CHAPTER 15
OTHER REQUIRED ANALYSES

15.1 INTRODUCTION

In addition to the analyses discussed in Chapters 3 through 14, both NEPA and CEQA require additional evaluation of the impacts of the proposed action. These evaluations include identifying and analyzing cumulative impacts, growth-inducing impacts (CEQA-only requirement), the relationship between short-term uses and long-term productivity (NEPA-only requirement), and any irreversible or irretrievable commitment of resources (NEPA requirement)/significant irreversible environmental changes (CEQA requirement). This chapter satisfies the NEPA and CEQA requirements for analyzing additional types of impacts.

Issues related to environmental justice are discussed in accordance with Federal Executive Order (Exec. Order) Number (No.) 12898, 3 Code of Federal Regulations (CFR) 859 (1995), reprinted in 42 USCA § 4321 note at 475-79 (West 1994), and issues related to protection of children from environmental health risks are presented in accordance with Exec. Order No. 13045, 3 CFR 198 (1998), reprinted in 42 USCA § 4321 note at 40-42 (West Supp. 1998).

15.2 CUMULATIVE PROJECTS AND IMPACTS

NEPA and CEQA both require that cumulative impacts of the proposed action be addressed (40 CFR 1508.25(a)(2); CEQA Guidelines §15130). In general, cumulative effects are the combination of individually minor effects of multiple actions over time (40 CFR §1508.7; CEQA Guidelines §15355). The Council on Environmental Quality (CEQ), a federal agency, has oversight of federal agencies implementing NEPA. CEQ has issued regulations on the implementation of NEPA, and these regulations specifically define cumulative effects as "the impact on the environment which results from the incremental impact of the action when added to past, present and reasonably foreseeable future actions regardless of what agency (Federal or non-federal) undertakes such other actions" (40 CFR §1508.7). CEQA requires that a lead agency describe those impacts that are "cumulatively considerable" and briefly describe its basis for concluding that a cumulative effect is not cumulative considerable (CEQA Guidelines §15355).

The CEQ has produced a guidance document titled, "Considering Cumulative Effects Under the National Environmental Policy Act" that has been used in preparing this section (CEQ 1997).

Information was gathered for the cumulative impact assessment in this document by researching literature and conducting interviews of local officials and experts. Projects that would possibly combine with the proposed actions to cause cumulative effects are identified, and those impacts are described. These cumulative impacts are evaluated, based on resource and socioeconomic trends.

Summary of Cumulative Impacts

Significant cumulative impacts resulting from the proposed action were identified in the following areas:

Soil Nail Wall

- Adverse significant cumulative impact on visual resources from ongoing coastal armoring and shoreline development;
- Beneficial cumulative effect on water quality by implementation of more effective coastal armoring to prevent erosion;
- Long-term beneficial cumulative effects on the provision of emergency services by the use of more effective coastal erosion projects to protect the right-of-way and prevent catastrophic failures; and
- Long-term beneficial cumulative effects on utilities by ensuring the security of the utility infrastructure.

Parkway Improvements

- Beneficial cumulative impact on land use from compliance with local plans to protect and enhance recreational opportunities;
- Beneficial cumulative effect on water quality from installation of a new filtration/storm drainage system; and
- Beneficial cumulative impact on recreational resources from parkway and beach access improvements; beneficial cumulative effects on parking, on the network of bicycle and pedestrian facilities in the region, and on coastal access.

15.2.1 Cumulative Impact Analysis Methodology

Aspects of the proposed action alternatives that are considered in the cumulative impact analysis include the proposed parkway, restroom, and beach stairways construction, beach debris removal, groin construction, and bluff protection of portions of East Cliff Drive. These measures are evaluated in this section for cumulative effects along with other actions including existing, proposed, or reasonably foreseeable projects that involve shore stabilization, near-shore erosion protective measures, coastal modifications that affect sand movement, and public beach access or beach viewing projects from either federal or nonfederal major actions.

In addition to a review of reports for completed projects and planning documents, a number of permitting agencies and institutions were contacted for possible future projects that were in the early stages of planning or discussion. Agencies or institutions contacted included the US Army Corps of Engineers, National Oceanic and Atmospheric Administration (NOAA), United States Fish and Wildlife Service (USFWS), Monterey Bay National Marine Sanctuary (MBNMS),

California Coastal Commission, County of Santa Cruz, City of Santa Cruz, City of Capitola, and the University of California, Santa Cruz. For the purposes of evaluating cumulative impacts, the existing and proposed actions are grouped into the following three categories—bluff protection and shoreline stabilization; beach access and bicycle or pedestrian paths; and road and parking improvements.

Bluff Protection Projects

Shoreline protection projects cover 108 miles of the California coast, which is about 10 percent of the coastline. The trends over the last 30 years have been a steady increase in coastline covered by seawalls, revetments, rip rap, bluff armoring, and bulkheads. Armoring projects covered the coastline in the following amounts—26.5 miles in 1971; 62 miles in 1977; 85 miles in 1985; and 108 miles in 2001 (Griggs 2003). Bluff protection has been an ongoing activity in the immediate area over the past two and a half decades due to growth and development along the Monterey Bay shore and the continual process of shoreline erosion. In 1995, the California Coastal Commission published a report on the cumulative effects of shoreline erosion prevention projects for Monterey Bay (California Coastal Commission 1995). That report estimated that approximately an eighth of the Monterey Bay coast was protected with some type of erosion control and that a third of the coast would eventually be protected if the current environment continued (California Coastal Commission 1995). Many of the projects were, and continue to be, emergency permit requests following severe storm damage, such as that which occurred at Larch Lane in 1995 and the emergency soil nail walls that were constructed in 2004 (Figure 2-9a). In addition to county projects, private properties within the project area have recently completed shoreline protection measures. The proposed bluff protection would connect to the existing bluffs that are armored.

