers, and Funding	Partial Implementation
Solicit Participation and Develop Incentives	Partial Implementation
Conduct Regional and On-Site Workshops	Partial Implementation
Evaluate Workshops and Modify as Needed	Not Initiated

General training modules about water quality were compiled for the harbors, and the package was introduced to several of the harbors as part of their training for the bilge water pumpout facility. Ongoing regional training has not been addressed, except for any staff training efforts already underway by harbormasters.

A review of technical training needs and opportunities should be conducted and programs developed to address gaps.

Activity 12.1: Update Training Materials as Necessary

Activity 12.2: Identify and Pursue Opportunities to Conduct On-site Trainings

Strategy WQPP-13: Promote Bilge Waste Disposal and Waste Oil Recovery

The objective of this strategy was to facilitate the collection of contaminated bilge water through the construction and operation of new bilge water pumpout and waste handling facilities.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Initiate Public Education Program	Substantial Implementation
Provide Absorbent Pads	Substantial Implementation
Identify Permits and Memorandum of Agreement (MOAs)	Completed
Identify Funding Sources	Completed
Identify Technology	Completed
Identify Appropriate Sites	Completed
Construct Pumpouts	Substantial Implementation
Publicize Location/Increase Enforcement	Partial Implementation

In 1999, the Sanctuary, in collaboration with Ecology Action and SOS, received a grant from the California Integrated Waste Management Board (CIWMB) to install bilge and crankcase oil pumpouts at Monterey and Moss Landing harbors, and to distribute absorbent pads. SOS installed another system in Santa Cruz harbor in 2002 through a similar grant. These systems, with a significant amount of education and promotion, have been very successful, leading to the recycling of over 8,000 gallons of oil in Monterey and Moss Landing harbors. The systems, however, have proven to be expensive to operate and maintain for the harbors. In addition, the pre-existing pumpout station at Pillar Point harbor has aged significantly and is now of insufficient capacity, and needs to be replaced.

The bilge pumpout system equipment and procedures should be updated as needed, and the use of the facilities promoted.

Activity 13.1: Develop Incentives and Promotions to Encourage Facility Use

Incentives should be developed to encourage boaters to use the pumpouts, along with an ongoing outreach program to promote the facilities.

Activity 13.2: Increase the Economic Viability of the Pumpout Systems

Measures should be developed that will make the region’s systems more economical to maintain, including revisiting the idea of sending the cleaned effluent to the sewer treatment plant or using a low-threat discharge permit.

Activity 13.3: Upgrade the Bilge Pumpout Facility at Pillar Point

The WQPP should work with the harbor to obtain funding for a new system, as well as assist with coordinating an appropriate disposal method.

Strategy WQPP-14: Topside and Haul-out Vessel Maintenance

The objective of this strategy in the original plan was to identify and promote regional guidelines on practices that reduce contaminants from hull wash-water and first flush runoff from boatyards and parking lots. Additionally, it sought to promote continued and expanded use of dust and drip containment methods and paint stripping technologies and products that result in reduced emissions. It recognized the need to review the effectiveness of policies and pollution controls addressing maintenance work at boat slips, parking lots, and unregulated work areas, and to promote boat maintenance methods that generate less pollution through education efforts and/or “Clean Worker Contract” programs.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Promote New Stripping/Refinishing Technologies	Not Initiated
Improve Containment and Filtering of Paint	Not Initiated
Ensure Compliance with Existing Regulations	Not Initiated
Improve Control and Filtering of Runoff	Not Initiated
Review Policies Regarding Work in Slips/Parking Lots	Not Initiated

No specific targeted work was conducted by the Sanctuary on this strategy, although various harbors and boatyards may have been addressing parts of the strategy.

Contaminants from hull wash-water and runoff from boatyards and parking lots should be addressed by improved management practices.

