Draft Findings of the Monterey County LCP Periodic Review

CHAPTER 4: Water Quality and Marine Resources

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CHAPTER 4: Water Quality & Marine Resources

A. Coastal Act Policy Framework

The Coastal Act includes several policies to protect marine/terrestrial resources and water quality. Section 30230 of the Act requires that marine resources be protected, maintained, and, where feasible, restored. The biological productivity of coastal waters, including streams, estuaries, and wetlands, must be maintained. Requirements include controlling runoff and waste discharges to protect water quality, preventing depletion of groundwater supplies and substantial interference with surface water flows in order to sustain the biological productivity of coastal waters, and minimizing the alteration of riparian habitats and streams (Sections 30231 and 30240). Such control, which includes preventing erosion, also supports agricultural land productivity (Section 30241) and visual resource /landform protection (Section 30251) mandates of the Coastal Act as well.

Since certification of the LCP, much has been learned about water quality and the planning and regulation framework has evolved. While early efforts at protecting water quality often focused on discrete sources of pollution (e.g., from point sources such as factories and outfall pipes), non-point source pollution has since emerged as a key concern in protecting water quality. As understanding of the non-point source impacts on water quality from development and land use practices has increased, avoiding or minimizing these impacts has become a greater focus in land use planning and regulation along the coast and throughout the State. Congress enacted the Coastal Zone Act Reauthorization Amendments (CZARA) in 1990 to better link coastal water quality issues and land use activities and to better manage non-point source pollution. In 2001, the Coastal Commission and State Water Resources Control Board jointly adopted the *Plan for California's Nonpoint Source Pollution Control Program,* which includes this framework of management measures that reflect the Environmental Protection Agency's (EPA's) guidance to better manage polluted runoff and protect water quality. A major component of the Commission's responsibilities under the *Plan* is to facilitate the incorporation of appropriate management measures into LCPs throughout the coastal zone.

B. Monterey County Certified Local Coastal Program

1. Background

A variety of coastal water quality concerns were identified at the time of certification of Monterey County's four land use plan segments. The *North County Land Use Plan* recognized that land development, sediment, erosion, waste disposal, and agricultural practices contribute to the degraded water quality along with the natural presence of salts, heavy metals, and animal coliform bacteria. Septic system failure was a problem in some areas and rapid erosion of soils and the consequent siltation and loss of the wetlands in the watersheds of Elkhorn Slough emerged as a growing public concern. Poor water quality resulted in banning of water contact recreation in the lower Salinas River and direct consumer sale of shellfish raised in Elkhorn Slough.

The *Carmel Area Land Use Plan* identified potential water quality problems from point source discharge of secondarily treated effluent from the Carmel Sanitary District Sewage Treatment plant into the Carmel Bay Area of Special Biological Significance (ASBS), and discharge of effluent from two existing package treatment plants into the open ocean south of Point Lobos.[1] Non-point sources of pollution included contaminants and sediments from urban stormwater runoff entering the Carmel River and the Carmel Bay ASBS, and septic system and leachfield failures in the Carmel Highlands area. At the time of certification, the Carmel River had experienced extensive erosion and sedimentation and water clarity in the Carmel Bay had declined.

The *Del Monte Forest Land Use Plan* recognized that, in addition to the impacts to the Carmel River and ASBS noted above, the Pescadero Creek watershed runoff and surface drainage for the Pebble Beach planning area drain to Carmel Bay and provide a source of pollutants to the bay, especially when considering cumulative effects of other watersheds draining to the bay (e.g. San Jose Creek, Carmel River). Unlike the *Carmel Area LUP* in 1983, the *Del Monte Forest LUP* noted that the existing water quality in Carmel Bay was improving. Such a conflicting assessment may have resulted due to a dearth of quantitative monitoring results.

Finally, the *Big Sur Coast Land Use Plan* recognized that inadequate stream setbacks, erosion, siltation, and impacts to vegetation could adversely affect water quality and stream resources.

2. Summary of Local Coastal Program Provisions

Monterey County's LCP addresses the identified water quality issues through a variety of regulations designed to protect water quality. The LCP contains Grading and Erosion Control Chapters (Chapters 16.08 & 16.12, respectively) in the *County Code*. The grading regulations spell out procedural requirements for obtaining a grading permit and contain standards governing excavations, fills, drainage facilities and terraces, and private roads. The erosion control regulations require implementation of plans to control erosion and runoff and standards to minimize land clearing, and control large winter grading operations.

In addition to these general provisions, each land use plan contains policies related to that planning area's specific issues. Water quality protection policies in the *North County LUP*, (Parts B & C of Chapter 2.5 Water Resources and Ch 2.6 Agriculture) address point and non-point source pollution by measures such as prohibiting discharge into riparian corridors, examining industrial discharges and community wastewater treatment systems, and monitoring of agricultural runoff to reduce pesticide and nitrate contents. In addition, subdivision policies require a minimum parcel size of 2.5 acres for property that will require septic systems, as well as adequate maintenance and repair of septic systems. Additional *North County LUP* policies addressing erosion and sedimentation control are discussed in more detail under Issue WQ-8: North County Water Quality and Watershed Restoration, below.

[1] Note that ASBSs are now termed "State Water Quality Protection Areas." However, since the use of this new term is recent and all of the literature currently refers to ASBSs, this term will continue to be used in this Periodic Review.

For the Del Monte Forest planning area, relevant water quality protection policies are contained primarily in the Water and Marine Resources section of the Resource Management Chapter of the *Del Monte Forest LUP*. The Policy Guidance Statement of that chapter provides:

> *The water quality of the Del Monte Forest Areas[sic] coastal streams, open coastal waters, Carmel Bay State Ecological Reserve, and Carmel Bay Area of Special Biological Significance shall be protected and maintained. This requires adherence to comprehensive management practices, including appropriate combinations of stream setbacks, stream flow maintenance, protection of riparian vegetation, and careful control of grading to minimize erosion and sedimentation.*

For the Carmel planning area, most of the relevant policies are contained in Chapter 2.4 "Water And Marine Resources." Key Policy 2.4.2 summarizes the more specific policies:

> *The water quality of the Carmel area's coastal streams and of the Point Lobos and Carmel Bay Areas of Special Biological Significance shall be protected and maintained. Instream flows should be protected in order to maintain the natural plant community and fish and wildlife. In general, the County will require adherence to the best watershed planning principles, including: stream setbacks, stream flow maintenance, performance controls for development site features, maintenance of safe and good water quality, protection of natural vegetation along streams, and careful control of grading to minimize erosion and sedimentation.*

The *Big Sur Coast Land Use Plan* lacks a separate water quality chapter but contains policies throughout the plan that require consideration of water quality in agricultural activities, trail development, parking projects, timber harvesting, mining, water withdrawals and other projects. Also, both the Big Sur River and Little Sur River Protected Waterway Management Plan components of the LCP have water quality protection policies.

C. Local Coastal Program Implementation Issues

1. Overview of Issues and Recommendations

Significant LCP implementation issues with respect to water quality protection in Monterey County fall into two main areas: 1) general methods for addressing various categories of development activities that have potential to create adverse water quality impacts; and 2) specific watershed initiatives to protect and/or restore natural drainage features.

a. General Water Quality Protection

Monterey County experiences several water quality problems as described above. Water quality issues, especially related to erosion control, were addressed in many of the County's coastal permits. Since LCP certification, water quality has received increased attention and a variety of implementation tools have become available to help coastal planners address the issue. Foremost is

an EPA guidance document that categorizes water quality issues and recommends corresponding best management practices.[2] Based in part on EPA's guidance document, the Commission developed a *Procedural Guidance Manual for Addressing Polluted Runoff*.[3] The LCP was reviewed in light of the latest guidance for different categories of development (see **Issues WQ-1: Dredging and Spoils, WQ-2: Sewage Outfalls, WQ-3: Erosion and Non-point Source Pollution Control, WQ-4: Agriculture and Confined Animal Facility BMPs, WQ-5: Wastewater Treatment Best Management Practices, and WQ-7: Public Works Maintenance**). Recommendations to incorporate revised, up-to date pollution prevention techniques to assure that policies are updated in conformance with Coastal Act policies are on pages 94-120 of Appendix A.

b. Specific Watershed Initiatives

Watershed planning is a means to comprehensively apply various individual water quality measures to an entire drainage basin. Watershed planning is in its infancy in Monterey County. A prior Commission study noted the emerging effort of the Monterey Bay National Marine Sanctuary Integrated Coastal Management (ICM) interagency program to protect Monterey Bay water quality as well as several watershed plans under development for the Carmel River Watershed and watersheds of the Elkhorn Slough.[4] Despite these emerging programs, Monterey County has not yet taken a consistent, comprehensive approach to watershed planning (see **Issue WQ-6: Watershed Planning**). Such planning is an important way to address the cumulative impacts of polluted runoff. Recommendations to incorporate such planning are on pages 118-119 of Appendix A.

The North County planning area has had the most extensive program for addressing non-point source pollution. This program is ripe for evaluation given concerns that required watershed restoration plans have not yet been prepared. (See Issue WQ-8 below). Also, the five-year Elkhorn Slough Watershed Permit Coordination Program will be expiring in May 2004. Therefore, review of the project's implementation should be useful in evaluating how successful the overall project has been at reaching its stated goals, and to evaluate if any changes to the program are needed.

The Del Monte Forest planning area had the LCP's only specific site coverage limitation policy to address non-point source pollution. As a result, it is useful to examine how this standard has been applied and whether it has been successful in addressing polluted runoff. (See Issue WQ-9 below). Since the purpose of this provision was to protect water quality and marine resources in the Carmel Bay ASBS, a more comprehensive look at all of the watersheds draining into Carmel Bay was undertaken.

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[2] U.S. Environmental Protection Agency, *Guidance Specifying Management Measures for Sources of Nonpoint Source Pollution in Coastal Waters*, 1993.

[3] California Coastal Commission, *Procedural Guidance Manual for Addressing Polluted Runoff in the California Coastal Zone, 2nd Edition,* June 1996.

[4] California Coastal Commission, *ReCAP Pilot Project, Findings and Recommendations: Monterey Bay Region*. September 1995, pp. 125-126.

2. Issues Analyzed in Detail

In addition to the issues mentioned above that are covered in Appendix A, the following issues are discussed in more detail in this section: Issue WQ-8: North County Water Quality and Watershed Restoration and Issue WQ-9: Carmel Bay Area of Special Biological Significance and Ecological Reserve. An overview of each issue leads, followed by background information, applicable County LCP policies, a description of how the policies have been implemented, analysis, and, finally, corrective recommendations.

a. Issue WQ-8: North County Water Quality and Watershed Restoration

(1) Overview

This subchapter addresses the following concern identified through issue scoping: **Ensure that the watershed restoration requirements of the LCP are being carried out in a manner that prevents non-point source pollution from affecting Elkhorn Slough, Monterey Bay and other resource areas.**

The watersheds draining into the Elkhorn and Moro Cojo Sloughs have experienced much erosion and continue to be threatened with continued erosion from agricultural activities and new development. Responses to date have included an erosion control program for farmers sponsored by the Natural Resources Conservation Service. Impacts of new development activities have been addressed through the permit process. Permit review of coastal development permits since certification has revealed that new development continues to be approved in the watershed, with some erosion control requirements, but not pursuant to required watershed restoration plans. Because the County has not always completely followed policies addressing development on steep slopes and has not completed preparation of watershed restoration plans, the LCP has not been implemented in a manner fully consistent with Coastal Act objectives to control erosion and protect water quality. Additionally, given the extent of existing development, real progress in addressing this issue will not occur until management measures are implemented to control erosion from existing land uses. Recommendations are made to more fully implement LCP policies, to continue and expand agricultural erosion control programs, and to prepare a comprehensive non-point source pollution control plan.

