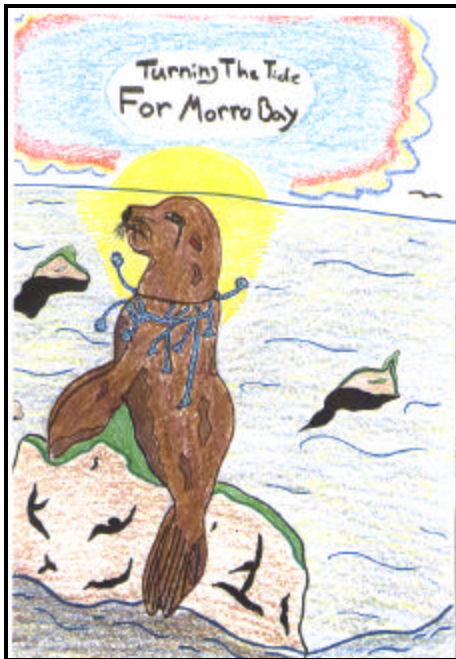


Turning the Tide



Executive Summary

of the
Morro Bay
National
Estuary
Program's
Comprehensive
Conservation &
Management Plan

Published July 2000

Morro Bay, California

companion documents:

Comprehensive Conservation & Management Plan (CCMP),

Contents

FORWARD	ii
ACKNOWLEDGMENTS	ii
INTRODUCTION.....	1
<i>Why is Morro Bay special?</i>	
STATE OF THE BAY	2
<i>The Place</i>	
<i>The Past</i>	
<i>The Present</i>	
THE MORRO BAY NATIONAL ESTUARY PROGRAM	4
<i>How did Morro Bay become a NEP?</i>	
<i>What is the CCMP?</i>	
<i>What is the Management Conference?</i>	
<i>The Goals of the Morro Bay National Estuary Program</i>	
THE PRIORITY PROBLEMS	6
<i>Rapid sedimentation</i>	
<i>Increased bacterial concentrations</i>	
<i>Increased nutrient concentrations</i>	
<i>Freshwater flow reductions</i>	
<i>Increased heavy metal concentrations</i>	
<i>Habitat loss</i>	
<i>Steelhead loss</i>	
MORRO BAY ESTUARY AND WATERSHED MAP	8
THE ACTION PLANS	9
<i>Cross-Cutting Actions</i>	
<i>Sedimentation</i>	
<i>Bacteria</i>	
<i>Nutrients</i>	
<i>Loss of Freshwater Flow</i>	
<i>Heavy Metals and Toxics</i>	
<i>Loss of Habitat</i>	
<i>Loss of Steelhead</i>	
<i>Public Outreach</i>	
IMPLEMENTATION	14
<i>Watershed Committees</i>	
<i>Public Participation</i>	
<i>Volunteer Monitoring</i>	
<i>Funding</i>	
<i>Measuring our Progress</i>	
CONCLUSION	17
CONTACT INFORMATION	18





A Western snowy plover on its nest in the dunes of the Morro Bay Estuary.

Forward

To meet the challenge of managing the Morro Bay Estuary and its extremely complex resources, the watershed communities of Morro Bay, Los Osos, Baywood, Cuesta-by-the-Sea and Chorro Valley have worked together for the last four years to develop the Morro Bay Comprehensive Conservation Management Plan (CCMP).

These communities have been confronting environmental problems such as:

- ◆ accelerated sediment loads in the estuary,
- ◆ bacterial contaminations of shellfish areas,
- ◆ runoff causing algal blooms,
- ◆ traces of heavy metals in creeks,
- ◆ reductions in functional habitat, and
- ◆ declining fish stocks such as steelhead trout and other native species.

These problems are causing social, economic and recreational impacts in the area. The CCMP is designed to address these environmental problems through the implementation of 61 recommended action items. Implementation of these actions is just the beginning of the ardent journey to a fully functioning, healthy estuary and watershed.

Acknowledgments

We take this opportunity to recognize the hundreds of citizens, organizations, agencies and businesses which assisted in developing the CCMP. In particular, we acknowledge the Bay Foundation of Morro Bay and the California Central Coast Regional Water Quality Board for serving as the financial administrators of the MBNEP. In addition, we acknowledge the Friends of the Estuary for coordinating the Volunteer Monitoring Program and the countless individuals who devote their time and energy to protecting the estuary and its watershed.



Introduction

Why is Morro Bay Special?

The Morro Bay Estuary supports one of the most important wetland systems on California's coast. Rich in natural diversity, Morro Bay sustains a wide variety of habitats as well as numerous sensitive and endangered species of plants and animals. Its rich resources support one of the state's largest waterfowl habitats. Morro Bay's role as a crucial stop on the Pacific Flyway attracts vast numbers of migrating birds to the area, as evidenced by the fact that Morro Bay repeatedly ranks in the top ten of the Audubon Christmas bird counts. The estuary and its watershed also offer many beneficial human uses, such as agriculture, commercial and recreational fishing, recreational boating, oyster farming, tourist attractions which support many community businesses, diverse water oriented recreational opportunities, and electric utility power generation. A healthy bay and watershed are vital to all these natural functions and human activities.



Morro Bay's rich resources support one of California's largest waterfowl habitats

There is no doubt that Morro Bay contains a variety of important natural resources. But one of the greatest resources may well be the community of people who have created a legacy of caring for Morro Bay, its watershed, and its resources. There are dozens of local organizations who have charged themselves with preserving what Morro Bay has to offer, be it clean water, open space, thriving fisheries, or native habitat. Without the desire and dedication of local people, agencies, and government – as expressed through countless hours of work – there would be no Morro Bay as we now know it. However, there remains much work to do as the community moves forward to protect these resources.

The goals of the Morro Bay National Estuary Program were developed over a decade by members of the local community, and as a result reflect the diverse – but not mutually exclusive – interests of the community. The central coast thrives on its tourism and prides itself on having a fine quality of life. Hence, environmental and commercial interests are both of concern as the stakeholders of Morro Bay work together to preserve and enhance what they have identified as important. This program exists because of and for the people of this community.

What is an estuary?