The County of Santa Cruz General Plan includes various programs and regulations regarding slope stability and policies regarding "Coastal Bluffs and Beaches." These policies include Local Coastal Plan Policy Number 6.2.12, which establishes setback requirements, normally 25 feet, from the top of bluffs; this policy is intended to ensure building and slope stability. Chapter 16.10 of the County of Santa Cruz Geologic Hazards ordinance establishes a permitting program for all coastal structures, including shoreline protection structures. Section 3(ii) of the ordinance states that "seawalls, specifically, shall only be considered where there is a significant threat to an existing structure and both adjacent parcels are already similarly protected." While bluff armoring projects continue to be implemented to protect existing coastal structures, the General Plan, the Geologic Hazards ordinance, and the local coastal plan (also discussed in Chapter 3) regulate and often discourage locating structures in bluff areas. Through the permitting review process, these policies should act to limit future development in bluff areas and, therefore, eventually reduce the need for bluff armoring structures.

The types of shoreline protective systems used and proposed for other projects are varied and include both bluff stabilization, such as armoring, and extensive beach rip rap, such as that used off West Cliff Drive in a recently completed City of Santa Cruz project. In Santa Cruz County there are 27 pending applications for shoreline armoring projects. These projects are mainly small in scale (approximately 50 linear feet on average) and are sponsored by individual applicants. These projects are identified in Table 15-1.

Table 15-1
Past, Present, and Future Armoring Projects in Santa Cruz County

Project	Application Number	Status
Proposed Williams revetment just upcoast of Pleasure Point at Moran Lake	Withdrawn.	Temporary emergency and other rock have been placed. CCC awaiting application to determine if material will be allowed to stay permanently.
Proposed Chambers revetment (increase in size and seaward extent) just upcoast of Pleasure Point at 26th Avenue	3-00-164	Approved, but not yet constructed.
Proposed Lang revetment refurbishment just upcoast of Pleasure Point at Moran Lake	3-03-016	Approved and completed.
Proposed Filizetti revetment refurbishment just upcoast of Pleasure Point at Corcoran Lagoon	3-03-036	Approved and completed.
Recently approved County Parks revetment expansion at end of 26th Avenue	None available	Approved June 11, 2003 and completed.
Proposed Roy seawall at Sunny Cove	None available	Temporary seawall has been removed.
Proposed Artana/Kirsch gunnite slope seaward of Pleasure Point Drive	3-03-021	Has not been scheduled for a CCC hearing yet.
Proposed Shklar seawall and revetment at Blacks Point	None available	Temporary seawall was installed in 1997. Has not been scheduled for a CCC hearing yet to determine if structure will be allowed to stay.
Proposed Gibson revetment refurbishment just upcoast of Pleasure Point near 25th Avenue	3-83-200-A2	Approved and completed.
Proposed Swenson seawall adjacent to Opal Cliffs (just inside Capitola city limits)	None available	CCC awaiting application.
Proposed Zelda's revetment refurbishment, just downcoast in Capitola	3-03-020	Emergency rock has been placed. Not yet scheduled for a CCC hearing
Proposed Las Olas Drive revetment refurbishment. Multiple homeowners, approximately 1,500 shoreline feet	None available	Approved and completed.
Proposed Beach Drive revetment in Rio del Mar (increase in size). Multiple homeowners, approximately 750 shoreline feet	3-02-099	Has not been scheduled for a CCC hearing yet
Proposed Podesto seawall at Manresa State Beach	3-02-107	Approved and completed.
Proposed Pajaro Dunes revetment refurbishment and potential seaward expansion	Withdrawn.	CCC awaiting application.

Table 15-1
Past, Present, and Future Armoring Projects in Santa Cruz County

Project	Application Number	Status
Recently approved sheetpile wall at Pelican Point in Pajaro Dunes. Multiple homeowners, approximately 680 shoreline feet	Coastal development permit 3-02-091	Approved June 11, 2003 and completed.
Proposed Caltrans revetment at Scott Creek, approximately 350 shoreline feet	Withdrawn.	Temporary emergency rock placed. CCC awaiting application.
Proposed Caltrans Waddell Creek bridge revetment, approximately 300 shoreline feet	Withdrawn	Temporary emergency rock placed. CCC awaiting application.
Proposed State Parks/Caltrans Waddell Creek parking lot revetment, approximately 600 shoreline feet	3-04-070	Temporary emergency rock placed this past winter, awaiting CCC hearing on whether it is allowed to stay permanently.
Watkins seawall repair on Las Olas Drive	3-05-058	Has not been scheduled for a CCC hearing.
Sager seawall repair seaward of Pleasure Point Drive	3-83-155-A1	Has not been scheduled for a CCC hearing.
Porter seawall repair seaward of Pleasure Point Drive	3-93-039-A1	Approved but not yet completed.

Source: California Coastal Commission, Santa Cruz 2003; Carl 2005

There are 2 other private projects in the area that are considered to be on hold:

- **Depot Hill in Capitola.** Private property owners have formed an assessment district for achieving bluff protection. The City of Capitola rejected the EIR for the project, but the property owners may resubmit (Rodrigues 2005); and
- **Opal Cliffs Drive.** To the north of the proposed East Cliff Drive project area, Opal Cliffs Drive property owners are in discussions with geological engineers for designing bluff protection (Rebagliati 2001) and have also discussed the project with the California Coastal Commission (Rodrigues 2005). Based on discussions with the California Coastal Commission, the property owners feel there is little chance of the project being approved and have put the project on hold indefinitely.

Pedestrian, Bicycle, and Beach Access Improvement Projects

In connection with the large number of shoreline protection projects, coastal and beach access has increased dramatically. In 1995, for example, approximately 75 percent of the Monterey Bay coastline that was physically suitable for public access provided such access (California Coastal Commission 1995). The following are projects designed to improve access or pedestrian and bicycle paths:

- **The Twin Lakes Beach Project.** This project is now in the preliminary design phase. It is west of the project area, along East Cliff Drive, between 5th Avenue and

12th Avenue, and near the Santa Cruz Yacht Harbor. It is sponsored by the County Redevelopment Agency. Concept plans, once finalized, will include some type of protection of the roadway at the edge of the beach, a new pedestrian walkway, organized parking, and beach access. Construction is expected to start in 2010 or 2011, following approvals and receipt of funding.

