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## **Section II**

### **Coastal Development**

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- **Coastal Armoring Action Plans**
- **Desalination Action Plans**
- **Harbors and Dredge Disposal Action Plans**
- **Submerged Cables Action Plans**



## Coastal Armoring Action Plan

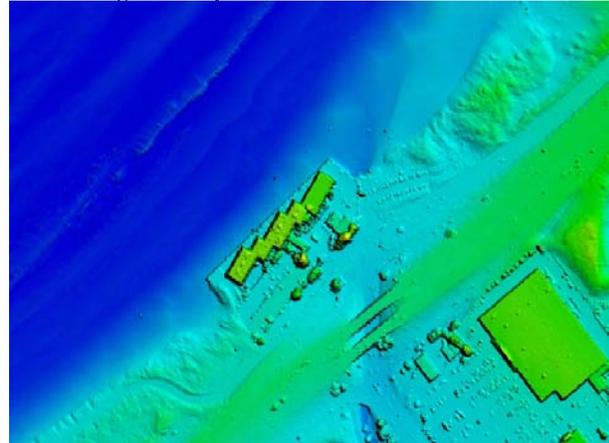
### Goal

Reduce expansion of hard coastal armoring in the coastal areas near the MBNMS through proactive regional planning, project tracking, and comprehensive permit analysis and compliance.

### Introduction

Shoreline protective structures have been used extensively along California’s coastline to protect infrastructure and other development from wave action, or to retain soil to avoid erosion. Private landowners and local, state, or federal governments have typically installed structures in an attempt to protect development threatened by coastal erosion. Structures have also been installed to protect public infrastructure such as Highway 1, which in some stretches is vulnerable to erosion related to bluff retreat. This practice is commonly known as coastal armoring, and seawalls, bulkheads and revetments are some of the structures that are used. Seawalls are barriers, usually vertical walls, between the land and water that protect from wave erosion. A bulkhead is used as a retainer, providing protection and stabilizing the land that it supports. Revetments are protective structures placed along slopes and are constructed of a sturdy material such as stone.

Figure CA-1: NOAA LIDAR Image of Armored Coastline Surrounding Monterey Beach Hotel



Increases in development and continued, natural erosion of coastal bluffs will cause additional pressure to install structures to protect private and public property from erosion. Development is continuing to occur in vulnerable areas along California’s coast, followed by a desire to protect both private and public property. The situation presents a serious predicament to both resource managers and property owners. However, it is clear that current policies need strengthening, and there is a need to develop collaborative approaches to address the issues of erosion and the demand for coastal armoring, including improved guidance to enable better decision making.

Sanctuary regulations prohibit alteration of the seabed, and all armoring structures placed below the mean high tide line require approval from the MBNMS. The Sanctuary regulates coastal armoring by authorizing California Coastal Commission permits, and placing specific conditions on those permits. Many seawalls have been constructed with no notification to or authorization from the MBNMS. Since 1992, MBNMS review of seawalls primarily focused on minimizing impacts from the construction process rather than long-term impacts from the armoring itself. Since its designation, MBNMS has reviewed and authorized California Coastal Commission permits for seawalls, riprap or other coastal armoring projects at fifteen sites. Only a portion of the total coastal armoring projects underway in the region came to the Sanctuary for review, clearly indicating a need for improved inter-agency coordination.

As with any activity that alters natural processes, there can be significant long-term impacts related to coastal armoring. Environmental impacts of coastal armoring vary significantly depending on the type of structure constructed, the magnitude of the project, and the specific geological, biological, and oceanographic conditions in the vicinity of the structure. Coastal armoring can potentially damage or alter local coastal habitats, deprive beaches of sand, lead to accelerated erosion of adjacent beaches, hinder access, and present problems with public safety. Coastal armoring projects may impede and eventually cut off access to significant stretches of public beaches.

Currents, waves, and wind normally transport sediment throughout the littoral system. Armoring of the coast can interfere with littoral transport, which in a natural state may reach a dynamic equilibrium. When the availability of sediment is reduced due to the existence of a structure, erosion can increase in other nearby locations. Vertical structures in particular can deflect wave energy causing increased erosion and altering natural habitat in front of the structure. Reflected wave energy may make it difficult for organisms to inhabit the area because of high turbidity.

Coastal armoring can negatively impact certain biological resources by causing changes in abundance and distribution of species. Coastal armoring structures can influence the structure of benthic communities, due to potential differences in settlement patterns for natural substrates and armoring structures. Armoring structures can encroach into the intertidal zone or disturb important buffer areas such as marsh habitat between the marine and terrestrial environments, which naturally mitigate erosion, and play an important role in flushing certain contaminants.<sup>2</sup> Certain structures can also provide habitat for predatory species not normally associated with the beach and intertidal zone such as rats and squirrels, which can feed on intertidal organisms, compete for food with native species, and transmit disease. Additionally, coastal armoring can act as a barrier to wildlife, by blocking access of certain species to the beach.

The construction phase of coastal armoring projects generally causes short-term impacts, lasting only a few days to a few weeks. Problems include increased turbidity caused by suspended solids in the immediate vicinity of the construction site, and the risk of chemicals or other materials entering the ocean from construction activities. Structures constructed in the intertidal zone generally have more impact than those constructed above the high tide line. Many short-term construction impacts can be minimized through appropriate mitigation measures, including scheduling of the construction phase to reduce impacts by considering animal migration patterns and spawning patterns or specific actions such as the use of silt curtains. However, the long-term impacts of coastal armoring projects are more difficult to address or prevent, and they are a key focus of this action plan.

### **Strategy CA-1: Conduct Issue Characterization and Needs Assessment**

Implementation of this strategy will identify existing information and data gaps, and compile and produce the necessary scientific data and evaluation tools. This will also involve an in-depth analysis of a subregion of the MBNMS and then development of a long-term monitoring program based on its success.

***Activity 1.1: Produce MBNMS-wide Maps and Database for use as Planning and Permit Review Tools***

The MBNMS will coordinate with partners to map existing coastal armoring sites and potential future site requests based on evaluation of coastal erosion rates and development patterns. The MBNMS will also coordinate with partners to develop a regional integrated database and Geographic Information System (GIS) layers showing land use types, parcels, coastal armoring locations, beach and bluff erosion and replenishment rates, bottom types, biological habitats, and geology/geomorphology. This database system should become integrated with Sanctuary Integrated Monitoring Network (SIMoN) to facilitate use by other agencies and the public.