An estuary is a partially closed body of water formed where freshwater from rivers and streams flows into the ocean, mixing with salty sea water. The productivity and variety of estuarine habitats foster a wonderful abundance and diversity of wildlife including: shore birds, fish, shellfish and marine mammals.

What is a watershed?

Watersheds are nature's boundaries. They are geographic regions within which water drains into a particular waterbody, such as a river, stream, lake, or bay.

State of the Bay

Endangered, Threatened, and Special Species in the Morro Bay Estuary and Watershed

American peregrine falcon
Brown pelican
California black rail
California clapper rail
California red-legged frog
California sea-blite
Chorro Creek bob thistle
Cuesta Grade checkerbloom
Indian Knob mountainbalm
Least bell's vireo
Morro Bay kangaroo rat
Morro manzanita
Morro Bay shoulderband snail
Salt marsh bird's beak
Southern sea otter
Southern steelhead trout
Southwestern willow flycatcher
Swainson's hawk
Tidewater goby
Western snowy plover



California black rail

Importance of Eelgrass

Eelgrass beds serve as spawning and nursery grounds for many species of fish, including halibut and English sole.

The Morro Bay Estuary is the only significant eelgrass habitat available to the black brant in central or southern California. Because eelgrass comprises more than 75% of the brant's food intake, the future health of the Pacific Flyway brant population is dependent on the continued preservation of this resource.

Eelgrass improves the water clarity and quality of the bay because the dense foliage of the beds function as a trickling filter and a moderator of current and wave action.

The Place

Morro Bay ...

- ♦ is located on California's central coast in San Luis Obispo County, about halfway between San Francisco and Los Angeles.

The Morro Bay Estuary ...

- ♦ encompasses about 2,300 acres of mudflats, tidal wetlands, and open water habitat.
- ♦ supports a rich eelgrass resource, whose apparent decline may be an indication of compromises to the entire Morro Bay watershed system.

The Morro Bay Watershed ...

- ♦ contains about 48,000-acres, including the estuary.
- ♦ provides habitat for a number of endangered and/or threatened species, including but not limited to: steelhead trout, California red-legged frog, tidewater goby, Morro Bay kangaroo rat, southern sea otter, and western snowy plover.



The Past

The rolling breakers of the outer bay, the sandspit, and quiet inner bay are guarded by the ancient Morro Rock, towering 576 feet above the entrance to Morro Bay. One of a chain of peaks stretching inland from the sea, Morro Rock was a landfall for Spanish galleons sailing the coast of California. The town of Morro Bay was founded in 1870 by Franklin Riley, who built an embarcadero where wagons could reach the deep water near the shore. This wharf soon became a center of thriving commerce, despite the treacherous harbor entrances. These early changes started a progression of growth that continues to this day.

Over the years, to improve the safety of the harbor and protect seafaring commerce, Morro Rock was quarried to provide materials for breakwaters and a jetty, which closed the north entrance to the harbor. The south channel was dredged and later the economy of Morro Bay boomed as commercial fisherman began bringing in huge catches of albacore, salmon, and cod.

In 1968, Morro Rock was designated as a State Historical Landmark. While the years of quarrying had forever changed this natural monolith, it still covers 50 acres at its base. Now protected, this "Gibraltar of the



Pacific” can only be altered by nature.

While Morro Rock is protected from further harm, the Morro Bay Estuary is still vulnerable to environmental degradation. Although the Morro Bay Estuary still remains relatively unspoiled, it is under pressure from tremendous demands and stresses. The known and potential threats to Morro Bay include accelerated sedimentation, water quality concerns, alterations in freshwater flows, and loss of critical habitat. The lack of estuarine data for the central coast of California severely limits our ability to assess potential effects of human activities. To that end, the Morro Bay National Estuary Program commissioned four studies to help provide data for developing the CCMP: Stream Flow and Sediment, Habitat Characterization, Bay Bathymetry and Tidal Circulation, and Bay Nutrients.

The Present

The City of Morro Bay has come a long way since the 1870 census, when the Moro Township was described as having 21 dwellings and 118 inhabitants. Since then, links to outlying communities have continued to expand and influence the area. Now, there are two primary coastal communities within the Morro Bay watershed. The City of Morro Bay has a population of 10,000 and the unincorporated communities of Los Osos and Baywood Park have a combined population of 15,800.

Commercial fishing is one of the area’s chief economic activities. Commercial landings in the area had an ex-vessel value of \$ 6.9 million in 1993. Other valuable commercial endeavors within the watershed include farming, ranching, and tourism. Morro Bay attracts an estimated average of 4,000 tourists daily, or 1.5 million people annually to its environs. A primary attraction for this high level of tourism is the estuary and the scenic waterfront and surrounding watershed. Morro Bay’s economy is dominated by tourism and visitor-serving businesses: they generate an estimated 37 percent of all jobs in the city and one-third of the city’s general fund revenues.



The Morro Bay Estuary system supports a variety of uses, including tourism and commercial fishing.



Morro Rock: The Gibraltar of the Pacific, Home to Peregrines

"...to the south an estuary of immense size enters this valley, so large that it looked like a harbor to us; its mouth opens to the southwest and we noticed that it is covered with reefs which cause a furious surf. At a short distance from it, we saw a great rock in the form of a morro, which at high tide is isolated and separated from the coast by little less than a gunshot."
— Father Crespi,
Portola Expedition, 1769

Morro Rock is a nationally known historic peregrine falcon nest site that continues to support the breeding attempts of resident pairs of falcons.

After intensive nest management from 1977 through 1992, a Morro Rock pair of peregrines produced young without assistance from 1993 through 1997. Though following years brought breeding failures and the deaths of those two adults, early reports in the spring of 2000 indicated that a new pair of peregrines would probably be successful in their breeding efforts.

Actions being taken to help achieve future nesting success include reducing human disturbance by keeping climbers off the rock, eliminating feral cats from the area, and maintaining the necessary habitat within and around the estuary which will continue to attract adequate numbers of the peregrines’ avifauna food supply.

The Morro Bay NEP



An aerial view of the Morro Bay Estuary and sandspit.

How did Morro Bay become a National Estuary Program?