(2) Resource Background

Watershed Characterization

Most of North County coastal zone is part of the Elkhorn and Moro Cojo Sloughs watershed complex (see Map WQ-8). The entire watershed encompasses 44,900-acres, the majority of which is located in Monterey County, with a small portion of the upper watershed located in San Benito County. The watershed extends east from the Pacific Ocean near Moss Landing on the west to Highway 101 near Prunedale, and from the town of Pajaro on the north to Castroville on the south. Elevations range from more than 6 feet below sea level in the channel under Moss Landing Road, to over 1,200 feet in the hills in the eastern part of the watershed. A significant portion of this watershed falls within the coastal zone, including as much as 4,000 acres of coastal estuary. The

watershed contains important wetland habitats, such as those located in the Elkhorn Slough National Estuarine Research Reserve, the Moss Landing Wildlife Refuge, Azevedo Marsh, and Blohm-Porter Marsh. Additionally, numerous streams, creeks, and water bodies are contained in the Elkhorn Slough Watershed.[5]

The Elkhorn Slough watershed encompasses tidal wetlands, surrounded by barrier dunes and coastal hillsides made up of highly erosive soils. The surrounding area includes a diverse landscape of working farms, urban residential development and relatively undeveloped hills of native upland vegetation. The Elkhorn Slough watershed is an incredibly rich biological area, with over 270 species of resident and migratory birds, and freshwater ponds and riparian wetland areas that support three rare amphibians, the California red-legged frog, Santa Cruz long-toed salamander and the California tiger salamander. Elkhorn Slough is one of the few, relatively undisturbed coastal wetlands remaining in California. The main channel of the slough winds inland nearly seven miles and encompasses over 2,500 acres of marsh and tidal flats. Over 500 species of invertebrates, 100 species of fish, and 270 species of birds have been identified in Elkhorn Slough.[6] The channels and tidal creeks of the slough are nurseries for many fish, including seven commercially important species. Harbor seals and sea otters also make their way through the Moss Landing Harbor to established haul outs in Elkhorn Slough. Additionally, the Slough is on the Pacific Flyway, providing an important feeding and resting ground for many kinds of migrating waterfowl and shorebirds. At least six listed rare, threatened or endangered species utilize the slough and environs, including peregrine falcons, Santa Cruz long-toed salamander, clapper rails, brown pelicans, least terns and sea otters.

Threats to Watershed Resources

The watershed's surface waters are threatened with sedimentation and with pollutants that are within the sediments. These pollutants also threaten the groundwater and lead to a loss of soil quality.

Sediment-induced degradation of water quality is a long-standing problem in the Elkhorn Slough watershed. Both chemical pollution and impaired clarity due to suspended loads decrease water quality in the wetlands. Pesticides persistent in agricultural soils and associated with fine grained sediments are transported to surface waters where aquatic fauna are exposed to toxic residues from Toxaphene, Endosulphan, DDT and other pesticides.[7] In addition, sedimentation caused by continued erosion can contribute to wetland fill. Sediments are deposited in deltaic fans where streams enter wetlands, especially significant in the *Salicornia* salt marshes along the western and northern shore of the slough. These deposits also occur in freshwater ponds and in Moro Cojo Slough.

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[5] For example, Paradise Canyon Creek, Long Canyon Creek, Strawberry Canyon Creek, Hidden Canyon Creek, Carneros Creek and its tributaries, Warner Lake and its tributaries, Moro Cojo Slough and its tributaries, McClusky Slough and its tributaries, Bennett Slough and its tributaries, and Castroville Slough and its tributaries.

[6] Elkhorn Slough Foundation and Tom Scharffenberger Land Planning and Design, *Elkhorn Slough at the Crossroads*, March 2002.

[7] U.S. Department of Agriculture Soil Conservation Service, *Watershed Plan and Environmental Assessment: Elkhorn Slough Watershed Project*, April 1994, p.5.

Sedimentation is a long-standing issue in the watershed. Preparation of the LCP was guided in part by a 1980 analysis of erosion problems in the Elkhorn Slough Watershed. Major findings of this analysis, described in the report titled Linking *the Cumulative Impacts of Watershed Development to Coastal Wetlands*[8] are as follows:

- *Almost half of the Salicornia (45%) and other wet grasslands (48%) surrounding the Slough have been converted to upland vegetation during the last 50 years. Much of the early loss of wetland habitat is associated with diking and drainage projects occurring between 1931 and 1956 on the northern, eastern and southern Slough boundaries. However, at least eighteen fans have been deposited on the western boundary of the Slough due to present agricultural and residential development adjacent to these areas.*

- *Existing land use within the watershed of Elkhorn and Moro Cojo Sloughs contributes a sediment load far in excess of the natural rate of deposition. Sediment activity values based on the combined rates of erosion and deposition at selected sites within the upland portions of the watershed indicate that intensive agriculture has more than twice the disturbance potential of urban development, and nearly ten times that of sites with natural vegetation.*

- *Significant volumes of sediment are presently carried by Carneros Creek during storms of relatively low magnitude, high frequency (2-year recurrence interval), and moderate streamflows (100-300 cfs). During such times, as much as 75% of the total sediment load is carried and delivered to the upper reaches of Elkhorn Slough.*

- *Sites where the soil has been disturbed are more active sediment sources than those where natural vegetation remains or where soil cover is managed to limit erosion. Unvegetated sites on steep slopes are the greatest contributors to the sedimentation of Elkhorn Slough, and hence, to the accelerated destruction of its natural values.*

- *The most important factors in considering the relationship between the intensity of land use in the watershed and impacts on estuarine processes is the differential erosion and infiltration rates of soils on the watershed. Large portions of the watersheds of Elkhorn and Moro Cojo Slough are comprised of highly erodible soils, particularly the Aromas Sands. Erosion and subsequent sedimentation in the estuaries varies based upon the soil type, management practice, and physiographic conditions (e.g. slope) within a particular area.*

- *Land use practices which affect the concentration of surface runoff (e.g. the construction of channels, culverts, and roads) increase downstream erosion. Mitigation measures, such as energy dissipators or vegetation stabilization are necessary on a project review basis to address this problem.*

[8] Dickert, Thomas and Andrea Tuttle, *Elkhorn Slough Watershed: Linking the Cumulative Impacts of Watershed Development to Coastal Wetlands,* revised April 1981.

- *Allocation of land use in accordance with the related amount of land disturbance will be the most effective means to reduce the long term cumulative impact of development within the Elkhorn Slough watershed. Such an allocation program should reflect not only hydrologic and soil characteristics within the watershed, but should also account for the amounts of land disturbance associated with various land uses.*

A more recent study by the Natural Resource Conservation Service (NRCS) identified 25 locations where freshwater ponds and pickleweed marshes in the watershed were under threat of burial by alluvial fans (sediment fans deposited by a stream or running water).[9] Without appropriate action, NRCS anticipates the loss of approximately 60 acres of wetlands within the watershed.

Poor cultivation practices, including physical disturbances to land cover, irrigation practices, pesticide- and fertilizer-application practices and grazing and livestock practices, are largely responsible for the majority of erosion, sedimentation and nonpoint source pollution in North County. As noted under Issue LU-8, much of the North County planning area is in agricultural use. Roughly one-third of the watershed east of Elkhorn Slough is classified as a Critical Erosion Area and a good portion of this land is in agricultural use. The Pajaro and Springfield Terrace areas are fully developed with respect to agriculture. The North and South Highlands areas are zoned and suitable for agriculture and thus the potential for erosion and runoff in these areas is likely to increase to a large degree in the near future. Strawberry production is responsible for about 75% of the anthropogenic erosion occurring in the watershed.[10] Background erosion rates are approximately 1 ton/acre/year, whereas erosion rates for land under strawberry cultivation average 8-145 tons/acre/year. The NRCS estimates that an average of 33 tons of sediment per acre per year is currently discharged via runoff from sloping strawberry fields, and an annual total of approximately 80,000 tons (of the total 180,000 tons/year) of sediment is transported into the surrounding water bodies.

Soil erosion reduces the productivity of prime and unique farmland in the watershed. Estimated annual monetary damage to strawberry lands resulting from erosion is $1.72 million, including $1.34 million in direct costs and $380,000 in lost strawberry production.[11] Overall costs due to soil erosion are estimated at approximately $3 million/yr, or about $800/acre, not including costs to restore the environmental damage caused by such erosion.[12]

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[9] Natural Resource Conservation Service, "Elkhorn Slough Watershed Project: Info for California Coastal Commission," 1998. Prepared by NRCS January 7, 1998 for Federal Consistency Determination CD-051-98.

[10] U.S. Department of Agriculture Soil Conservation Service, *Strawberry Hills Target Area: Watershed Area Study Report Monterey County California*, June 1984. This report estimated total erosion in the entire Elkhorn Slough watershed at about 226,400 tons per year, of which about 166,400 tons was man-caused and, of that, about 128,900 tons was attributable to strawberry growing.

[11] U.S. Department of Agriculture Soil Conservation Service, *Watershed Plan and Environmental Assessment: Elkhorn Slough Watershed Project*, April 1994, p.8.

[12] U.S. Department of Agriculture Soil Conservation Service, *Strawberry Hills Target Area: Watershed Area Study Technical Report Monterey County*, *California*, June 1984.

In addition to increased erosion, strawberry and other cultivation leads to nutrient loading via runoff of applied fertilizers. DDT, toxaphene, dieldrin, endrin, aldrin, and endosulfan are major persistent pesticides that have historically been used for agricultural operations throughout the Salinas Valley and Elkhorn Slough Watershed. With the exception of endosulfan these chemicals have now been banned for use in California. Studies undertaken to examine water quality suggest that though previously banned, these persistent organocholorine pesticides are still present in agricultural fields and adhere to fine grained sediments leaving the fields, thereby finding their way as suspended sediments in surface water bodies.[13] Because they are insoluble in water but highly soluble in lipids or animal fatty tissue, they tend to concentrate in aquatic organisms and may be passed through the food chain via bioaccumulation.