- **Wider Bike and Pedestrian Path on West Cliff Drive.** The City of Santa Cruz has approved and is implementing plans for a wider bike and pedestrian path on West Cliff Drive. The first phase will run from Bay Street to Woodrow Avenue. The City Council approval the project on July 24, 2001.
- **Sanctuary Scenic Trail.** The MBNMS is exploring a sanctuary scenic trail concept, with the help of a multiagency task force and federal and state grants. The multiagency task force was charged with developing a planning process and an action plan to maximize the positive economic, interpretive, and educational benefits that the sanctuary would bring to Santa Cruz County and to the region (Pearlman 2001). An interpretive plan and alternative routes, including East Cliff Drive, were recently approved (Rodrigues 2005). One of the goals of the project is to develop a multiuse recreation and scenic trail along already established public access bike and pedestrian routes. This trail would provide a link between and access to existing parks, interpretive spaces, recreation areas, and coastal access areas (Pearlman 2001). An additional focus of the project would be to place interpretive and educational signs along the shores of the sanctuary.

Road and Parking Projects

Coastal road improvement projects have been completed and are planned at several locations in the vicinity of the project area. The improvements include drainage, landscaping, and road repair and are described as follows:

- **41st Avenue Drainage Improvements (Completed).** A new parking lot, restrooms, landscaping, and new sidewalks were completed at The Hook at the end of 41st Avenue in 1998.
- **41st Avenue Improvements (Completed).** Other street projects include the lower 41st Avenue sidewalk and landscape improvements, and on 7th Avenue, Capitola Road, and Brommer Street, new sidewalks, new street trees, and road improvements.
- **30th to 33rd Avenues Drainage and Sidewalk Improvements (Construction Completed).** New sewer lines are under construction for 30th Avenue, as well as drainage and sewer improvements for 32nd Avenue, 33rd Avenue, and Calla and Hawes streets. The new drainage system includes updated stormwater filtration systems and a drainage monitoring program.
- **Portola Drive Pedestrian Improvements.** In association with a new Live Oak library, pedestrian walkway improvements along Portola Drive, to the west of the project area and between 22nd and 26th avenues, were completed at the end of 2005 (Rodrigues 2006).

Although the numbers of coastal access parking areas have increased, the demand has outpaced this growth in the Monterey Bay area (California Coastal Commission 1995). The Twin Lakes Beach Project (described above), in addition to road improvements, is the only project known at this time that has plans for a reorganization of parking at the site.

15.2.2 Land Use

The region of influence (ROI) for land use cumulative impacts would be the coastal areas in Santa Cruz County. This ROI has been identified because planning decisions are normally made by municipal and county entities, and the coastal areas in Santa Cruz County have similar land use designations and land uses as the proposed project area. All of the proposed alternatives would be compatible with the existing and planned land uses in or adjacent to the project site. Similarly, all projects identified in Chapter 2 appear to be activities that would be allowable in and compatible with the existing, planned, and adjacent land uses. Consistency with the county general plan and LCP would be required of all projects.

The coastline in Santa Cruz County is designated as "Neighborhood Commercial," "Urban Residential, Medium Density," "Parks and Recreation," and "Resource Conservation." Coastline in the City of Santa Cruz is similar except that density is slightly higher in the city. There have been no notable recent trends regarding changes in land use in coastal areas of Santa Cruz County due to state and local coastal land preservation policies (Santa Cruz County 1994b). Shore protection work has been ongoing in Santa Cruz County due to homeowners groups' desire to protect residential areas. As noted above, more shoreline in California is being covered by shoreline protection projects. The trend, therefore, is for coastal bluffs or beaches to increase the acreage of shoreline protection, and the proposed action does contribute to that trend in California. While there are currently several projects underway and several applications pending, these shore protection projects would not change land use and instead would maintain current land uses in adjacent areas for uses such as recreation or residential. Therefore, the proposed action would not combine with other projects to conflict with local land plans or land uses on a countywide scale.

Santa Cruz County has been growing in population, and there is increased demand for recreational resources. As discussed in Section 3.2, the proposed action would be consistent with and, in many cases, would implement specific programs in Chapter 2 of the general plan and LCP, as outlined in Section 3.1.2 of this EIS/EIR. The proposed actions would have a beneficial impact on designated recreational lands by preserving the right of way and bluff and beach access, by constructing the pedestrian and bike lanes and adding more stairways, and by integrating the pedestrian and bike lanes into existing rights of way at either end of the project area.

Similarly, there would be a beneficial cumulative impact because the proposed action would combine with other recreational projects, such as the West Cliff Drive bike and pedestrian path and the MBNMS Sanctuary Scenic Trail, to provide more recreational resources for Santa Cruz County residents and visitors in general.

15.2.3 Recreation

The ROI for recreational cumulative impacts would be the coastal areas in Santa Cruz County and adjacent areas of Monterey in Monterey Bay. This ROI has been identified because coastal land used for recreation in Monterey includes state and county lands, and coastal recreation users from Santa Cruz County may choose to use a variety of Monterey Bay coastal recreation areas. There has been an increase in demand for recreational opportunities in the ROI as the Monterey Bay and Santa Cruz County populations have increased. Additional recreation areas have been and are being developed in the ROI, but there is a demand for more.

East Cliff Drive is designated as a part of Santa Cruz County's Master Bikeway Plan (Bikeway Plan). The Bikeway Plan defines a network of regional bikeways, which coordinates with and complements adjacent county and city bike routes. The Bikeway Plan supports general plan and LCP Land Use Plan policies. The proposed National Marine Sanctuary Scenic Trail also designates the Pleasure Point Park site, the area near 35th Avenue, and The Hook area as minor or major interpretive and viewing sites for Monterey Bay.

While the parkway project does not include an actual bikeway, the proposed bike path is consistent with the objectives of these county-wide and regional plans and would have a beneficial cumulative impact on long-term recreational opportunities. The proposed action, together with other actions in the ROI, such as the 41st Avenue improvements, West Cliff Drive bike and pedestrian path, and MBNMS Sanctuary Scenic Trail, would have a cumulatively beneficial impact on recreation through expansion of pedestrian/bike paths, increased beach access and support facilities, and the overall integration of recreational opportunities along the coastline.