***Activity 1.2: Compile and Analyze Ecological and Socioeconomic Data***

This activity is a long-term characterization that will begin as a pilot project with an in-depth analysis on a critical subregion. The MBNMS will first coordinate with partners to identify methods and to assess individual and cumulative impacts of coastal armoring on sand supply dynamics, marine biological habitats and ecosystems, and public access. Compilation of this data should include studies to estimate coastal bluff erosion rates, and shoreline change rates and a regional evaluation of sand transport dynamics and beach nourishment.

***Activity 1.3: Incorporate Data and link with State Programs***

Incorporate data into maps and database from Activity 1.1, and link to State of California's COASTAL SEDIMENT MANAGEMENT MASTER PLAN.

***Activity 1.4: Develop and Implement a Long-term Monitoring Program***

Quantify and compare the impacts of different types of coastal armoring structures in various habitat types and conditions. Considerations for monitoring program include intertidal biological community structure, changes in beaches, wave refraction patterns, and impacts on sand budget.

**Strategy CA-2: Develop and Implement Regional Approach to Coastal Armoring**

MBNMS will collaborate with partners to develop and implement a more proactive and comprehensive regional approach that minimizes the negative impacts of coastal armoring. This approach will consider impacts throughout the life of the structure from construction and maintenance to the long-term cumulative impacts.

***Activity 2.1: Apply Hierarchy of Preferred Responses to Erosion***

The MBNMS will use the following hierarchy of responses as preferred approaches to addressing coastal erosion that may threaten structures.

***A. Use of preventative measures***

Identify and evaluate preventative measures aimed at reducing the need for coastal armoring. Considerations may include increased setback requirements, incorporation of a “no hard armoring” policy (possibly in covenants, codes, and restrictions) for new subdivisions or situations when coastal agricultural land is converted to development, re-alignment of coastal roads and highways, and new setback requirements to be established for demolition/rebuild projects in urbanized areas.

**B. Alternatives to coastal armoring**

Identify and evaluate alternatives to coastal armoring, including but not limited to: (a) alternatives conforming to MBNMS regulations such as relocation of vulnerable structures, re-alignment of coastal infrastructure such as roads, bridges, and highways, and control of surficial erosion; and (b) alternatives not conforming to MBNMS regulations, including some sand supply strategies and artificial reef structures.

**C. Preferred types of coastal armoring**

In cases where armoring is deemed necessary, identify and evaluate the least environmentally damaging types of coastal armoring, including more natural alternatives for specific conditions and geographic locations, taking into account engineering, environmental, aesthetic and public access concerns.

***Activity 2.2: Develop and Implement Guidelines for Identifying Sub-regions***

Guidelines will be developed with partners to identify pristine or particularly sensitive areas where coastal armoring should be strongly discouraged or not allowed; urban zones that are already heavily armored and where efforts should focus on restoration and improved armoring techniques; and areas in-between where thorough case-by-case review and additional research is needed.

***Activity 2.3: Identify Planning Sub-regions***

MBNMS staff will work with partners to identify boundaries for sub-regions and consider measures developed in Activity 2.1 to determine planning approaches for each sub-region. Sub-region and size will be based on complexity and continuity of similar habitats or land uses. This may include continual habitats of rocky shores, sandy beaches, littoral cells, estuarine environments, and land use such as existing armoring, urban areas, rural coastlines, or beaches with heavy visitation. These areas will be identified based on ecological and land use criteria for identifying planning sub-regions for coastal armoring policies and strategies. Identifying sub-regions should be based on: (a) biological sensitivity of habitats; (b) physical considerations, including geological factors such as sediment sources and sinks, beach nourishment needs, shoreline orientation and erosion rates; and (c) development pressures, including the extent of existing armoring, potential for new armoring requests, types of structures to be protected, and level of development and infrastructure.

***Activity 2.4: Develop Specific Planning Guidelines for each Sub-region***

MBNMS staff will work with partners to develop specific planning guidelines for each sub-region identified in Activity 2.3, based on application of the hierarchical approach as stated in Activity 2.1. All policy development and application of guidelines to sub-regions should involve significant outreach to affected parties and agencies. Sub-regions will be addressed sequentially beginning with an initial pilot region in Southern Monterey Bay.

***Activity 2.5: Develop Maintenance and Restoration Program***

MBNMS staff will work with partners to develop a program for maintenance and restoration of existing armoring, including “clean-up” of poorly maintained sites, for both authorized and illegal structures. If or when maintenance is requested, MBNMS and partners will re-evaluate the need for protection. All maintenance and restoration programs should incorporate improvements in beach access and public safety. In heavily armored areas where maintenance is

necessary and appropriate, MBNMS and partners will consider the potential for installation of a comprehensive, uniform structure to replace multiple individual structures.

***Activity 2.6: Reduce Need for Emergency Permits***

The MBNMS will coordinate with partners to reduce the use of and need for emergency coastal development permits through better predictive erosion analyses, potential alteration of current guidelines regarding initiation of work, and more proactive regional planning. Staff will consider areas where it is appropriate to either initiate the work or develop alternative solutions, before the site becomes an emergency.

***Activity 2.7: Broaden the Multi-Agency Enforcement Program***

MBNMS will work with partners to develop cooperative enforcement mechanisms for inspection of permitted coastal armoring structures, tracking/notification and corrective action regarding illegal structures, assessment of fines, and removal of emergency structures that are not permitted to remain in place permanently.

***Activity 2.8: Pursue Pilot Program for Alternatives to Coastal Armoring***

Based on the scientific and needs assessment, MBNMS will pursue a pilot program to investigate environmentally sound alternatives to coastal armoring, and develop and implement monitoring protocols for the program. Alternatives will include but not be limited to: preventative measures, planned retreats, beach nourishment, and structural responses such as groins or breakwaters.

MBNMS will convene interagency working groups to identify and help design sub-region specific design alternatives for the coastal erosion responses identified in Activity 2.1. Considerations will include:

- A. Identifying the suite of preventative measures such as restricting activities that contribute to erosion, predevelopment conditioning of projects and the necessary legal measures or relocation of structures such as road realignment or development demolition, or enhanced vegetation of exposed, erosion prone areas.
- B. Identifying hard structures that may preempt erosion or help retain sand on beaches. Types of structures may include groins (narrow wooden or concrete constructions that extend from a shore into the sea to protect a beach from erosion), offshore seawalls, breakwater, or submerged structures such as artificial reefs that dissipate wave energy prior to reaching the shoreline. All hard structures would alter the seabed and therefore trigger review by MBNMS as a prohibited activity.
- C. Identifying appropriate sources of beach quality material and one or more locations for one or more pilot demonstration projects that might receive an MBNMS scientific research permit (and other necessary agency permits) to test and develop appropriate sand supply and beach nourishment program options. MBNMS will develop a coordinating mechanism with the California Coastal Sediment Management Workgroup to promote the exchange of information and ideas. If appropriate sources of sand and potentially beneficial nourishment sites can be identified, the pilot study or studies would develop specific research objectives and study methodologies. Criteria for “success” will also be developed. The criteria could include minimal environmental impacts, recreational access, shoreline protection and habitat benefits, the potential for using maintained

nourishment to avoid or mitigate for shoreline armoring, and other identifiable overall benefits to MBNMS resources.