In 1987, Congress established the National Estuary Program (NEP) as part of the Clean Water Act. The purpose of the NEP is to identify, restore and protect estuaries along the coasts of the United States. The goal of the Program is to involve local communities and encourage them to take responsibility for managing their estuaries.

Morro Bay Is One of 28 Other Programs

Currently, there are 28 NEPs around the country, and all are at least partially funded by the U.S. Environmental Protection Agency (EPA).

Other NEPs include:

- San Francisco Estuary, California
- Santa Monica Bay, California
- Puget Sound, Washington
- Lower Columbia River Estuary, Oregon and Washington
- Tillamook Bay, Oregon
- Long Island Sound, Connecticut and New York
- Barataria-Terrebonne Estuarine Complex, Louisiana
- Tampa Bay, Florida

Like Morro Bay, virtually all of these estuaries are facing similar problems, such as sedimentation, habitat loss, degradation to water quality, and threats to economic activities dependent on the estuary / watershed system.

In April 1994, through the efforts of the Friends of the Estuary (FOE), the Governor established Morro Bay as California's first State Estuary. This designation formally recognized the importance of "preserving and enhancing Morro Bay and its watershed as one of the state's rare natural treasures" and further required a multi-jurisdictional planning effort. With the designation of Morro Bay as a State Estuary and the continuous dedication of local grass roots efforts, Morro Bay was accepted into the National Estuary Program (NEP) in October 1995. Subsequently, the MBNEP was charged with finding ways to achieve the goals of the program, which were identified during the previous decade by the Morro Bay Task Force and through subsequent MBNEP activities.

What is the CCMP?

The Comprehensive Conservation and Management Plan (CCMP), is a plan to address seven priority problems causing harmful impacts to the Morro Bay National Estuary. From the many cross cutting actions such as Urban Runoff, Stream Geomorphology, and Total Maximum Daily Load Allocations, to specific actions under each priority problem, the CCMP strives to sustain existing wildlife resources and environmental quality, taking into account and addressing pollution from a variety of sources.

What is the Management Conference?

The MBNEP Management Conference (MC) refers to the collection of stakeholders, organizations, agencies, and individuals that have been involved in developing the CCMP. The MC includes a Local Policy Committee (LPC), a Watershed Committee (WC), and a Technical Advisory Committee (TAC).

Local involvement in the MC has been critical in integrating all aspects of the planning process, as well as resolving conflicts over management goals among stakeholders who live and work in the watershed. In total, over 75 agencies, organizations, and businesses will participate in the implementation of the CCMP.

The Goals of the Morro Bay National Estuary Program

- ◆ Slow the process of bay sedimentation through implementation of management measures which address erosion and sediment transport.
- ◆ Reestablish healthy steelhead trout habitat in Chorro and Los Osos Creeks through measures including reduction of sediment loading in gravels, stabilization of riparian corridors, removal or mitigation of migration barriers, improvement of water quality, and restoration and maintenance of adequate freshwater flow.
- ◆ Ensure that bay water remains of sufficient quality to support a viable commercial shellfish and mariculture industry, safe recreational uses, healthy eelgrass beds, and thriving fish and shellfish populations.
- ◆ Ensure the integrity of the broad diversity of natural habitats and associated native wildlife species in the bay and watershed.
- ◆ Maintain watershed functional integrity through appropriate management of fires, grazing, riparian corridors and impervious surfaces.
- ◆ Protect social, economic, and environmental benefits provided by the bay and watershed, including agriculture and fisheries, through comprehensive resource management planning.
- ◆ Promote public awareness and involvement in estuarine management issues through outreach, educational programs, and the use of volunteers in ongoing bay monitoring and other programs.

The MBNEP Management Conference

The MBNEP Management Conference (MC) refers to the collection of stakeholders, organizations, agencies, and individuals that have been involved in developing the CCMP. The MC structure and responsibilities were defined by the following groups throughout the CCMP development process.

Local Policy Committee (LPC)

had the primary authority for the Morro Bay National Estuary Program (MBNEP). It was the executive decision making body and had the leadership role in selecting and guiding the program director, revising the Management Conference Agreement as needed, and approving annual work plans and budgets.

Watershed Committee (WC)

advised the LPC and ensured adequate representation of the agencies, organizations, and local interests in the development of the CCMP. Individuals of the WC served as delegates for the particular group or agency that they represent and kept their constituents informed of the progress, actions and decisions of the WC. The group also served as the Citizens Advisory Committee.

Technical Advisory Committee (TAC)

provided the WC with an appropriate scientific and technical basis for decision making. It also reviewed and offered input on technical studies, action plans and other CCMP documents.

The Priority Problems

Fight Against Increased Sedimentation Already Underway

To date, the Morro Bay Watershed Enhancement Plan (MBWEP) — developed by the Coastal San Luis Resources Conservation District (CSLRCD) — has provided the technical and financial assistance necessary to install over 245 conservation practices in the watershed.

These projects have kept over 172,000 tons of soil erosion from entering Morro Bay, and caught an estimated 300,000 cubic yards of sediment.

The most significant single action included in the MBWEP is the Chorro Flats Enhancement Project (CFEP), which essentially reconnected Chorro Creek with its historical floodplain, allowing sediment to be deposited there instead of in Morro Bay.

Anticipating the erosion potential following the 1994 Highway 41 fire, a 500-foot section of the levee confining Chorro Creek was removed. After the 1995 floods at Chorro Flats, three to four feet of sediment was deposited in some areas, an estimated 140,000 cubic yards of soil that would have ended up in Morro Bay.



Identifying the Problems

Since 1995, a broad group of citizens, scientists and government specialists has been studying the Morro Bay Estuary and watershed, examining its health, identifying its high-priority problems, and devising plans of action. The goal has been to create a balance of interests in the watershed by including advisors and advocates from all the groups who had a stake in the process, including agriculturalists, environmentalists, landowners, tourism-based business owners, commercial fishers, and recreational boaters. Seven important areas of concern were identified by this broad coalition, and focused studies were then undertaken to gather more information. This new information, coupled with past studies dating back as far as the 1960s, has provided important information about trends.