Without proper management, sediments and the agricultural chemicals adhered to them eventually make their way into the Elkhorn Slough and the Monterey Bay National Marine Sanctuary. Contaminated sediments enter the Elkhorn Slough drainage system from several tributaries, including the Old Salinas River Channel, Tembladero Slough and Carneros Creek by runoff, percolation, and wind transport. These contaminated sediments reduce the biological health of the estuary and create other associated problems due to sediment deposition elsewhere in the estuarine system. Recent studies have documented some of the highest levels of historic pesticides (found within the top 10% all California estuaries) are now found within the bottom sediments of Moss Landing Harbor, having originated from these watersheds.[14] Sediment sampling and testing conducted in Moss Landing Harbor in the last half of the 1990s indicates that bottom sediments in the harbor include heavy metals (including arsenic, copper, nickel, cadmium, chromium and mercury), pesticides (including DDT, chlordane, dieldrin, endrin) and PCBs (aroclor) and tributiltin at levels that exceed environmentally safe limits.[15] As such, Harbor dredging costs have escalated due to the increased necessity for upland disposal of contaminated sediments. In the last five years, approximately 62,870 cubic yards (roughly 25%) of sediments dredged in Moss Landing Harbor have required upland disposal at a confined landfill (see Issue LU-11).[16]

Many of these contaminants are biologically available, meaning that they are ingested, absorbed or otherwise available to the animals living in these systems. For instance, several studies demonstrate the persistent toxicity of sediments and associated waters in the south harbor area. The State Mussel Watch program has thirty years of data documenting the high levels of pesticides that have accumulated in mussel tissue within the harbor. Other animals, specifically the California Sea Otter (*Enhydra lutris*), eat these mussels, and local sea otter tissue samples have identified high levels of these contaminants.

Responses to Enhance Watershed Resources

[13] Association of Monterey Bay Area Governments, *Northern Salinas Valley Watershed Restoration Plan,* 1996.

[14] Downing et al., "Chemical and Biological Measures of Sediment Quality in the Central Coast Region," 1998. http://www.swrcb.ca.gov/bptcp/docs/reg3report.pdf.

[15] Coastal Commission coastal permit 3-01-049, to Moss Landing Harbor District.

[16] California Coastal Commission, Staff report for coastal permit 3-01-049, adopted 8/8/02, pp. 13.

The fragility of the watershed and the threats to it were increasingly recognized in the 1970's and led to the creation of the Elkhorn Slough National Estuarine Research Reserve and companion Moss Landing State Wildlife Refuge. Subsequent programs were developed and implemented to help prevent these areas from being polluted, including the *Elkhorn Slough Management Plan*, the Elkhorn Slough Watershed Project, Water Quality Protection Program for MBNMS Agricultural and Rural Lands, and the *Elkhorn Slough Watershed Conservation Plan*. Additionally, the Regional Water Quality Control Board has sponsored a variety of regulatory, planning, and monitoring programs aimed at reducing the area's non-point source pollution.[17]

The Elkhorn Slough Watershed Project has led to a sustained effort by the NRCS to work with individual landowners and farmers on a voluntary basis to control erosion and runoff. Another voluntary program that has met with some success in erosion control is the Central Monterey Bay Wetlands project. This project has resulted in the direct improvement of 537 acres of agricultural lands, and has provided assistance to landowners representing 3,720 acres of land for a total impact on 25% of the farmland in the Elkhorn Slough watershed.[18] These voluntary efforts, while promising, are limited in addressing the problem of water quality impacts from agricultural activities.

Other efforts have been made to address barriers to implementing erosion controls on agricultural lands, such as a watershed-wide permit coordination program prepared by the NRCS Elkhorn Slough Watershed Project and Sustainable Conservation's Partners in Restoration Program. This permit coordination program streamlines the process for the permitting of ten different resource conservation development activities designed to implement ten different Best Management Practices (BMPs) to reduce the high levels of pesticides found in the Elkhorn Slough Watershed, reduce the degradation and loss of wetlands and riparian habitats resulting from sediment deposition, and maintain the prime and unique agricultural soils characteristic of this watershed.[19] In 1998, the Coastal Commission and other state and Federal regulatory agencies issued watershed-wide permits to the NRCS and the Resource Conservation District of Monterey County, as co-permittees for the Elkhorn Slough Watershed Project.

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[17] For a more thorough discussion of the various agencies that have water quality authorities and programs for the watersheds see California Coastal Commission, *A Pilot Methodology for Assessing Cumulative Impacts of Activities that Generate Polluted Runoff in the Elkhorn Slough Watershed, Monterey County,* October 1996, Chapter 1 and RWQCB, "Former Pacific Gas and Electric Company, Moss Landing Monterey County," Staff Report for July 11, 2003.

[18] U.S. Department of Agriculture Natural Resources Conservation Service, *The Elkhorn Slough Watershed Project, 2000 – 2001 Report,* 2002.

[19] The ten BMPs are diversions, filter strips, grade stabilization structures, grassed waterways, sediment basins, streambank protection, stream channel stabilization, underground outlets, and water and sediment control basins. Each project is required to document the resource problem and restoration option, whether the scale of the project is appropriate for the permitted conservation practices allowed, an evaluation of the site for special-status plant and animal species habitats, evaluation of the site for wetlands, identification of trees to be protected, protection of cultural artifacts, and photo documentation of the site for baseline and post-project conditions. An annual report documenting the cumulative results of project activities is also submitted to the permitting agencies.

Growers in the region were involved in drafting the *Agricultural and Rural Lands Action Plan* of the Water Quality Protection Program (WQPP) for the MBNMS, which encourages voluntary compliance with outlined management practices.[20]

> *The Agriculture and Rural Lands Plan was developed in 1999 to address agricultural runoff in the form of sediments, nutrients and persistent pesticides. The original plan outlines six sections containing twenty-four strategies and ninety activities intended to protect and enhance the quality of water that drains into the Sanctuary while sustaining the economic viability of agriculture. The strategies include organizing agricultural industry networks and watershed groups, increasing technical assistance and education, funding and economic incentives for conservation measures, permit coordination for conservation practices, and improving maintenance practices for rural roadways and public lands.*
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> *The many partners that are working together throughout the six-county area on implementation of the Agriculture and Rural Lands Plan are known as the Agriculture Water Quality Alliance (AWQA). AWQA includes agriculture industry groups, federal, state, and local agencies, technical experts, environmental organizations and university researchers. The AWQA Steering Committee, directing the effort, has representatives from the Sanctuary, Coalition of Central Coast County Farm Bureaus, Natural Resources Conservation Services, Resource Conservation Districts, and University of California, Cooperative Extension.*
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> *The Coalition of Central Coast County Farm Bureaus formed in 2000 to oversee the agricultural industry's regional implementation of this plan, and continues to meet quarterly. Ten Agricultural Watershed Working Groups have been organized by the Coalition since then. Over 150 farmers and ranchers participate in these groups by developing Water Quality Plans for their properties and installing conservation practices that reduce erosion and nutrient runoff. Water quality plans have been developed for 97,200 acres of crop and rangeland, and applied on 77,500 acres of crop and rangeland. A diversity of crops are represented in Agricultural Watershed Groups: cattle, vegetables, vineyards, orchards, field and greenhouse flowers, strawberries, pumpkins, etc. Many additional groups are in the process of being formalized. Additional work is needed to ensure that growers who are not part of existing large organizations are also reached.*[21]

The WQPP is meant to complement existing programs that promote voluntary adoption of conservation measures. The success of the program is to be evaluated over time by analyzing data from several sources: 1) the Coordinated Regional Monitoring Program, 2) records from implementation of management practices, and 3) voluntary self-monitoring by growers and ranchers. The information is meant to flow from these sources to the Farm Bureau Coordinating committees, then to the RWQCBs and finally to the WQPP.

[20] Monterey Bay National Marine Sanctuary, *Agricultural and Rural Lands Action Plan*, 1999.

[21] Monterey Bay National Marine Sanctuary, *Sanctuary Joint Management Plan Review*, 2003.

The *Elkhorn Slough Watershed Conservation Plan* has recognized and supported land acquisition and subsequent land management activities to reduce non-point source pollution. An example of this strategy is Agricultural Land-Based Training Association's (ALBA's) acquisition of a 110-acre land parcel that includes riparian and steeply sloped areas that were formerly under cultivation and slated for a residential subdivision, which is now being used as a test farm where pilot projects that apply alternative agricultural practices are used for teaching and research. In partnership with the Rural Development Center (RDC) and the Farmer Training and Research Center (FTRC), ALBA focuses on urban-rural agricultural exchange and organic agricultural growth to promote economically viable agricultural methods that also protect the environment through sustainable production. The management plan for the parcel includes using cover crops, restoring of riparian lands, taking some land out of production, growing some organic crops and re-routing roads away from steep slopes. ALBA also uses this test farm to host programs for farmers to achieve greater independence while increasing economic returns.

Under the state Clean Water Act, the Regional Water Quality Control Board (RWQCB) has identified many of receiving water bodies in the Elkhorn Slough/Lower Salinas Valley watershed as impaired. Previous monitoring efforts led to the designation of Moss Landing Harbor as a high priority toxic hot spot and to its inclusion in a Watershed Management Initiative (WMI). According to the RWQCB[22]:

> *One objective of the RWQCB's WMI effort is to integrate and coordinate permitting, enforcement, implementation of Coastal Zone Act Reauthorization Amendments (CZARA), basin planning, monitoring and assessment, total maximum daily load (TMDL) analysis, groundwater protection and Nonpoint source (NPS) pollution control activities within the watershed.*

The Salinas Valley watershed (which virtually includes all of the North County planning area) is currently the Regional Board's top priority watershed. Water bodies that are listed as impaired and slated to have Total Maximum Daily loads determined for them include, in addition to the Harbor, Elkhorn Slough, Old Salinas River Estuary, Salinas River Lagoon, Salinas River, Moro Cojo Slough, and Tembladero Slough.

The *Toxic Hot Spot Cleanup Plan* recommends several best management practices of note. These BMPs include numerous drainage improvement activities that have been documented to improve water quality such as: maintenance of vegetative buffers between creek drainages and agriculture activities, re-vegetation of drainage ways, reestablishment of floodplain and overall reduction of pesticide use and over spray. Many of these activities are occurring through current projects and programs but have not yet been embraced by the County as the appropriate actions for future management of the watershed's drainages.

[22] State Water Resources Control Board, *Consolidated Toxic Hot Spots Cleanup Plan*, June 1999, pp 171.

The Central Coast Regional Water Quality Control Board recently settled alleged pollution discharges by PG&E and as part of this settlement will be receiving $5 million dollars from the utility. Of this, $2.85 million is targeted to establish a "Non-Point Source Projects Fund" and $950 thousand is earmarked to establish a "Nonpoint Source Monitoring Fund."[23]

The California Water Code requires that permits be obtained for irrigation water discharge into creeks and rivers from agriculture operations. Previously, such discharges were allowed under an Agriculture Waiver; however, that waiver expired on January 1, 2003.[24] The Central Coast Regional Water Quality Control Board is in the process of amending the discharge waiver for irrigated agricultural discharges. Based on preliminary discussions, the new waiver will be available to farming operations which meet specific criteria for implementation of Best Management Practices either independently or as part of the various programs being implemented under the guidance of the Monterey Bay National Marine Sanctuary Agriculture Plan. Those not meeting these requirements, will be required to obtain a discharge permit which will most likely include requirements for the installation or implementation of agricultural BMPs.[25]

(3) Local Coastal Program Provisions

The County's LCP contains a multi-faceted approach to controlling non-point source pollution. This approach relies on overall land use prescriptions, density limitations, site design criteria, locational criteria, bare ground limitations, and comprehensive plans to carry out Coastal Act policies on water quality and resource protection.[26]

Land Use and Density Provisions

With regard to overall land uses and densities, the *North County Land Use Plan* has a general statement that they shall be limited to minimize further erosion (e.g., Policy 2.5.2.1). The LCP accommodates agriculture, but does indicate some preference to keep cultivation off of steep slopes to address water quality concerns. With regard to density for new subdivisions, there is a 2.5-acre minimum parcel size throughout most of the North County planning area due to area's reliance on septic systems for wastewater treatment.