Short-term impacts on recreation would be expected during construction of any of the action alternatives. These direct impacts would be adequately mitigated by measures recommended in Chapter 4. Cumulative projects involving bluff protection and shoreline stabilization, beach access and bicycle or pedestrian paths, and road and parking improvements would be expected to have similar short-term impacts on recreational opportunities in the area. While there are currently several projects underway and several applications pending for shoreline protection projects, such as seawalls, these shore protection projects would not change recreational land use or recreational opportunities and instead would maintain current land uses. Also it is unlikely that the proposed action would prevent a long-term recreational use, conflict with the objectives of local land use plans, or interfere with the public's right of access to the sea. Therefore, it is unlikely that the short term construction impacts caused by the proposed action, in combination with other cumulative projects, would result in cumulatively significant impacts.

Some of the projects identified in Table 15-1 are likely to result in changes in wave reflection, particularly any projects involving seawall construction. However the proposed action is designed to duplicate the shape and form of the existing cliff face and would have no significant impact on surfing opportunities. Therefore the proposed action would not contribute to any cumulative adverse effects on surfing.

15.2.4 Visual Resources

The ROI for cumulative impacts on visual resources is identified as the coastal areas of Santa Cruz County, and along Monterey Bay, because this area includes the same general types of visual resources as the project area and is generally considered as a unit by visitors and residents who enjoy these resources.

The overall trend for both the cumulative ROI and the State of California as a whole is for increasing amounts of coastal armoring (Griggs 2003b). That is, while the *rate* of increase is decreasing, the total amount of shoreline covered continues to increase, although more and more slowly over time. The projects listed in Table 15-1 all would involve visual impacts on views of and from the shoreline to a greater or lesser extent. Development close to the shoreline continues countywide, and while the county and the California Coastal Commission regulate such development, the ever-increasing daily human presence on the coastline is likely to result in continued requests for shoreline protection projects to protect residences, infrastructure, and recreational resources.

As discussed in Chapter 5, all action alternatives for stabilizing East Cliff Drive would have significant effects on the visual quality of the site (alternatives 2 and 3 would have a slightly greater impact than Alternative 1 due to the inclusion of retaining walls). Other bluff stabilization projects currently affect or would be expected to affect the visual quality of the ROI. The extent of the impact on the visual quality of each individual site would vary according to the extent of modification to the basic visual components (such as landform and vegetation), and the specific design elements (such as form, texture, color, and scale). Alternatives 1 through 3 would limit these impacts as much as possible by replicating the natural appearance and contour of the bluff, by removing rubble and riprap along the foot of the bluff, by removing the cribwall near the end of 35th Avenue and replacing it with the more naturalistic sculpted concrete wall, and by removing the old crumbling restroom and temporary safety barricades.

Bluff stabilization within the immediate project area currently includes bluff armoring, wood and concrete retaining walls, and rip rap. Projects listed in Table 15-1 include seawalls and revetments, which, depending on their design, could have significant impacts on visual resources in the coastal zone. While the degree of overall modification to the coastal bluff landform from cumulative bluff stabilization projects is not known and the specific design elements of other proposed bluff stabilization projects are not known, the likelihood is that visual impacts would accompany most if not all of these projects, by impairing sensitive views, introducing features incompatible with adjacent areas, or substantially modifying a sensitive view. These structures would vary in terms of landform modification and in terms of design elements, such as color, scale, and texture.

The proposed action would result in a significant direct impact as a result of the changes to the bluff face. This change would be dissimilar to the types of visual impacts likely to result from the projects listed in Table 15-1; this is because the project is designed to be integrated as much as possible with the existing visual environment or to improve on it through the removal of unattractive or contrasting elements such as the 35th Avenue cribwall or the concrete rubble. While integration with future projects is not assured, and greater visual disparities along the shoreline in the ROI are likely to occur, the incongruity of the future projects with Alternatives 1

through 3 would be no greater than it would be under existing conditions. Therefore Alternatives 1 through 3 would not result in a cumulatively considerable contribution to the ongoing cumulative impact on visual resources in the ROI.

Alternative 4 would result in a different visual impact from the other action alternatives. The visual effect is different from this alternative, and the cumulative effect in combination with other coastal armoring projects in the ROI would be significant because of substantial changes to the natural environment. Under Alternative 4, these substantial changes would constitute a cumulatively considerable contribution to the ongoing significant impact on coastal visual resources within the ROI.

15.2.5 Geological Resources and Coastal Process

The ROI for cumulative impacts on geological resources could conceivably be considered to be the entire coastline of California and beyond, since shoreline stabilization and bluff armoring projects affect the natural evolution of the coastline. Every project may potentially have an impact on the potential for new projects to be implemented, based on its success or failure in meeting the objectives for which it was designed and the degree of public approval. Most stabilization projects on the California coast have been constructed in developed areas, and most of these are located south of San Francisco, because the southern half of the state has the most developed coastline. About 30 percent of the coastal armoring projects in California are in the four most populated counties—Ventura, San Diego, Orange, and Los Angeles (Griggs 2003a).

By 2001 about 108 miles (10 percent) of California's coastline had been armored in some way, including with seawalls, revetments, rip rap, bluff armoring, and bulkheads (Griggs 2003a). Within Monterey and Santa Cruz counties, the amount of shoreline armoring increased rapidly from 1971 to 1978, but tapered off from 1978 to 1993. In 1971, the Corps estimated that there was about three miles of armoring in Santa Cruz County and northern Monterey County. By 1978, this had increased to about 9.6 miles of armoring (about 6 miles in Santa Cruz County and 3.6 miles in the northern portion of Monterey County). In 1986, the total had increased to about twelve miles, with most of the increase occurring in Santa Cruz County; by 1993 the total was nearly unchanged. During the period from 1978 to 1993, most projects involved reconstruction of existing armoring in response to storm damage (CCC 2003).

Clearly, not all coastal armoring is the same. Armoring varies in permanence, effectiveness, aesthetic qualities, impacts on coastal processes, and other factors. Of the existing projects in the Monterey Bay area, most are rip rap or rock rubble revetments. According to the California Coastal Commission, only about 1.1 miles of the 12 miles of armoring in Santa Cruz and northern Monterey counties involve concrete or timber structures without rock (CCC 2003). Few existing projects have the expected permanence and effectiveness of the proposed action.