The Priority Problems

Rapid sedimentation —

The size of Morro Bay is decreasing at an alarming rate. Erosion in the watershed and sedimentation in the estuary are believed to be the greatest threats. The rate of sediment delivery has increased rapidly due to changes in land use, alteration of natural sediment deposition areas, and wildfires.

Increased bacterial concentrations —

Bacterial contamination is threatening shellfish operations within the bay to the extent that harvesting is always restricted in about one quarter of the lease area, and other areas are closed to harvesting during storm events. High coliform counts have been found in both summer and winter near shoreline locations discharging contaminated water into the bay.

Increased nutrient concentrations —

Runoff from agricultural areas, grazing pastures, roadsides and lawns is increasing nutrient concentrations in the bay, resulting in increased algal growth and reduced levels of dissolved oxygen, which can affect aquatic organisms. Poorly functioning septic systems, fertilizers, and animal waste are believed to be contributing to this problem.



Above: The 7th Annual National Non-Point Source Monitoring Conference was held in Morro Bay in 1999.
Below: Volunteer monitor Al Pardo measures a stream channel in one of the creeks within the Morro Bay watershed.
Volunteer monitoring has been and will continue to be a crucial vehicle for obtaining data about the Morro Bay Estuary and watershed.

Freshwater flow reductions –

Groundwater aquifers are recharged from the same sources that provide freshwater to the estuary. Increases in surface and groundwater diversions directly affect the quality, and timing of creek flow into the bay, as well as the wildlife and botanic values associated with the supply of freshwater.

Increased heavy metal and toxic pollutant concentrations –

Inactive mines in the upper watershed are believed to be the source of eroding sediment containing high levels of heavy metals into Chorro Creek. Runoff from urban stormwater and bayside marina activity also introduces heavy metals and other toxic pollutants into the bay.

Habitat loss –

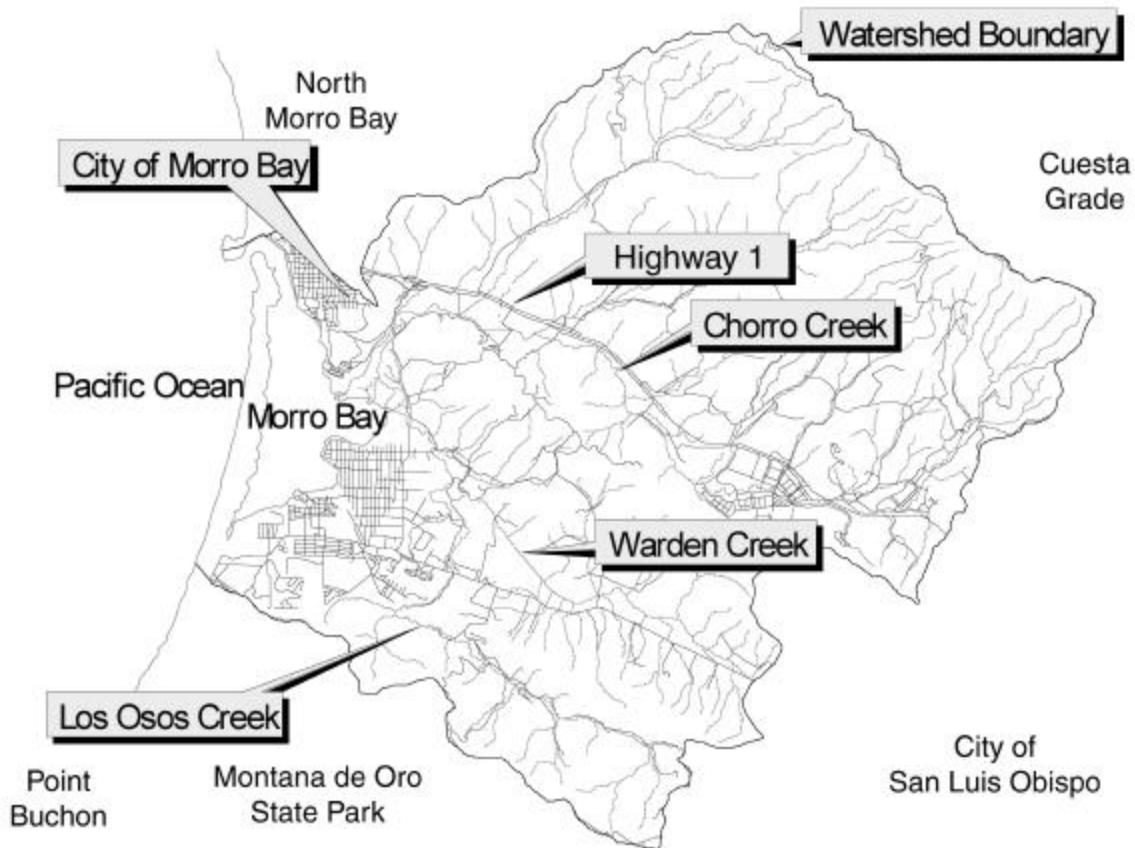
Development pressures in this region of the central coast are rapidly increasing. Greater population density and altered land use threaten water quality and wildlife habitat. Changes in drainage patterns, erosion, and invasive species are contributing to this problem.

Steelhead loss –

Water diversion projects, migration barriers, drought and siltation upstream have greatly reduced the viability of steelhead in Chorro and Los Osos Creeks.



The Morro Bay Watershed



This GIS-generated map shows the streams and waterways of the Morro Bay Estuary and its watershed system. The major creeks – Chorro, Los Osos, and Warden – are marked, as are several relevant landmarks.

The Morro Bay watershed encompasses an area of approximately 48,000 acres, or 75 square miles. Its highest elevation is 2,763 feet above sea level and its furthest point from Morro Bay is about 10 miles.

The Action Plans

At the heart of the CCMP are the 61 “Action Plans.” These actions have been developed based on information from scientific studies, the goals and objectives of the NEP, the priority issues, and significant stakeholder input. The MC ranked the top 31 high priority actions, as noted below by this symbol: ★. Like other aspects of the NEP, this priority ranking is subject to change as various opportunities and needs arise.

Cross-Cutting Actions

Most of the action plans are organized by the priority issue they most directly address. However, due to the complexity of the watershed environment and the interrelationships of problems, the cross-cutting objectives and actions broadly cover a number of the priority issues.