Development Controls

The LCP relies more on individual development controls to address water quality. The LCP contains some erosion control provisions that universally apply and others that are targeted to the more

[23] Central Coast Regional Water Quality Control Board,, "Former Pacific Gas and Electric Company, Moss Landing Monterey County," Staff Report for July 11, 2003.

[24] RWQCB Resolution 89-04 regarding general waivers for specific types of discharge.

[25] National Marine Sanctuaries Monterey Bay, *Joint Management Plan Review of Proposed Action Plans, A Report to the Monterey Bay National Marine Sanctuary Advisory Council*, June 10, 2003; Roberts, Traci, "Water Quality/Watershed Updates," *Between the Furrows,* Vol 27, #11, p.6.

[26] For a more extensive discussion of applicable LCP policies see, California Coastal Commission, *A Pilot Methodology for Assessing Cumulative Impacts of Activities that Generate Polluted Runoff in the Elkhorn Slough Watershed, Monterey County,* October 1996.

critical areas. As noted, the LCP includes Erosion Control and Grading chapters, which are applicable to most development in the North County planning area. *County Code* Section 16.12.040 of the Erosion Control Ordinance contains provisions that no person shall cause or allow the continued existence of a site condition that is causing or likely to cause accelerated erosion and outlines erosion and runoff control and land clearing measures to prevent or control such conditions. The countywide ordinances are reinforced by some *North County Land Use Plan* policies that universally apply, including maximizing retention of vegetation (e.g., *North County LUP* policies 2.5.1; 2.5.2.1, and 2.5.3.C.6).

The LCP defines critical erosion areas as those that have soils with high erosion potential (>4 "K-factor" [27]) and/or with > 25% slope. All new development in the North County planning area needs to be located off critical erosion areas if possible (e.g., policy 2.5.3.C.3). This policy is complemented by policies that restrict development on slopes greater than 25% in certain areas such as the Long Valley Watershed (policy 4.3.6.D.7), and on lands with slopes over 30% in other areas (policies 2.2.2.3 and 2.2.3.A.4). Coastal permit applications are required to clearly indicate critical erosion areas, vegetated areas, and hydrologic features, and projected land disturbance (policy 2.5.2.C.2).

Comprehensive Plans

The LCP suggests that different levels of comprehensive water quality planning occur. The LCP embraces the concept of Watershed Restoration Areas (WRA) - areas where land disturbance is already over a target.[28] Thirteen of the 37 subwatersheds in the North County coastal zone are WRAs. These are shown as shaded areas on Map WQ-8. For each WRA, the LCP requires that a restoration plan be developed to reduce erosion and sedimentation within the area to a sufficient level, e.g., 50% of a Land Disturbance Target (LDT). Complementary policies require that the County periodically review development within each WRA to determine if its Restoration Area designation should be removed. Permittees are also required to submit a one-time contribution of $500 per acre of land disturbance that they cause once the restoration plans are completed (*County Code* Section 20.144.070.F.4).

Another LCP provision requires development and implementation of agricultural management plans that include measures to maintain sedimentation and erosion at or near pre-conversion levels. Agricultural management plans are required for lands containing slopes between 10 and 25 percent, for areas designated for exclusive agricultural use, and for any lands designated as Critical Erosion Areas of Watershed Restoration Areas. Specific erosion control measures to be included in every agricultural management plan include reduction of bare ground, retention of storm water runoff and continuous vegetation cover. This LCP provision is complemented by a specific interpretation of the definition of development as including "conversion of uncultivated lands to croplands on lands

[27] The K-factor is used in the Universal Soil Loss Equation (USLE) and represents a relative index of susceptibility of bare, cultivated soil to particle detachment and transport by rainfall.

[28] Based on Dickert, Thomas and Andrea Tuttle, *Elkhorn Slough Watershed: Linking the Cumulative Impacts of Watershed Development to Coastal Wetlands,* revised April 1981.

where 50% or more of the parcel has slope of 10% or greater" and hence subject to coastal permit requirements (*North County LUP* Policy 2.6.3.8; *County Code* Sections 20.06.310, 20.144.070.E.and F and 20.144.080.A).

In addition to preparing WRA plans and agricultural management plans, other actions that the County committed to in the LCP include amending the grading ordinance to prohibit all dumping of spoils into riparian corridors and other drainage courses (North County Policy 2.5.2.B.1), to enforce the erosion control ordinance through fines and other measures to address existing sources of erosion (*North County LUP* Policy 2.5.3.B.6.a), and to monitor agricultural runoff (*North County LUP* Policy 2.5.2.B.2). Also, the *North County LUP* Recommended Action 2.3.1.4 states that:

> *A comprehensive natural resource and water basin management plan should be prepared for North County. The plan should include recommendations for monitoring residential and industrial runoff, regulation of discharges into coastal wetland and stream courses, instream flow protection, regulation of spoils disposal, development of best management practices for control of non-point discharge and erosion. Criteria should be set for adequate setbacks and development practices to protect environmentally sensitive habitats. All appropriate public agencies should participate in the management plan financing development and implementation.*

(4) Local Coastal Program Implementation

The County has implemented various LCP provisions through permit requirements, but has not followed through on many of the more comprehensive planning measures also called for in the LCP.

Permit Review

Since certification about 1,013 coastal permits have been issued in the North County planning area. Typical erosion control conditions include requiring adherence to drainage plans and prohibiting grading during the rainy season.[29]

A review of some permit applications revealed that in the early days of implementation, bare ground exposure was calculated. More recent applications lack such calculations or depictions of critical erosion areas.

Since certification, at least twenty permits were issued to construct residential dwelling units on or to subdivide lands classified as Critical Erosion Areas, and at least two subdivisions within Watershed Restoration Areas were authorized.[30]

[29] More complete descriptions of water quality related permit conditions on earlier Monterey County coastal permits for the Elkhorn Slough Watershed are found in California Coastal Commission, *Final Report: A Pilot Methodology for Assessing Cumulative Impacts of Activities that Generate Polluted Runoff in the Elkhorn Slough Watershed*, *Monterey County*, October 1996.

[30] County coastal permits PC92-39 (3-MCO-92-167) in Watershed Restoration Area # 16 and County coastal permit MS 91-01 (3-MCO-92-146) in Watershed Restoration Area # 12.

In addition, in 20 cases the County waived the policy prohibiting development on slopes in excess of 25% in the North County planning area. Seven of these waivers were granted for subdivisions. Nine of these permits were for construction of a SFD, six included construction of a septic system and eight required grading. All of these projects were located within a Critical Erosion Area; three projects were also within a Watershed Restoration Area. All required preparation of an Erosion Control Plan and additional erosion control measures including deed restrictions to ensure development only within a building envelope, no land clearing during the rainy season, and seeding or covering of cut/fill slopes.

No permits were issued for clearing of steep sloping agricultural land, and thus the agricultural management plan requirement was never triggered.

The aforementioned Elkhorn Slough Watershed Permit Coordination Program authorized 41 projects from 1998–2002. The top three practices involved were construction of control basins to retain sediments and runoff, critical area planting, and stream channel stabilization. All the completed projects were judged successful with no adverse impacts.[31]

The County's enforcement of the Erosion Control Ordinance provisions designed to prevent accelerated erosion from existing development has been mixed. In some cases the County was simply cleaning up the roads of eroded soils and not aggressively seeking fines from those who caused the problem, as authorized.[32]

Planning Experience

Many of the more comprehensive planning initiatives called for in the LCP have yet to be implemented. Since LCP certification, no watershed restoration plans have been prepared for the North County planning area. Thus, individual developments proposed in WRAs were neither required to contribute their share of erosion reduction (because it was never calculated) nor required to contribute in-lieu financial contributions to watershed restoration efforts. Instead development was permitted in WRAs with standard erosion control conditions and a condition for a deed restriction to agree to contribute $500 to any future WRA planning process.

In response to continued water supply problems in North County, Monterey County commenced a new series of studies (see Issue LU-8: Protection of North County Water Supply and Agriculture). Because a useable water supply relies in part on uncontaminated groundwater, the resultant 1997 *North Monterey County Water Issues Action Plan* includes suggested revisions to the County's Grading and Erosion Control Ordinances as they apply to North County. Recommended revisions include runoff protection for adjacent properties, subsurface drainage for stability, prevention of erosion at point of discharge, paved interceptor drains, incorporation of geological report recommendations into grading plans, drainage facilities and terracing standards, tighter private road

[31] U.S. Department of Agriculture Natural Resources Conservation Service and the Resource Conservation District of Monterey County, *Elkhorn Slough Watershed Permit Coordination Program 2002 Implementation Report*, February 2003.

[32] Beldon, T., R. Gramlich, D. Leland, T. Panella, and H. To, "Policy Strategy to Reduce Erosion in the Elkhorn Slough Watershed," University of California at Berkeley, 1994.

standards, enforcement capability to correct accelerated erosion, agricultural conservation practices for erosion control on slopes, control of irrigated and storm water runoff, and application of "25-year" storm water runoff standards.[33] However, despite several years of consideration, these have yet to adopted and forwarded to the Coastal Commission as LCP amendments (see Issue WQ-3: Erosion and Non-point Source Pollution Control in Appendix A).

In terms of other actions called for in the LCP, the County has not implemented an agricultural runoff-monitoring program. Nor, has it implemented the comprehensive natural resource and water basin management plan. The County has sponsored individual wetland management plans for Elkhorn and Moro Cojo Sloughs that include some watershed wide provisions aimed at controlling non-point source pollution into the respective Sloughs.[34] The County is now preparing a plan for improving water quality and reducing flood hazards in the Tembladero Slough (see Issue CH-12).

(5) Analysis of Coastal Act Conformance

Control of erosion, sedimentation and polluted runoff is required to protect water quality and resources in conformance with the Coastal Act. Despite implementation of LCP policies, erosion and sedimentation into the Slough waters continues. Much of this erosion may be attributable to pre-existing development and even some to natural causes. But new development authorized by County coastal permits may also be contributing to the problem. In addition, existing LCP standards and programs need to be updated to reflect new requirements for controlling nonpoint source pollution that have been enacted since certification.

Implementation of Erosion Control Provisions

The County has implemented LCP requirements for erosion control measures in new development. However, it is not known if these erosion control measures have been successful in controlling polluted runoff consistent with the Coastal Act because long-term monitoring and implementation of remedial actions were generally not required in the coastal permit authorizations. Furthermore, as previously noted, the amount of erosion prevented by control measures required for new residential development alone is unlikely to be significant when compared to the roughly 180,000 tons/year total erosion occurring in the North County planning area.

