

CALIFORNIA COASTAL COMMISSION

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**Tu 14e**STAFF RECOMMENDATIONON CONSISTENCY DETERMINATION

Consistency Determination No.	CD-12-00
Staff:	MPD-SF
File Date:	1/28/2000
45th Day:	3/13/2000
60th Day:	3/28/2000
Commission Meeting:	3/14/2000

FEDERAL AGENCY: **Environmental Protection Agency**

PROJECT
LOCATION:

Morro Bay, San Luis Obispo County (Exhibits 1-3)

PROJECT
DESCRIPTION:

National Estuary Program Comprehensive Conservation
Management Plan (Exhibits 4-9)

SUBSTANTIVE FILE
DOCUMENTS:

See page 11.

EXECUTIVE SUMMARY

The Environmental Protection Agency (EPA) has submitted a consistency determination for the Morro Bay National Estuary Program (MBNEP) Comprehensive Conservation and Management Plan. This Plan is a comprehensive program addressing habitat and water quality concerns in the Morro Bay watershed.

The Plan designates the following six issues as top priority concerns: sedimentation, bacterial contamination, nutrient enrichment and dissolved oxygen, heavy metals and toxics, freshwater flow, and habitat loss. The water quality measures cover both point and non-point sources of pollution, with action items proposed to help maintain and restore the estuary. The Plan further identifies the primary causes for the identified problems, and proceeds to recommend 67 actions (Exhibit 6) to address them. Some of the actions build on past efforts, and some constitute new approaches. The plan identifies the ideal implementation strategy for each proposed action. Implementation will occur through a wide variety of activities and by a broad spectrum of federal, state, and local agencies and citizen group. As the plan states, the actions are "both a blueprint for and a call to action." The plan serves as a model for comprehensive

watershed resource planning and protection, and its implementation would significantly benefit the estuary and is consistent with the fundamental goals of the Coastal Act. The Plan would protect, and restore, where feasible environmentally sensitive habitat, water quality, wetlands, rare, threatened and endangered species, and marine resources. The Plan would also protect and support commercial and recreational fishing. Thus, the plan is consistent with the applicable policies (Sections 30210-30214, 30230-30233, 30234, 30234.5, and 30240) of the Coastal Act.

STAFF SUMMARY AND RECOMMENDATION

I. Background/Project Description. The Environmental Protection Agency (EPA) has submitted a consistency determination for a comprehensive watershed management plan for Morro Bay. The plan was established under the auspices of the National Estuary Program (NEP), which itself was established under the Clean Water Act for the purpose of pioneering a broader focus for coastal protection, and demonstrating practical, innovative approaches for safeguarding coastal areas and their living resources. The NEP currently includes 28 major estuaries and coastal water bodies nationwide. The intent of the NEP was to identify nationally significant estuaries threatened by pollution, development, or overuse and to promote the preparation of comprehensive management plans to ensure their ecological integrity. One purpose of National Estuary Programs is to develop of plans to coordinate implementation by local, state and federal agencies of Comprehensive Conservation Management Plans.¹

Morro Bay was accepted into the National Estuary Program in 1995. Under the NEP, the Morro Bay program established an Executive Conference and various subcommittees, working with abroad spectrum of public agencies (federal, state and local), as well as interest groups and private citizens (Exhibit 7). After several years of effort, the program published a Draft Comprehensive Conservation Management Plan in August 1999.

The plan states that the purposes of the Morro Bay NEP include an emphasis on characterization and trend detection in its statement of seven purposes and objectives:

- 1) Assess trends in the estuary's water quality, natural resources, and uses of the estuary;*
- 2) Collect, characterize and assess data on toxics, nutrients, and natural resources within the estuarine zone to identify the causes of environmental problems;*
- 3) Assess pollutant loadings in the Estuary and relate them to observed and potential changes in uses of the estuarine zone, water quality and natural resources;*

¹ To avoid confusion caused by the fact that "CCMP" can refer both to the "California Coastal Management Program" and the "Comprehensive Conservation and Management Plan," any references in this report to the acronym "CCMP" will mean the California Coastal Management Program.

- 4) Develop a comprehensive conservation and management plan that recommends priority corrective actions and implementation schedule addressing point and nonpoint sources of pollution to restore and maintain the chemical, physical, and biological integrity of the estuary, including restoration and maintenance of water quality, a balanced indigenous population of shellfish, fish, and wildlife, and recreational activities in the estuary, and assure that the designated uses of the estuary are protected.*
- 5) Develop plans for the coordinated implementation of the plan by the states as well as federal and local agencies participating in the conference;*
- 6) Monitor the effectiveness of actions taken pursuant to the Plan;*
- 7) Ensure that federal assistance and development projects (per Executive Order 12372, September 17, 1983) are consistent with the Management Plan, meet the requirements of CWA Section 320(b)(7) and further the goals of the Plan.*

In addition, the Morro Bay NEP has adopted broad goals for protecting and enhancing the resources of the bay and watershed, which are to:

- 1) Slow the process of bay sedimentation through implementation of management measures which address erosion and sediment transport.*
- 2) 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 fresh water flow.*
- 3) Ensure that bay water remains of sufficient quality to support a viable commercial shellfish mariculture industry, safe recreational uses, healthy eelgrass beds, and thriving fish and shellfish populations.*
- 4) Ensure the integrity of the broad diversity of natural habitats and associated native wildlife species in the bay and watershed.*
- 5) Maintain watershed functional integrity through appropriate riparian corridor management, impervious surface management, fire management, and grazing management.*
- 6) Protect social, economic, and environmental benefits provided by the bay and watershed through comprehensive resource management planning.*

7) 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.

Finally, in the "heart" of the Plan are 67 recommended actions designed to accomplish these goals (summarized in Exhibit 6), including a detailed discussion of implementation for each action, with timeframes, implementation strategies, cost, funding sources, monitoring and evaluation (Exhibits 5 & 9), progress made to date as of August 1999 (Exhibit 8), and related information. Several representative samples of these more detailed discussions are attached as Exhibit 9.

II. Status of Local Coastal Program. The standard of review for federal consistency determinations is the policies of Chapter 3 of the Coastal Act, and not the Local Coastal Program (LCP) of the affected area. If the LCP has been certified by the Commission and incorporated into the California Coastal Management Program (CCMP), it can provide guidance in applying Chapter 3 policies in light of local circumstances. If the LCP has not been incorporated into the CCMP, it cannot be used to guide the Commission's decision, but it can be used as background information. The San Luis Obispo County and City of Morro Bay LCPs have been certified by the Commission but have not been incorporated into the CCMP.

III. Federal Agency's Consistency Determination. The Environmental Protection Agency has determined the plan consistent to the maximum extent practicable with the California Coastal Management Program.

IV. Staff Recommendation. The staff recommends that the Commission adopt the following motion:

MOTION: I move that the Commission agree with consistency determination CD-12-00 that the plan described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the California Coastal Management Program (CCMP).

STAFF RECOMMENDATION:

*Staff recommends a **YES** vote on the motion. Passage of this motion will result in an agreement with the determination and adoption of the following resolution and findings. An affirmative vote of a majority of the Commissioners present is required to pass the motion.*

RESOLUTION TO AGREE WITH CONSISTENCY DETERMINATION:

The Commission hereby agrees with the consistency determination by the Environmental Protection Agency, on the grounds that the plan described therein is fully consistent, and thus is consistent to the maximum extent practicable, with the enforceable policies of the CCMP.

V. Findings and Declarations:

The Commission finds and declares as follows:

1. Environmentally Sensitive Habitat, Wetlands, Marine Resources. The Coastal Act provides:

30230: Marine resources shall be maintained, enhanced, and where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain the biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

30231: The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, minimizing adverse effects of waste water discharges and entrainment, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface water flow, encouraging waste water reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

Section 30233(a). The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects, and shall be limited to ... [eight specified uses].

Section 30240. (a) Environmentally sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on those resources shall be allowed within those areas.

(b) Development in areas adjacent to environmentally sensitive habitat areas and parks and recreation areas shall be sited and designed to

prevent impacts which would significantly degrade those areas, and shall be compatible with the continuance of those habitat and recreation areas.

The Morro Bay estuary encompasses approximately 2,300 acres of mudflats, eelgrass beds, tidal wetlands, and open water. The entire watershed totals 48,000 acres, and includes the Chorro Creek drainage (27,000 acres) and Los Osos Creek drainage (17,000 acres). Morro Bay supports the most significant wetland system on California's south central coast. The estuary is an essential link in the Pacific Flyway, providing one of the state's largest waterfowl habitats south of San Francisco. It supports a rich eelgrass resource and provides habitat for a number of endangered and/or threatened species, including: steelhead trout, California red-legged frog, tidewater goby, Morro Bay kangaroo rat, southern sea otter, and western snowy plover.

The Morro Bay estuary and its various habitats are threatened by a large number of disturbances from human activities. To help protect these resources, the Plan designates six issues as top priority concerns: sedimentation, bacterial contamination, nutrient enrichment and dissolved oxygen, heavy metals and toxics, freshwater flow, and habitat loss. The following discussion (taken from the NEP's "Base Programs Analysis") elaborates on these concerns:

Sedimentation - Erosion in the watershed and sedimentation in the estuary are the greatest threats to Morro Bay. If sediment deposition in the estuary continues at the present rate, the health of the estuary is in severe jeopardy. Under normal conditions, an estuary and lagoon such as Morro Bay, could have a life measured in thousands of years (USDA/SCS, 1989a). However, if there is no abatement of sediment deliveries to the estuary, its life expectancy is likely limited to approximately 300 years (Haltiner, 1988), with parts of the southern section of the bay disappearing much sooner. The economic and environmental impact of this loss would be severe.

Bacteria

Elevated levels of bacteria 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. Elevated levels of bacteria are an indication that other pollutants, such as pathogens and viruses, may be present.

Bacteria levels in Morro Bay have increased noticeably since 1993. The increased levels have already impacted shellfish growing operations. Rising levels of bacteria could adversely impact recreational uses of the bay. These pollutants can have adverse effects on humans and many marine species who utilize the bay..

Nutrients - *Sediment and fertilizer runoff from agricultural land contains significant amounts of nitrogen and phosphorus as well as organic matter. Nutrients are also added by animal waste runoff into water ways. Other nutrient sources include the wastewater discharge at the California Men's*

Colony treatment plant and septic systems in Los Osos and Baywood Park. These increased nutrient additions to the creeks and estuary can result in increased algal growth and reduced levels of dissolved oxygen in the water. The reduced oxygen contents can adversely affect aquatic organisms, particularly fish. This problem may increase as grazing lands are converted to higher intensity agriculture and in sections of the watershed, to horse operations and residential parcels.

Heavy Metals and Other Toxins - Inactive mines in the upper watershed have resulted in high levels of heavy metals, particularly nickel and chromium, being found associated with sediments eroding from these areas. Mine tailings and dredging spoils have been used for years in the upper watershed as fill and as road surface material. Dust from this soil may present a risk for those frequently exposed to it, as nickel is a lung carcinogen. Neither nickel nor chromium have been detected in significant quantities in surface waters; they are found primarily in association with soil particles. Their presence in sediment could impact the health of benthic fauna.