At the conclusion of this/these demonstration pilot project(s), the agency working group will evaluate the desirability of, and necessary steps for, continuing such a program involving beach nourishment within MBNMS boundaries. If the sand supply project is to continue, this evaluation will also examine whether revision of MBNMS regulations may be warranted, if a beneficial program might continue via MBNMS permit or authorization in concert with other regulatory agencies.

### **Strategy CA-3: Improve Permit Program**

MBNMS will improve the current case-by-case permit system and strengthen coordination with other agencies regarding coastal armoring permit processing.

#### ***Activity 3.1: Integrate State and Federal Planning Programs***

Where possible, MBNMS will link and integrate aspects of the MBNMS coastal armoring plan with California state erosion policy and Coastal Sediment Management Master Plan.

#### ***Activity 3.2: Develop Consistent Permitting Conditions***

Following the initiation of regional analysis from Strategy 2, identify permit conditions and authorization criteria of the agencies involved in the regulation of coastal armoring. Staff will subsequently compare typical multi-agency seawall permit conditions, identify and discuss selected discrepancies, and where possible seek to rectify discrepancies.

#### ***Activity 3.3: Incorporate MBNMS Standard Conditions into Other Agency Permits***

The MBNMS will coordinate with the California Coastal Commission to incorporate current MBNMS standard conditions regarding construction processes into Coastal Commission permits

#### ***Activity 3.4: Clarify Level of MBNMS Involvement in Projects and Develop Review Thresholds***

MBNMS staff will develop and identify a threshold for full MBNMS review of selected projects based on overall footprint, location, and potential impacts, and ensure early communication on these projects.

#### ***Activity 3.5: Share Information with Other Agencies***

MBNMS staff will continue to improve early sharing of information on projects and permits among all relevant agencies.

#### ***Activity 3.6: Conduct Permit Enforcement Inspections and Actions***

The MBNMS will conduct enforcement inspections of permitted coastal armoring activities and follow up to ensure compliance with conditions of permits and authorizations. The MBNMS will conduct general surveillance patrols to detect coastal armoring activities being conducted without required permits.

## **Strategy CA-4: Implement Programs and Increase Training**

MBNMS will provide outreach and training to local, state and federal agencies and the general public about the sanctuary’s sub-regional approach to addressing the issue of coastal erosion.

### ***Activity 4.1: Conduct Needs Assessment***

MBNMS staff will conduct a needs assessment to determine best strategies for reaching target groups including: decision makers, agencies, coastal landowners, and coastal developers.

### ***Activity 4.2: Conduct Outreach to Agencies and Property Owners***

MBNMS will coordinate with partners to increase outreach to agencies not involved in the planning process, developers, and private property owners about regional approaches to coastal erosion, existing guidelines, and the impacts of coastal armoring.

### ***Activity 4.3: Review and Comment on Local Land Use Decisions***

MBNMS staff will track and evaluate local and regional land use decisions where coastal development may impact MBNMS resources. Where appropriate, produce verbal or written comments on specific projects.

### ***Activity 4.4: Review and Comment on Local Coastal Program Updates***

MBNMS will coordinate with the California Coastal Commission and local agencies during Local Coastal Program updates to improve existing policies and incorporate coastal armoring guidelines where possible.

*Action Plan Partners:* California Coastal Commission, United States Geological Survey, California Department of Transportation, California Department of Boating and Waterways, Local Municipalities, Research Institutions, California Department of Fish and Game, Local Jurisdictions, Local Experts, Elkhorn Slough NERR, Property Owners

Table CA.1: Measuring Performance of the Coastal Armoring Action Plan

Desired Outcome(s) For This Action Plan:	
Reduce expansion of hard coastal armoring in the coastal areas near MBNMS through proactive regional planning, project tracking, and comprehensive permit analysis and compliance.	
Performance Measure	Explanation
By 2012, complete three collaborative coastal erosion response plans for the planning sub-regions of the MBNMS.	MBNMS will track performance annually through the development of three detailed plans for three sub-regions that will include: an analysis of coastal erosion and management response including an analysis of local and regional alternatives to manage coastal erosion.

Table CA.2: Estimated Timelines for the Coastal Armoring Action Plan

Coastal Armoring Action Plan	YR 1	YR 2	YR 3	YR 4	YR 5
<b>Strategy CA-1: Conduct Issue Characterization and Needs Assessment</b>	●	—————▶			
<b>Strategy CA-2: Develop and Implement Regional Approach to Coastal Armoring</b>		●	—————●		
<b>Strategy CA-3: Improve Permit Program</b>	●	●			
<b>Strategy CA-4: Implement Programs and Increase Training</b>				●	—————▶
Legend					
Year Beginning/Ending	:	● ——— ●	Major Level of Implementation:	—————	
Ongoing Strategy	:	● ———▶	Minor Level of Implementation:	.....	

Table CA.3: Estimated Costs for the Coastal Armoring Action Plan

Strategy	Estimated Annual Cost (in thousands)*				
	YR 1	YR 2	YR 3	YR 4	YR 5
<b>Strategy CA-1: Conduct Issue Characterization and Needs Assessment</b>	\$198	\$98	\$106	\$64	\$80.4
<b>Strategy CA-2: Develop and Implement Regional Approach to Coastal Armoring</b>	\$17	\$53	\$61	\$33	\$24
<b>Strategy CA-3: Improve Permit Program</b>	\$8	\$8	\$8	\$8	\$4
<b>Strategy CA-4: Implement Programs and Increase Training</b>	\$4	\$14.5	\$19.5	\$15.5	\$11.5
<b>Total Estimated Annual Cost</b>	<b>\$227</b>	<b>\$173.5</b>	<b>\$194.5</b>	<b>\$120.5</b>	<b>\$119.9</b>

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



# **Desalination Action Plan**

## **Goal**

Minimize the impacts to sanctuary resources and qualities from desalination activities.