- ★ CC-1 Acquire and protect lands with ecologically valuable habitat and/or beneficial functions
- ★ CC-2 Reduce drainage problems by acquiring detention and retention areas
- CC-3 Develop and implement Total Maximum Daily Loads (TMDLs)
- ★ CC-4 Implement urban storm water Best Management Practices (BMPs)
- CC-5 Maintain, restore, and enhance stream geomorphology and water quality for steelhead
- ★ CC-6 Expand and maintain the existing Volunteer Monitoring Program (VMP)
- CC-7 Establish a Watershed Crew to provide planning, labor, outreach and mapping services

Sedimentation

It is a natural process for estuaries to eventually fill due to sedimentation. However, Morro Bay has been experiencing abnormally accelerated rates of sedimentation due to watershed disturbances. The contributing factors may include upland and streambank erosion, as well as land disturbances such as roads, construction, agricultural and mining activities, and sediment transportation by ocean currents.

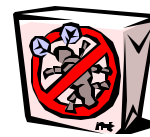
Objectives

- ▶ Reduce sedimentation into the estuary and increase clarity of estuary waters
- ▶ Decrease erosion from upland areas
- ▶ Minimize agricultural soil loss, increase stakeholder involvement; implement Best Management Practices (BMPs)
- ▶ Reduce bedload (in-stream) and stream bank soil erosion
- ▶ Decrease the rate of shoreline erosion and dune migration

Save the Bay Tips

Keep your septic systems functioning at optimum levels, and use boat pumpout facilities.

Landscape your yard using plants that have low requirements for water, fertilizers, and pesticides.



Apply lawn and garden chemicals sparingly and according to directions.

Keep litter, pet waste, leaves, and debris out of street gutters and storm drains — these outlets drain directly to the bay and its watershed.

Drive less — Automobiles emit tremendous amounts of airborne pollutants, which increase acid rain; they also deposit toxic metals and petroleum byproducts into the environment.

Regular tuneups and inspections can help keep automotive waste and byproducts from contaminating runoff.

Use water-based products whenever possible

Dispose of used oil, antifreeze, paints, and other household chemicals properly, not in storm sewers or drains.



One quart of oil can contaminate up to two million gallons of drinking water!



The boat rental facility at the Morro Bay State Park Marina in the Morro Bay Estuary. In the background are the hills of Montaña De Oro State Park.

Actions

- SED-1 Increase use of management measures for road maintenance and construction activities
- ★ SED-2 Install new and maintain existing sediment traps
- ★ SED-3 Develop and implement a watershed fire management plan
- ★ SED-4 Assist landowners to implement Best Management Practices (BMPs)
- ★ SED-5 Assist landowners to implement creek restoration projects
- SED-6 Revegetate north sandspit areas
- SED-7 Encourage landowners to control erosion and retain sediment
- SED-8 Improve degraded estuary navigation channels and habitat, and increase circulation

Bacteria

Morro Bay has experienced elevated levels of bacteria, which present a potential health threat to those who utilize the bay for recreational purposes and economic threats to those who depend upon the resources of the bay for their livelihood. Sources of high bacteria include discharged effluent, failing septic systems, wildlife and domestic animal waste, boats with inadequate waste disposal capabilities, and urban and agricultural runoff.

Objectives

- ▶ Reduce the length of closures for restricted shellfish lease areas and meet standards for water contact recreation
- ▶ Decrease levels of bacteria originating from live-aboard boats
- ▶ Minimize bacterial pollution from wildlife, domestic pets and horses
- ▶ Promote consistent and comprehensive water quality standards and monitoring efforts

Actions

- ★ BACT-1 Implement grazing management measures
- BACT-2 Provide new and upgrade existing pump-out facilities
- ★ BACT-3 Remove illegal moorings in the backbay
- ★ BACT-4 Remove abandoned, derelict boats and vessels in the backbay
- BACT-5 Decrease levels of bacteria from live-aboard boats
- BACT-6 Explore the bio-filtration potential of the Pacific oyster (*Crassostrea gigas*)
- BACT-7 Install and maintain bird-deterrent floats in shellfish growing areas
- BACT-8 Promote an off-leash dog park and horse trails away from creekbeds and other estuarine areas
- BACT-9 Coordinate state and local bacteriological water quality standards and monitoring efforts

Nutrients

Nutrient enrichment impacts the beneficial uses of drinking water, commercial and sport fishing, shellfish harvesting and wildlife habitat. The potential sources of these excess nutrients include urban runoff, leaking or failing septic systems, animal waste, wastewater discharges, fertilizer application and other natural processes.

Save the Bay Tips

Preserve existing trees, and plant three levels of vegetative cover (trees, shrubs, and ground cover) to help prevent erosion and promote infiltration of water into the soil.

Use drip irrigation, and/or keep a careful watch on watering. If water is running off the yard area, it's not getting to your plants, and maybe carrying away valuable topsoil.

Water in the evening or early morning, not during the heat of the day.

Over-watering may also increase leaching of fertilizers to ground water.

Take short showers instead of baths and avoid letting faucets run unnecessarily.



Repair leaking faucets, toilets, and pumps. The drips add up!

Objectives

- ▶ Reduce the concentrations of nitrates in watershed creeks, streams and groundwater
- ▶ Decrease fertilizer runoff from residential and golf course areas
- ▶ Protect social, economic, and environmental benefits provided by the bay and watershed
- ▶ Promote public awareness and involvement in estuarine management issues

Actions

- ★ NUTR-1 Support efforts to increase and improve the level of wastewater treatment in Los Osos
- ★ NUTR-2 Develop nitrogen-control measures for wastewater effluent
- NUTR-3 Implement agricultural management practices which reduce nitrate levels
- NUTR-4 Implement Best Management Practices (BMPs) to decrease fertilizer runoff



“Dawn Patrol” members Liz Blake and Dorothy Rooney with the dissolved oxygen meter they use in their early morning monitoring.

Freshwater Flow

The Morro Bay Estuary ecosystem is dependent on the delicate balance of salt water and freshwater. Significant reductions in freshwater flow to the watershed and bay have a direct impact on a wide variety of social and economic conditions in the region, including water supply, flooding, habitat, recreation, and fishing. Potential causes of these reductions in freshwater flow include water usage and poor water management.