The Los Osos Landfill in the Los Osos Creek watershed may be another source of pollutants. Until early 1988, the waste dump for residential wastes, toxic materials including motor oil, pesticide containers, lubricants, and other domestic pollutants. Pollutant discharges from the landfill have not been found in surface water. However, recent studies (Engineering Science, 1987) show low level hydrocarbon contamination in two wells adjacent to the landfill. Erosion of contaminated sediment from the landfill could be a concern. For example, from major storms in 1983, portions of the buried trash were exposed and eroded by a tributary of Los Osos Creek. Monitoring of water continues in the estuary through the Bay Protection and Toxic Cleanup Program (State Water Resources Control Board, 1988).

Other potential sources of heavy metals and other toxic pollutants include urban runoff discharges from the streets of the city of Morro Bay and the Community of Los Osos, live-aboard boaters, boat painting and cleaning, and fuel docks.

Limited mussel data is [sic] available as an indicator of the bay's quality with respect to metals and organics. These data do, however, indicate that a potential for problems exists in Morro Bay. Efforts are needed to prevent one-time occurrences of toxic concentrations from becoming chronic problems.

Reduced Fresh Water Flows The Morro Bay watershed is the source of drinking water for the communities of Los Osos (population about 16,000), the California Men's Colony (population about 6-8,000), and the city of Morro Bay (population about 10,000). At present, groundwater recharge of aquifers comes from the same sources that bring fresh water to the estuary,

and increases in ground and surface water diversion directly affect the flow of creeks, the number of flow days, and wildlife and botanic values associated with a fresh water supply. Fresh water flows from the two main creeks (a third was diverted from the bay in the 1940's) entering the bay have been reduced, and at times completely interrupted, through a combination of agricultural and urban uses.

Effluent from septic tanks recharges the upper portion of the sand dunes in Los Osos, and some of this water probably returns to the estuary through springs. The amount of flow of these springs controls the boundary and vitality of fresh and brackish water ecosystems surrounding the estuary, and these may be affected as changes in effluent disposal are implemented in Los Osos. Such changes are being mandated by the Basin Plan of the Regional Water Quality Control Board, which will require an end to septic tank effluent disposal in Los Osos, and the diversion of effluent to a central treatment plant and disposal site. Such changes may have a significant effect on the estuary's ecosystems.

Habitat Loss - Impacts to wetlands around the bay are closely linked to sedimentation. Seasonal runoff of fresh water produces measurable turbidity in mid-estuary zones (eelgrass), the duration of which is significantly longer in a simple flow system like a mature river (Phillips, 1984). Increased turbidity leads to decreased eelgrass growth, and reduces the depth range at which it will occur in the estuary. Desiccation through increased sediment accumulation is a major factor limiting the upper intertidal distribution of eelgrass. There appears to be no species succession in the eelgrass stage of the ecosystem. Eelgrass is the initial colonizer as well as the climax stage of development (Phillips, 1984).

*The salt marsh and mudflats, while increasing in area at the estuary edge, does so at the expense of the eelgrass beds and deep water zones. With increased sedimentation, salt marsh habitat is being replaced in the upper delta by lower-salinity tolerant species. These include the introduced and extremely invasive Hoary Cress (*Cardaria draba*). Habitat quality at this expanding interface has been severely degraded (Cicero, 1991). Also invasive in riparian woodlands adjacent to the delta is German Ivy, again probably exacerbated by disturbed soils resulting from sedimentation.*

These impacts and issues are systematically and comprehensively analyzed and addressed in the 67 "actions items" (Exhibit 6) presented in the Plan. These actions items are specifically oriented towards protecting and restoring, where feasible, the health and biological diversity of the Morro Bay estuary and its watershed. The action items include such measures as land acquisitions, development of Best Management Practices (BMPs) and Total Maximum Daily Loads (TMDLs), restoration and revegetation efforts, sediment traps, fire management plans, grazing and other agricultural management plans, technical and financial assistance to various

landowners to modify land use practices and implement best management practices, improved water quality treatment, removal of nuisances, support for water reclamation, improved public access, and various inventorying, mapping, public education, and public outreach efforts.

Along with the action items are detailed implementation programs and strategies for each (see Exhibit 9 for representative samples). The Commission applauds these efforts and believes they constitute a strong, long-term commitment to resource protection. Implementation necessarily involves multi-agency and citizen efforts, including significant efforts by the Coastal Commission itself. The Commission is a working partner in these efforts and is committed to continuing to support this model watershed approach. The Commission will continue to be involved in the plan and use its available regulatory authorities to implement the plan to the extent possible, as well as to help provide continuing staff resources to assist others agencies and involved citizens interested in and motivated to achieving the plan's goals. Implementation of the plan's provisions in the county area will be considered in the Periodic Review of the San Luis Obispo County LCP currently being undertaken by the Commission. The Commission believes the plan serves as a model for comprehensive resource planning and protection, and the Commission concludes that the plan is consistent with the applicable Coastal Act policies because it will protect and enhance marine, estuarine, and wetland resources, environmentally sensitive habitat, and water quality, will protect and enhance commercial and recreational fishing, and will improve public access and recreation opportunities in this important coastal region. The Commission therefore finds the proposed Plan consistent with Sections 30210-30214, 30220, 30224, 30233, 30234, 30234.5, and 30240 of the Coastal Act.

2. Commercial and Recreational Fishing. The Coastal Act provides:

Section 30234. Facilities serving the commercial fishing and recreational boating industries shall be protected and, where feasible, upgraded. Existing commercial fishing and recreational boating harbor space shall not be reduced unless the demand for those facilities no longer exists or adequate substitute space has been provided. Proposed recreational boating facilities shall, where feasible, be designed and located in such a fashion as not to interfere with the needs of the commercial fishing industry.

Section 30234.5. The economic, commercial, and recreational importance of fishing activities shall be recognized and protected.

Along with the extensive biologically valuable natural resources (discussed in the previous section of this report) associated with the Morro Bay estuary and watershed, the resources support extensive commercial and recreational fishing, oyster farming, and other recreational and tourist-oriented activities that depend on the health of the wildlife. Because of its small, relatively rural nature, which is dependent on tourism, the economic health of the Morro Bay region is inextricably linked to the protection of its wildlife resources. The Bay supports a small marina, campground, natural history museum, restaurants, public boat-launch ramps,

sportfishing facilities, boat repair yard, and marine hardware stores. At least 180 commercial and sport fishing boats and 350 small recreational boats regularly use the harbor, and at least 200 boats from other harbors around the state land fish at Morro Bay. According to past Commission consistency reviews (CC-123-98), the following commercially and recreationally valuable fish species are found in Morro Bay:

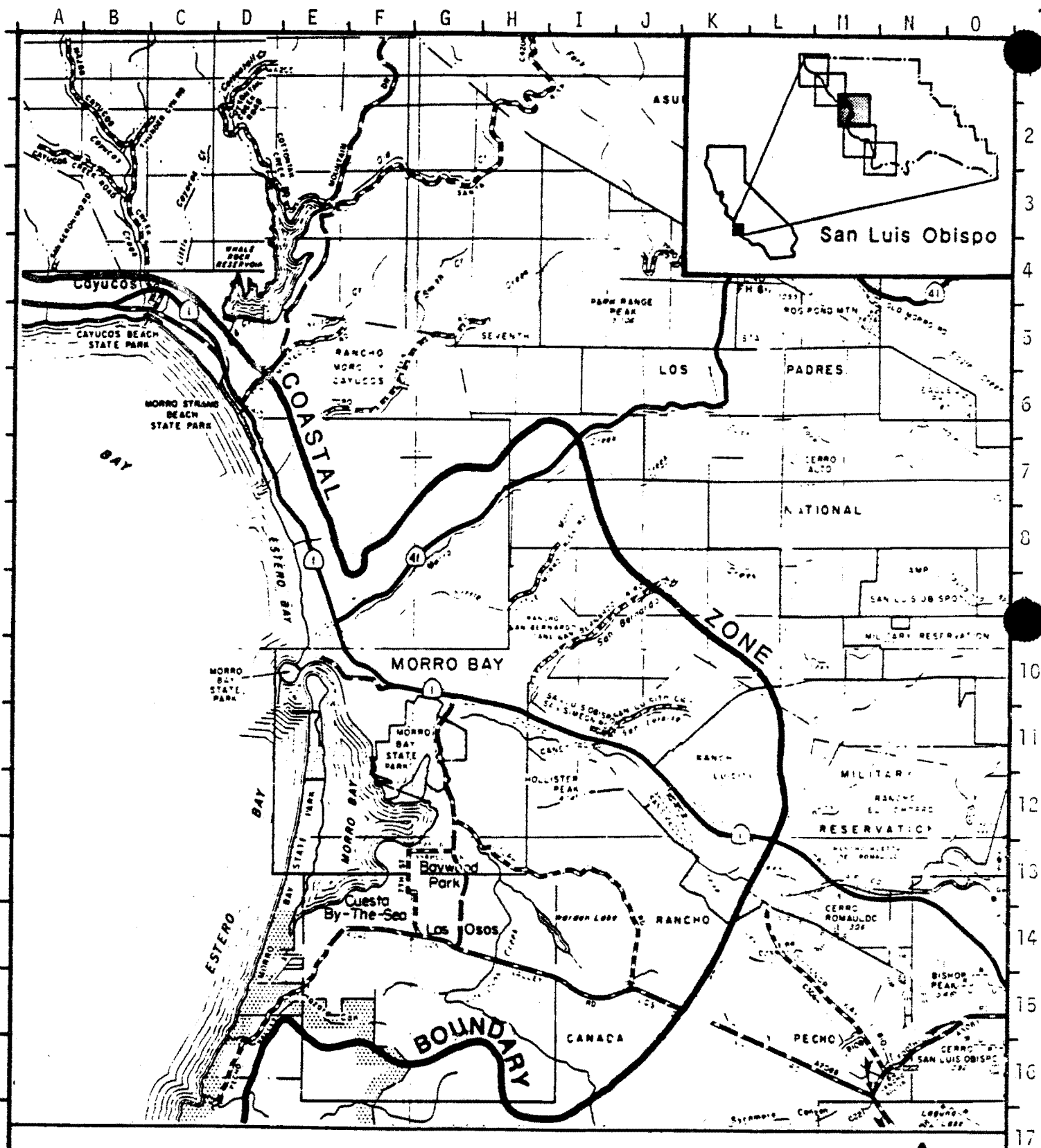
... in the Morro Bay/Estero Bay area, sandy bottom fishes include various members of the orders Pleuronectiformes (flatfish), Squaliformes (sharks) and Rejiformes (sharks and rays). A variety of commercial and sport fish are found in the vicinity of the Morro Bay-Cayucos WWTP discharge area. Commercial catches from the Morro Bay area are typically dominated by rockfish (Sebastes spp.), albacore tuna (Thunnus alalunya), California halibut (Paralichthys californicus) and the red abalone (Haliotis rufescens). Catches from sport fishing (i.e. recreational party boat, pier, and shore fishermen) include rockfish, a variety of flatfish (Bothidae and Pleuronectidae), lingcod (Ophiodon elongatus), bocaccio (Sebastes paucispinis), cabezon (Scorpaenichthys marmoratus), pacific staghorn sculpin (Leptocottus armatus), various surfperch (Embiotocidae), white croaker (Genyonemus lineatus), queenfish (Seriphus politus), jacksmelt (Atherinopsis californiensis) and occasionally striped bass (Roccus saxatilis). Recreational harvesting for the Pismo clam (Tivela stultorum) and several other bivalve species has been conducted in the past along Atascadero State Beach north of Morro Rock.