Among the proposed local projects identified above, most are modifications or additions to existing armoring. Such projects are easier to implement because they do not require the same level of permit approval as new projects. Projects face increasingly difficult permit obstacles the more they would alter existing conditions. Those involving the least alteration, presumably, are projects that simply replace existing armoring that has been destroyed by natural disaster. Section 30610 of the Coastal Protection Act provides that if a replacement structure is in the same

location as a destroyed structure, and not more than 10 percent larger or higher than the destroyed structure, no coastal development permit is required for the replacement structure.

Armoring projects designed to protect existing development require permit review but are generally allowed under Section 30235 of the Coastal Protection Act. However, for new development, Section 30253 requires that the development "…neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area, or in any way require the construction of protective devices that would substantially alter natural land forms along bluffs and cliffs." In most local coastal plans in the Monterey Bay region, a setback sufficient to protect new structures for a 50-year period is required, based on site-specific conditions (CCC 2003). The current proposed action is also a replacement structure for a portion of existing failing walls in the area.

During the period from 1983 to 1993, 96 shoreline armoring project permits were approved in Santa Cruz and northern Monterey counties. Forty-seven of these were in Santa Cruz County, thirteen were in the City of Santa Cruz, and three were in Capitola, so that the majority of the projects were in northern Monterey Bay. About 60 percent of the approved projects were to protect private residential, commercial, or industrial development, 15 percent were to protect harbors, and 21 percent were to protect public works or public recreation interests. About 63 percent of the permits were for projects to repair, maintain, or expand existing structures (CCC 2003). A flurry of project approvals occurred in 1983 and 1984, probably in response to the 1983 storms, accounting for placement of about two-thirds of the total rip rap placed during the 10-year period.

Based on these historical data, the following trends are apparent:

- Shoreline armoring occurs mainly in developed areas of the California coast;
- Most armoring projects are for protection of existing structures on private property;
- Most local projects involve maintenance of existing rip rap or rock revetments;
- Shoreline protection of new development is discouraged under existing state and local policies;
- The rate of increase in armored shoreline in Santa Cruz and northern Monterey counties has been decreasing since the 1970s; and
- Most armoring projects are for emergency maintenance of existing protection structures and occur in response to large storm events.

Based on these observations of trends, the rate of increase in shoreline armoring appears to be decreasing and generally stabilizing. With fewer projects needed for protection of new coastal development, most projects are likely to be for maintenance of existing armoring structures, and most of the rest are for protection of existing buildings at sites where past regulations did not require large setbacks. It is likely that most of these projects will be in areas with existing protection structures nearby, so that future projects will fill gaps between existing armored segments of shoreline. The proposed action is unusual relative to most existing and proposed action because it is a relatively long, contiguous, thin-walled, and vertical structure with a long

expected life. Depending upon its public acceptance, and because it would solve problems that exist with other types of shoreline protection structures, the approach taken by the proposed action could encourage gradual replacement of existing armoring that is less effective or desirable, such as small, discontinuous rip raps, which take up valuable beach space, require frequent maintenance, and are less effective at preventing erosion.

The primary cumulative geomorphologic effect, if existing rip rap and other less-effective armoring structures were to be gradually replaced by more effective erosion control structures such as the proposed structure, would be that the existing shoreline in highly developed areas (often defined by the historical development of streets and structures, rather than by natural geologic features) would be more effectively preserved. Also, Santa Cruz County's General Plan (Policy 6.2.12) requires that new structures be set back from coastal bluffs a sufficient distance to provide a stable building site for 100 years. However, planning periods for permitting coastal development projects are typically limited to 50 years (relative to the need for coastal protection) and it is too speculative to estimate trends that far in the future. In the short term, therefore, there may be a reduction in the need for armoring projects due to the type of technology used in the proposed action. In the periods longer than 50 years however, it is difficult to predict the increase in demand for coastal protection projects in areas beyond existing development.

On the north shore of Monterey Bay, improved armoring and infill of currently unprotected shoreline would generally have minor impacts on the amount of sand on beaches because the littoral cell that supplies this sand is primarily from streams rather than from shoreline erosion. Generally, the cumulative effects of constructing more effective armoring structures such as the proposed structure, over time, would be similar to the effects discussed in Chapter 6 for the proposed action and would not be cumulatively significant overall. There would be no significant cumulative impacts on beach width, offshore scouring, or surfing.

15.2.6 Water Resources

The ROI for cumulative impacts on water resources is Monterey Bay, or more specifically, the waters of the northern portion of Monterey Bay. As described for geologic resources, the successful implementation of the proposed action, because it is expected to be a superior engineering solution to coastal erosion in high value urban areas than other forms of protection, could encourage gradual replacement of those existing, segmented structures by structures similar to the proposed structure. The cumulative effects on water resources of continued infilling of unprotected shoreline and replacement of existing structures with more effective and permanent structures are expected to be minor, but these effects would depend on the nature of the future projects. For example, the structures might impact groundwater flow or seepage from the bluffs, but they could be designed to accommodate this flow. Cumulative impacts on wave reflection or refraction are expected to be minor, or might improve existing conditions, since as with the proposed structure, future structures would conform to the shape of the existing bluffs and shoreline. More permanent and durable armoring structures could result in benefits to marine water quality, since installation of such projects is an opportunity to address non-point discharges (from storm sewers in streets), and because existing wide, porous ripraps may be in areas where trash or other illegal disposal of wastes could occur. Removing ripraps might remove this nuisance.

In the long term, increased rates of sea level rise, if it occurs, would result in increased rates of erosion along the coast in areas without shoreline armoring or with ineffective armoring. Structures such as the proposed structure would be effective for a longer period of time at preserving the existing shoreline. One of the potential impacts of erosion, especially during periods of intense storm-generated wave activity, is that structures, pipelines, roadways, vehicles, and other bluff top features or occupants may be washed into the sea when the slope collapses, resulting in potential impacts on water quality. Increased willingness to upgrade existing coastal armoring in urban areas with more effective armoring methods, which may be one of the indirect results of successful implementation of the proposed action, could reduce the cumulative adverse effects on water quality that now occur, resulting in an indirect beneficial cumulative effect.