Objectives

- ▶ Increase and maintain freshwater flow in the Chorro and Los Osos basins

Actions

- FLOW-1 Support City of Morro Bay efforts to reclaim water
- FLOW-2 Maintain minimum stream flows in Chorro Creek
- ★ FLOW-3 Promote ground water conservation and reuse
- FLOW-4 Maintain and dedicate wastewater treatment plant releases to prevent streamflow reduction and enhance fishery and wildlife uses of Chorro Creek

Heavy Metals and Toxics

A variety of toxic substances and heavy metals are reaching Morro Bay in small amounts. Heavy metals can be a serious water quality concern because of their toxicity, persistence and potency. Sources of heavy metals and toxic substances include stormwater runoff, vehicle brake pad dust and other discharges, mine runoff, solid waste disposal areas, household and industrial uses, agriculture and wastewater discharges.

Ways to Become Involved in Your Estuary and Watershed

Participate in the Volunteer Monitoring Program

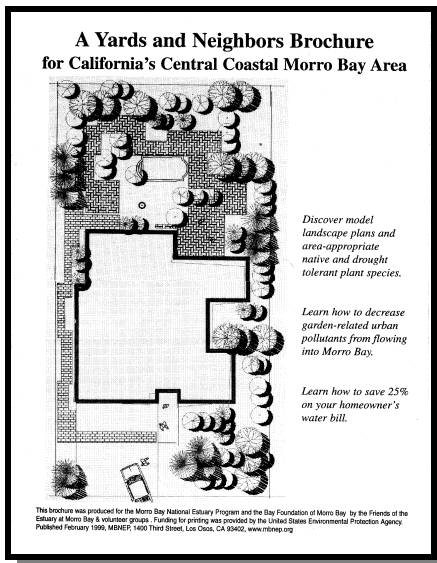
Show the “Change on the Range” video to your class or group

Attend MBNEP Public Meetings

Volunteer for groups, such as SWAP or MEGA.

Enjoy a walk or field trip that gets you, your family, and friends out on the estuary or in the watershed

Realize that YOUR actions ultimately affect the health of the Morro Bay Estuary and watershed



Save the Bay Tips

Landscape using native plants, or at least using non-invasive plants that will not threaten the native vegetation. For more information about this type of landscaping, refer to the “Yards and Neighbors Brochure” developed by Friends of the Estuary and available at the MBNEP.

Wash your car only when necessary; use a bucket to save water. Alternatively, go to a commercial carwash that uses water efficiently and disposes of runoff properly.

Use low-flow faucets, shower heads, reduced-flow toilet flushing equipment, and energy and water efficient appliances.

Use dishwashers and clothes washers only when fully loaded, and use low-phosphate or phosphate-free detergents.

Participate in local clean-up activities.

Objectives

- ▶ Reduce the introduction of heavy metals and other toxic pollutants to watershed streams, estuary waters and sediments

Actions

- ★ HMT-1 Remediate inactive/abandoned mines and reduce heavy metals and sediment loadings
- HMT-2 Implement marina Best Management Practices (BMPs)
- HMT-3 Support development and design for environmentally friendly boat haulouts and maintenance facilities for large vessels
- HMT-4 Establish a network of easily accessible hazardous waste facilities, including bayside locations

Loss of Habitat

Due to the interdependency of ecosystem components, habitat loss has become a significant priority problem in Morro Bay and its watershed. Habitat loss and degradation occur as a result of other priority problems– sedimentation, nutrients, bacteria, heavy metals and toxics and freshwater flows. Habitat impacts from these problems include decreased waterfowl populations, reduced recreational and commercial value, fewer pollutant buffers, and less biodiversity.

Objectives

- ▶ Support and strengthen actions by public agencies and private parties to protect habitat and function
- ▶ Increase the quality and quantity of riparian corridors and estuarine wetland habitats
- ▶ Reduce habitat loss to invasive species

Actions

- ★ HAB-1 Develop planning overlay maps for sensitive habitat and listed species
- HAB-2 Inventory and protect ecologically significant upland habitat
- HAB-3 Map shoreline, near shoreline wetlands, upland vernal pools and riparian vegetation along all creeks and their tributaries
- HAB-4 Implement appropriate actions in existing and future species recovery plans
- HAB-5 Implement policies and projects to protect, restore and create habitats, including wetlands, in connection with dredging projects
- HAB-6 Maintain and promote wetland resources and riparian vegetation through proven management techniques
- HAB-7 Develop methods, including voluntary and incentive programs to protect riparian and wetland resources
- ★ HAB-8 Implement restoration activities to improve the quantity and quality of eelgrass habitat
- ★ HAB-9 Implement management measures to control the impacts of nonindigenous species
- HAB-10 Implement pilot project to remove *A. donax* from riparian vegetation corridors

Loss of Steelhead

In the Morro Bay watershed, both Chorro and Los Osos Creeks support southern steelhead populations. However, declining habitat, water diversion projects, migration barriers, drought and siltation have greatly reduced the viability of local steelhead population. In August 1997, southern steelhead was listed as federally threatened by the National Marine Fisheries Service.

Objectives

- ▶ Protect and enhance steelhead populations and habitat

Actions

- STL-1 Implement steelhead trout recovery goals
- ★ STL-2 Restore and increase access to critical habitat
- ★ STL-3 Maintain and enhance pool/riffle structure
- STL-4 Maintain and enhance riparian corridors



MBNEP Scientific Coordinator Regina Wilson helps a group of local school children learn more about creeks and their importance in the Morro Bay Estuary and watershed system.

Public Outreach

The ultimate goal of the MBNEP is the protection and restoration of the unique natural resources of Morro Bay. Through the cooperative efforts of federal, state and local interests, the program is focused on promoting environmentally sound management of the estuary. Broad-based public involvement and support are required to accomplish this goal.