For the reasons discussed in the previous section, in which the Commission determined that the Comprehensive Conservation Management Plan's extensive action items and implementation programs are designed to protect and restore water quality and the wildlife values of the watershed, the proposed Plan's efforts to protect these resources would similarly protect, and improve where feasible, commercial and recreational fishing and aquaculture. The Commission therefore finds the Plan consistent with Sections 30234 and 30234.5, as well as with the other recreation and access policies, of the Coastal Act.

3. Related Commission Action. On October 11, 1994, the Commission concurred with EPA's Consistency Determination for another Comprehensive Conservation Management Plan, the Santa Monica Bay Restoration Plan (CD-83-94). Like the current proposal, that plan was also developed under the National Estuary Program and similarly addressed comprehensive watershed habitat and water quality needs. The Commission found the plan supportive of and consistent with the applicable Coastal Act policies.

VI. SUBSTANTIVE FILE DOCUMENTS:

1. Base Programs Analysis For The Morro Bay National Estuary Program National Estuary Program Comprehensive Conservation Management Plan, RWQCB/CCC, December 1998.
2. Turning the Tide for Morro Bay, Draft Comprehensive Conservation and Management Plan for Morro Bay, Morro Bay NEP, The Bay Foundation of Morro Bay, Central Coast RWQCB, EPA Region IX, August 1999.
3. Consistency Determination CD-83-94, EPA, Santa Monica Bay Restoration Plan.
4. Consistency Certification No. CC-123-98, Secondary Treatment Waiver, City of Morro Bay and Cayucos Sanitary District.
5. Environmental Assessment, Maintenance Dredging at Morro Bay Harbor, U.S. Army Corps of Engineers, August 1997.



California Coastal Commission

LOCATION MAP

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miles

County of San Luis Obispo

EXHIBIT NO.

APPLICATION NO.

CD -12-00

EPA, Morro Bay NEP



Figure 2.1 The MBNEP Study Area

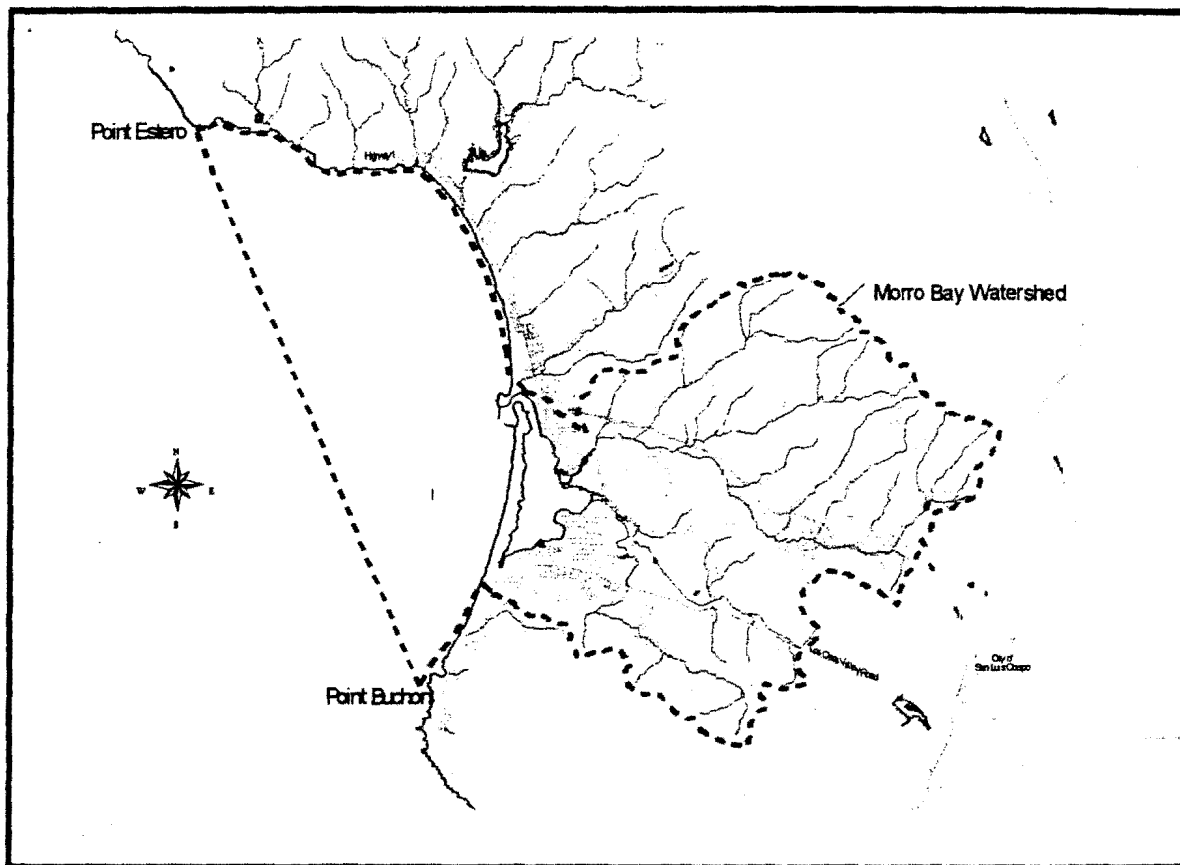


EXHIBIT NO. 2

APPLICATION NO.

CD-12-00

Figure 2.2 The Morro Bay Watershed

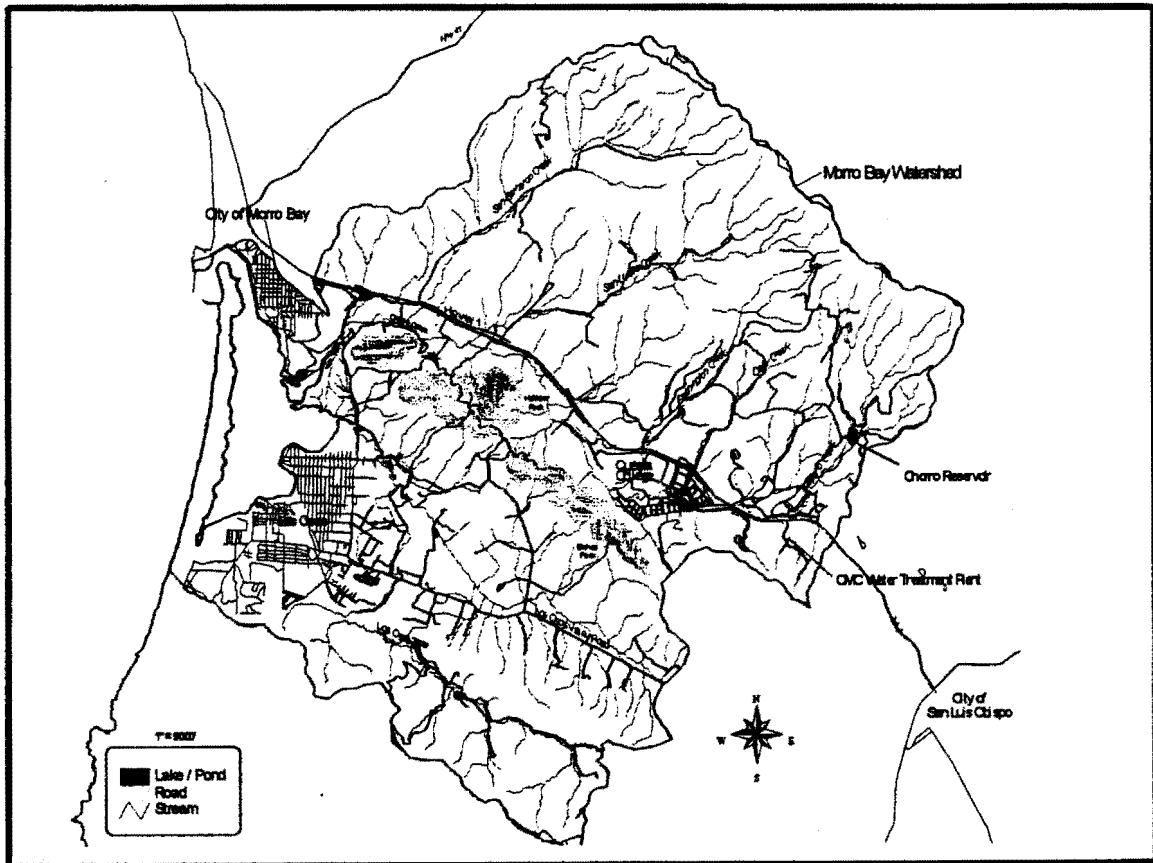


EXHIBIT NO. 3

APPLICATION NO.

CD-12-00

limits. These lease areas are known as Area 1 and Area 2 (see Figure 2.3), and are managed by CDPR and CDFG, respectively.

Prior to the 1992 lease agreement, CDPR and CDFG administered some of the "backbay" area of the estuary for recreational boating and natural resource protection, preservation, and management. CDFG also managed private shellfish mariculture and had oversight of waterfowl pothunting activities.

Most of those who share the resources of Morro Bay are engaged in the activities described in Table 2.4.

Table 2.4 Activities of the Users of Morro Bay

Commercial and Sport Fishing	The central coastline of California is one of the longest unprotected shorelines on the Pacific coast. The Morro Bay estuary provides a large year-round and all-weather commercial and recreational boat harbor. Since the nearest such harbors are over 100 miles to the north and south, Morro Bay provides a critical resource to fishing and recreational boating industries, with over 100 commercial fishing boats contributing an ex-vessel value of \$7 million to the area's economy. Morro Bay began and is still widely known as a fishing community. Sport fishing of lingcod, rockfish, cabezon, king salmon, albacore and halibut account for well over \$1 million in gross revenues. Between 50 and 300 transient commercial vessels use the harbor and facilities each year.
Aquaculture	This includes propagation, cultivation, maintenance or harvesting of aquatic plants and animals for human consumption or bait. Abalone production has occurred in Morro Bay and could once again contribute important economic benefits to the area. High water quality is critical to aquaculture operations.
Shellfish Harvesting	Morro Bay has in the past and may in the future contain significant shellfisheries, providing clams, oysters and mussels for human consumption. Currently it is the site of one primary shellfish operation. Central and southerly portions of the estuary are used for oyster growing. Presently, 269 acres of mudflats are leased for shellfish growing.
Water Navigation	Area waters are used for shipping, travel and other transportation by private, military and commercial vessels.
Agricultural Water Supply (for grazing and croplands)	Sixty percent of the watershed area is grass rangeland, primarily for cow/calf enterprises. Emphasis on rangeland beef production and economic return has brought steeper and more marginal areas of rangeland into use. Non-irrigated cropland is farmed using a grain-garbanzo bean rotation. Grazing livestock use the grain stubble. Snow peas and vegetables are grown where irrigation water is available and winter temperatures permit active growth.
Industrial Service (cooling water for electric power generation)	A thermal plant at Morro Bay owned by Duke Energy Power Services is one of the major steam electric-generating plants on the Pacific coast. Water is drawn directly from the bay to cool its boilers, then the heated water is discharged to the ocean just north of the bay. This plant is the single largest industrial employer in Morro Bay, employing 130 people.