The County has not been entirely successful in carrying out LCP policies to locate new development off of critical erosion areas, especially steep slopes. As noted, at least two subdivisions were approved allowing new lots in a watershed restoration area and several waivers were granted that allowed development on slopes over 25%. In most of these cases, the actual structures and septic tanks were located off of the steep slopes, but parts of the access roads were not. In some cases, the road location is unavoidable; but in other cases, a structural relocation may obviate the need for the steep road. Again, hindering this analysis is the lack of required information found in the coastal

[33] Monterey County Planning & Building Inspection staff report to Board of Supervisors [regarding adding grading and erosion control ordinances applicable within the North Monterey County Hydrogeologic Study Area], for July 10, 2001.

[34] ABA Consultants, *Elkhorn Slough Wetland Management Plan*, December 1989; and The Habitat Restoration Group, *Moro Cojo Slough Management and Enhancement Plan Final Report*, February 1996.

permits to determine if siting criteria were met, and the lack of monitoring to determine if the erosion controls were as effective at preventing erosion as relocation would have been.

By not requiring coastal permits, the County does not appear to have adequately prevented additional clearing of steep slopes. Based on the information reviewed and cited in the Resource Characterization section above, it is likely that some unpermitted clearing of sloping lands for agricultural activities has occurred. This review identified that approximately 1,032 acres of agricultural lands in North County (based on Assessor's land use codes) are located on slopes greater than 25 percent. Aerial photo interpretation conducted by Van Dyke and Holl, 2003, in a portion of North County, along with GIS queries of land use codes, have identified nine areas, totaling 2.7 acres, where maritime chaparral has been cleared on agricultural lands with slopes greater than 25%.[35] Recommendations WQ-8.1 and WQ-8.3 would strengthen implementation of erosion control provisions to protect water quality in conformance with Coastal Act policies.

Implementation of Provisions to Address Existing Causes of Non-Point Source Pollution

The County is limited in its ability to control polluted runoff from existing development or existing agricultural operations because coastal permits are triggered only by new development. The *North County Land Use Plan* partially addresses this by requiring preparation of watershed restoration plans that require applicants for new development to actually achieve a reduction in bare ground exposure in certain subwatersheds so that overall runoff in the watershed would decrease. Since these were not prepared by the time of *Coastal Implementation Plan* certification, the requirement was modified in the *County Code* so that applicants only had to demonstrate no increase in land disturbance or bare ground exposure and to agree to pay a fee at the time a watershed restoration program was implemented. These *Code* requirements were found to be necessary to conform with Coastal Act policies to protect water quality. However, no watershed restoration plans have been completed since certification. Because none of these plans have been implemented, the effectiveness of the concept to attain targeted vegetative coverage as a way of reducing non-source pollution in the entire watershed complex remains untested. And, in light of new scientific information and runoff control methodologies, measures to address runoff from existing development need to be reexamined and updated.

Lacking these specific watershed restoration plans, LCP implementation to reduce existing non-point source pollution has relied largely upon regulations and actions not tied to coastal permits. While the provisions of the Erosion Control Ordinance to address existing erosion are comprehensive, it appears enforcement of the requirements has not always occurred and the County is lacking a sustained, coordinated effort to systematically and comprehensively reduce impacts of

[35] Van Dyke, Erik and Karen Holl, *Mapping the Distribution of Maritime Chaparral Species in the Monterey Bay Area,* report prepared for the US Fish and Wildlife Service, April 26, 2003.

polluted runoff.[36] Recommendation WQ-8.3 suggests an action to increase enforcement in order to ensure protection of water resources.

Other agencies and non-profits have been limited in their ability to implement polluted runoff controls. Voluntary programs, such as the Elkhorn Slough Permit Coordination Project and the Central Monterey Bay Wetlands Project that can address already cleared lands, are promising and are showing encouraging results. However, the amount of sediment reduction achieved by these programs does not as yet represent a significant portion of the total erosion and sedimentation occurring in the North County planning area. The roughly 16,330 tons of sediment contained through the Permit Coordination program in 2002 is only 9% of the total 180,000 tons per year estimated to erode in the watershed.[37] Also, many projects undertaken by these programs involved hydrologic manipulations, either in stream channels or in drainage ways. While some corrective work is obviously necessary in these sensitive areas, the more resource-friendly approach is to prevent the source of the problems, so that excessive runoff or sedimentation does not occur in the first place. Evaluation to date of these voluntary programs has been limited to determining the success of the measures that were voluntarily proposed, and not to the broader question of whether these particular proposals were the most appropriate measures to employ. Recommendations WQ-8.4 through WQ-8.8 suggest measures to strengthen and expand polluted runoff control programs in order to more fully carry out Coastal Act requirements.

Conclusion

In conclusion the regulatory policies that are being implemented to protect water quality in the North County planning area are insufficient to achieve resource protection, and the policies and programs that have more potential for solving erosion problems in North County have not been implemented. The LCP's attempt to link some planning, management, and restoration to the permit process was progressively astute, but unfortunately has not fully succeeded. In the meantime, vast arrays of other programs are occurring, most dependent on voluntary cooperation, which have great promise. But, with the magnitude of the existing erosion problem, increasing land conversion for agriculture, and increasing residential development including the unknown potential for additional exposure of bare ground post-permitting, the current combination of regulatory controls and voluntary measures does not approach what is needed to achieve consistency with Coastal Act water quality objectives. Effective control of nonpoint source pollution will require a number of different actions to fully implement the LCP in conformance with Coastal Act policies First, the County needs to update the LCP provisions based on current EPA guidance for non-point source pollution (see Recommendations for Issues WQ-1 Dredging and Spoils, WQ-3 Erosion and Non-point Source Pollution Control, and WQ-4 Agriculture and Confined Animal Facility BMPs). As noted, the County has yet to complete a process of changing its grading and erosion control regulations that

[36] See: California Coastal Commission, *Final Report: A Pilot Methodology for Assessing Cumulative Impacts of Activities that Generate Polluted Runoff in the Elkhorn Slough Watershed, Monterey County*, October 1996, Chapter 1, for a discussion of various County departments involved in non-point source pollution control efforts.

[37] U.S. Department of Agriculture Natural Resources Conservation Service: *The Elkhorn Slough Watershed Project. 2000 – 2001 Report,* 2002.

began several years ago. To support these regulations the County needs to implement updated policies and expand and strengthen monitoring and enforcement of required management measures to ensure that water quality and marine resources are being protected consistent with Coastal Act requirements. At the same time, the various efforts underway to address existing non-point source pollution should be integrated and coordinated, with a plan to prioritize efforts to ensure that the most serious and pervasive problems are addressed in a timely manner. Recommendation WQ-8-2 addresses the parameters of such a plan, which is already called for in the LCP (see also Recommendations for Issue WQ-6: Watershed Planning). The upcoming infusion of almost $5 million into Monterey County non-point source pollution programs from the aforementioned PG&E settlement has the potential to greatly further this objective. Finally, necessary policy and program improvements to preserve more native central maritime chaparral habitat and prevent groundwater depletion as discussed under Issues LU-8 Protection of North County Water Supply and Agriculture and SH-28 Protecting Central Maritime Chaparral Habitat will also help control non-point source pollution.

b. Issue WQ-9: Carmel Bay Area of Special Biological Significance and Ecological Reserve

(1) Overview

This subchapter addresses the following concern identified through issue scoping: **Ensure that the Carmel Bay Area of Special Biological Significance (ASBS) and Ecological Reserve are protected from adverse non-point and point source pollution.**

Carmel Bay is an environmentally sensitive habitat where the focus has been to maintain its biological productivity and water quality. The Carmel Bay ASBS and Ecological Reserve are threatened by both non-point and point source pollutants. Reponses to date have been limited to placing effluent limitations on wastewater discharges into the Bay. Permit review of coastal development permits since certification has revealed that new, larger developments have continued to be approved in the Pescadero Watershed, some of which exceed LCP-defined limits. Whether this means that the LCP has not been implemented in a manner totally consistent with Coastal Act objectives to protect marine water quality is not clear as data is lacking as to whether Carmel Bay's water quality is suffering. However, given improved knowledge of water quality protection techniques, recommendations are made to update and strengthen existing measures and to further study and comprehensively plan for maintaining and, if necessary, improving water quality in the Carmel Bay.

(2) Resource Background

Carmel Bay ASBS and Ecological Reserve Characterization

The Carmel Bay is an environmentally sensitive habitat where the focus has been to maintain its biological productivity and water quality. Carmel Bay is protected under two special designations. The California State Water Resources Control Board designated the Carmel Bay as an "Area of

Biological Significance" (ASBS) in June 1975, and in October 1976 the California Fish and Game Commission authorized the establishment of the Carmel Bay Ecological Reserve.

According to the *California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report*:[38]

> *The ASBS are intended to afford special protection to marine life through prohibition of waste discharges within these areas… certain biological communities, because of their value or fragility, deserve very special protection that consists of preservation and maintenance of natural water quality conditions to practicable extents.*

The Carmel Bay ASBS is described in this report as follows:

> *The ASBS is south of the Monterey Peninsula, just north of the Santa Lucia mountain range, and west of the Carmel Valley. The ASBS includes 6.2 miles (9.98 km) of coastline, extending from Pescadero Point, the northern boundary of the ASBS,…The seaward boundary of the ASBS is formed in a straight line drawn between Pescadero and Granite Points; the landward boundary is the mean tide line. The total surface water of the ASBS is 959 acres (38 ha).*
>
> *The ASBS coastline is characterized by alternating rocky points and extensive granitic sand beaches. A high rocky cliff extends northward from Pescadero Point, forming partial protection for Stillwater Cove and Pebble Beach. Arrowhead Point, just south of Stillwater Cove, is oriented in a southwesterly direction and partially protects both the cove and Carmel City Beach to the south from wave action. Carmel City Beach extends south to Carmel Point (also known as Mission Point), which marks the midpoint of the Bay's coastline.*

Investigations in 1979 in support of the ASBS designation noted the significance of the resources of Carmel Bay for scientific study, including various species of special interest such as the rare purple hydrocoral (*Allopora californi)* several deep-water marine invertebrates, previously unstudied sponges, and the California (southern) sea otter (*Enhydra lutris*).[39] And, according to State Parks[40]:

> *The presence of the Carmel Submarine Canyon causes seasonal upwellings of nutrient-rich deep seawater. This phenomenon makes Carmel Bay an extremely rich, diversified, and highly productive marine ecosystem of statewide, if not national, significance…*

[38] State Water Resources Control Board, *California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report,* April 1979.

[39] State Water Resources Control Board, *California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report,* April 1979, p. ii-2.

[40] California Park and Recreation Commission, *Point Lobos State Reserve and Carmel River State Beach General Plan*, October 1979, pp. 29-30.