Objectives

- ▶ Increase public awareness of resources, processes and priority problems
- ▶ Increase children's awareness of resources, processes and priority problems
- ▶ Improve cooperative efforts and understanding of issues for partnering agencies, organizations and stakeholders

Actions

- ★ EDU-1 Conduct general outreach and education focused on a healthy environment
- ★ EDU-2 Develop educational materials regarding marine pollution and habitat issues
- ★ EDU-3 Develop educational materials regarding erosion, sedimentation, sensitive resources and fertilizers
- ★ EDU-4 Organize workshops on the positive and negative uses of pesticides
- ★ EDU-5 Coordinate "State of the Estuary" conference to encourage community involvement
- ★ EDU-6 Create an interactive monitoring display for the Morro Bay Natural History Museum
- ★ EDU-7 Increase public knowledge of MBNEP and projects through the media
- ★ EDU-8 Provide at least two public access locations to the estuary in Los Osos
- ★ EDU-9 Prepare an education plan focusing on natural resources and watershed enhancement for k-12 schools
- ★ EDU-10 Develop a minigrants program for community organizations to assist in the implementation of the CCMP
- ★ EDU-11 Review and refine the CEQA/NEPA initial study environmental checklist

Poster & Poetry Contests Get Kids Involved

Since 1995, the MBNEP has been holding a poster contest involving SLO County students of all ages to help educate students, parents and the community about the challenges facing the Morro Bay Estuary and watershed.



Last year, some 130 children turned in poster entries.*

Artwork from entries has been used in MBNEP documents, a calendar, notepads, and magnets.

In 2000, the MBNEP also co-sponsored a poetry contest in conjunction with the Morro Bay Winter Bird Festival and Friends of the Estuary.



* At left is artwork from last year's Grand prize winner Bethany Anderson

Implementation



A work crew installing a straw bale fence as a sediment control measure to protect a riparian zone.

We celebrate the dedication and determination of the numerous citizens, organizations, agencies and businesses which are committed to the protection and restoration of Morro Bay and its watershed. The difficult phase of developing the CCMP has been completed. The next step is to move into the implementation process. The Management Conference signed the final draft CCMP on May 4, 2000 and sent it forward to California Governor Gray Davis and EPA Administrator Carol Browner for final approval.

Watershed Committees

Upon receipt of the final approval, the Management Conference will turn over implementation responsibilities to a new MBNEP organizational structure. This structure will be composed of an Executive Committee, Implementing Committee, Task Force and MBNEP Staff. Although each of these organizational groups will have unique responsibilities in the implementation process, the larger objective is to function as an united body to effectively and efficiently facilitate and administer important supporting projects carried out by community stakeholders, organizations, agencies and individuals.

Local Involvement Has Been and Will Continue to be Critical

"The Morro Bay watershed communities have been the cornerstone of the CCMP..."

"In total, over 75 agencies, organizations, and businesses will participate in the implementation of the CCMP."

"Thanks to community involvement and the considerable investment of time, energy and vision of each stakeholder, the CCMP accurately reflects the priority problems of the Morro Bay National Estuary, as well as makes recommendations that community members can individually or jointly help to implement."

Public Participation

Thanks to community involvement and the considerable investment of time, energy and vision of each stakeholder, the CCMP accurately reflects the priority problems of the Morro Bay National Estuary, as well as makes recommendations that community members can individually or jointly help to implement. To streamline projects and ensure steady progress, the MBNEP office will be the primary coordinator of implementation activities. In addition to these duties, the office will continue to promote general community awareness of the MBNEP, encourage formal and informal educational opportunities related to the estuary and its watershed, and remain committed to engaging further public participation in future MBNEP planning processes.

There are many more ways to participate, contact the MBNEP at 601 Embarcadero, Suite 11, Marina Square, Morro Bay, CA 93442, (805) 772-3834, Fax: (805) 772-4162, Email: mbnep@mbnep.org for more information.

Volunteer Monitoring

The Volunteer Monitoring Program has developed into a partnership between many agencies, organizations and citizens. The Bay Foundation and the Central Coast Regional Water Quality Board (through the MBNEP) provide support for volunteer coordination, program management, and laboratory funds for monitoring activities. The Friends of the Estuary provides funds for water quality equipment and volunteer recognition. Partnerships are continually forming to expand the watershed wide Volunteer Monitoring Program. Hundreds of volunteers have gotten their feet wet in the creeks and bays. To find out how you can get involved, contact the MBNEP staff at (805) 772-3834.

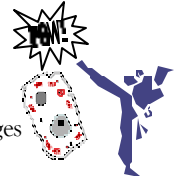
Current Opportunities:

Benthic Invaders

Each spring, citizen monitors venture into the creeks using kicknets to gather benthic macroinvertebrates from the stream bottom gravels. These bottom-dwelling aquatic insects are surveyed as indicators of water and habitat quality as part of a sampling method called Rapid Bioassessment.

Bac Attackers

Routine sampling for *E.coli*, total coliform, and nitrates has also been occurring bi-weekly on the fringes of the bay at freshwater seeps. The Bac Attackers collect and analyze bacteria levels in conjunction with the Surfrider Foundation's Blue Water Task Force.



Stream Profilers

Habitat assessments and stream channel profiles are conducted once a year, during the summer, when flows in the creeks are low. These assessments are conducted to evaluate characteristics such as riparian corridor health, creek channel shading, stream bank stability, fish habitat quality, and siltation of stream bottoms.

SLO Floaters

Every other week, rain or shine, volunteers measure creek flows in the tributaries that flow into Morro Bay. Volunteers also help collect water quality samples at these locations as part of a ten-year EPA funded cooperative program between Cal Poly State University and the CCRWQCB - The National Monitoring Program.



Dawn Patrol

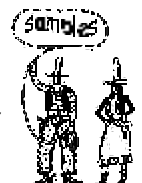
Every month, the Dawn Patrol takes to the water in kayaks to measure dissolved oxygen. The team gathers their data before sunrise to document oxygen levels that may be stressful for fish and other marine organisms.

Bay Nitrate Monitoring

Volunteers venture into the bay by boat, canoe, and kayak to collect nitrate and salinity samples as part of a Cal Poly senior project coordinated study. The data collected is being used to evaluate quarterly nutrient levels in the estuary.

Drain Rangers

The Drain Rangers are "on call" to collect storm water runoff samples from culverts and storm drains during the winter season. Volunteers collect samples during the "first flush," when the first large storm of the rainy season flushes accumulated pollutants from roads and other surfaces.