EXHIBIT NO. 4
APPLICATION NO.
CD-12-00

Table 2.4 Continued

Education and Scientific Research	The estuary's large and readily accessible tracts of intertidal and marsh area provides an ideal location for both educational and scientific work. The Coastal Resources Institute at Cal Poly University and other universities regularly conduct research at the bay. The Bay Foundation of Morro Bay does research and also plans to develop a research station within city limits. The Morro Bay Natural History Museum serves 10,000 students and 79,000 visitors annually.
Groundwater Recharge	Groundwater (including surface water underflow) can be naturally or artificially recharged for purposes of future extraction, maintenance of water quality, or halting of saltwater intrusion into freshwater aquifers.
Freshwater Replenishment	Surface water quantity or quality (e.g., salinity) can be replenished naturally or artificially through one body of water that supplies another downstream. This includes streams that supply reservoirs, lakes or estuaries; and reservoirs and lakes that supply streams.
Municipal & Domestic Water Supply	Community, military and individual water supply systems, including drinking water.
Recreation (with or without water contact)	Morro Bay and Montana de Oro State Parks represent the second largest land use acreage next to agriculture in the watershed. State and city parks and beaches in the area include over 2250 acres within the city limits of Morro Bay. Morro Bay State Park, visited by 500,000 people each year, is home to a 100-boat capacity marina, a natural history museum, and a golf course that is also an environmental sanctuary. Its land includes fresh and saltwater wetlands, open water and upland habitats. The estuary also contains other parks, a bird sanctuary, environmentally sensitive wildlife and plant habitats. The last decade has seen a dramatic increase in the use of canoes, kayaks, and small boats. Party and whale-watching boats also operate out of the bay.
Habitat Use	<p>Water supports, preserves and enhances several different kinds of habitats:</p> <ul style="list-style-type: none"> • Terrestrial ecosystems containing vegetation and wildlife (e.g., mammals, birds, reptiles, amphibians, invertebrates), as well as wildlife water and food sources; • Cold and warm freshwater habitats where water preserves or enhances the vegetation, fish or wildlife including invertebrates; • High quality aquatic habitats suitable for reproduction, spawning and early development of fish; • Biological habitats of special significance, such as refuges, parks, sanctuaries, ecological reserves or Areas Of Special Biological Significance, where the preservation or enhancement of natural resources requires special protection. • Habitats necessary for migration or other temporary activities by aquatic organisms such as anadromous fish. • Estuarine habitats, the ecosystem of a semi-enclosed body of water having a free connection with the open sea at least part of the year and within which the seawater is diluted with fresh water drained from the land.
Habitat Use (by rare, threatened, or endangered species)	These plant and animal species require the support of certain types of water for their survival, and usually must be treated according to specific governmental regulations.



Table 6.1 CCMP Action Plans and Sample Evaluation Methods

Action Plan	Action Evaluation (Programmatic)	Sediment Reduction Evaluation (Environmental) ¹
SED-1 (Cross-Cutting Action: Land Acquisition)	<ul style="list-style-type: none"> Establishment of guidance committee Habitat selection & recommendations identified Acres of land purchased & put into easement 	<ul style="list-style-type: none"> Improved and/or maintained high habitat and water quality (suspended sediment, bed load; turbidity; stream profiles and vegetation cover) Buffered non-point source runoff
SED-2 Sediment Traps	<ul style="list-style-type: none"> Numbers of sediment traps (i.e. flood plain restoration projects, sediment ponds, filter strips) installed 	<ul style="list-style-type: none"> Measured habitat improvements Measured reduction in sediment (suspended sediment, bed load; turbidity) at upstream and downstream sites following implementation
SED-3 Fire Management	<ul style="list-style-type: none"> Watershed Fire Management Plan completed Annual Report documenting projects completed Evaluation of the effects to sensitive species, habitats, air quality, and impacts of an escaped fire conducted 	<ul style="list-style-type: none"> Vegetation analysis of age class conducted using transect data, mapping, and GIS overlays Estimated reduction in sediment loading to the bay during peak flows
SED-4 (Cross-Cutting Action: TMDLs)	<ul style="list-style-type: none"> Develop technical components of TMDL (water quality attainment strategy) Complete Implementation and Monitoring Plan Implement Plans 	<ul style="list-style-type: none"> Measured reduction in sediment (suspended sediment, turbidity, siltation of creek gravels, bed load) in Chorro and Los Osos Creeks Acreage of marine to terrestrial habitat alteration Reduced sedimentation in the Morro Bay estuary
SED-5 Best Management Practices	<ul style="list-style-type: none"> Numbers and acres of BMPs installed 	<ul style="list-style-type: none"> NMP data on project effectiveness Estimates of sediment captured Measured reduction in suspended sediment and turbidity at downstream sites following implementation Estimates of erosion prevented (RUSLE or WEPP)
SED-6 Road Management	<ul style="list-style-type: none"> Inventory of roads and identification of problem areas Numbers of maintenance and construction measures implemented 	<ul style="list-style-type: none"> Measured reduction in sediment (suspended sediment, turbidity) from roadways and in drainage areas to waterbodies
SED-7 Creek Restoration Projects	<ul style="list-style-type: none"> Numbers and acres of BMPs installed 	<ul style="list-style-type: none"> Entire system evaluated for upstream effects NMP data on project effectiveness Estimates of erosion prevented and/or sediment captured Measured reduction in suspended sediment and turbidity at downstream sites following implementation Improved and/or maintained habitat at BMP sites
SED-8 Revegetate the sandspit	<ul style="list-style-type: none"> Acres of land revegetated 	<ul style="list-style-type: none"> Improved and/or maintained high quality habitat through transects and GIS/aerial overlays Measured reduction in sand delivered to Morro Bay estuary from sandspit

EXHIBIT NO. 5

APPLICATION NO.

CD-12-00

Table 4.3 List of Action Plans

ACTION PLAN #	ACTION PLAN DESCRIPTION
Cross-Cutting LAND ACQUISITION	Acquire or otherwise protect lands that contain ecologically valuable habitat or habitats that provide beneficial functions to the estuary, in order to minimize nonpoint sources of pollution entering the estuary. Such acquisition will occur in cooperation with willing landowners.
Cross-Cutting DRAINAGE	Reduce Los Osos drainage problems by acquiring low lying parcels for use as detention and retention areas.
Cross-Cutting TMDLs	Develop and implement Total Maximum Daily Loads for siltation, pathogens, nutrients, metals, and priority organics.
SED-1	See Cross-Cutting LAND ACQUISITION
SED-2	Install new and maintain existing sediment traps to reduce the delivery of sediment to Morro Bay.
SED-3	Develop and implement a watershed fire management plan to create and maintain an uneven age class of brush.
SED-4	See Cross-Cutting TMDL
SED-5	Supply technical and financial assistance to landowners to implement Best Management Practices (BMPs) on their land.
SED-6	Increase use of management measures for road maintenance and construction activities to reduce damage to streams and the Morro Bay estuary.
SED-7	Supply technical and financial assistance to landowners to implement creek restoration projects (including re-establishing floodplains and meander patterns) in Los Osos and Chorro Creeks.
SED-8	Re-vegetate north sandspit areas.
SED-9	Provide incentives for landowners to encourage implementation of Best Management Practices (BMPs) for erosion control and sediment retention.
BACT-1	See Cross-Cutting TMDL
BACT-2	Implement grazing management measures that are successful at reducing bacteria levels.
BACT-3	Upgrade existing pump-out facilities (where needed), improve accessibility, and provide new pump-out facilities at additional locations where feasible, to minimize the impacts of waste discharges and improperly functioning marine sanitation devices (MSDs).
BACT-4	Remove illegal moorings in the backbay to reduce the potential for high-concentrations of bacterial pollution in the vicinity of shellfish harvest areas.
BACT-5	Remove abandoned, derelict boats, and vessels in the backbay to reduce the potential for high-concentrations of bacterial pollution in the vicinity of shellfish harvest areas.
BACT-6	Decrease levels of bacteria from liveaboard boats (both within and outside the City of Morro Bay limits).
BACT-7	Explore the bio-filtration potential of the Pacific Oyster (<i>Crassostrea gigas</i>) to decrease bacterial levels and increase the overall water quality of the bay.
BACT-8	Install and maintain bird-deterrent floats in shellfish-growing areas to reduce the potential for avian fecal contamination of harvestable shellfish.
BACT-9	Establish an off-leash dog park and provide supplies around high use recreational areas for the pick-up of pet waste.
BACT-10	Coordinate state and local bacteriological water quality standards and monitoring efforts so they are consistent and comprehensive.
NUTR-1	See Cross-Cutting TMDL
NUTR-2	Support the efforts of the Los Osos Community Services District to increase and improve the level of wastewater treatment in the community of Los Osos.

Table 4.3 Continued

ACTION PLAN #	ACTION PLAN DESCRIPTION
NUTR-3	Improve the quality of water discharged at Los Osos standpipes to reduce nitrate concentrations.
NUTR-4	Develop nitrogen-control measures for wastewater effluent at the California Men's Colony.
NUTR-5	Implement agricultural management practices that are successful at reducing nitrate levels.
NUTR-6	Implement Best Management Practices (BMPs) to decrease fertilizer runoff from residential and other urban areas.
FLOW-1	Support City of Morro Bay efforts to reclaim water for the support of instream resources by providing technical assistance for construction of a new treatment plant in Chorro Valley that would discharge effluent to Chorro Creek.
FLOW-2	Maintain a Chorro Valley Water Users Workgroup and continue to seek agreements, such as the County of San Luis Obispo agreement to work with other Chorro Valley water users, to maintain minimum stream flows in Chorro Creek at or above 1.5 cubic feet per second (as stated in the County Board of Supervisors action related to the Dairy Creek Golf Course).
FLOW-3	See Cross-Cutting DRAINAGE
FLOW-4	Support and adhere to the agreements between the California Men's Colony, California Department of Fish and Game, Central Coast Regional Water Quality Control Board, and County of San Luis Obispo to maintain and dedicate wastewater treatment plant releases to Chorro Creek to prevent the reduction of present Chorro Creek streamflows, and where possible, enhance the fishery, wildlife and other instream uses of Chorro Creek.
HMT-1	See Cross-Cutting TMDL
HMT-2	Promote the use of Integrated Pest Management Principles.
HMT-3	Implement urban storm water Best Management Practices (BMPs) to reduce pollutants entering Morro Bay and its tributaries.
HMT-4	Remediate inactive chromium and nickel mines in the upper Chorro Creek watershed to reduce heavy metals and sediment loading to the estuary and creeks.
HMT-5	Implement marina (harbor and waterfront) Best Management Practices (BMPs).
HMT-6	Support the construction of a new boat haul-out and maintenance facility for large vessels (generally over 30 feet).
HMT-7	Establish a network of easily accessible hazardous waste facilities, including bayside locations near pump-out facilities, fuel docks, bathing areas, marinas, and launch facilities, in the City of Morro Bay and the community of Los Osos.
HAB-1	See Cross-Cutting LAND ACQUISITION
HAB-2	Develop planning overlay maps for sensitive habitat and listed species within the watershed, based on habitat functions and values, particularly wetlands and dune habitat in and near the bay.
HAB-3	Inventory and protect ecologically significant upland habitat required by bay species.
HAB-4	Map shoreline, near shoreline wetlands, upland vernal pools, and riparian vegetation along all creeks and their tributaries in conjunction with San Luis Obispo County (currently a Combining Designation Program within Estero Area Plan).
HAB-5	Implement appropriate actions in existing and future species recovery plans, in alignment with MBNEP goals and objectives.
HAB-6	Implement policies and projects to protect, restore, and create habitats, including wetlands, in connection with the dredging of authorized federal navigation projects.
HAB-7	Maintain and promote adequate wetland resources and riparian vegetation through identification and implementation of proven management techniques.