15.2.7 Biological Resources

The cumulative impact ROI for biological resources includes the coastline of Santa Cruz and Monterey counties. This includes the cliff habitat, intertidal zone, and subtidal and nearshore waters. Other projects in the area could combine to affect resources in the study area.

Similar to the proposed action, impacts of the projects listed in Table 15-1 include temporary disturbance to biological resources resulting from elevated noise and activity levels, along with the long-term loss or alteration of habitat. Noise from construction and road improvements could affect special status species, deterring shorebirds from foraging and nesting along the beach, and discouraging marine mammals from hauling out. Construction-induced erosion and sedimentation may also be problematic to intertidal and nearshore foraging birds, such as the California brown pelican and tern species. However, these impacts are limited to construction and maintenance times, and therefore are temporary in nature, and are likely to be mitigated by basic protection measures such as those discussed as part of the proposed action. As a result, these impacts are unlikely to permanently change distribution patterns or long-term success of species.

The greatest impact on biological resources within the ROI from the cumulative effect of coastal armoring projects would be the overall loss of cliff habitat and the loss of beach width, which would negatively impact intertidal habitat. Covering or altering present cliff formations would reduce or exclude nesting use of these areas by cliff nesting and burrowing birds. Species likely to be affected include the belted kingfisher, and cliff and Northern-rough winged swallow, that are known to nest in cliffs within the Santa Cruz and Monterey Bay shoreline (Suddjian 2003) and would be negatively affected by this trend. Coastal armoring would also limit the use of the areas in the construction footprint by invertebrate species and small mammals, which may burrow in or forage throughout the bluffs and waterfront. The continuation of the present coastal armoring trends, which has resulted in the armory of 19.1 percent of the Santa Cruz County and 3.9 percent of Monterey County coast, would mean a greater loss of natural coastal habitat and could negatively impact species usage of the coastline.

A decrease in beach width, which would result from coastal armoring projects, would mean a decrease in the amount of high tide area. Although the expected change in high tide area would fall within the natural seasonal and yearly variance, the cumulative loss would be a modification of habitat throughout the Santa Cruz and Monterey coast and would affect wildlife species that utilize this area. High tide species, such as the green-lined shore crab, and other crustaceans that

live in and around the high tide wrack line, would lose habitat along the portions of the shoreline where coastal armoring is conducted. Altering the makeup of the intertidal area would affect gulls, plovers, and other shorebirds that forage in this area. Other human uses of the marine environment in the vicinity of the project area may affect biological resources. Human activity in nearshore areas can affect kelp forests (Foster and Schiel 1985). Boating traffic can have visible effects on a kelp canopy by cutting surface fronds. Coastal construction can change local oceanographic conditions, as well as turbidity and sedimentation (Foster and Shiel 1985). Finally, and perhaps most importantly, water quality degradation via point source and nonpoint source pollution can have significant impacts on the ecology of a kelp forest. Experts generally agree that sewage discharge from the Los Angeles area led to the complete destruction of the Palos Verdes area kelp forests, starting in the 1940s. Only after water quality improvement mandates were imposed did the kelp forest begin to reappear (Wilson 1982).

Siltation and equipment fuel spills could affect offshore kelp beds without the appropriate mitigation measures. At this time, however, it cannot be determined if standard mitigation measures, such as those described in Chapter 8 for the proposed action, will be adopted by future coastal construction projects in the area.

The long-term loss and alteration of cliff and high tide habitat from coastal armoring would negatively impact biological communities along the coasts of Santa Cruz and Monterey and could decrease use of these areas by MBTA and MMPA species. While this loss of coastal habitat is a significant cumulative impact, the incremental impact of the proposed action on coastal habitat would not be cumulatively considerable, because the cliff habitat that would be lost as a result of the project is of relatively low value, no sensitive species reside there, and the habitat would not likely improve if the project were not to be implemented. The intertidal habitat that would be affected by the proposed action would be able to re-establish itself after construction, and may even improve in value as a result of the removal of the rubble and rip-rap. The incremental impacts of the proposed action on biological resources would not, therefore, combine with other Santa Cruz County and Monterey County projects for an overall significant impact on biological resources.

15.2.8 Transportation and Safety

The ROI for cumulative transportation and safety impacts would encompass the Santa Cruz County coastal roadway network between Watsonville and Santa Cruz. This area would include Highway 1 and local roadways between Highway 1 and the coast.

Traffic patterns in the project vicinity could be affected by cumulative traffic increases on Highway 1. Increased congestion on Highway 1 from cumulative development could result in motorists using alternate local routes, such as Portola Drive, to travel east-west along the coastal corridor. It is unlikely that many motorists would use the project segment of East Cliff Drive as an alternate route, due to its distance from Highway 1, its circuitous alignment around Soquel Point, and its narrow width and low travel speeds. As such, the project area is not expected to be directly affected by cumulative regional traffic.

The proposed action does not contain any traffic-generating land uses and would not contribute to cumulative long-term traffic volumes in the area. However, the cumulative congestion on

Highway 1 could result in some visitors to the East Cliff Drive corridor choosing to return west toward Santa Cruz or east toward Aptos using local roadways, such as Portola Drive or Capitola Road, rather than using Highway 1. These trips would not be expected to significantly affect cumulative traffic conditions within the ROI.

The proposed action would result in short-term traffic impacts related to all construction phases, including temporary increases in traffic in the area and lane closures or blockages along East Cliff Drive. Short-term traffic impacts would not be considered cumulatively significant because they are not expected to overlap with any other major construction activities in the area and would cease immediately following completion of the projects.

The proposed action would provide 10 additional parking spaces, including two spaces for handicapped users. Parking impacts therefore would be considered cumulatively beneficial.

The proposed action also would be considered to have cumulatively beneficial long-term impacts related to bicycle and pedestrian safety and access because they would generally improve bicycling and pedestrian conditions along East Cliff Drive. Combined with other planned and proposed bicycle and pedestrian improvements in the area, such as various sidewalk improvements, the West Cliff Drive path widening, and the Monterey Bay Scenic Trail development, the proposed improvements under Project 2 would contribute to an improved network of bicycle and pedestrian facilities within Santa Cruz County and the Monterey Bay region. By providing an additional beach access staircase at Pleasure Point Park and reconstructing two of the staircases, the proposed action also would provide a cumulatively beneficial impact on coastal access in the region.