The "Change on the Range" video illustrates how local landowners are using BMPs to preserve both their own land and the health of the watershed.

Action Plan Demonstration Projects

On July 2, 1998, the Watershed Committee (WC) approved funding for several Action Plan Demonstration Projects (APDPs). The primary goals of these projects were to improve the water and habitat quality of the Morro Bay Estuary, and demonstrate the effectiveness of action plans being considered for the CCMP.

- Morro Bay Watershed Run-Off Model
- Introduced Marine Species Management
- "Yards and Neighbors" Brochure
- Permit Streamlining
- Environmental Photojournalism
- Veldt Grass Suppression
- Bayfront Boatyards/Marinas BMPs
- Giant Reed (*Arundo donax*) Eradication
- Poster Contest and MBNEP Calendar
- Harbor Debris Removal
- Riparian Fencing Project
- Boat Rinse Station Project
- Volunteer Monitoring Program
- "Change on the Range" Video

(More information about these projects is available in Appendix C of the CCMP.)

Funding

The MBNEP receives funding from the U.S. EPA, but a large portion of implementation funding is expected to come from Consent Decree funds (awarded to the MBNEP via a legal settlement in 1997). The Bay Foundation (a local non-profit organization) acts as bursar for all NEP funds; however, decisions regarding Consent Decree funding are made jointly by the Bay Foundation, the California Regional Water Quality Board (a State agency), and the Local Policy Committee. This partnership is unusual for an NEP, as most NEPs are administered solely by state or local government entities.

Measuring Progress

The MBNEP anticipates that the CCMP Action Plan will take 5 years to implement. The Action Plan has been divided into 7 sections corresponding to each of the priority problems. Each priority problem contains specific actions for implementation, providing a total of 61 recommendations for action. From the total, 31 actions have been determined to have precedence for implementation and have been given priority implementation deadlines.

To measure progress, the MBNEP will track the implementation of these actions and provide formal updates to the U.S. Congress, MBNEP Committees and to the Morro Bay community. The MBNEP Office will use a variety of reporting techniques including: quarterly newsletters, annual reports, online status updates available through the MBNEP website and community presentations. For more information about the CCMP implementation strategy or progress, please refer to the MBNEP Office at (805) 772-3834 or online at www.mbnep.org.

The CCMP was carefully drafted using the best information available. However, circumstances may arise which require necessary adjustments to the Plan. The MBNEP Committees have made organizational preparations and designed the CCMP to be flexible to allow for adaptations to be made if necessary. Nevertheless, MBNEP is confident that implementation will occur without delay. In fact, many of the action items have already begun to be implemented!

Conclusion

The Morro Bay Estuary and its watershed are important and extremely complex resources, and managing them is a significant challenge. The Morro Bay Estuary is still vulnerable to environmental degradation, and environmental protection must be integrated with the uses of the land, water, and other natural resources. The Comprehensive Conservation and Management Plan (CCMP) offers an array of actions to protect and restore the health of the Estuary and watershed.

The most valuable tools and resources for the work ahead exist in the community committed to carrying out the Action Plans. This community has demonstrated that with increased awareness and interest, people become more involved in protection, restoration, and management of the Morro Bay Estuary and watershed. With their involvement, watershed management can strengthen a sense of community, help reduce conflicts, increase commitment to the actions necessary to meet environmental goals, and ultimately, improve the likelihood of success.

The active involvement of the local community is the essential key to making the CCMP a true living document that grows and improves with lessons learned and successes gained, rather than just a plan that remains on a shelf. The commitment of the Morro Bay community certainly offers a future bright with promise for the Estuary and all of its inhabitants.



Mara Waddell, William Chesnut, Casey Unger, and Shane Wilwane celebrate the completion of their Morro Bay Watershed Run-Off Model APDP.

We can make a difference

Contact Information

Morro Bay National Estuary Program

The MBNEP maintains an office within the Morro Bay watershed under the auspices of the Bay Foundation of Morro Bay and the state's Central Coast Regional Water Quality Control Board (CCRWQCB).

The office is located at: 601 Embarcadero, Suite 11, Marina Square, Morro Bay, CA 93442
Tel: (805) 772-3834, Fax: (805) 772-4162
mbnep@mbnep.org

Morro Bay NEP Website — <http://www.mbnep.org>

EPA National Estuary Program Website — <http://www.epa.gov/owow/estuaries/nep.htm>

Production

Writing & Editing:

Katy Budge, Erika Clark, Monica Hunter, Cheryl McGovern, Regina Wilson

Design & Layout :

Katy Budge, Erika Clark

Artwork Credits:

front cover: Lindsay Hunter, Sara Sciortino, & Gilbert Escobeda,
all from Grade 7, Judkins Middle School;

back cover: Ariel Martz-Stepp – Grade 7, Judkins Middle School

page 8: map courtesy of USDA Natural Resources Conservation Service
and the Coastal San Luis Resource Conservation District

page 13: Bethany Anderson – Grade 3, Monarch Grove Elementary*
& Darija Malinauskas – Grade 7, Judkins Middle School

page 17: Bethany Anderson – Grade 3, Monarch Grove Elementary*
(* 1999 Grand Prize Winner of the MBNEP Poster Contest)

Photo credits:

page ii: Greg Smith, Bay Foundation

pages 1, 3: Katy Budge, Morro Bay National Estuary Program

pages 4, 10: provided by U.S. Environmental Protection Agency

pages 7, 11, 18: Katie Kropp, Regional Water Quality Control Board

page 13: provided by the Morro Bay National Estuary Program

page 14: provided by USDA Natural Resources Conservation Service
and the Coastal San Luis Resource Conservation District

page 16: provided by San Luis Video Publishing

page 17: Jean Spooner, North Carolina State University



In memory of Bill Williams ,
Williams Shellfish Company, shown here taking
water samples on the bay near his oyster beds.

Printed on recycled paper



Morro Bay National Estuary Program
601 Embarcadero, Suite 11, Marina Square, Morro Bay, CA 93442
(805) 772-3834, (805) 772-4162
www.mbnep.org