Activity 14.1: Promote New Stripping and Refinishing Technologies

Activity 14.2: Improve Containment and Filtering of Paint

Activity 14.3: Ensure Compliance with Existing Regulations

Activity 14.4: Improve Control and Filtering of Runoff

Activity 14.5: Review Policies Regarding Work in Slips/Parking Lots

Strategy WQPP-15: Underwater Hull Maintenance

This strategy in the original plan sought to initiate a program targeted at boat hull maintenance that promotes less toxic paints and improved underwater cleaning practices to reduce discharges to harbor waters. This would be accomplished by distributing information on less toxic paints and results of demonstration projects that evaluate new materials and maintenance methods that reduce discharges. The need to consolidate and promote guidelines for bottom paint preparation and to reduce excessive sloughing of paint was also identified. This strategy sought to initiate a

training and certification program for divers who conduct underwater cleaning to reduce discharges from hull cleaning practices.

Implementation of WQPP Steps as of 2007

Steps	Implementation Status
Promote Safe Marine Products	Partially Implemented
Promote Results of Demonstration Events	Not Initiated
Improve Bottom Paint Preparation	Not Initiated
Initiate Hull Training and Cleaning Certification	Not Initiated

No specific regional work has been conducted on this strategy, although the California Clean Boating Network is considering the issue, and safe products lists have been included in education materials.

Improvements in underwater hull maintenance should be implemented due to the potential to discharge numerous toxic chemicals into harbors and due to the growing concern regarding introduction of exotic species into harbors and coastal areas. Boaters and harbormasters need to be updated on newly developed improved methods and need to have resources available to disseminate to interested boaters. Guidelines should include recommendations on preventing the spread of introduced species in addition to reducing water quality contamination.

Activity 15.1: Promote Safe Marine Products and Procedures for Antifouling Use

Safe products for use as hull paints should be identified and promoted via outreach and demonstration events. Proper techniques for bottom paint preparation to reduce sloughing should also be included in the guidelines and demonstrations.

Activity 15.2: Initiate Guidelines and Trainings for Hull Cleaning

Develop guidelines and training for divers who conduct underwater hull cleaning, including recommendations to reduce water quality contaminations and spread of exotic species. Consider development of a certification program for cleaners who use proper techniques.

ACTION PLAN IV: AGRICULTURE AND RURAL LANDS

The Agriculture and Rural Lands Plan was developed in 1999 to address agricultural runoff in the form of sediments, nutrients and pesticides. The original plan outlines six sections, containing twenty-four strategies and ninety activities intended to protect and enhance the quality of water that drains into the Sanctuary while sustaining the economic viability of agriculture. To more briefly summarize these recommendations for inclusion in the MBNMS Management Plan, each of the six chapters or sections of the original plan is here termed a strategy, and each of the original twenty-four strategies is here termed an activity. This allows for the omission of some of the detailed steps that can be referred to in the original plan. The strategies include organizing agricultural industry networks and watershed groups, increasing technical assistance and education, funding and economic incentives for conservation measures, permit coordination for conservation practices, and improving maintenance practices for rural roadways and public lands.

The many partners that are working together throughout the six-county area on implementation of the Agriculture and Rural Lands Plan are known as the Agriculture Water Quality Alliance (AWQA). AWQA includes agriculture industry groups, federal, state, and local agencies, technical experts, environmental organizations and university researchers. The AWQA Steering Committee, directing the implementation efforts, has representatives from the Sanctuary, Central Coast Agricultural Water Quality Coalition (Coalition of Farm Bureaus), USDA, Natural Resources Conservation Service (NRCS), Resource Conservation Districts (RCDs), and University of California, Cooperative Extension (UCCE).

Because the Agriculture and Rural Lands Plan is relatively new, there has been less time for implementation to proceed and the original recommendations are still relevant. Therefore, we are using a slightly different format to identify future activities for this portion of the WQPP plan, as all current strategies and activities in the original plan will be maintained as future activities in this JMPR action plan. Also, as this is a much longer plan in terms of number of original strategies and activities, both the recommendations and the implementation to date are summarized only at a broad level.

Strategy WQPP-16: Establish Agricultural Industry Networks to Address Water Quality

The three activities in this strategy establish a process for developing industry-led networks of landowners and operators to address agricultural nonpoint pollution issues. Watershed-level agricultural working groups will be established in the Sanctuary's watersheds, under the leadership of existing large agricultural organizations such as Farm Bureaus and related industry groups. These industry networks will take the lead in organizing and working with their own members to establish joint projects for nonpoint source management in priority watershed areas. Activities in this section also include identifying priority target regions for joint projects, conducting outreach on nonpoint issues, assisting growers and ranchers in developing and carrying out voluntary site-specific management plans, obtaining outside technical assistance as needed, and tracking implementation success over time.