Table 4.3 Continued

ACTION PLAN #	ACTION PLAN DESCRIPTION
HAB-8	Develop methods, including voluntary and incentive programs, and possibly standards, to provide additional protection to riparian and wetland resources.
HAB-9	Implement restoration activities to improve the quality and quantity of eelgrass habitat.
HAB-10	Implement management measures to control the impacts of nonindigenous species on wetland and upland habitats.
STL-1	Implement agency-decision-making in the Morro Bay watershed consistent with steelhead trout recovery goals, and support the implementation of the National Marine Fisheries Service (NMFS) Recovery Plan.
STL-2	Restore and enhance access to critical habitat for steelhead trout.
STL-3	Maintain and enhance pool/riffle structure and other aspects of instream habitat in trout bearing waters.
STL-4	Maintain and enhance riparian corridors adjacent to trout bearing waters to improve bank stability and structure, creek shading, and biological productivity
STL-5	Maintain, restore, and enhance stream geomorphology and water quality to provide quality habitat for steelhead.
EDU-1	Conduct general public outreach and education focused on the viability of resources, habitat, and non-point source pollution issues.
EDU-2	Develop educational materials regarding marine pollution and habitat issues geared toward the commercial and recreational boating community of Morro Bay.
EDU-3	Develop educational materials regarding erosion, sedimentation, sensitive resources, fertilizers, and habitats within the watershed geared toward agricultural and ranch landowners and various public agencies to improve partnering, lessen impacts and educate all parties of pressing issues.
EDU-4	Conduct cross-educational workshops on the positive and negative uses of pesticides.
EDU-5	Promote water conservation and reuse among all water users.
EDU-6	Expand and maintain the existing Volunteer Monitoring Program (VMP).
EDU-7	Sponsor a biennial "State of the Estuary" conference to support the biennial review process, share progress reports, address challenges, recognize environmentally responsible citizens and businesses, and provide public education.
EDU-8	Develop an interactive monitoring display for the Morro Bay Natural History Museum and support other Natural History Association education projects.
EDU-9	Increase communication through media [i.e., graphic/text, television, continuation of <i>Turning the Tide</i> , MBNEP newsletter] to spotlight collaborative efforts, forums, ongoing status, and informational messages.
EDU-10	Provide at least two additional locations for public access to the estuary within the community of Los Osos.
EDU-11	Develop a strategic education plan, with the assistance of AmeriCorp, to provide educational opportunities focusing on natural resources and watershed enhancement for K-12 schools.
EDU-12	Develop a mini-grants program for community organizations to assist in implementation of the CCMP.
EDU-13	Review and refine the CEQA/NEPA initial study environmental checklist to increase awareness of beneficial uses of water and estuarine resources.

Table 4.2 Action Plan Components

Component	Description
Action Title:	Describes a specific means to address one or more of the priority issues.
" > "	Designates the action as a 2-Year and/or 5-Year Priority Action.
Background/Major Issues:	Discusses why the action is important and identifies which of the priority issues are being addressed, what has contributed to the problems, and previous or ongoing management activities.
Example of Similar In-Place Actions:	Provides examples of similar actions that have proven successful in addressing the priority issues.
Benefit of the Action:	Describes the environmental and/or programmatic benefits that may be realized by implementing the action.
Implementation:	Describes methods and/or steps for implementing the action. This is not an exhaustive list, but rather suggestions for approaches or tools believed to best address the action at this time. The approaches and tools will be evaluated by the implementing agencies and organizations and potentially revised over time.
When:	Provides a suggested timeframe for implementing the action.
Who—Primary:	Defines who would be most appropriate to take the lead in implementing the action. The responsibilities of the "primary" implementers are to: (1) secure financial support; (2) provide in-kind services; (3) provide technical and administrative expertise; (3) implement regulations, if appropriate; (4) obtain commitments; (5) initiate actions; (6) communicate progress; (7) advocate with constituencies; and (8) enter into written agreements.
Who—Support:	Defines who would need to be involved with the implementation of the action—coordination, communication, funding, personnel, equipment, technical assistance, in-kind services, etc. The role of supporting partners will vary depending on the action and statutory responsibilities.
Cost:	Provides preliminary cost estimates for implementation of the action. Costs will be further refined as funding sources are identified.
Basis for Cost:	Describes rationale for preliminary cost estimates (i.e., comparison of costs of similar project, agency estimate).
Funding Sources:	Identifies potential funding sources for the action. Chapter 7 discusses sources of funding in more detail.
Evaluation:	Describes how the progress of the action will be measured. Some measures are environmental (i.e., reduced pollution, species recovery) and other are programmatic (i.e., progression or status of the action).
Related Actions:	Provides cross-referencing to other related actions in the CCMP.



Figure 7.1 Proposed MBNEP Organizational Structure for CCMP Implementation

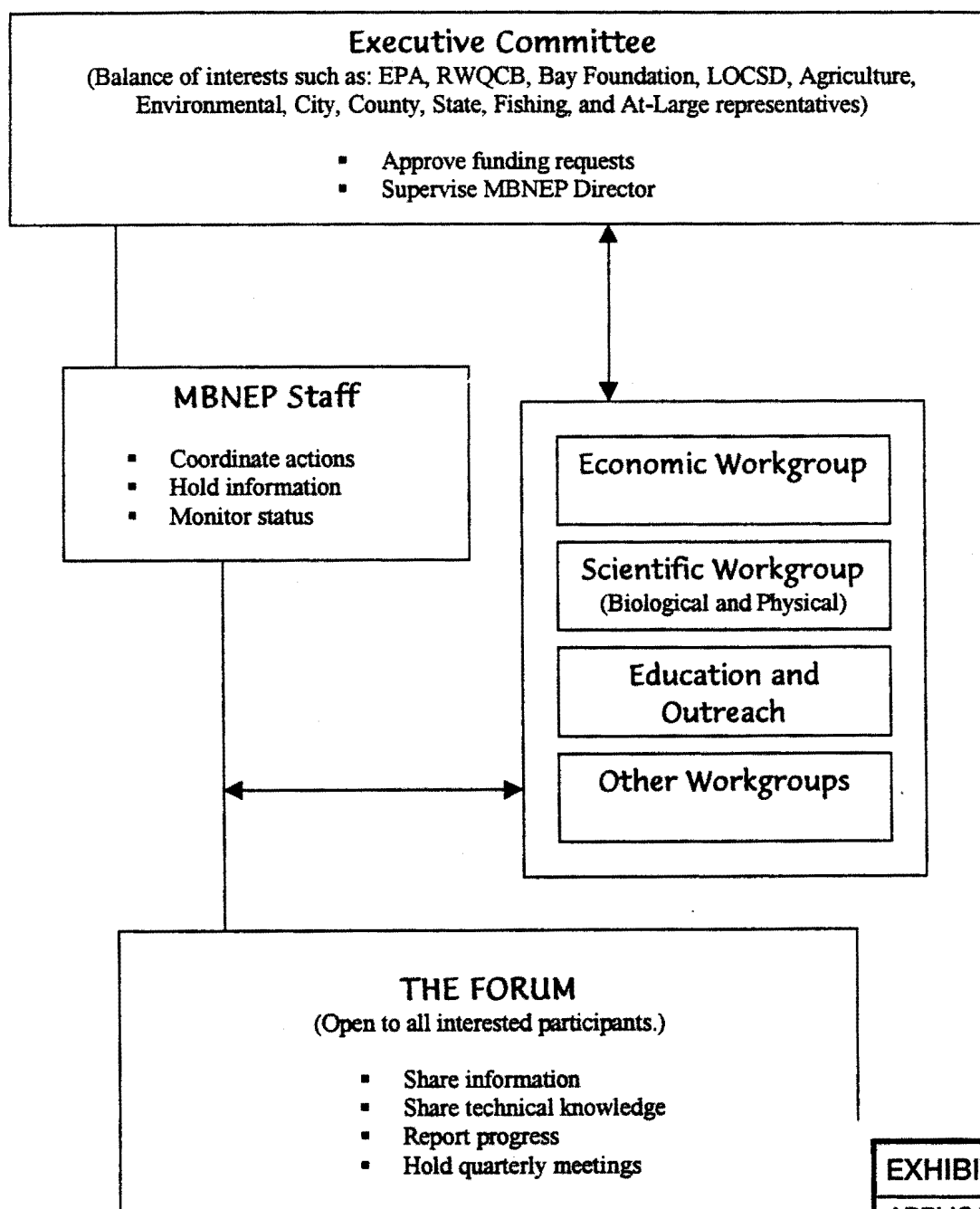


EXHIBIT NO. 7

APPLICATION NO.

CD -12-00



Table 6.2 Report of CCMP Progress to date

CCMP Action	Government and Private Initiatives (Public, private and cooperative programs and good intentions)	On-the-ground Implementation (Examples of specific local completed or in-progress projects)	Current Gaps and Roadblocks	Ideas and Opportunities for Further Progress
Cross-Cutting Action: Land Acquisition (Related Actions: HAB-3,5,7; STL-2,4)	Trust for Private Lands, MEGA, and MBNEP partnership	<ul style="list-style-type: none"> Acquisition of 15 acre coastal dune scrub parcel (in process) 	Public access issues need to be considered in agreement	Purchase of additional adjacent properties, develop prioritization criteria
SED-5 Agricultural BMPs (Related Actions: EDU-3)	Cooperation of permitting agencies, participation of landowners in short courses	<ul style="list-style-type: none"> Sustainable Conservation Permit streamlining project (APDP in process) 	Permitting delays & costs; loss of productive ag land	Multi-agency coordination, willing landowner involvement
BACT-2 Grazing Management (Related Actions: SED-5)	Multi-agency and landowner coordination, National Monitoring Program (RWQCB)	<ul style="list-style-type: none"> Riparian fencing projects (APDP in progress) 	Costs of cattle exclusions v.s. riparian pastures	Prioritization of problem areas needed, Willing landowner involvement needed
BACT-4 Illegal Moorings (Related Actions: HMT-7, 9)	Agreement with oyster grower to monitor boats and moorings	<ul style="list-style-type: none"> Debris removal (APDP in progress) 	Jurisdictional overlap	Agency coordination needed
NUTR-5 Urban BMPs (Related Actions: EDU-1)	35% of urban residents already have bay-friendly gardens	<ul style="list-style-type: none"> Development of <i>Yards and Neighbors Brochure</i> project (APDP) 	none	
HMT-5 Harbor BMPs (Related Actions: EDU-2)	Coordination with bay-front businesses, CEC assessment	<ul style="list-style-type: none"> Boatyard BMPs Boat rinse station project (APDPs in progress) 	Need large-scale cooperation for measurable results	
HAB-10 Exotic Species	Coordination with public landowners and permitting agencies	<ul style="list-style-type: none"> Restoring Los Osos (veldt grass removal project) (APDP) <i>Arundo</i> eradication project (APDP) 	Permitting process lengthy; need to prioritize problems areas	
EDU-2 Boater Outreach (Related Actions: EDU-1 & HAB-10)	Regional Coordination, Local cooperation	<ul style="list-style-type: none"> Introduced marine species educational project (APDP) 		Statewide education/action needed to control problem
EDU-6 Volunteer Monitoring Program	Multi-agency participation, Friends of the Estuary grant proposal submitted	<ul style="list-style-type: none"> Volunteer Monitoring Program (APDP in progress since 1995) 	Limited resources	Clean Water Act 319 (h) for fiscal years 2000-03, MBNEP partnership with Americorps
EDU-9 Media (Related Actions: EDU-1)		<ul style="list-style-type: none"> Photo Journalism (APDP) 		
EDU-11 K-12 Education (Related Actions: EDU-1)	Involvement of 4-H with various schools, CCC partnership with Americorp	<ul style="list-style-type: none"> Watershed Model (APDP) Poster Contest & Calendar (APDP) 	Integration with existing curriculum, limited resources	MBNEP partnership with Americorps

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APPLICATION NO.
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CROSS-CUTTING ACTION

LAND ACQUISITION: Acquire or otherwise protect lands that contain ecologically valuable habitat or habitats that provide beneficial functions to the estuary, in order to minimize nonpoint sources of pollution entering the estuary. Such acquisition will occur in cooperation with willing landowners.