## **Introduction**

Desalination is the process by which salts and other chemicals are removed from salt or brackish water and other impaired water resources. It is also known as desalinization or desalting or commonly referred to as “desal.” As traditional sources of fresh water continue to be depleted and degraded, society is increasingly looking toward desalination as an option for obtaining water for both private and municipal freshwater supply. Various water project proponents are increasingly attracted to desalination due to increasing efficiency in desalting technologies’ ability to produce the water as well as escalating costs of obtaining fresh water from conventional sources.

Three desalination facilities currently operate within the boundaries of the Monterey Bay National Marine Sanctuary (MBNMS); however, there has recently been an increase in interest for both private and public desalination plants. Approximately ten facilities have recently been proposed. Rather than utilizing a coordinated regional planning approach, each plant has been conceived and designed as a separate project. Due to population growth in the area, continuing shortages and degradation of conventional water supplies, and advances in desalination technology, the trend will likely continue.

Desalination plants can impact the marine environment through the introduction of brine effluent and other substances to MBNMS waters. Construction of desalination facilities and associated pipelines often causes alteration of the seabed. Intake of water directly from the ocean typically results in biological impacts as a result of impingement and entrainment. Impingement is when organisms collide with screens at the intake, and entrainment is when species are taken into the plant with the feed water and are killed during plant processes. In addition, desalination facilities bring a potential for community growth. Along most of California’s central coast, fresh water supply is the limiting factor for community growth. With the addition of an unlimited source of freshwater, growth can be allowed to occur. While population growth is not addressed directly by MBNMS regulations, it is of major concern. Significantly increased development of the coastline adjacent to the MBNMS could lead to degradation of water quality and many other challenges to the protection of MBNMS resources.

This action plan is developed as a regional approach to address desalination, aimed at reducing impacts to marine resources in the MBNMS through consideration of regional planning, facility siting issues, on-site mitigation measures, modeling and monitoring, and outreach and information exchange.

## **Desalination in the Sanctuary**

Three of the Sanctuary’s regulations relate directly to desalination. The first involves a prohibition on discharging or depositing any material or other matter within Sanctuary

boundaries. Since the brine effluent, and in some cases other material, are usually disposed of in ocean waters, this activity requires Sanctuary authorization of Regional Water Quality Control Board (RWQCB) permits. The second Sanctuary regulation pertains to discharging material or other matter outside of the boundaries, which subsequently enter Sanctuary waters and injure MBNMS resources or qualities. As with the previous regulation, Sanctuary approval via authorization of the RWQCB permit is required. The third relevant regulation involves a prohibition on activities that alter the seabed. Thus installation of certain desalination facility structures such as an intake/outfall pipeline on or beneath the ocean floor would also require Sanctuary authorization.

Three small desalination plants currently operate in the Sanctuary:

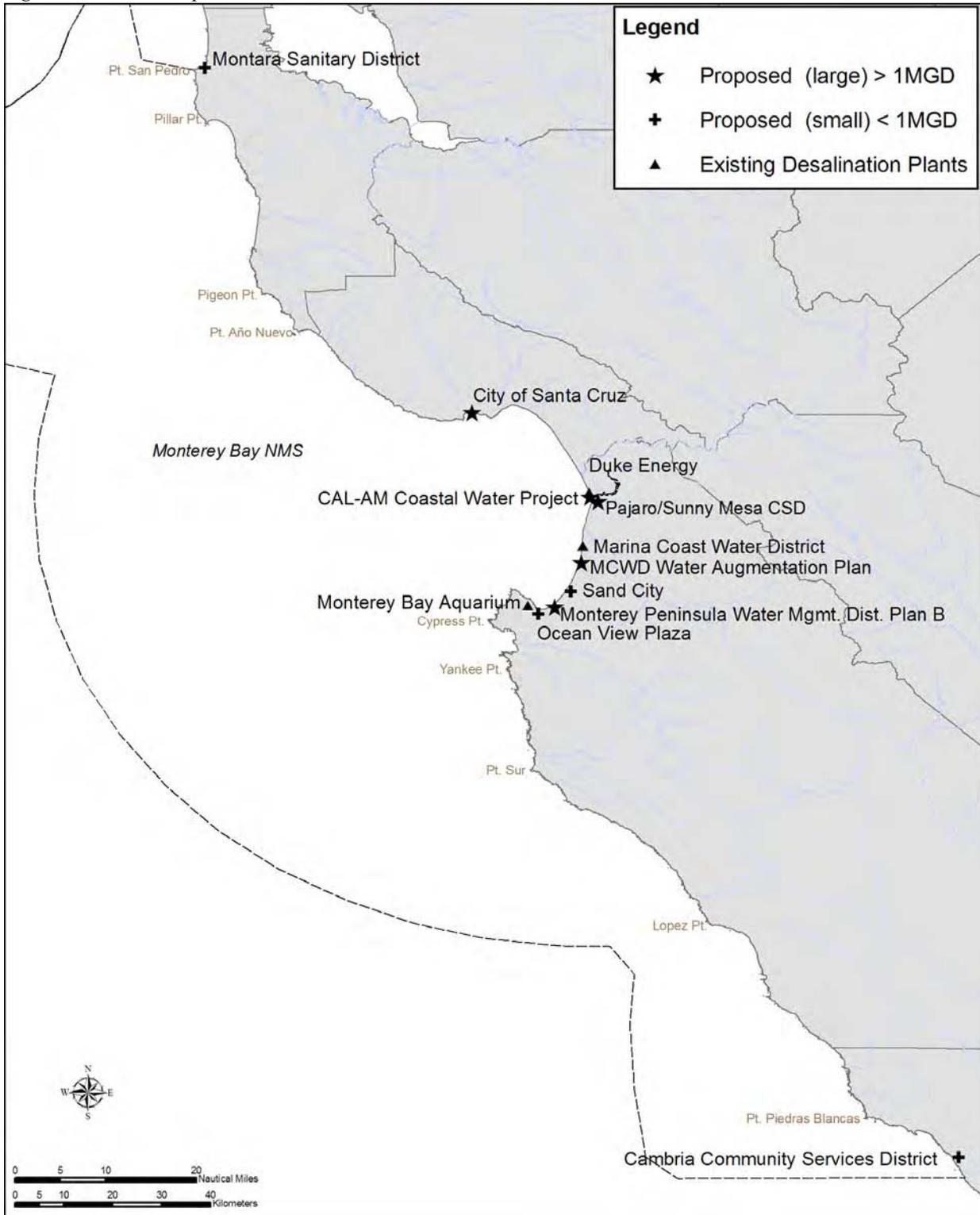
*Duke Power Plant* in Moss Landing contains a seawater distillation plant that produces a little less than 0.5 million gallons per day (MGD) for use in its boiler tubes for the power production process. This facility uses power plant cooling water as the source for the desalination feed water and brine effluent discharge. Due to the large volume of cooling water being discharged by the plant, the brine effluent is diluted and impacts from the salinity are eliminated.