Activity 16.1: Establish Regional Industry Networks as a Framework for Addressing Nonpoint Source Management

Activity 16.2: Identify Priority Sites for Landowner Joint Projects

Activity 16.3: Implement Nonpoint Source Management Practices Using Industry-Led Watershed Groups

Implementation of WQPP Steps as of 2007

The Coalition of Central Coast County Farm Bureaus formed in 2000 developed into a non-profit organization known as the Central Coast Agricultural Water Quality Coalition in 2004 and continues to oversee the agricultural industry's regional implementation of this plan. Twenty-three Agricultural Watershed Working Groups have been organized by the Coalition. Over 400 farmers and ranchers participate in these groups by developing water quality plans for their properties and installing conservation practices that reduce erosion and nutrient runoff. Water quality plans have been developed for 97,200 acres of crop and rangeland, and applied on 77,500 acres. A diversity of crops are represented in Watershed Working Groups: cattle, vegetables, vineyards, orchards, field and greenhouse flowers, strawberries, pumpkins, etc. Additional work is needed to ensure that growers who are not part of existing large organizations are also reached. The AWQA Committee has established a template for annual tracking of on-the-ground implementation of practices.

Strategy WQPP-17: Strengthen Technical Information and Outreach to Agriculture

Although extensive technical information exists on agricultural techniques and tools to improve water quality, this information is not always readily available/easily usable for growers and ranchers. This strategy contains seven activities developed to make this information more accessible and useful through increased support for existing technical outreach services, development of networks, cross-training of outreach staff, packaging of easily understood information, and conducting on-site follow-up with workshop participants.

Activity 17.1: Compile, Develop and Distribute User-Friendly Technical Information on Agricultural Conservation Practices

Activity 17.2: Strengthen Referral Network and Cross-Training in Sediments, Nitrates And Pesticides For Technical Field Staff

Activity 17.3: Increase Agency Staff Time to Provide Technical Field Support and Prevention Efforts

Activity 17.4: Strengthen Information Transfer From Industry to Agencies to Keep Up-To-Date On Technical Advances in Conservation Measures

Activity 17.5: Strengthen Grower/Rancher Peer Advisory Networks to Share Conservation Information Among Peers, Including Outreach to Both Landowners And Tenants

Activity 17.6: Evaluate And Distribute Information on Cost-Effectiveness of Water Quality Management Practices

Activity 17.7: Develop And Promote Self-Monitoring Tools for Conservation Management Practices to Assess Problems And Track Success

Implementation of WQPP Steps as of 2007

Using a congressional allocation from the United States Department of Agriculture (USDA) to implement the Sanctuary’s agricultural plan, several technical field staff have been hired by the agricultural agencies to assist farmers and ranchers in the six-county area, including an Agronomist, Water Quality Monitoring Specialist, Rural Roads Engineer, Rangeland Specialist, Irrigated Agriculture Specialist, Hydrologist, and an Outreach Coordinator.

Over 500 farmers and ranchers have attended a UCCE training course designed to help farmers develop individual water quality protection plans for their properties. Numerous workshops have been held to train farmers in the benefits and use of specific conservation practices such as cover crops, stream bank protection, irrigation evaluation, and crop row alignment. Training on monitoring practices has also been conducted for the Coalition coordinators.

Research has been completed on the cost effectiveness of fifteen common conservation practices used in the six-county region. This information will be a useful tool for landowners to understand the financial costs and benefits of each practice.

Strategy WQPP-18: Improve Education and Public Relations on Watersheds and Agricultural Conservation Measures

There is a need for improved education of the general public about agricultural conservation issues, and of agricultural groups and the public about watershed issues as a whole. The three activities in this section were developed to enhance public, grower, government agency, and media knowledge about watershed issues, and develop better recognition of the conservation practices that the agricultural community employs.