➤ 2-Year and 5-Year Priority Action

BACKGROUND/MAJOR ISSUES:

The Morro Bay Watershed is home to at least fourteen species that are listed by the Federal Endangered Species Act as Threatened or Endangered. Many more special status species also occur in the watershed. The estuary and watershed contain tideland and wetland habitat vital to the Pacific Flyway, geographically and highly-restricted salt marsh and bay fringe wetland habitat, globally rare dune habitat, and upland serpentine and older dune habitat containing rare and endemic species. Much of this land is at risk from coastal development, or from land uses that damage natural habitat, and will require protection if the species and habitat are to survive. Land prices are high, and therefore some prioritization of lands and species in need of protection must be made to enable protection measures to be optimized. These natural landscapes often function as water quality filters that capture and reuse sediment and nutrients, as well as reduce the energy of surface water flows and increase groundwater recharge. Acquisition of land, especially wetlands, riparian areas and low-lying areas, from willing sellers can meet the multiple goals of the MBNEP.

EXAMPLES OF SIMILAR IN-PLACE ACTIONS:

- The current programs being coordinated through Morro Estuary Greenbelt Alliance concentrate on dune habitat around Los Osos and have, in association with the U.S. Fish and Wildlife Service, and the California Department of Fish and Game, identified parcels of dune habitat for purchase.
- Morro Coast Audubon Society has identified and protected shoreline habitat important to shore birds at Sweet Springs and at the Audubon Overlook.
- In San Francisco Bay, a three year study of habitats in and around the Bay was conducted by 100 scientists entitled: Baylands Ecosystem Habitat Goals, released dated March 1, 1999, prepared by the San Francisco Bay Area Wetlands Ecosystem Goals Project.

BENEFITS OF THIS ACTION:

- This action includes the first critical steps in the acquisition of critical habitat within the watershed and the follow through actions needed to acquire or protect habitats in the watershed. It will result in the increase of protected habitats in the watershed.
- Reduction of drainage problems through the use of detention and retention solutions on acquired low-lying land.

IMPLEMENTATION:

1. MBNEP will establish a science-based prioritization committee to assess habitat protection needs on the basis of species and species habitat requirements and the goals of the MBNEP. The committee will include, by recommendation, representatives of state and federal wildlife agencies, local conservation organizations, landowners, scientific experts drawn from the area.

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and representatives of conservancies that are active, plus representatives of NEP and USEPA. The committee will elect a chair and define its structure, guiding principles, operating procedures, etc., with the intent of implementing the actions of 2 and 3 below. The MBNEP, with the assistance of scientific and conservation representatives in the program, will produce a list of invitees to the prioritization committee, and will advertise the meetings, which will be open to all interested parties as an open process.

2. In cooperation with willing sellers, the committee will identify criteria and prioritize lands for purchase.
3. In cooperation with willing sellers and other appropriate groups, the MBNEP implementation committee will seek funding and set up mechanisms to purchase, or protect through conservation easement or other methods, wetlands, coastal dune habitat in the vicinity of the Bay, and other habitat considered vital or valuable to the ecosystem function of the estuary. These habitats may include those identified under the Sensitive Habitat Program of the Estero Area Plan.
4. The MBNEP implementation committee will develop plans, agreements and financing for the long-term management of lands protected or acquired through this action plan.

WHEN:

- **Short Term:** The prioritization committee will be formed as soon as possible to begin identifying key parcels and applying for grants. While the committee will be coordinated through the NEP office, it is suggested that an organization such as Morro Estuary Greenbelt Alliance that has been active in coordinating meetings between agencies for the purposes of making land purchases continue in this role. The committee will establish relationships with land conservancy organizations, develop a priority habitat list, and in concert with the NEP program, explore means by which high priority parcels can be protected. The committee will also advise county or city government.
- **Long Term:** It is hoped that the prioritization committee would be reconvened as needed while lands ranked worthy of protection still remain as possible purchase opportunities. Such a committee would continue to function as originated under NEP.

WHO:**Primary:**

- Morro Estuary Greenbelt Alliance (continue to coordinate the Partnership for Coastal Dunes; efforts will be combined where possible.)
- Morro Bay National Estuary Program (with the assistance of scientific and conservation representatives in the program will establish a prioritization committee, and will advertise the meetings, which will be open to all interested parties as an open process)
- The Bay Foundation
- California Coastal Conservancy

Support:

- Landowners
- Small Wilderness Area Preservation
- Land Conservancy of San Luis Obispo County (potential manager)
- Trust for Public Lands (lands negotiation)
- Los Osos Community Services District



CROSS-CUTTING ACTION

- U.S. Fish & Wildlife Service
- Landowners

COST:

Description	Estimate
Cost of committee meeting under the current NEP Program—to meet monthly after priority list is developedt NOTE: costs do not include MBNEP staff time.	\$500 /year
Acquisition, conservation easements, and other protection actions	\$20 million

BASIS FOR COST:

- Current real estate prices, costs for other development rights transfers.

FUNDING SOURCES:

- Small grants from local government
- State and federal species protection programs
- Species recovery programs
- Donated services from committee members
- CWA Section 320 Funds
- Better America Bonds (if passed by Congress)
- Morro Bay Estuary Restoration Funds
- Other land acquisition grant and loan programs

EVALUATION:

- Establishment of an appropriately structured and fully functioning committee(s) with guiding principles.
- Selection of key species and habitats, preparing recommendations, developing goals based on species needs; assembling qualitative and quantitative data on them and preparing habitat recommendations for acquisition and protection.
- Acres of land purchased or put into easement.

RELATED ACTIONS:

- SED-1 (Land Acquisition)
- HAB-1 (Land Acquisition)
- FLO-3 (Land Acquisition)



DRAINAGE: Reduce Los Osos drainage problems by acquiring low lying parcels for use as detention and retention areas.

➤ 5-Year Priority Action

BACKGROUND/MAJOR ISSUES:

For years, the community of Los Osos has experienced flooding problems. As population has increased and impervious surfaces have proliferated without a community wide drainage plan, these problems have grown increasingly severe. Storm water runoff entering the bay throughout the rainy season contains a variety of pollutants such as nitrogen, phosphate, fecal coliform, and metals such as copper, zinc, and lead. In Los Osos, surfacing septic tank effluent during storm events adds to the problem. San Luis Obispo County recently developed a drainage study that offers various solutions to problems in different areas of the community of Los Osos.

The community has been debating wastewater treatment alternatives, including sewerage, for many years now. Although the sewer will address many of the pollutants mentioned above, it will not directly solve flooding problems. Sewering Los Osos will result in changes to freshwater outflows along the shore of the bay and the freshwater wetlands dependent upon these flows. The sewer will affect groundwater recharge and overall drinking water supply for the community. Beneficial uses that would be affected by long range solutions to flooding and stormwater retention problems include estuarine habitat, riparian habitat, wetland habitat, and municipal water supply.

BENEFITS OF THIS ACTION:

- Homeowner protection from flood impacts, reduced economic damages due to flooding
- Recreational opportunities created by parkland
- Improved water quality
- Increase in estuarine, riparian and other wetland habitat
- Reduced impervious surfaces

EXAMPLES OF SIMILAR IN-PLACE ACTIONS:

In cooperation with the Town of Marion, the Buzzards Bay Project (BBP) prepared an application for funding from the State 319 (h) Non-Point Source Pollution Program for design and construction of a three-acre wetland adjacent to Silvershell Beach in Massachusetts. The purpose was to treat stormwater runoff and associated non-point source pollutants from impervious areas such as roads, driveways, and rooftops in a 64-acre watershed. The BBP worked with the town to acquire four separate grant awards for various phases of design and construction of the project. USDA Natural Resources Conservation Service provided technical expertise. Design and construction were complete in 1995. Intensive sampling over the course of the summer of 1996 indicated an overall reduction in fecal coliform bacteria.

IMPLEMENTATION:

- Identify and prioritize most appropriate sites for acquisition and restoration as wetland retention/detention basins utilizing information in the existing drainage plan.
- Negotiate and acquire land from willing sellers. This may involve acquisition of flood-prone housing or other structures, or low-lying parcels of vacant land.
- Design Treatment Plan for constructed wetlands. Project designs should include such features as seasonal recreational use, linear and neighborhood parks, etc.
- Conduct CEQA and NEPA review as necessary.



CROSS-CUTTING ACTION

- Develop implementation schedule, detailed cost estimates, and an overall financial strategy for cooperative funding of projects
- Convey flood flows to retention areas if appropriate, using appropriate design plan. Sites need to be large enough to either retain all inflow or hold it long enough to improve water quality before discharge. It may be more effective to develop a number of small retention sites rather than a few very large ones.
- Provide for continued maintenance.
- Implement other "engineered" drainage projects contained in the Preliminary Engineering Evaluation prepared for County Service Area No. 9J by EDA, Inc. and the Morro Group, Inc. (1998). These measures include installation of storm drains, construction of retention and detention basins, and maintenance and regrading of roads in the community of Los Osos.

Possible obstacles to implementation include land availability in appropriate locations, private sector reluctance to sell key parcels, and funding availability to continue with overall drainage plan. These retention and detention areas can act as the initial component for a community-wide drainage plan.

WHEN:

Properties should be identified as soon as possible, with priority for acquisition placed first on most critical sites, and second on properties currently for sale or available for acquisition. Conveyance facilities should be developed in association with the sewer collection system whenever possible.

WHO:

Primary:

- Los Osos Community Services District and Drainage Sub-Committee

Support:

- Morro Bay National Estuary Program (monitoring and coordination assistance)
- The Bay Foundation (funding)
- Morro Estuary Greenbelt Alliance (land acquisition)
- Regional Water Quality Control Board (technical assistance)
- California Department of Fish & Game (technical assistance; permitting)
- U.S. Army Corps of Engineers (technical assistance; permitting)
- San Luis Obispo County (technical assistance; permitting)



COST:

Task/Step	Cost/yr.	Duration	Potential Funding	Potential Source
Identify, prioritize, and conduct feasibility study	30k	1 yr.	CWA 319 (h); 205 (j) grants	EPA/SWRCB
Negotiate and acquire land	\$1,000,000 – \$2,000,000	1-2 years	MBERF 319 (h) Grants other grants	BF Packard Fndtn SWRCB EPA Ca State Revolving Fund FEMA
Treatment Design Plan and Review	100k	1-2 yrs.		
CEQA/NEPA review	60-100k	1 yr.		
Construction and Installation	700 –1,000k	2-5 yrs.	“	“
Maintenance	100k	3-5 yrs.	Zone of Benefit Fees	CSD Assessment District

Low Estimate: \$2,000,000; High Estimate: \$4,000,000

BASIS FOR COST:

County recommended property cost evaluations included in Engineering Evaluation, Los Osos/Baywood Park Community Drainage Project (EDA 1998).