*Marina Coast Water District* in the City of Marina operates a small plant with the capacity of 0.45 MGD, which currently supplies about 13 percent of the city's annual municipal water consumption. This plant uses a beach well for intake water and an injection well for discharging brine effluent. This facility, originally built in 1996, will be renovated in the near future with new technologies that will greatly increase its efficiency.

*The Monterey Bay Aquarium* operates a very small facility that provides about 0.040 MGD for maintenance purposes such as flushing the toilets. The saline brine discharge is blended with, and effectively diluted by, the exhibit water outfall.

Although there are currently only three facilities in operation, there has recently been an increase in proposals for both private and public desalination plants. Approximately ten additional facilities in the Sanctuary region are in some stage of initial consideration or planning (See Figure DESAL-1). These range from small, less than 0.050 MGD private facilities such as the proposed reverse osmosis plant for the Ocean View Plaza to be built on Cannery Row in Monterey, to larger multi-city regional projects like the ones Cal-Am and Pajaro Sunny Mesa Community Services District are currently investigating. There are also several proposals for smaller projects to serve a single city, such as the proposed plants in Cambria or Sand City. Due to population growth in the area, continuing shortages and degradation of conventional water supplies, and advances in desalination technology, the trend will likely continue.

Figure DESAL-1. Proposed or Potential Desalination Facilities



## **Strategy DESAL-1: Develop and Implement Regional Desalination Program**

MBNMS will collaborate with partners to encourage the development and implementation of a regional planning program to address desalination facility development and operation in the MBNMS. A comprehensive regional approach to desalination issues would likely help minimize the impacts to resources by providing increased coordination and planning among desalination proponents and relevant agencies that are now addressing a multitude of independent desalination proposals.

### ***Activity 1.1: Encourage the Development of and Provide Input to a Regional Planning Program***

The MBNMS staff will collaborate with partners in the development and implementation of a regional planning approach to desalination that considers siting, volume of water requested, service areas, and potential collaborations. The following system standards and an analysis will be incorporated into the program:

- A. Develop and implement a system for improved coordination among agencies involved in permitting desalination, and among interested parties, in implementing the following strategies and activities in this action plan.
- B. Ensure opportunity for input from local jurisdictions and the interested public.
- C. Investigate potential for and encourage use of full capacity of existing desalination facilities before approval of construction of new plants.
- D. Develop and implement a system to improve tracking of new desalination proposals in order for the MBNMS and other agencies to enter into discussion with desalination plant proponents and interested parties early on in the process.
- E. Evaluate regional opportunities for joint facilities serving multiple jurisdictions, collocation of facilities at existing discharge sites, etc. Evaluate advantages and disadvantages of joint facilities versus several smaller well-sited plants.
- F. In collaboration with the California Coastal Commission, consider the ramifications of public versus private ownership of desalination facilities.
- G. Facilitate assessment and analysis of the potential growth inducing impacts of desalination plants in the region with other interested agencies and parties. Affected local governments, Association of Monterey Bay Area Governments (AMBAG), the Coastal Commission and other appropriate land use entities will be looked to for providing information and analysis on potential growth inducing impacts.

## **Strategy DESAL-2: Develop Facility Siting Guidelines**

Environmental impacts in large part depend on specific physical and biological conditions in the vicinity of the facility, including the intake and outfall. Through proper siting of facilities and intake/outfall structures, impacts can be minimized. The goal of this strategy is to develop and implement a set of desalination facility siting guidelines and recommendations to minimize impacts to MBNMS resources and qualities.

***Activity 2.1: Identify Preferred Conditions and Habitats***

Building on the work done by California Department of Fish and Game and others, identify preferred conditions and habitats types that are the most resilient to the impacts of brine effluent, as well as sensitive species and habitats where brine effluent disposal should be avoided.

***Activity 2.2: Develop Intake/Outfall Siting Guidelines***

The MBNMS will coordinate with the appropriate regulatory agencies to develop and implement recommendations and guidelines for siting of intake and outfall structures, which require appropriate outfall siting and design that ensures adequate mixing and dilution of brine effluent. Considerations for siting include avoiding areas with limited water circulation and ensuring discharge to an appropriate depth and distance offshore. Guidelines should encourage use of appropriately sited existing pipelines of acceptable structural integrity to minimize seabed alteration. Other considerations include mixing of brine effluent with power plant cooling water or sewage treatment plant discharges where appropriate and ensuring that temporal variations in operation and maintenance of facilities are addressed to ensure sufficient dilution of brine effluent. In cases where new pipeline construction is required, it is vital to ensure proper routing and construction techniques to minimize environmental impacts e.g., impingement and entrainment, recreational impacts, potential for the effluent to be entrained in the intake, and potential for concentration of contaminants in the feed water.

***Activity 2.3: Ensure Comprehensive Consideration of Potential Impacts***

The MBNMS will coordinate with the appropriate regulatory agencies, to develop and implement recommendations and guidelines to ensure that planned facilities consider:

- A. Aesthetic, recreational, public access, and safety aspects
- B. The effects of surface waves, circulation, density, and mixing, on the dispersal of brine effluent
- C. Surface wave and sea level effects and geological considerations, including earthquake hazards, liquefaction, sand transport patterns, and beach erosion rates for proposed structures to be located on or near beach
- D. Alternatives analysis for water supply needs and supply options under NEPA and CEQA
- E. Emergency contingencies and incorporation of system-wide fail-safe technologies to address the potential for emergency scenarios (mechanical failures, terrorist attacks, etc.)
- F. Potential cumulative impacts from multiple facilities

**Strategy DESAL-3: Identify Environmental Standards for Desalination Facilities**

Specific engineering and design aspects of desalination plants are a major determinant of the severity of the impacts to the marine environment. There is an increasing range of technologies available, including many promising new advances in intake design, pretreatment, reverse osmosis, and brine disposal technology. This strategy defines and seeks to implement environmental standards for desalination facilities operating in the MBNMS. The MBNMS will collaborate with partners to define specific standards that proposed facilities would be required to meet through proper design and engineering. Compliance with standards shall be measured using requirements included in Strategy DESAL-4: Modeling and Monitoring Requirements.