Activity 18.1: Increase Public Knowledge of and Support for Agriculture and Agricultural Conservation Measures through Media and Outreach

Activity 18.2: Increase Grower and Public Awareness of Watershed-Based Management by Incorporating Watershed Message into Existing Programs and Media Outreach

Activity 18.3: Increase Agency Staff Understanding of Agriculture Through Development of Bulletins and Conducting Tours

Implementation of WQPP Steps as of 2007

Two major press events have been held to highlight AWQA activities and promote conservation practices. A public relations firm was contracted to help develop a media kit explaining watershed management and agricultural conservation practices that protect water quality. A freelance journalist has been contracted to develop stories on conservation practices for both general media and industry trade journals. Resource agency staff have attended many of the

agricultural workshops and field days hosted by AWQA partners. The UCCE Farm Water Quality Short Course, taken by all members of Watershed Working Groups, includes an overview presentation on watershed definition and function. An AWQA website (www.awqa.org) is currently under construction, designed to educate both the public and the agriculture industry about watershed management and agricultural conservation practices. Additional outreach models need to be developed to inform farmers and ranchers who are not involved in the Watershed Working Groups, or who do not speak English as a primary language.

Strategy WQPP 19: Coordinate and Streamline Regulations for Conservation Projects

This strategy stems from comments from both agency staff and landowners on the difficulty of the existing permitting process for conservation practices due to multiple agencies having jurisdiction over projects. A grower or rancher may need multiple permits from each of several agencies at the local, state, and federal levels, with separate fees, different requirements, different timelines, and sometimes contradictory mandates, even for projects that have a beneficial impact on water quality such as sediment basins, vegetative buffers, etc. The three activities in this section were developed to simplify and coordinate the existing permitting process for practices that protect water quality, more effectively apply existing regulations, and strengthen collaborative efforts between the regulatory agencies and the landowners.

Activity 19.1: Develop User-Friendly Permit Guidebooks

Activity 19.2: Develop Regional or Watershed-Based Permits for Conservation Management

Activity 19.3: Improve Collaborative Efforts Between Regulatory Enforcement Agencies and Landowners

Implementation of WQPP Steps as of 2007

A watershed-level permit for water quality improvements has been developed for the Salinas Valley, modeled after the successful Elkhorn Slough permit coordination program. Under a watershed permit, conservation practices are pre-approved by the agencies, and growers can work directly with the NRCS to design and install the conservation practice. This is expected to lead to an increased number of on-the-ground projects that protect water quality. A promotional brochure on the permit streamlining program for the Salinas Valley has been developed and distributed. Work has begun to develop a similar streamlining program in Santa Cruz County.

Strategy WQPP-20: Improve Funding Mechanisms and Incentives for Water Quality Improvements

Growers and ranchers are sometimes discouraged from installing conservation practices due to the initial costs for construction and then ongoing maintenance. The five activities in this section include ways to assist landowners and tenants in developing funding and economic incentives for agricultural conservation measures, and to promote their long-term economic benefits. Also included are strategies to inform growers and ranchers about tax policies that provide tax relief for implementing conservation measures, and to develop new policies that can serve as an additional incentive for voluntarily adopting such measures.

Activity 20.1: Improve Agricultural Community’s Knowledge of and Access to Funding Sources

Activity 20.2: Facilitate Availability of Trained Assistance for Conservation Field Projects

Activity 20.3: Broaden Applicability of Cost-Share Programs for Conservation Measures and Streamline Application Process

Activity 20.4: Increase Understanding of Existing Tax Benefits for Installing Water Quality Conservation Measures

Activity 20.5: Improve Tax Incentives for Implementing Conservation Measures

Implementation of WQPP Steps as of 2007

The Coalition, RCDs, Sanctuary and UCCS have all obtained funding to assist with watershed working groups, conservation practice implementation, research and coordination from state grants and private funding sources. NRCS has also substantially increased its funding under the EQIP cost-share program to growers installing conservation projects in several key Sanctuary watersheds. Additional funding sources are available under the new Farm Bill. However many of the specific recommendations in this section regarding improving funding for conservation measures have not been initiated.