- \$100,000 per undeveloped residential lots;
- \$205,000 per developed residential lot;
- \$150,000 per acre for undeveloped commercial lots.

EVALUATION:

- Number of projects implemented.
- Acreage of wetland habitat created.
- Reduced incidents of structure and road flooding in Los Osos.
- Increased total water retention volume.
- Improved quality of water discharged to Los Osos Creek and Morro Bay.

RELATED ACTIONS:

- Land Acquisition
- HMT-3 (urban stormwater measures)



CROSS-CUTTING ACTION

TMDLs: Develop and implement Total Maximum Daily Loads for siltation, pathogens, nutrients, metals, and priority organics.

BACKGROUND/MAJOR ISSUES:

The Regional Water Quality Control Board is mandated to develop and implement Total Maximum Daily Loads (TMDLs) for the Morro Bay watershed. A TMDL is the allowable total maximum daily load, from each source of pollution contributing to impairment of a waterbody, that assures attainment of water quality standards. Development of a TMDL for impaired waters is required by Section 303 of the Clean Water Act. The Clean Water Act requires that TMDLs be incorporated into the state's water quality management plan (which consist of Regional Board basin plans). Porter Cologne Water Quality Control Act, in turn, requires that basin plans have a program of implementation to achieve water quality objectives.

The following TMDLs are required for waterbodies within the Morro Bay watershed:

- Siltation for Chorro Creek and Los Osos Creek, and for the Morro Bay estuary
- Pathogens for the Morro Bay estuary
- Nutrients for Chorro Creek and Los Osos Creek
- Metals for Chorro Creek, and for the Morro Bay estuary*
- Priority Organics Los Osos Creek*

*Monitoring and assessment are needed to determine if TMDL is necessary.

This is accomplished by a phased process which includes assessing point and nonpoint sources of pollution, determining the contribution from each source, determining appropriate load reductions for each source, implementing a program to achieve load reductions, adoption of a basin plan amendment, and monitoring to determine attainment of water quality standards. Federal Law requires a TMDL to include a problem-statement, numeric targets, source analysis, and load allocations (also referred to as a "technical" TMDL). Federal and State Law require the basin plan be amended to include the technical TMDL, the implementation plan and monitoring plans. Public participation is critical during development of the technical TMDL, development of the implementation plan, adoption of the basin plan amendment, implementation of control actions, and monitoring for effectiveness.

EXAMPLES OF SIMILAR IN-PLACE ACTIONS:

- TMDLs are being developed in other watersheds throughout the state and nation as required by Porter Cologne Water Quality Control Act and The Clean Water Act. Numerous waterbodies are listed in the Clean Water Act 303(d) list of impaired waters and, therefore, must develop and implement TMDLs.

BENEFITS OF THIS ACTION:

Participation of the MBNEP in the development and implementation of TMDLs for the Morro Bay estuary and Chorro and Los Osos Creeks will strengthen the process from development through implementation. The MBNEP recently completed five Technical Studies that will provide a scientific foundation for the TMDLs. The Morro Bay NEP will also provide the forums for the public participation activities critical for development and implementation of TMDLs for the Morro Bay Watershed. Implementation of management measures in the watershed through cost-sharing programs will provide the resources for landowners to implement actions to reduce sediment loading.

**IMPLEMENTATION:**

The MBNEP will coordinate with the RWCQB in the development and implementation of Total Maximum Daily Loadings for all the following components of a TMDL:

- a. **Develop Problem Statement-** The objective of problem identification is to identify the key factors and background information for a listed waterbody that describe the nature of the impairment and the context for the TMDL. Regional Board staff will develop and write a problem statement based on existing information collected and developed for the Morro Bay National Estuary Program and National Monitoring Program, and other relevant information.
- b. **Identify Numeric Targets-** When the standard for a pollutant is in narrative form, it must be interpreted quantitatively in order to provide a numeric target(s) for the TMDL. The purpose of this component is to identify measurable indicators and target values that can be used to evaluate the TMDL and attainment of water quality standards. Multiple indicators can be used, to provide a stronger basis for assessing attainment of standards. Regional Board staff will develop and write numeric targets based on existing information, including but not limited to, information for the Morro Bay National Estuary Program and National Monitoring Program. Regional Board will also consider using a "weight of evidence" approach, which will look at indicators as a group, and will not consider exceedence of one target as proof that a TMDL is not working.
- c. **Conduct Source Analysis-** The purpose of the source analysis is to demonstrate that all pollutant sources have been considered, and significant sources estimated, in order to help determine the degree of pollutant reductions needed to meet numeric targets and allocation of pollutant allowances among sources. Regional Board staff will develop and write up the sources and analysis methods based on existing information collected and developed for the Morro Bay National Estuary Program and National Monitoring Program and other relevant documents. Review of similar budgets may make it possible to extrapolate some information (e.g., in the San Diego Creek sediment TMDL, a budget found that slightly more than half the sediment discharge to the creek from upland sources settled out, with the remainder being discharged to the Bay).
- d. **Assign Allocations-** A TMDL is defined as the sum of the individual waste load allocations for point sources, load allocations for nonpoint sources and natural background pollutants or analysis of controls needed to attain needed load reductions. Allocations may be assigned in a variety of ways (e.g. discharger sector, land use), but the relationship must be explained. USEPA Staff, in coordination with Regional Board staff, will develop best estimates for allocations based on information, including but not limited to that collected for the Morro Bay National Estuary Program and National Monitoring Program. Development and description of the allocations will include e. and f., as follows.
- e. **Conduct Linkage Analysis-** In order to develop a TMDL, a linkage must be defined between the numeric targets and the loading capacity. This linkage demonstrates how allocations attain standards. Linkage may be based on information from within the watershed, or in similar watersheds, on established practices. USEPA Staff, in coordination with Regional Board staff, will include this in task d. above.
- f. **Establish Margin of Safety-** TMDLs must be established at levels necessary to attain and maintain the applicable narrative and numerical water quality standards with seasonal



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variations and a margin of safety which takes into account any lack of knowledge concerning the relationship between effluent limitations and water quality. The margin of safety can either be incorporated implicitly through conservative analytical approaches and assumptions used to develop the TMDL or added explicitly as a separate component of the TMDL. Given the uncertainties in developing TMDLs for large watersheds, the most sensible approach would appear to be to incorporate and document conservative assumptions and approaches to be used. USEPA Staff, in coordination with Regional Board staff, will include this in task d. above.

- g. **Prepare Technical TMDL Report** – Regional Board staff will prepare report (assemble elements “a-f”) for submittal to USEPA in a format similar to existing TMDL reports.
- h. **Foster Stakeholder Participation**- This task would include activities such as participation with or facilitation of stakeholder groups, including landowners, to be involved in technical TMDL development, implementation planning, monitoring and implementation of management measures. Current public participation forums of the Morro Bay National Estuary Program will be used for stakeholder participation in TMDL development and implementation planning. Existing educational programs, such as UCCE Watershed Management Education, will also be utilized. New forums may be developed via the Morro Bay National Estuary Program or other programs for monitoring and implementation.
- i. **Develop Implementation Plan** – Regional Board staff will develop and write an implementation plan by 1) reviewing and incorporating results of current implementation planning from the Morro Bay National Estuary Program Comprehensive Conservation and Management Plan, 2) facilitating and focusing existing forums of the Morro Bay NEP, or new forums sponsored by the Regional Board or other watershed partners, and 3) write up the results of 1) and 2), including a phased approach to allow for implementation, monitoring, and feedback to adjust numeric targets and activities as appropriate over time.
- j. **Conduct Monitoring/Re-evaluation** – Regional Board will evaluate past and current monitoring activities of the Morro Bay NEP and National Monitoring Program and continue or modify these activities as appropriate to inform the TMDL process. Results of data and information analysis will determine whether and how targets, implementation activities, etc. need to be changed.
- k. **Staff Workshops**- Regional Board staff will build workshops into the stakeholder participation activities described above and implement the Regional Board’s existing public hearing process to address l. and m. below.
- l. **Notice of Filing for Hearing before the RWQCB**
- m. **Regional Board Hearing and Basin Plan Amendment**

WHEN:

- Short-term (year 1) – Complete TMDL development 6/2000
- Long-term (year 5-10) – Begin TMDL implementation 6/2001



WHO:

Primary:

- Regional Water Quality Control Board – required to develop and implement TMDLs for 303(d) listed waters
- Morro Bay National Estuary Program—assists RWQCB in support of addressing priority pollutants, stakeholder participation, and technical assistance.

Support:

- State Water Resources Control Board
- U.S. Environmental Protection Agency
- University of California Cooperative Extension (education)
- All associated action plan implementers
- Landowners

COST:

Task/Step	Cost/yr.	Duration	Potential Funding	Potential Source
Develop Siltation TMDL	40k; 5K (320)	1 yr	Within existing resources; CWA 106; 205j; 314; 319; CWA 320	EPA/SWRCB MBNEP
Develop Bacteria TMDL	40k; 5k (320)	1 yr	Within existing resources; CWA 106; 205j; 314; 319; CWA 320	EPA/SWRCB MBNEP
Develop Nutrient TMDL	40k; 5k (320)	1 yr	Within existing resources; CWA 106; 205j; 314; 319; CWA 320	EPA/SWRCB MBNEP
Develop Metals TMDL	5k (320)	1 yr		
Develop Priority Organics TMDL	5K(320)	1 yr		

BASIS FOR COST:

Federal grant funds per Clean Water Act Section 106, 205(j), 314, and 319 have funded TMDL work performed to date. This includes components of TMDLs for San Lorenzo River, San Luis Obispo Creek, Morro Bay Watershed, Pajaro River, Llagas Creek, and Salinas River. Region 3 has several additional waters listed in the Clean Water Act 303(d) list of impaired waters and, therefore, must develop and implement TMDLs for these waters. At least a similar level of financial support will have to be directed at TMDLs for this effort to proceed. Funding beyond the current level is necessary to increase the number and pace of TMDL development and adoption of basin plan amendments.



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EVALUATION:

- Development and Implementation of required TMDLs.
- Completion of assessment of point and nonpoint sources of pollution, determination of the contribution from each source, determination of appropriate load reductions for each source, implementation of a program to achieve load reductions, adoption of a basin plan amendment, and completion of monitoring to determine attainment of water quality standards.
- Removal of waterbodies from the 303(d) list.

RELATED ACTIONS:

- SED-4 (TMDLs)
- BACT-1 (TMDLs)
- NUTR-1 (TMDLs)
- HMT-1 (TMDLs)



4.2 SEDIMENTATION

While it is a natural process for estuaries to eventually fill due to sedimentation over time, the concern with Morro Bay is that the natural processes have been accelerated due to watershed disturbances. It has been estimated that Morro Bay has lost more than 25 percent of its tidal volume in the last 100 years due to sedimentation. The contributing factors may include upland erosion, streambank erosion, sediment transport by ocean currents, and land disturbances, such as roads, construction, agricultural activities, and mining activities.

The rapid increase of sedimentation in Morro Bay may have negative impacts on following: navigation, commercial and sport fishing, shellfish harvesting, estuarine habitat, wildlife habitat, freshwater habitat, migration of aquatic organisms, spawning, endangered species habitat, water contact and non-contact recreation, municipal water supply, and agriculture.

MBNEP GOALS SUPPORTED BY SEDIMENTATION ACTION PLANS:

- Slow the process of bay sedimentation through implementation of management measures that 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 fresh water flow.
- 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 riparian corridor management, impervious surface management, fire management, and grazing management.
- Protect social, economic, and environmental benefits provided by the bay and watershed through comprehensive resource management planning.