15.2.9 Emergency Services

The ROI for cumulative emergency service impacts is Santa Cruz County. No cumulative adverse effects on emergency services, in addition to those resulting from the proposed action itself, would be expected for any of the alternatives. No regional projects have been identified that would affect emergency services within the ROI described in Chapter 10, and the incremental effect of the proposed action would not result in a cumulative adverse impact on emergency services within the county. Depending upon the success of the project at stabilizing the shoreline and public acceptance of this type of structure, the proposed action could have an indirect cumulative effect of encouraging this type of coastal protection in the ROI. Using more effective coastal protection measures could reduce the frequency of replacing less effective coastal protection measures (e.g., rip rap and revetments) and could improve public safety by preventing catastrophic failures, resulting in a long-term cumulative benefit to emergency service requirements in the ROI.

15.2.10 Paleontological and Cultural Resources

The ROI for cumulative paleontological and cultural resource impacts includes the Monterey Bay coastline, and to some extent, the entire California coast. Coastline protection is a double-edged sword when it comes to these resources. On the one hand, erosion protection measures that effectively seal cliff faces protect buried paleontological and cultural resources from both natural and human disturbances. On the other hand, the information that we may gain from these resources is essentially blocked from researchers and future study. Planned shoreline armoring,

however, may be more beneficial to these resources than emergency road and coastal protection measures following natural events. Emergency repairs are not usually subject to in-depth analysis of resources, which may result in inadvertent destruction of sites.

Due to the rise in sea level following the end of the last Ice Age, submerged prehistoric archaeological sites may be damaged if coastal protection involves the use of dredging or heavy machinery in the tidal zone. In addition to immediate impacts from construction, and because shoreline protection has the potential to affect sand migration, there is also the cumulative potential for exposure of submerged archaeological sites off shore. Although high-energy surf areas and tidal zones may have naturally affected these sites, each project should assess the potential for damage to submerged near and off shore resources. As the trend of increased coastal protection continues, the potential for impacts on buried cultural and paleontological resources would continue as well.

There are no known cultural resources within the East Cliff Drive project area, and unexpected discoveries are unlikely due to the nature of proposed construction activities. Although there may be buried and yet undiscovered resources beneath East Cliff Drive, there are no current plans to replace the road. The work would be monitored by a qualified archaeologist, and if ground-disturbing activities uncovered sensitive deposits, the archaeologist would order work to halt, and the resources would be recorded and avoided. Because there are no recorded or expected cultural resources in the project area, there are no anticipated cumulative adverse effects from the proposed action.

Adverse cumulative effects on paleontological resources could include lack of access to fossils caused by armoring of the bluff at East Cliff Drive as well as at other coastal locations within the ROI. Construction also may damage some resources. Direct and indirect impacts on paleontological resources in the project area could be avoided by implementing the mitigation measures described in Section 11.2.1. Such mitigation would ensure that potential direct and cumulative impacts on paleontologic resources from the proposed action would be less than significant. Direct impacts of the proposed action would be less than significant, and therefore would create a less than significant cumulative impact on paleontological resources in the ROI. Any potential contribution of the project to significant cumulative impacts could be reduced by implementation of mitigation measures similar to those described in Section 11.2.1 and application of similar measures to future projects would reduce impacts on a broader geographic scale.

15.2.11 Air Quality

The ROI for cumulative air quality impacts is the North Central Coast Air Basin, which consists of Santa Cruz, Monterey, and San Benito counties. This ROI was selected because the counties within the air basin share similar air pollution problems and characteristics. Air quality management decisions are made for the basin as a whole by the MBUAPCD.

Coastal bluff protection projects, such as those listed in Table 15-1 and the action that is the subject of this EIS/EIR, do not upon completion result in the direct emission of air pollutants. Therefore, these projects have no direct long-term cumulative air quality impacts. Construction of these projects does result in the short-term generation of air pollutants from operating

construction equipment. Projects that occur simultaneously would cumulatively emit air pollutants in the ROI, but these projects are temporary, short-term, and generally small in scale and would have no significant lasting cumulative air quality effects. In addition, mitigation measures such as those discussed in Section 4.8 would serve to reduce construction emissions to the greatest extent practicable.

Coastal protection measures serve to protect existing structural and recreational resources and would not indirectly generate substantial new growth in the ROI. Therefore, the proposed action in combination with other cumulative projects would not indirectly result in significant cumulative air quality impacts.

15.2.12 Noise

The ROI for cumulative noise impacts is Santa Cruz County. Noise is a localized event since it dissipates within about one-half mile of the noise source, depending upon what the source is; however, individual sources of noise contribute to and can therefore affect the larger noise environment.

Coastal bluff protection measures do not, upon completion, generate noise. Therefore, the proposed action, in conjunction with similar projects in the ROI, would have no long-term direct cumulative noise impacts. Coastal protection measures do generate noise during construction from operating construction equipment and powered machinery. This would have minor cumulative noise impacts only if the projects occurred simultaneously and in close proximity to one another. Any cumulative effects would be temporary and would cease upon completion of project construction. No indirect cumulative noise effects have been identified.

15.2.13 Utilities

The ROI for the utility infrastructure cumulative impacts would be the coastal areas in Santa Cruz County. The ROI for solid waste would be the area served by the Buena Vista Landfill. These ROIs have been identified because planning decisions are normally made by municipal and county entities, and the coastal areas in Santa Cruz County have similar utility infrastructure as that of the proposed project area. All of the proposed action alternatives would be compatible with existing or planned utility systems adjacent to the project site. Similarly, all of the activities of the projects identified in Chapter 2 appear to be compatible with existing, planned, and adjacent utility infrastructure in the county. Consistency with the county general plan would be required of all projects.

Utility infrastructure considered in this section includes stormwater, potable (drinking) water, wastewater, natural gas, electricity, telephone, and solid waste. The most recent noticeable trend regarding changes in utility infrastructure is the loss of electrical and telephone lines due to coastal erosion. Shore protection work has been ongoing in Santa Cruz County due to homeowner groups' desire to protect residential areas. While there are currently several projects underway, and several applications pending, these shore protection projects would not adversely alter utility systems and will most likely have a beneficial impact on Santa Cruz County's utility infrastructure.