> *Carmel Bay is noted for its water clarity. Before the Carmel Bay area was extensively developed, 60-meter (200 foot) visibility was relatively common.*

In 1979, the following restrictions applied in the implementation of ASBSs in general:

> *1) Discharge of elevated temperature wastes in a manner that would alter natural water quality conditions is prohibited.*
>
> *2) Discharge of discrete point source sewage or industrial process wastes in a manner that would alter natural water quality conditions is prohibited.*
>
> *3) Discharge of wastes from nonpoint sources, including but not limited to storm water runoff, silt and urban runoff, will be controlled to the extent practicable. In control programs for wastes from non-point sources, Regional Boards will give high priority to areas tributary to ASBS.*

Special water quality requirements determined in the *California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report* included:

> *The hydrocorals Allopora california and Allopora porphyra are able to grow in the ASBS due to the combination of clear water, high relief rock and lack of sediment. These species would be adversely affected by increased sedimentation…*

Water Quality Standards in the ASBS are based on the *California Ocean Plan,* which includes probable effluent limitations for ocean discharge.[41] Effluent limitations have been established for contaminants including; Biological Oxygen Demand (BOD), suspended solids, oils and grease, pH, and carcinogenic and non-carcinogenic contaminants including PAHs, PCBs, pesticides and solvents (Ocean Plan 2001). Toxic metal concentrations (in mg/l) not to be exceeded in marine habitats are as follows: Cadmium: 0.0002; Chromium: 0.05; Copper: 0.01; Lead: 0.01: Mercury: 0.0001: Nickel: 0.002 and Zinc: 0.02.[42]

The Carmel Bay Ecological Reserve is almost coterminous with the Carmel Bay ASBS (see Map WQ-9 for location). It includes all state-owned tide and submerged lands in Carmel Bay bounded on the west by a line between Pescadero Point and the northeast corner of Point Lobos Ecological Reserve. Also included are offshore rocks, The Pinnacles, located approximately 0.6 miles south of Sunset Point. The reserve is approximately 1,642 acres in size. Depth range is 0 to77 fathoms, or 0 to141 meters.

The ecological reserve was established to preserve the great biological diversity of the marine ecosystem and to provide future generations with an opportunity to observe and study and flora and fauna of the Carmel Submarine Canyon. In addition to general regulations, specific regulations were

[41] State Water Resources Control Board, 2001 *California Ocean Plan – Water Quality Control Plan Ocean Waters of California*. Approved by the US EPA December 3, 2001. See: http://www.swrcb.ca.gov/plnspols/oplans/op2001.pdf..

[42] State Water Resources Control Board, *Central Coast Region-Water Quality Control Plan,* 1994.

enacted pertaining to harvesting of invertebrates and kelp removal. No commercial fishing is permitted. Recreational fishing is allowed for all species except mollusks and crustaceans. According to the California Department of Fish and Game[43]:

> *This area covers a wide range of habitats, including rock reefs, sand bottom, and the head of the Carmel submarine canyon. It is a popular area for the observation of marine life, and the site of long-term monitoring sites and many scientific studies. The canyon head serves as a reserve for spot prawns, a species harvested commercially. The Monterey Peninsula is a northerly outpost for some southern California fishes, and Carmel Bay is oceanographically complex due to its proximity to both Monterey Bay and the Pt. Sur upwelling center.*

Characterization of Watersheds Feeding into Carmel Bay ASBS and Ecological Reserve

The Carmel Bay ASBS receives surface water runoff from three main watersheds along the Carmel coast: the Pescadero Creek watershed to the north, the Carmel River watershed in the central bay, and San Jose Creek watershed to the south.[44]

The Pescadero Creek watershed is located in the northern portion of the Carmel coastline. Its boundary is shown on Map WQ-9. The watershed occupies approximately 582 acres, of which 448 acres lie within the Del Monte Forest planning area, and 134 acres are within the City of Carmel-by-the Sea and the unincorporated Carmel planning area. Land uses within the Pescadero watershed include the Huckleberry Hill Nature Preserve, residential housing, and two golf courses. Within the County's jurisdiction, approximately 342 acres of the watershed are currently undeveloped, mostly in Pescadero Canyon. Within Del Monte Forest, the Pescadero Canyon (which includes planning areas P/Q/R) is characterized by dense coverage of native Monterey pine stands of varying ages, slopes of varying degrees from moderate to steeply sloping, several major ravines and many smaller ones.[45] An unnamed tributary also traverses a portion of the north side of the canyon and flows southwest into Pescadero Creek. The soils in the Pescadero Creek watershed are clay loam, characterized with a high erosion potential and low percolation rates. The southern portion of Pescadero watershed extends into the City of Carmel-by-the-Sea. It is urbanized except for two small segments of sensitive habitat.[46]

By far the largest watershed emptying into Carmel Bay is the Carmel River watershed at over 150,000 acres. The boundary of the lower River watershed is shown on Map WQ-9; the upper

[43] Department of Fish and Game Web Site: http://www.dfg.ca.gov/mrd/mlpa/concepts_sc.html#d9.

[44] Some agencies aggregate data from the Pescadero Creek and/or San Jose Creek watersheds into their descriptions of the Carmel River watershed.

[45] Most of the forest understory is composed of species of the Central Maritime Chaparral community, which is considered environmentally sensitive habitat by the *Del Monte Forest LUP*. A notable exception occurs on the south slopes near Del Ciervo Road, where oaks are found and the forest canopy coverage is only approximately 30 percent. Additional environmentally sensitive habitat and sensitive plant species that occur in this area include riparian habitats, seasonal wetlands, Yadon's piperia, Hooker's manzanita, Hickman's onion, and Sandmat manzanita.

[46] Jones & Stokes Associates, *Final Results of the Environmentally Sensitive Habitat Area Study Conducted for the City of Carmel-by-the-Sea*, July 1995.

watershed extends several more miles inland encompassing the Carmel Valley. Land uses within the Carmel River Watershed are predominately forest (107 square miles), rangeland (92 square miles) and agriculture (45 square miles). Eight square miles of the watershed are urban.[47] There are four golf courses in Carmel Valley. The Carmel area wastewater treatment facility is located along the River about one-half mile from Carmel Bay.

The southernmost watershed emptying into Carmel Bay is the San Jose Creek watershed. The boundary of this watershed is partially shown on Map WQ-9. The complete watershed of 8,831 acres extends further inland than the map shows, however, it is mostly within the coastal zone in unincorporated Monterey County. This watershed is mostly undeveloped with grazing uses and some rural homes.

Threats to Carmel Bay Resources

The Carmel Bay ASBS and Ecological Reserve are threatened by both non-point and point source pollutants. The Carmel Bay receives water and associated pollutants from the aforementioned Carmel River, Pescadero Creek, and San Jose Creek. Because of the size of the 225 square miles of watersheds drained, nonpoint source pollution was identified as a concern as early as 1979 and information pertaining to past and current water quality conditions and land use in the Carmel River Watershed is more readily available than such information related to the Pescadero Creek Watershed. In 1979, assessments by State Parks noted that, "with increasing sedimentation and the addition of a sewer outfall into the bay, water clarity has dropped and good visibility is now 60 feet, with exceptional visibility being 100 feet [compared to 200 feet previously].[48] More recently, in 1994 the Sanctuary prepared an assessment of water quality, ranking the Bay "Intermediate." The protection of the ASBS, urban runoff, and toxic pollutants were the three problems identified in the assessment.[49]

Non-point source pollution from present land use activities pose a potential threat to water quality. According to the 1979 *California Marine Waters* report:

> *The Carmel River Basin alone is at least 225 square miles in area. San Jose Creek has a large watershed which extends several miles eastward. Pescadero Canyon and other unnamed ravines also contribute a considerable amount of runoff to the ASBS on an intermittent, seasonal basis. Depending on adjacent land uses, non-point source discharges to the ASBS could therefore constitute a considerable water quality threat because of the large land they drain.*

[47] U.S. Department of Commerce, National Oceanic and Atmospheric Division, *Monterey Bay National Marine Sanctuary Water Quality Protection Program Workbook - Regional Characteristics,* January 1994.

[48] California Parks and Recreation Commission, *Point Lobos State Reserve and Carmel River State Beach General Plan*, October 1979, p. 30.

[49] U.S. Department of Commerce, National Oceanic and Atmospheric Division, *Monterey Bay National Marine Sanctuary Water Quality Protection Program Workbook - Regional Characteristics,* January 1994, p.96.

There is a potential cumulative impact to the Carmel Bay ASBS resulting from the aforementioned golf course, residential, commercial, and agricultural land uses. Further development of residential and commercial properties may have an increase in the transport of toxins and metals in runoff. Golf courses typically result in high use of pesticides, fertilizers and herbicides. As a result, high levels of nitrogen and pesticides can be released into runoff that can ultimately enter the Bay.

There are over 350 discharges into the Carmel Bay ASBS.[50] Over 50 are relatively large storm drains that appear to be maintained. Over 270 are drains serving smaller service areas such as individual properties or sections of golf courses. About 30 are sheet flow runoff (e.g., down stairs, ramps, piers, etc.) that have no distinct pipe or conduit.

Additionally, the Carmel Sanitary District Sewage Treatment Plant's outfall, servicing the Carmel Area Wastewater District and the Pebble Beach Community Services District, is the one major point source discharge into Carmel Bay ASBS. In the 1979 *California Marine Waters* report, impacts from the effluent were noted to create an impact area that was "barren except for a scum-like material…[attributed to] the inability of organisms to recruit [there]."[51] In the early 1980's there were frequent violations of effluent limitations. Improvements to the Carmel area wastewater treatment facility in the early 1990's have since reduced violations. Compliance with waste discharge requirements, with the exception of occasional violations, has occurred since 1994.[52]

In addition to pollution coming from land into the Bay, other impacts to the Carmel Bay ASBS may include direct human contact with organisms by scuba divers and beach goers. Water vessels are not directly regulated under the ASBS designation, but they may be responsible for direct deposition of metals, (i.e., copper, zinc), to the ASBS waters.[53]. While there are no specific data indicating levels of impact, use is anticipated to vary seasonally. Also, the sewer outfall may be hazardous to the health of recreational divers.[54]

Responses to Enhance Carmel Bay Resources

There have been some measures taken by agencies, including the State Water Resources Control Board (SWRCB), the Regional Water Quality Control Board (RWQCB), the Monterey Bay National Marine Sanctuary (MBNMS), California Department of Fish and Game (CDFG), the City of

[50] Personal communication, Dominic Gregorio, State Water Resources Control Board, June 5, 2003; SWQCB, *Final Report Discharges into State Water Quality Protection Areas*, July 2003.

[51] State Water Resources Control Board, *California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report,* April 1979.

[52] California Regional Water Quality Control Board -Central Coast Region. "Staff Report for Meeting of March 22, 2002 re: Reissuance of Waste Discharge Requirements for Carmel Area Wastewater District and Local Sewering Entity of Pebble Beach Community Services District, Monterey County, Order No. R3-2002-026, NPDES Permit No. CA0047996."

[53] State Water Resources Control Board, *California Marine Waters Areas of Special Biological Significance Reconnaissance Survey Report,* April 1979.

[54] California Park and Recreation Commission, *Point Lobos State Reserve and Carmel River State Beach General Plan*, October 1979, p. 50.

Carmel-by-the Sea, and the Coastal Commission to manage and improve Carmel Bay's water quality.