Strategy WQPP-21: Improve Water Quality Management on Public Lands and Rural Roads

This section addresses management issues for public and private rural lands that may include activities other than farming and ranching. Roadways in rural areas can generate significant erosion and sedimentation problems if not properly maintained. The intent of the three strategies in this section is to improve both public and private planning and maintenance practices for rural roadways, in order to reduce erosion and properly dispose of sediment. In addition, this section includes a strategy to address the management and maintenance related to erosion on public trust lands, which is often deficient due to a lack of foresight and funding for long-term maintenance/improvement needs.

Activity 21.1: Provide for Maintenance Practices to Address Sedimentation on Public Roads and Waterways

Activity 21.2: Reduce Sedimentation from Rural Unsurfaced Roads and From Surfaced Roads

Activity 21.3: Improve Conservation Measures on Agency/Public Trust Lands

Implementation of WQPP Steps as of 2007

Training workshops for Public Works staff have been presented in Santa Cruz and San Mateo Counties. Guidelines for road maintenance practices that can prevent sedimentation and erosion are being finalized in Santa Cruz County and will be distributed to other counties for adoption of similar practice standardization. The recently hired Rural Roads Engineer (NRCS) has

undergone training to begin his advisory role in the six-county area. However, this section of the plan has not yet received a strong focus due to attention paid to the agricultural sections of the plan in early years.

FUTURE ACTION PLAN: PROTECTING WATER QUALITY IN WETLANDS AND RIPARIAN CORRIDORS

The original scope of the Water Quality Protection Program (WQPP) as defined by the WQPP Committee was to include an action plan addressing the issue of Wetlands and Riparian Corridors. This was to be the program's sixth action plan (Beach Closures and Microbial Contamination is the fifth), but resource limitations have prevented its development up to this point. The IWRP, Central Coast Wetland Working Groups, Elkhorn Slough Foundation, Watershed Institute, and others have made considerable progress on this issue. The MBNMS will work closely with these entities in the implementation of this plan. The WQPP will develop this action plan in the future as resources permit, and the following is a skeleton outline of the action plan that was developed by the WQPP Committee.

Strategy WQPP-22: Develop Wetlands and Riparian Corridor Action Plan

Activity 22.1: Develop and Implement Wetlands and Riparian Corridors Action Plan

Monterey Bay National Marine Sanctuary (MBNMS) Staff will use the following outline to develop the Wetlands and Riparian Corridors Action Plan

Goals:

- To recognize the relationship between water quality, wetlands and riparian corridors
- To inventory central California coastal wetlands and evaluate potential impacts
- To identify problems with the existing system of wetland/riparian protection and develop policy guidance that addresses these problems
- To integrate land-use planning objectives and resolve conflicts between flood control and wetlands/riparian conservation and restoration
- To implement restoration and protection projects
- To complement existing WQPP action plans and further program goals

Wetland Inventory and Assessment

- Create map of historic central California coastal wetlands
- Compile inventory of existing central California coastal wetlands that identifies location, health, functioning, and projected impacts

Wetland Regulation and Permit Review

- Identify and develop mechanisms to ensure consistent wetland and riparian corridor regulation and protection
- Develop and implement permit streamlining mechanisms for restoration activities
- Design and implement wetlands and riparian corridor education and outreach programs to landowners

Evaluate and design strategies that eliminate or reduce wetlands permitting obstacles, legal liabilities for created wetlands, and vector control concerns

Integrate Land-Use Policy Objectives and Administer Conflict Resolution

Resolve conflicts between flood control agencies and wetland and riparian corridor protection and restoration activities

Wetlands Restoration

Review existing restoration information to establish benefits to water quality from restoring coastal wetlands – identify gaps in knowledge and initiate research recommendations

Establish criteria for future restoration and allowances for appropriate uses of created wetlands for water quality protection purposes

Develop incentives for wetlands/riparian protection (e.g., cost-sharing programs, safe harbor programs, regulatory flexibility and streamlining, reduced/waived fees, etc.)