***Activity 3.1: Define Limits for Constituents of Brine Effluent***

MBNMS staff will collaborate with the appropriate regulatory agencies to define and implement limits for salinity levels, toxicity, anti-corrosion additives, and other constituents of brine effluent. Standards shall take into consideration potential cumulative impacts from multiple facility operations.

***Activity 3.2: Define Entrainment and Impingement Standards***

MBNMS staff will coordinate with partners to define and implement environmental standards for entrainment and impingement including identification of preferred designs, screening, intake well siting, and maximum flow velocities. Standards shall also consider potential cumulative impacts from multiple facility operations.

**Strategy DESAL-4: Develop Modeling and Monitoring Program**

MBNMS will work with partners to develop a comprehensive modeling and monitoring program to determine predicted properties of brine plume and measure short-term, long-term, and cumulative impacts. The program will include information requirements for parties seeking permits, as well as a multi-tiered modeling and monitoring program. This multi-tiered approach includes identifying different levels of requirements based on characteristics of a proposed facility such as its location, the biological sensitivity of the habitat near its intake and outfall, specific properties of the brine discharge plume, and other characteristics.

***Activity 4.1: Establish Regional Modeling Guidelines***

MBNMS staff will coordinate with partners to establish and implement regional guidelines for modeling of expected brine effluent plumes by evaluating accuracy of existing plume and circulation models applied to desalination, including field testing, if necessary, and identifying acceptable models.

***Activity 4.2: Identify Submittal Information Required for Project Application***

MBNMS staff will coordinate with the appropriate regulatory agencies to identify the minimum requirements for the standard information submitted by the applicant for any proposed facilities seeking permits. These should include:

- A. Initial evaluation of recreational, public use, and commercial impacts in vicinity of desalination facility
- B. Initial monitoring to determine currents, tides, water depth and similar parameters of receiving waters
- C. Pre-construction biological analysis, with consideration of seasonal variability, of marine organisms in the affected area and control site to include indices, species richness, and abundance, along with evaluation of entrainment and impingement impacts
- D. Pre-construction estimation of expected brine composition, volumes, and dilution rates of the brine in the zone of initial dilution
- E. Plan for toxicity testing of the whole effluent as an ongoing monitoring requirement
- F. Studies to determine properties of combined discharges (cooling water or sewage), and their effects and toxicity on local species

- G. Post-operational monitoring of salinity in zone of initial dilution and control site, as an indicator for plume spreading and dispersal, to be compared with expected results from plume and circulation modeling; if not in compliance, then identify and implement corrective actions
- H. End of pipe monitoring program to verify results from expected brine composition and dilution
- I. Facility plans, and anticipated operations and management plans, including identification of potential land and water use implications stemming from plans to ensure public safety against possible hostile actions

***Activity 4.3: Identify Additional Submittal Requirements for Projects in Sensitive Areas***

Staff will coordinate with the appropriate regulatory agencies to identify additional requirements for those proposed facilities that may affect sensitive habitats or may have increased or significant impacts on coastal resources. Based upon sensitivity of habitat in vicinity of the discharge and size of zone of initial dilution, additional requirements may include:

- A. Pre-construction monitoring of affected area as well as a control site to include sampling of water column and sediments
- B. Post operational monitoring of affected area as well as a control site, to include sampling of water column and sediments, to be compared with pre-operational monitoring results
- C. Post operational monitoring of oxygen levels, turbidity, heavy metals or other chemical concentrations with regard to water quality standards
- D. Post operational sampling of sediments for heavy metals to monitor possible accumulation (possible bio-monitoring to sample tissues for heavy metals)
- E. Post operational biological analysis of marine organisms in the affected area and control site, including indices, species richness, and abundance to be compared with the pre-operational results
- F. Monitoring of long-term impacts of discharge (e.g. potential changes in species composition etc.)

***Activity 4.4: Coordinate Enforcement and Permit Compliance***

The MBNMS will coordinate with state partners to evaluate permitted desalination facilities and follow up to ensure compliance with conditions of permits and authorizations.

***Activity 4.5: Determine Cumulative Impacts from Multiple Facilities***

MBNMS staff will coordinate with partners and other agencies to develop and implement a regional monitoring program to evaluate cumulative impacts from multiple facilities, including methods to assess impacts of saline brine effluent and cumulative entrainment and impingement.

**Strategy DESAL-5: Conduct Outreach and Information Exchange**

Extensive outreach on the guidelines and recommendations developed by this working group will be conducted.

***Activity 5.1: Continue Participation in Other Desalination Initiatives***

MBNMS staff will continue to participate in other desalination initiatives, including state and federal task forces and workgroups, and will actively seek to include the information and relevant recommendations resulting from those efforts into this action plan, as appropriate.

***Activity 5.2: Develop Outreach Plan for MBNMS Desalination Guidelines and Regulations***

MBNMS staff will develop and implement a program for outreach to agencies, desalination plant proponents, and other interested parties about the guidelines as well as relevant regulations.

***Activity 5.3: Develop Outreach Plan for Information about Desalination Issues***

MBNMS will coordinate with partners to develop and implement strategies for ongoing outreach to the public and agencies regarding desalination projects, issues, and potential impacts to MBNMS resources.

***Activity 5.4: Track and Evaluate Emerging Desalination Technology***

MBNMS staff will develop a program to track and evaluate new and emerging desalination technologies, and a system to incorporate these into existing and proposed plants.

***Activity 5.5: Conduct Community Growth Impact Outreach***

MBNMS staff will work with partners to share information and concerns with agencies and local jurisdictions about the potential impacts of community growth to MBNMS resources.

*Action Plan Partners:* California Coastal Commission, Central Coast Regional Water Quality Control Board, State Water Resources Control Board, local jurisdictions, counties, land use and environmental organizations, California Department of Fish and Game, Scientific consultation, C-Clean monitoring project, Elkhorn Slough National Estuarine Research Reserve

Table DESAL.1: Measuring Performance of the Desalination Action Plan

Desired Outcome(s) For This Action Plan:	
Minimize entrainment, concentrated discharges and impacts to the seabed from desalination facility construction and operation.	
Performance Measure	Explanation
100% of new desalination plants permitted in the MBNMS have been reviewed in a coordinated regional approach and constructed consistent with MBNMS siting guidelines and environmental standards for intakes and outfalls.	MBNMS will track the review of new facility applications and determine the number of projects reviewed in a coordinated regional approach.