When the SWRCB designated the Carmel Bay ASBS, it gave the Carmel Area Wastewater District three years to phase out its point source discharge into the Bay.[55] However, the State Board later modified this prohibition, first to allow a continued winter discharge and subsequently to allow a discharge of up to 3 mgd into the Bay with no seasonal prohibitions. This authorization was in conjunction with treatment plant improvements that allow for much of the wastewater to be recycled for irrigation. Carmel Area Wastewater District must meet waste discharge requirements and monitor the effluent discharge weekly.[56] Currently, the District is preparing a required comprehensive study of the effect its discharge has on Carmel Bay.[57]

The SWRCB is currently sponsoring a survey to inventory discharges into all ASBSs, with a final report due soon.

In 1992, Carmel Bay became part of the Monterey Bay National Marine Sanctuary. The MBNMS regulates such activities as discharges, alteration or construction on the seabed; marine mammals; over flights, and personal watercraft[58]. The Sanctuary has also prepared four Action Plans under its Water Quality Protection Program. Several of the Program's strategies should help to protect the water quality of Carmel Bay, especially those addressing urban runoff.[59] The MBNMS also has been active in initiatives to coordinate and improve water quality monitoring. Water quality in the MBNMS is monitored through two programs, the CDFG Mussel Watch program and the SWRCB Toxic Substance Monitoring program, but neither has sampled Carmel Bay recently.[60]

The Department of Parks and Recreation's 1979 *Point Lobos State Reserve and Carmel River State Beach General Plan* recommends a greatly expanded ecological reserve so that the entire bay ecosystem could be comprehensively managed and used for scientific observation.[61] This recommendation has not yet been implemented. Under the Marine Life Protection Act, the Department of Fish and Game is charged with developing a series of marine protected areas. The Department proposes retaining the Carmel Bay Ecological Reserve as presently constituted, and is

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[55] Sedway/Cooke Urban and Environmental Planners, *Carmel Sanitary District Areawide Facilities Plan;* 1979. The SWRCB 1990 *California Ocean Plan* does not allow wastewater discharges into ASBSs.

[56] Central Coast Regional Water Quality Control Board, *NPDES Permit NO. CA0047996 for Carmel Area Wastewater District*, 2000.

[57] CRWQCB-Central Coast Region. *Staff Report for Meeting of March 22, 2002 re: Re-issuance of Waste Discharge Requirements for Carmel Area Wastewater District and Local Sewering Entity of Pebble Beach Community Services District, Monterey County, Order No. R3-2002-026, NPDES Permit No. CA0047996.*

[58] U.S. Department of Commerce, National Oceanic and Atmospheric Division, *Monterey Bay National Marine Sanctuary Final Environmental Impact Statement/Management Plan,* June 1992.

[59] Monterey Bay National Marine Sanctuary, *Action Plan I: Implementing Solutions to Urban Runoff*, 1996.

[60] More water quality monitoring occurs near the mouth of Carmel River by the Sanctuary's Citizen Monitoring Program, the Regional Water Quality Control Board and the Monterey Peninsula Water Management Agency. This data is useful in determining inputs into Carmel Bay.

[61] California Department of Parks and Recreation *Point Lobos State Reserve* and *Carmel River State Beach General Plan*, October 1979, p. 90.

considering an expansion to include a protected area around Point Lobos, to encompass the southern part of Carmel Bay.[62]

The City of Carmel-by-the-Sea has recently completed its local coastal program land use plan. The City's Land Use Plan contains updated policies to use state of the art best management practices in order to protect the water quality and biological productivity of Carmel Bay. Among the policies are requirements addressing new construction and site design and implementation of a City-wide Stormwater Management Plan.[63]

The U.S. EPA sponsors a Pesticide Environmental Stewardship Program, a voluntary public/private partnership to reduce pesticide risk.[64] Pebble Beach Company, as a partner, has agreed to employ various Golf Course and Open Space Management strategies, some of which can reduce non-point source pollution into Carmel Bay. These include using less herbicides and algaecides, using containment areas for pesticide storage, and employing other integrated pest management techniques.[65] Monitoring is also a program component. The Company monitors storm water runoff and water quality at ten coastal points. For 2002, testing "…resulted in no contaminants being found above acceptable levels."[66]

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[62] California Department of Fish and Game Marine Life Protected Areas website: http://www.dfg.ca.gov/mrd/mlpa/schedule.html. The Marine Life Protection Act Master Plan process is ongoing and the plan is expected to be put out for public review in April 2005, with adoption of the final Master Plan expected to occur in December 2005. Dates may be subject to change due to potential budget constraints.

[63] Examples of such provisions from City of Carmel-by-the-Sea, *General Plan and Coastal Land Use Plan*, May 2003, include:

G5-7: Conserve water and minimize storm runoff.

O5-22: Maximize retention of surface water on each site through site design and use of best management practices.

P5-9: Evaluate the storm-water outfall system for purposes of reducing impacts to the beach environment. Consider options to modify and/or remove outfalls from the beach and replace or retrofit storm drains with filters or treatment devices to reduce impacts on the shoreline environment.

P5-110: New construction plans should include design features to enhance surface water percolation. Where practical, runoff from the roof, driveway and other impervious surfaces shall be collected and directed into pervious areas on the site (landscaped areas) for infiltration in a non-erosive manner, prior to being conveyed off-site.

P5-186: Develop, Implement, Monitor and Modify (as necessary) a Citywide Storm Water Management Plan (SWMP) outlining specific tasks, BMP's, and responsibilities necessary to implement the City's National Pollution Discharge and Elimination System permit and to protect water quality…

P5-195: Provide development guidelines and permit conditions which that: limit impervious surfaces and the connection of multiple impervious surfaces; implement simple infiltration techniques throughout drainage areas to efficiently manage storm water; infiltrate runoff into the soil, retain runoff for slower release and convey runoff slowly through vegetation.

P5-199: Consistent with section 30231 of the Coastal Act, development shall not result in the degradation of coastal waters caused by the introduction of pollutants, or by changes to the landscape that adversely impact the quality, quantity and flow dynamics of coastal waters. Runoff shall not be discharged in a manner that adversely impacts the biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and protect human health.

[64] http://www.epa.gov/oppbppd1/PESP/.

[65] http://www.epa.gov/oppbppd1/PESP/strategies/2000/pbc00.htm.

[66] http://www.epa.gov/oppbppd1/PESP/strategies/2003/pbc03.htm.

California state agencies, including the Coastal Commission, have established the Critical Coastal Areas Program pursuant to the state's Non-point Source Pollution Plan.[67] The Carmel Bay ASBS and its watersheds within the coastal zone comprise a Critical Coastal Area. Critical Coastal Areas are a planning designation that does not impose requirements on local governments. They are based on existing designations of water quality problem areas, such as 303d impaired water bodies.[68] They are a means to focus State resources on identifying and correcting problems by building programs to help implement the State's non-point source pollution control management measures. Critical Coastal Areas focus at a watershed level. If grants are available, they can be used to target Critical Coastal Areas. The resulting products of Critical Coastal Area efforts are Action Plans identifying what the major problems are in the watershed and the best management measures necessary to address specific problems.

(3) Local Coastal Program Provisions

The Carmel Bay ASBS is located adjacent to portions of the Del Monte Forest and Carmel Area segments of unincorporated Monterey County. The *Del Monte Forest Land Use Plan's* approach to non-point source pollution prevention is generally a coverage limitation approach, supplemented by policies to reduce runoff and maintain vegetation. The *Carmel Area Land Use Plan's* approach relies on policies to reduce runoff and maintain vegetation, supplemented by a directive to consider coverage limitations.

Currently, 64 vacant lots exist in the Pescadero Creek watershed. Under the *Del Monte Forest LUP* and corresponding zoning up to 107 more residential lots could potentially be created through subdivision in the Pescadero watershed.[69] The *Del Monte Forest LUP* policy 1 states:

> *New development in the Pescadero watershed, and the smaller unnamed watersheds of the Pebble Beach planning area which drain into the Carmel Bay Area of Special Biological Significance (ASBS), as well as the watersheds of Seal Rock Creek and Sawmill Gulch, shall be sited and designed to minimize runoff, site disturbance, erosion, and sedimentation. All new development shall be designed to conform to site topography. New residential driveways and other road surfaces shall be kept to the minimum length and width to provide simple, direct access. Other paved areas shall be limited to the minimum required to meet daily (not occasional) parking needs. This policy shall not be read to preclude safe bicycle lanes nor adequate parking for commercial visitor-serving development and access points.*

This is implemented and elaborated on by *County Code* Section 20.147.30.A.1 that sets coverage limitations of 5,000 square feet for structures (total of main and accessory structures on a lot) and an additional 4,000 square feet for other impervious surface coverage. With regard to development proposals on properties where coverage already exceeds the 5,000/4,000 square feet limit, *County*

[67] State of California, *Plan for California's Nonpoint Source Pollution Control Program*, January 2000. The critical coastal areas website is: http://www.coastal.ca.gov/nps.

[68] Clean Water Act 303(d) list.

[69] Based on one unit per acre over 107 undeveloped acres. The remaining 235 acres are designated Open Space Forest.

Code Section 20.68.040.A states that the enlargement, extension, reconstruction or structural alteration of a nonconforming structure nonconforming only as to height and yard regulations, may be permitted if the enlargement, extension, reconstruction or structural alteration conforms to all the regulations of the district in which they are located. Hence, since this Section would not allow expansions where the non-conformance is to coverage, Section 20.78.040 governing the granting of variances applies. Variances can only be granted if all the following criteria are met:

> *A. That because of special circumstances applicable to subject property, including size, shape, topography, location or surroundings, the strict application of this Title is found to deprive subject property of privileges enjoyed by other properties in the vicinity and under identical zone classification; and*
>
> *B. That the variance not constitute a grant of special privileges inconsistent with the limitations upon other properties in the vicinity and zone in which such property is situated.*
>
> *C. A Variance shall not be granted for a use or activity which is not otherwise expressly authorized by the zone regulation governing the parcel of property.*

Other relevant *Del Monte Forest LUP* policies include:

> *34. In considering potential development projects, project designs shall be required to minimize to the extent feasible the removal of vegetative cover or damage to soil resources. Land use concepts which minimize removal will be preferred. Retained trees which are located close to construction sites shall be protected from inadvertent damage by construction equipment through wrapping of trunks with protective materials, bridging or tunneling under major roots where exposed in foundation or utility trenches, and other measures appropriate and necessary to protect the well-being of the retained trees.*
>
> *2. Non-point sources of pollution to the Carmel Bay ASBS, rocky intertidal areas, and wetlands shall be minimized through careful attention to drainage and runoff control systems. The criteria of the AMBAG 208 Water Quality Management Plan shall apply in watersheds affecting these resources.*

The AMBAG criteria are also cited in the *Carmel Area Land Use Plan (Appendix B)*, the most relevant being:

> *6. In sensitive water quality impacting areas, institute provisions in local zoning ordinances which control site coverage and limitations of impervious surface.*

The Carmel Bay ASBS is also defined as an environmentally sensitive habitat area and is thus subject to the *Del Monte Forest LUP* sensitive habitat policies. The LUP's guiding policy statement is:

> *The environmentally sensitive habitat areas of the Del Monte Forest Area are unique, limited, and fragile resources, which are important to the enrichment of residents and*

visitors alike. Accordingly, they shall be protected, maintained, and, where possible, enhanced and restored in accordance with the policies of this LUP and the associated policies and maintenance standards of the OSAC [Open Space Management] Plan. All categories of land uses, both public and private, shall be subordinate to the protection of these areas.