Develop funding partnerships

Using inventory and assessment information and permit streamlining mechanisms, identify priority areas for restoration, obtain funding, and implement projects

Integrate monitoring to restoration activities for long-term water quality trend analysis

Wetland Policy and Action Plan Implementation

Develop guidance document for local planners for policy integration into general plans, design standards, California Environmental Quality Act (CEQA) review, and local coastal programs

Coordinate and link implementation of plan with existing WQPP action plans

Action Plan Partners: California Coastal Commission, Environmental Protection Agency, California Department of Fish and Game, United States Fish and Wildlife Service, U.S. Army Corps of Engineers, Association of Monterey Bay Area Governments, State Parks, property owners, Academic and Research Institutions, Central Coast Joint Data Committee, Coastal Conservation Corps, California Watershed Network, existing WQPP partners, Regional Water Quality Control Boards, NRCS, RCDs, Local Jurisdictions, Agricultural Watershed Working Groups, Private Foundations, California Coastal Conservancy, NGOs, AWQA, Farm Bureau Coalition, USGG, Local and Regional Flood Control and Planning agencies, Counties, land trusts, Bureau of Land Management, United States Forest Service, local park districts, Monterey Regional Water Pollution Control Agency, schools, business organizations, developers, volunteer monitoring groups, State Water Resources Control Board, Ocean Conservancy, California Department of Fish and Game Office of Spill Prevention and Response, Harbormasters, Memorandum Of Agreement signatories, paint supply companies, boating organizations, California Clean Boating Network, independent hull cleaners, boatyards.

Table WQPP.1: Measuring Performance of the Water Quality Protection Program Implementation Action Plan

Desired Outcome(s) For This Action Plan:	
Prevent impacts to MBNMS resources and qualities from point and nonpoint source pollution resulting from urban, rural and agricultural runoff.	
Performance Measures	Explanation
Increase acreage of agricultural lands with improved water quality management practices from 77,500 acres in 2005 to 150,000 acres by 2012.	Expanding the Agricultural and Rural Lands Water Quality Program will increase the acreage with management plans that address soil erosion, sediment control and subsequent loss of fertilizers and pesticides used in the soil. Performance in implementing this program will be evaluated by tabulating the expansion of the program to new farms on an annual basis
Reduce the concentrations of urban water quality contaminants by 30% in 2012.	MBNMS, in coordination with its partners, will track the contaminants in urban water quality as reported through the First Flush program, Urban Watch, and monthly reporting by the County Environmental Health Departments and RWQCB.

Table WQPP.2: Estimated Timelines for the Water Quality Protection Program Implementation Action Plan I: Urban Runoff

Water Quality Protection Program Action Plan	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy WQPP-1: Increase Public Education and Outreach	●	—	—	—	→
Strategy WQPP-2: Increase Technical Training	●	—	—	—	→
Strategy WQPP-3: Collaborate with Regional Urban Runoff Management Efforts	●	—	—	—	→
Strategy WQPP-4: Promote Structural/Non-structural Controls	●	—	—	—	→
Strategy WQPP-5: Promote Sedimentation/ Erosion Controls		●	—	●	
Strategy WQPP-6: Increase Storm Drain Inspection	●	●			
Strategy WQPP-7: Produce and Promote CEQA Additions	●	●			
Strategy WQPP-8: Increase Regional Monitoring	●	—	—	—	→
Strategy WQPP-9: Increase Access to Monitoring Data	●	●	→
Strategy WQPP-10: Interagency Coordination	●	—	—	—	→
Strategy WQPP-11: Increase Public Education and Outreach	●	—	—	—	●
Strategy WQPP-12: Develop and Implement Technical Training Program	●	—	●		
Strategy WQPP-13: Promote Bilge Waste Disposal and Waste Oil Recovery	●	●			
Strategy WQPP-14: Promote Topside and Haul-out Vessel Maintenance		●	●		
Strategy WQPP-15: Increase Underwater Hull Maintenance	●	—	—	—	●

Monterey Bay National Marine Sanctuary – Final Management Plan
 Section VI – Water Quality: Water Quality Protection Program Implementation Action Plan