The proposed action would not combine with other projects to conflict with local utility plans or utility systems on a countywide scale. Santa Cruz County has been growing in population; therefore, there is increased demand for utility resources. The proposed action would have a beneficial impact on utility infrastructure by safeguarding utility lines located along shorelines. Therefore, there would be a beneficial cumulative impact because the proposed action would combine with other proposed and active projects in coastal areas, such as proposed bluff protection projects, to ensure the security of utility infrastructure for Santa Cruz County residents and visitors in general.

15.3 GROWTH-INDUCING IMPACT (CEQA)

An EIR must discuss the ways in which the proposed action and alternatives could foster economic or population growth or the construction of additional housing, either directly or indirectly, in the surrounding area. Analysis of growth-inducing effects includes those characteristics of the action that may encourage and facilitate activities that would, either individually or cumulatively, affect the environment. Population increases, for example, may impose new burdens on existing community service facilities. Similarly, improvement of access routes may encourage growth in previously undeveloped areas. Growth may be considered beneficial, adverse, or of no significance environmentally, depending on its actual impacts on the environmental resources present.

The purpose of the proposed action is to protect the public right-of-way, utilities, and public access by protecting the coastal bluff from erosion. The construction activities would occur for a limited time and would employ a small number of workers. No additional housing would be required nor would businesses be established as a result of these projects. No growth inducement would result from implementation of the proposed action. The proposed action would protect existing coastal development, including coastal access and utilities, rather than encourage future or additional development; there are regulations and guidelines in place that deal with future development of coastal areas.

15.4 RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF THE ENVIRONMENT AND LONG-TERM PRODUCTIVITY (NEPA)

NEPA requires that an EIS consider the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity.

The construction activities associated with the proposed action are short-term and temporary, and negative effects of construction can be mitigated. All of the project alternatives would protect the public right-of-way from coastal erosion and would preserve public access to the shoreline to some degree and therefore, overall, the proposed action would result in a long-term benefit to the protection of the East Cliff Drive right-of-way. No losses in long-term productivity have been identified as a result of the proposed action or project alternatives.

15.5 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

NEPA and CEQA require that an EIS/EIR analyze the extent to which the proposed action's primary and secondary effects would commit nonrenewable resources to uses that future generations would be unable to reverse. No irreversible and irretrievable commitments of resources would occur as a result of project implementation.

Implementing any of the alternatives would require commitments of both renewable and nonrenewable energy and material resources for demolition and for construction of the proposed bluff protection structures and parkway development. As described in Chapter 4, construction equipment would use petroleum fuels, such as gasoline and diesel. This temporary energy expenditure would occur over the short term and would not substantially increase the overall demand for electricity or natural gas.

15.6 ENVIRONMENTAL JUSTICE AND ENVIRONMENTAL HEALTH SAFETY RISKS TO CHILDREN

15.6.1 Environmental Justice

Executive Order 12898, Environmental Justice in Minority and Low-Income Populations

Former President Clinton signed Executive Order 12898, "Federal Actions to Address Environmental Justice in Minority and Low-Income Populations," on February 11, 1994. It requires, to the greatest extent practicable, each federal agency to "make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations."

The US EPA's Office of Environmental Justice offers the following definition of Environmental Justice:

"The fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income with respect to the development, implementation, and enforcement of environmental laws, regulations, and policies. Fair treatment means that no group should bear a disproportionate share of the negative environmental consequences resulting from industrial, municipal, and commercial operations or the execution of federal, state, local, and tribal programs and policies" (US EPA 1996).

The goal of this "fair treatment" is not to shift risks among populations, but to identify potential disproportionately high and adverse human health or environmental effects and identify alternatives that may mitigate these impacts.

The project area is located in census tract 1216 in Santa Cruz County. Census tract 1216 represents the project area for the purpose of analyzing potential environmental justice impacts. Based on estimates by the US Census Bureau, the population of the city of Santa Cruz has decreased by 0.7 percent between 2000 and 2004 (US Census Bureau 2005a). The minority population in the project area (15 percent) (US Census 2000a) is significantly smaller than the minority population in the county (25 percent) (US Census 2000d). Therefore, the projects would not result in disproportionate impacts on minority populations.

According to the Bureau of Economic Analysis, the per capita personal income for the county was $38,126 in 2003, which was the ninth highest in the state out of 58 counties (BEA 2005). Past figures indicate a higher countywide median income of $51,500 (County of Santa Cruz 2001). Similarly, according to the most recent US Census estimates, the total number of persons living below the poverty level in Santa Cruz County was 10.6 percent, which was lower than the statewide poverty level of 13.3 percent in 2003 (US Census 2005b). Since there is not a

substantial population of low-income residents in the project area (8.7 percent below the poverty line, according to the most recent census data for the census tract [US Census 1990]), the project would not result in disproportionate impacts on low-income populations.

15.6.2 Environmental Health and Safety Risks to Children

Executive Order 13045, Environmental Health and Safety Risks to Children

On April 21, 1997, former President Clinton signed Executive Order 13045, "Environmental Health and Safety Risks to Children." The policy of the Executive Order states that: "A growing body of scientific knowledge demonstrates that children may suffer disproportionately from environmental health risks and safety risks." Therefore, to the extent permitted by law and appropriate, and consistent with the agency's mission, each federal agency:

(a) shall make it a high priority to identify and assess environmental health risks and safety risks that may disproportionately affect children; and

(b) ensure that its policies, programs, activities, and standards address disproportionate risks to children that result from environmental health risks or safety risks.

This Executive Order defines "environmental health risks and safety risks" as "risks to health or to safety that are attributable to products or substances that the child is likely to come into contact with or ingest (such as the air we breathe, the food we eat, the water we drink or use for recreation, the soil we live on, and the products we use or are exposed to)."

The percentage of the population under 18 years of age for the project area is 19.7 percent, which is lower than the countywide percentage of 23.8 (US Census 2000b). In addition, there are no schools or daycare centers adjacent to the project area, and the proposed action would not result in disproportionate impacts on children.