SEDIMENTATION OBJECTIVES AND SUMMARY OF ACTIONS:

SED OBJECTIVE 1: Reduce sedimentation into the estuary and increase clarity of estuary waters.

- Action SED-1: Acquire or otherwise protect lands that contain ecologically valuable habitat or habitats that provide beneficial functions to the estuary, in order to minimize nonpoint sources of pollution entering the estuary (See Cross-Cutting LAND ACQUISITION Action).

Action SED-2: Install new and maintain existing sediment traps to reduce the delivery of sediment to Morro Bay.

- Action SED-3: Develop and implement a watershed fire management plan to create and maintain an uneven age class of brush.



SEDIMENTATION

SED OBJECTIVE 2: Reduce erosion from upland brush-covered slopes.

Action SED-4: Develop and implement Total Maximum Daily Loads (TMDLs) for siltation, pathogens, nutrients, metals, and priority organics (See **Cross-Cutting TMDL Action**).

SED OBJECTIVE 3: Reduce agricultural soil loss and increase stakeholder development and implementation of best management practices

- **Action SED-5:** Supply technical and financial assistance to landowners to implement Best Management Practices (BMPs) on their land.

Action SED-6: Increase use of management measures for road maintenance and construction activities to reduce damage to streams and the Morro Bay estuary.

SED OBJECTIVE 4: Reduce bedload (in-stream) and stream bank soil erosion.

- **Action SED-7:** Supply technical and financial assistance to landowners to implement creek restoration projects (including re-establishing floodplains and meander patterns) in Los Osos and Chorro Creeks.

SED OBJECTIVE 5: Reduce the rate of shoreline erosion and dune migration.

Action SED-8: Re-vegetate north sandspit areas.

Action SED-9: Provide incentives for landowners to encourage implementation of Best Management Practices (BMPs) for erosion control and sediment retention.



Table 4.5 Sedimentation Actions—
Potential Implementing Organizations

Agency/Organizations	SED-1	SED-2	SED-3	SED-4	SED-5	SED-6	SED-7	SED-8	SED-9
	Land Acquisition	Sed Traps	Fire Mgmt	TMDLs	Land-owner BMPs	Road Mgmt	Creek Restrtn	Sandspit Reveg	BMP Incentives
ACOE		S			S		S		
Air Resources Board			S						
Audubon Society								S	
Bay Foundation	S	S			P		S		
CA Coastal Cons.	S								
CA Native Plant So.								S	
CalPoly		S			S		S		
CalTrans						P			
Camp SLO		S			S	S	S		
Cattlemen's Assoc.		S			S		S		
CA Cons. Corps			S		S		S	S	
CDF			P						
CDFG		S			S		P		
CDPR		S	S		S		S	P	
City of Morro Bay		S				P		P	
CMC		S			S	S	S		
CSLRCD		P			P		P		S
LOCSO	S	S							S
Cuesta College		S			S		S		
Consultants		S					P		
Farm Bureau		S			S		S		
Land Conservancy	S								
Landowners	S	P	S	S	S	P	S	S	P
MBNEP	P	P		P		S	P	S	P
MEGA	P								
NMFS		S			S		S		
NRCS		P	S		P		P		S
RWQCB		S		P		S	S		
Sierra Club								S	
SLO County		S			S	P	S		
SWAP	S								
SWRCB				S					
Trust for Public Lands	S								
UCCE				S	P	S	P	S	S
USEPA		S		S	S		S		S
USFS		S	P		S	S	S		
USFWS	S	S			S		S		S

P = Primary role in implementation

S = Supporting role in implementation



SED-1: Acquire or otherwise protect lands that contain ecologically valuable habitat or habitats that provide beneficial functions to the estuary, in order to minimize nonpoint sources of pollution entering the estuary.

➤ 2-Year and 5-Year Priority Action

NOTE: See Cross-Cutting LAND ACQUISITION for detailed Action Plan.



SED-2: Install new and maintain existing sediment traps in order to reduce the delivery of sediment to Morro Bay.

➤ 2-Year and 5-Year Priority Action

BACKGROUND/MAJOR ISSUES:

The filling in of Morro Bay by sediment produced in the watershed has been identified as the number one problem facing the estuary. Sedimentation is resulting in the loss of mudflat and open water habitat. Salt marsh habitat is likewise being replaced by upland habitat. The shellfish industry is negatively impacted by sedimentation in the bay, as is the commercial fishing industry and the power plant. Freshwater habitat in lakes, ponds and other wetlands are being lost due to sedimentation. Fish habitat in the creeks is being lost or negatively impacted due to sediment. Pools are filled in, spawning gravel is clogged and habitat diversity and cover is lost. Riparian habitat is being lost due to streambank erosion.

Sediment trapping upstream of the bay can take many forms. Every type of sediment trap has environmental and economic costs and benefits that need to be evaluated on a case by case basis to determine the correct project for the site. Examples of sediment traps include:

- Flood plain restorations
- Sediment ponds
- Stock water ponds
- Buffer and/or filter strips
- Natural lakes and wetlands
- Small ponds high in the watershed
- Small traps associated with the road network at culvert inlets and along road side ditches

EXAMPLES OF SIMILAR IN-PLACE ACTIONS:

The partners of the MBWEP (CSLRCD, NRCS, SCC & RWQCB) purchased and constructed the Chorro Flats Enhancement Project (CFEP). The CFEP has already caught more than 210,000 tons of sediment. A perpetual easement on the Los Osos Creek Wetland Reserve site on Los Osos Creek was acquired by the partners of the MBWEP. This site has trapped more than 135,000 tons of sediment. These two sites are examples of flood plain restoration for collecting sediment. Both sites will require funds in the future for maintenance.

Examples of sediment ponds include those found at the Los Osos Landfill. In that case a series of ponds were built for the sole purpose of collecting sediment from a site that was known to be a high producer of sediment. Sediment ponds trap the sediment on site, thereby filtering the water before it reaches a stream.

Many ranchers in the watershed have small dams on tributary creeks in the watershed. The ponds created by the dams serve many purposes including: providing water for livestock and wildlife, sediment capture and storage, flood water detention, habitat for amphibians, turtles and other wildlife, fire protection and irrigation. After several years these ponds fill with sediment and lose their capacity to store water and further sediment. These ponds occasionally need to be cleaned out in order to maintain their effectiveness.

While the need to conduct maintenance activities unabated is recognized, the MBNEP cannot negate other agency mandates (i.e., Endangered Species Act). However, the MBNEP can actively facilitate cooperative agreements to avoid regulatory conflicts, and incentives, such as permit streamlining.

Buffer and filter strips are usually used adjacent to cropland, but can be used in urban and other areas as well. A buffer or filter strip is a strip of land parallel to a creek that is heavily vegetated. This zone of vegetation traps sediment and other pollutants before they reach the stream. There are federal programs that have incentive payments for landowners that chose to install buffer or filter strips.

Natural wetlands and lakes, such as Warden Lake, collect sediment from the streams that feed them. It is possible to alter these sites in order to increase their sediment trapping efficiency. It is also possible to dredge these sites in order to remove the accumulated sediment and create room for future sedimentation. Projects such as these need careful consideration and planning in order to minimize environmental damage and unintended consequences such as altering ground water levels.

Building sediment ponds in the upper watershed can have several benefits. These ponds can trap and store sediment, provide water and habitat for wildlife, slow down flood flows, and provide a source of water for fighting fires. Unfortunately, the upper part of the Morro Bay watershed is very steep and there are few sites where dams can be built. Also, the access to these sites is difficult and it may create more erosion to build roads into the sites than the dams can trap. It would be wise to do a complete inventory of the upper watershed to evaluate the potential for small sediment ponds.

Within the road network there are opportunities to create small sediment traps. Inlets to culverts can be raised in order to create a sediment trap. Within a roadside ditch, small holes can be scooped out that will trap sediment. These types of projects require the entity that maintains the roads to commit to maintaining these traps.

The Reconnaissance Study completed by the ACOE identified a federal interest under ACOE programs to develop a plan to reduce the significant adverse impacts of sedimentation, tidal circulation, and flushing restriction that are causing the degradation of valuable wetland and aquatic habitat areas along the Morro Bay Estuary. The ACOE is planning to conduct a feasibility study for the area.

BENEFITS OF THIS ACTION:

- Less sediment delivered to the bay.
- Increased riparian, freshwater, wetland and fishery habitat.
- Monitoring by the National Monitoring Program has shown that sediment control BMPs also reduce bacteria and nutrients in the creeks.

IMPLEMENTATION:

- Support the ACOE Habitat Restoration Feasibility study.
- Fund a study of the potential sites for trapping sediment.
- Fund the NRCS and UCCE and the CSLRCD to a level where they can provide technical assistance to landowners within the watershed.
- Provide funding to landowners to share the costs of implementing sediment control practice so that the cost for the landowner is reasonable and economically feasible.
- Provide incentives, such as permit streamlining, to landowners to implement sediment control practices.
- Fund a feasibility study on the potential of Warden Lake as a sediment trap.



- Utilize funding sources, such as WRP and CRP and 319(h).
- Find funding for the long-term maintenance of Chorro Flats and the Los Osos Creek Wetland Reserve.
- Encourage SLO County, CalTrans, and the City of Morro Bay to install sediment traps within their road networks.

WHEN:

- Begin as soon as possible.
- Continue until the watershed is adequately treated.

WHO:**Primary:**

- Natural Resource Conservation Service
- Coastal San Luis Resource Conservation District
- Morro Bay National Estuary Program
- Landowners

Support:

- The Bay Foundation
- City of Morro Bay
- Public Landowners (Camp San Luis Obispo, U.S. Forest Service, Cal Poly, San Luis Obispo County, California Department of Parks & Recreation, Cuesta College, California Men's Colony)
- U.S. Environmental Protection Agency
- Permitting Agencies (San Luis Obispo County, U.S. Fish & Wildlife Service, Army Corps of Engineers, Regional Water Quality Control Board, National Marine Fisheries Service California Department of Fish & Game)
- Farm Bureau
- California Cattlemen's Association
- Los Osos Community Services District
- Private Engineers and/or Consultants

COST:

Task/Step	Cost/year	Duration	Potential Funding	Potential Source
Technical Assistance	120k	1-5 years	EQIP MBERF 319 (h) Grants other grants	BF Packard F SWRCB EPA CDFG
Installation	700k	1-5 years	"	"
Maintenance	50k	1-5 years	"	"

BASIS FOR COST:

- Existing program costs.
- Estimate of cost share potential.

EVALUATION:

- NMP water quality data on practice effectiveness.
- Habitat measurements.
- Direct measures of sediment removed from the system using upstream/downstream and before/after using evaluation designs.
- Number of additional sediment trap projects.
- Progress on U.S. Army Corps of Engineers Habitat Restoration Feasibility Study.

RELATED ACTIONS:

- | | |
|-------------------------------|-------------------------------|
| ▪ All SED Actions | ▪ HAB-7 (Riparian Vegetation) |
| ▪ HMT-4 (Mines) | ▪ HAB-1 (Land Acquisition) |
| ▪ BACT-2 (Grazing Management) | ▪ NUTR-5 (Agricultural BMPs) |
| ▪ NUTR-6 (Urban BMPs) | ▪ FLO-3 (Land Acquisition) |
| ▪ HMT-3 (Urban BMPs) | ▪ HMT-4 (Mines) |
| ▪ STL-4 (Riparian Corridors) | |