Table DESAL.2: Estimated Timelines for the Desalination Action Plan

Desalination Action Plan	YR 1	YR 2	YR 3	YR 4	YR 5
<b>Strategy DESAL-1: Develop and Implement Regional Desalination Program</b>	●————●		●		
<b>Strategy DESAL-2: Develop Facility Siting Guidelines</b>	●	●			
<b>Strategy DESAL-3: Identify Environmental Standards for Desalination Facilities</b>	●	●			
<b>Strategy DESAL-4: Develop Modeling and Monitoring Program</b>	●	●	.....●		
<b>Strategy DESAL-5: Conduct Outreach and Information Exchange</b>	●	—————▶			
Legend					
Year Beginning/Ending	: ●————●	Major Level of Implementation: —————			
Ongoing Strategy	: ●————▶	Minor Level of Implementation: .....			

Table DESAL.3: Estimated Costs for the Desalination Action Plan

Strategy	Estimated Annual Cost (in thousands)*				
	YR 1	YR 2	YR 3	YR 4	YR 5
<b>Strategy DESAL-1: Develop and Implement Regional Desalination Program</b>	\$24	\$25	\$21	\$9	\$8
<b>Strategy DESAL-2: Develop Facility Siting Guidelines</b>	\$20	\$20	\$4	\$0	\$0
<b>Strategy DESAL-3: Identify Environmental Standards for Desalination Facilities</b>	\$16	\$16	\$4	\$0	\$0
<b>Strategy DESAL-4: Develop Modeling and Monitoring Program</b>	\$8	\$284.4	\$29.8	\$176.4	\$0
<b>Strategy DESAL-5: Conduct Outreach and Information Exchange</b>	\$31.5	\$59.5	\$15.5	\$13	\$9
<b>Total Estimated Annual Cost</b>	<i>\$99.5</i>	<i>\$404.9</i>	<i>\$74.3</i>	<i>\$198.4</i>	<i>\$17</i>

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

## Harbors and Dredge Disposal Action Plan

### Goal

Address the need for disposal of dredged material and the continued protection of MBNMS resources and qualities.

### Introduction

There are four major harbors adjacent to the Monterey Bay National Marine Sanctuary (MBNMS): Pillar Point, Santa Cruz, Moss Landing and Monterey (See Figure HDD-2). The periodic dredging of the local harbors is a necessary component of keeping the harbor channels clear and allowing access for vessels. Dredging generally occurs within a port or harbor and

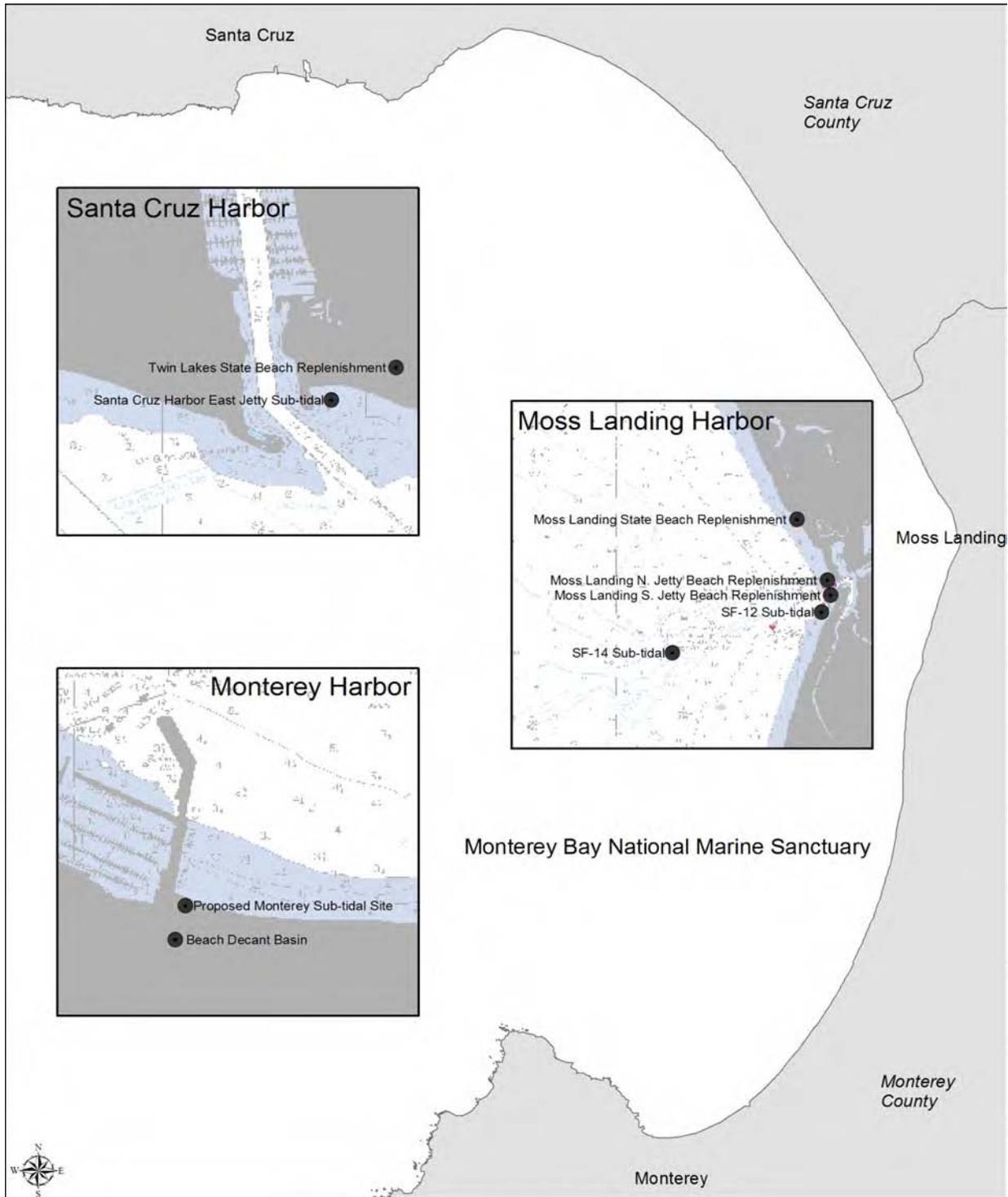
therefore outside of MBNMS boundaries. Santa Cruz and Moss Landing regularly dredge the bottom of the harbor. Harbors dispose of their dredged material either in the ocean, on land at landfill sites, or at designated beach nourishment sites adjacent to the harbors. When the MBNMS was designated in 1992, two existing offshore sites for dredge disposal were identified, and the establishment of new sites was prohibited within its boundaries. While dredging itself, within the confines of harbors, is not prohibited by MBNMS regulation, disposal of dredged material is prohibited within the MBNMS except for dredged material deposited at authorized disposal sites.