Similar protective policies are found in the *Carmel Area Land Use Plan.* The following pertain directly to the protection of Carmel Bay water quality:

2.3.4.Wetland.6: The County shall support the continued designation of Carmel Bay as an Area of Special Biological Significance.

2.4.B.2. Urban stormwater runoff entering Carmel River Lagoon and Carmel Bay should be monitored where possible and managed accordingly to reduce potential contamination from pollutants found in urban runoff.

2.4.3.2 Point and non-point sources of pollution of Point Lobos and Carmel Bay ASBS's, coastal streams and the Carmel River Lagoon and Marsh shall be controlled and minimized.

3.3.2 Key Policy: The County should support wastewater disposal systems and the establishment of water quality management and monitoring programs intended to protect and maintain a high level of water quality in the ASBS and in the Carmel area's coastal streams.

2.3.5.Monitoring.5: The Department of Fish and Game should work with the U.S. Fish and Wildlife Service and the Point [Reyes] Bird Observatory to assess and report on the status of pelagic bird and marine mammal populations off the Carmel coast in relation to West Coast populations. Special attention should be given to threats to food sources and habitat integrity, particularly to potential expansion of the squid fishery which could reduce the available food supply for marine birds and mammals.

Implementation of the key policy is to be accomplished by retaining sediment on site, revegetation, grading controls, and onsite retention of storm water. (Section 3.3.2.C.Erosion and Sedimentation Control policies).

Carmel Bay is defined as environmentally sensitive habitat in the *Carmel Area Land Use Plan* as well. The series of applicable policies for environmentally sensitive habitat areas (ESHA) include:

2.3.3.2: Land uses adjacent to locations of environmentally sensitive habitats shall be compatible with the long-term maintenance of the resource. New land uses shall be considered compatible only where they incorporate all site planning and design features needed to prevent habitat impacts and where they do not establish a precedent for continued land development which, on a cumulative basis, could degrade the resource.

2.3.3.3: New development adjacent to environmentally sensitive habitat areas shall be allowed only at densities compatible with the protection and maintenance of the adjoining resources. New subdivisions shall be approved only where potential impacts to environmentally sensitive habitats from development of proposed parcels can be avoided.

(4) Local Coastal Program Implementation

This review focused on the Pescadero Canyon watershed within the Del Monte Forest planning area, and specifically the required site coverage limitations. Since certification of the LCP there have been about 265 permits issued for development in the mapped watershed: about 25 for new homes on vacant lots; about 30 for demotions and rebuilds, about 170 for additions; and the rest for other types of development.[70] There was one permit issued for a subdivision for the Macomber Estates, which is discussed in Issue SH-29: Protection of Monterey Pine Forest Habitat. A review of aerial photography of that site illustrates a loss of approximately 80% of the forest cover. Field review also revealed drainage and erosional issues affecting that site.

About 50 permits were granted with variances to exceed structural and impervious surface coverage limitations within the Pescadero Watershed. A sampling of permits requesting construction of additions on properties where impervious coverage was initially over the 9,000 square foot limit and permits for new single-family dwellings was reviewed. In a majority cases permit findings stated that literal implementation of the Pescadero Watershed coverage policy will, "deprive the property owner of the privileges enjoyed by other Del Monte Forest/Pescadero Watershed area property owners to remodel and modernize older residences,"[71] Similarly, to deny the granting of special privileges it was often stated that, "Numerous other properties in this watershed have been granted variances related to coverage limitations" or previously approved permits themselves were directly cited.[72]

In many instances, however, although the proposal called for an addition of structural coverage there was a net reduction in overall impervious coverage because pre-existing coverage was modified and/or removed. Lastly, to address the issue of potentially increased runoff, applicants were directed to, "install a new drainage system to retain all storm water on the property."[73] Also, while the County appears to have applied some requirements to limit impervious surface coverage, the LCP provisions for monitoring have not been implemented.

(5) Analysis of Coastal Act Conformance

Control of polluted runoff into Carmel Bay is required to protect water quality and resources in conformance with the Coastal Act. In reviewing LCP implementation it appears that data are lacking to determine whether implementation of current LCP policies and standards are protecting

[70] Information available on County permit final actions and in the County permit data base was not presented in a form that allowed aggregate or average coverage calculations.

[71] County coastal permit 980469 (3-MCO-99-016).

[72] County coastal permit 970540 (3-MCO-98-060).

[73] County coastal permit 000454 (3-MCO-01-182).

water quality consistent with the Coastal Act. Much of the runoff into Carmel Bay may be attributable to pre-existing development and even some to natural causes. New development authorized by County coastal permits may also be contributing, but again data are not available to determine the effect of new development. However, to be most protective of resources, existing LCP standards and programs need to be updated to reflect new requirements for controlling non-point source pollution that have been enacted since certification.

Implementation of Coverage Limitations

The County has approved a large number of permits and variances for development in Pescadero Canyon. A purpose of the LCP policy limiting structural and pervious coverage is to protect the water quality of Carmel Bay. The County has implemented the coverage restrictions in a manner that they believe meets the intent of the LCP, recognizing that they are not always following the exact policy limiting structural coverage to 5,000 square feet. Allowing structural coverage in excess of 5,000 square feet up to 9,000 square feet may be partially explained by the fact that proposed projects that are additions or demolitions and rebuilds involve properties already over the LCP's limits. Thus, if someone is upgrading their property, the County's policy interpretation is that they should not have to greatly reduce coverage or they should be entitled to the same degree of coverage as their neighbors. However, other related factors are not always considered in the County actions. First, if pervious surfaces are replaced with only semi-pervious surfaces, or if vegetation and/or ground disturbance occurs beyond the coverage limitation, then the intent of the policy is not being achieved. (See Issue WQ-8 above for a discussion of bare ground coverage and disturbance.) There is stark evidence of the impacts of vegetation disturbance in the Macomber subdivision (discussed in Issue SH-29: Protection of Monterey Pine Forest Habitat) where the overall forest canopy loss is much greater than what the coverage limitation alone would yield.[74]

There is insufficient data to measure the direct effect of the coverage limitation standard on the water quality of Carmel Bay. Models involving existing and projected coverage, estimated pollutant loads, and hydrology could be utilized to more specifically change the coverage limitation standard of this policy (see Recommendation WQ-9.6 to make use of such techniques). However, achieving the objective of maintaining a clean Bay must involve much more than residential coverage limitations in only part of one of its watersheds.

Conclusion

The County is implementing its Del Monte Forest coverage limitation in a manner that meets the intent of the policy. However, not enough data are available to suggest changes in the coverage limitation standard. In the absence of such data the County, as a precautionary measure, is assuring that new development will not result in any increase in runoff from sites. Recommendation WQ-9.1 would ensure the LCP policies are consistent in assuring that development will not increase runoff. In addition, a monitoring program, as called for in Recommendation WQ-9.2, should be initiated to

[74] Twenty lots were created on this 78.54-acre site, which would yield about 5% coverage under the LCP policies. This can be compared to the approximate 80% loss of tree canopy.

ensure that the required runoff controls are installed and remain functional. Even if further analysis shows that either the approach of runoff retention alone and/or other measures are effective enough to render coverage limitations unnecessary to protect Bay water quality, such coverage limitations have other benefits and should be maintained. For example, the entire Pescadero Canyon is Monterey pine forest habitat. A primary means of protecting habitat is to limit its disturbance, which can partly be achieved by limiting development coverage. Thus, the 5,000/4,000 square foot coverage limitation may be more essential to protect the Monterey Pine forest (see Issue SH-29). Also, coverage limits can serve to limit water intensification, a serious concern in Del Monte Forest (see Issue LU-9: Water Supply in the California-American Water Company Service Area). Finally, coverage limitations can be a component of design control (see recommendations for Issue SR-9: "Trophy" Homes).

Based upon knowledge about the Bay's watersheds and watersheds in general, some additional conclusions can be drawn. First, since there are golf courses close to the Bay and since golf course operators typically apply chemicals to maintain courses, measures to control such applications should benefit Bay water quality. RecommendationWQ-9.5 would encourage measures specific to the many golf courses that drain into the bay and in conformance with recent actions the Commission has taken to address water quality issues related to golf course development and management. Second, since there are so many documented outfalls into the Bay and since for the most part their outflows are likely to contain non-point source pollutants which are not treated, measures to consolidate outfalls and install controls should also benefit Bay water quality. Recommendation WQ-9.3 would encourage consolidation of point source discharges, Third, since pollutants tend to concentrate in closed lagoon systems and breaching the Carmel River will release them into the Bay, this activity needs to be more rigorously controlled, as further discussed under Issue CH-10. Fourth, since irrigation application of treated wastewater means a smaller direct wastewater discharge into the Bay, opportunities for further use of reclaimed water from the Carmel Area Wastewater District's plant should be pursued. Recommendation WQ-9.4 would encourage increased use of reclaimed water. Finally, there are many other general Best Management Practices that can be applied throughout the Bay's watersheds (see Recommendations for Issues WQ-2 Sewage Outfalls, WQ-3 Erosion and Non-point Source Pollution Control, WQ-4 Agriculture and Confined Animal Facility BMPs, WQ-5 Wastewater Treatment Best Management Practices, and WQ-7 Public Works Maintenance in Appendix A). All of these recommendations would update LCP provisions to ensure water quality protection in conformity with Coastal Act policies.

Additionally, Carmel Bay would benefit from comprehensive watershed planning that addresses the various land uses and the contributing factors to non-point source pollution (see recommendations for Issue WQ-6: Watershed Planning). A watershed plan can provide more detailed directions for application of the highest priority management measures in the most critical locations. Although the County's coastal jurisdiction only covers a small portion of the watersheds of Carmel Bay, the watersheds are almost entirely within the unincorporated County. The County is, therefore, the logical entity to undertake such planning. There are other existing and potential interested parties that could also have a role, such as the Regional Water Quality Control Board (RWQCB) and Coordinated Resource And Management Planning (CRMP) organizations. Recommendation WQ-

9.7 suggests the formation of a CRMP for both the Pescadero Canyon and San Jose Creek watersheds to complement the existing Carmel River watershed CRMP.

A component of this planning effort should include more monitoring of Carmel Bay as called for in the LCP. Although implementing water quality protection measures has received much attention in recent years and Monterey Bay National Marine Sanctuary now encompasses Carmel Bay, the special attributes of Carmel Bay that lead to its dual ASBS and Reserve designations may require revised priorities or application of special protective measures. Unfortunately, little information about the Bay's water quality has been collected recently that could be used in studying its relationship to non-point (and point) source pollution sources on land and the effect of particular control measures. While this does not mean that control measures are unimportant, it does suggest that there is much more to be done to get a better handle on protecting Carmel Bay's water quality.