Water Quality Protection Program Action Plan	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy WQPP-16: Establish Agricultural Industry Networks to Address Water Quality	●————●……………▶				
Strategy WQPP-17: Strengthen Technical Information and Outreach to Agriculture	●————●				
Strategy WQPP-18: Improve Education and Public Relations on Watersheds and Agricultural Conservation Measures	●……………▶				
Strategy WQPP-19: Coordinate and Streamline Regulations for Conservation Projects	●……………▶				
Strategy WQPP-20: Improve Funding Mechanisms and Incentives for Water Quality Improvements	●————●				
Strategy WQPP-21: Improve Water Quality Management on Public Lands and Rural Roads	●……………●————●				
Strategy WQPP-22: Develop Wetlands and Riparian Corridor Action Plan	●————▶				
Legend					
Year Beginning/Ending	: ●————●		Major Level of Implementation: —————		
Ongoing Strategy	: ●————▶		Minor Level of Implementation: ……………		

Table WQPP.3: Estimated Costs for the Water Quality Protection Program Implementation Action Plan

Strategy	Estimated Annual Cost (in thousands)*				
	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy WQPP-1: Increase Public Education and Outreach	\$151	\$151	\$131	\$131	\$146
Strategy WQPP-2: Increase Technical Training	\$97	\$97	\$92	\$92	\$77
Strategy WQPP-3: Collaborate with Regional Urban Runoff Management	\$16	\$16	\$16	\$16	\$16
Strategy WQPP-4: Promote Structural/Non-structural Controls	\$24	\$24	\$24	\$24	\$24
Strategy WQPP-5: Promote Sedimentation/ Erosion Controls	\$20	\$20	\$12	\$12	\$78
Strategy WQPP-6: Increase Storm Drain Inspection	\$114	\$114	\$114	\$114	\$48
Strategy WQPP-7: Produce and Promote CEQA Additions	\$29	\$29	\$8	\$8	\$8
Strategy WQPP-8: Increase Regional Monitoring	\$480	\$480	\$480	\$480	\$480
Strategy WQPP-9: Increase Access to Monitoring Data	\$175	\$115	\$115	\$115	\$115
Strategy WQPP-10: Increase Interagency Coordination	\$58	\$58	\$58	\$58	\$57
Strategy WQPP-11: Increase Public Education and Outreach	\$75	\$75	\$75	\$75	\$75
Strategy WQPP-12: Develop and Implement Technical Training Program	\$0	\$0	\$13	\$13	\$13
Strategy WQPP-13: Promote Bilge Waste Disposal and Waste Oil Recovery	\$33	\$41	\$16	\$16	\$16
Strategy WQPP-14: Promote Topside and Haul-out Vessel Maintenance	\$60	\$20	\$12	\$12	\$12
Strategy WQPP-15: Increase Underwater Hull Maintenance	\$58	\$28	\$20	\$12	\$12

Monterey Bay National Marine Sanctuary – Final Management Plan
 Section VI – Water Quality: Water Quality Protection Program Implementation Action Plan

Strategy	Estimated Annual Cost (in thousands)*				
	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy WQPP-16: Establish Agricultural Industry Networks to Address Water Quality	\$24	\$24	\$24	\$24	\$129
Strategy WQPP-17: Strengthen Technical Information and Outreach to Agriculture	\$129	\$129	\$129	\$129	\$30
Strategy WQPP-18: Improve Education and Public Relations on Watersheds and Agricultural Conservation Measures	\$34	\$34	\$30	\$30	\$20
Strategy WQPP-19: Coordinate and Streamline Regulations for Conservation Projects	\$20	\$20	\$20	\$20	\$24
Strategy WQPP-20: Improve Funding Mechanisms and Incentives for Water Quality Improvements	\$24	\$24	\$24	\$24	\$48
Strategy WQPP-21: Improve Water Quality Management on Public Lands and Rural Roads	\$148	\$48	\$48	\$48	\$48
Strategy WQPP-22: Develop Wetlands and Riparian Corridor Action Plan	\$0	\$4	\$116	\$56	\$56
Total Estimated Annual Cost	<i>\$1,769</i>	<i>\$1,551</i>	<i>\$1,577</i>	<i>\$1,509</i>	<i>\$1,532</i>

* Cost estimates are for both “programmatic” and “base” (salaries and overhead) expenses.