The MBNMS works with other state and federal agencies to ensure that MBNMS resources are protected during dredge disposal. The MBNMS coordinates with the California Coastal Commission, the US Army Corps of Engineers (ACOE), Environmental Protection Agency (EPA), the Regional Water Quality Control Board (RWQCB), California Department of Fish and Game (CDFG), National Marine Fisheries Service (NMFS), and the US Fish and Wildlife Service (FWS) to review and authorize dredge disposal, as well as other discharges within the MBNMS. The MBNMS reviews the composition of the sediment, volumes, grain size, and associated contaminant load to determine if the dredge sediments are appropriate for disposal in the ocean and comply with the provisions of the NMSA.

Figure HDD-1 – Moss Landing Harbor



Figure HDD-2. Harbors and Dredge Disposal Sites



### **Strategy HDD-1: Improve Agency Coordination**

The MBNMS will continue to authorize, as appropriate, other agency's permits for dredge disposal and consider improving the interagency review process.

#### ***Activity 1.1: Continue to Improve and Participate in Coordinated Permit Review***

Increased efficiency, collaboration and coordination are necessary in the review of permits for dredge disposal. The MBNMS will continue to coordinate with the Coastal Commission, ACOE, and EPA to review permits and authorizations. The MBNMS will work collaboratively with others to establish an interagency Central Coast Dredge Team that would meet at regular intervals and develop a regional plan to:

- A. Improve understanding of joint agency roles
- B. Encourage harbors to undertake advanced planning and coordination that may minimize the need for emergency permits
- C. Schedule permit planning meetings with agencies and harbors in advance of the application process to address needs and collectively evaluate both the regular and emergency permit process, to include agency concerns and conditions in the permit
- D. Evaluate other joint-permit programs
- E. Where possible, align agency permits so each permit or authorization is valid for the same time interval
- F. Evaluate changes to dredge disposal practices, methods, and operations to benefit the resources, such as timing disposal events with winter storms, changing the methodology to increase oxygen levels or adding an additional pipe, where appropriate, or attempt to mimic natural sedimentation processes

#### ***Activity 1.2: Issue Multi-year Authorizations for Dredge Disposal Activities***

The authorization intervals may be increased to provide efficiency for both the harbor as well as the MBNMS. MBNMS will work with partners to coordinate the timing and conditions of the multi-year permit process. The MBNMS will also work with partners to evaluate multi-year authorizations and the conditions of the authorizations to include additional testing, or sampling and monitoring requirements as necessary.

#### ***Activity 1.3: Enforcement and Permit Compliance***

The MBNMS will coordinate with partners to monitor dredge activities and follow up to ensure compliance with conditions of permits and authorizations.

### **Strategy HDD-2: Review Offshore Dredge Disposal Activities**

MBNMS recognizes four sites as approved for disposal of dredged material including SF-12, SF-14, and limited disposal sites at Monterey and Santa Cruz Harbor. MBNMS will review and process permit applications for these sites consistent with these locations. Further analysis of additional sites or modifications to existing sites may occur as necessary; however, a modification to the Designation Document and regulations would be required to allow dredged material to be deposited at a disposal site not authorized prior to January 1, 1993.

***Activity 2.1: Review Santa Cruz Dredge Disposal Activities***

MBNMS will continue to work with its partners and the Santa Cruz Port District in reviewing proposals to dispose of dredged material at the Twin Lakes Disposal Site adjacent to the harbor entrance. The MBNMS will also coordinate with partners in reviewing future applications to modify the disposal area or location.

***Activity 2.2: Review Dredge Disposal Activities at Monterey Harbor***

MBNMS staff will continue to work with its partners and the City of Monterey in reviewing proposals to dispose of dredged material at its site adjacent to Wharf 2, adjacent to the harbor.

***Activity 2.3: Review Dredge Disposal Activities at Redefined SF-12 (Moss Landing)***

MBNMS staff will continue to work with its agency partners including the Environmental Protection Agency, Army Corps of Engineers, and California Coastal Commission in reviewing proposals to dispose of dredged material at EPA Dredge Disposal Site SF-12. Proposals will utilize the redefined location of SF-12 adopted in 2005 to ensure disposal of dredged material at the head of the Monterey Canyon.

***Activity 2.4: Coordinate with Gulf of the Farallones National Marine Sanctuary (GFNMS) in Evaluation of Dredge Disposal Site for Pillar Point Harbor***

The Pillar Point Harbor has not been dredged since the 1980's when the inner harbor was created. The harbor is considering dredging the outer and inner harbor areas to eliminate sedimentation that has accumulated. The estimated volume of this project would be approximately 72,000 cubic yards for the maintenance-dredging component. Upon submission of a project application, MBNMS will coordinate with the GFNMS to evaluate options for allowing maintenance of this local harbor disposal. MBNMS will also coordinate with GFNMS to explore ways to better manage dredging needs as identified in Strategy HDD-3. Any addition of dredge disposal sites to the MBNMS would require modifications to the regulations and Designation Document.

**Strategy HDD-3: Coordinate with Sediment Monitoring and Reduction Programs**

This strategy recognizes the need to track and evaluate the call for increased disposal volumes, identify areas where improvements could be made to reduce increased sedimentation in harbors, evaluate contamination levels and sources, and conduct research to minimize information gaps.

***Activity 3.1: Assess Changes in Aquatic Disposal Volumes***

Harbors abutting the MBNMS have applied for and received significant increases in the permit volume of dredge disposal sediments over the past ten years. The Santa Cruz Harbor has increased its allowable permit volume by greater than 275 percent of the disposal quantity identified at the time of MBNMS designation. The Moss Landing Harbor has increased its allowable permit volume by 100 percent since MBNMS designation. In both instances, the MBNMS has authorized these increases. There are currently information gaps as to why this permitted increase is needed. MBNMS will work with the EPA, ACOE and harbors to develop an interagency database for tracking volumes and sediment types while facilitating submittal of electronic data, increase accessibility for the public via a website, and work with others to

promote monitoring at designated disposal sites to establish and evaluate long-term trends and related habitat and biological impacts from increased volumes.

***Activity 3.2: Coordinate with Sediment Reduction Programs***

In order to reduce the amount of material dredged from harbors, the MBNMS will encourage reduction of the amount of sediment entering the harbors by evaluating the watershed as a whole to determine where sediment reduction efforts could be implemented. MBNMS will work with partners to promote retention of sediment in the watershed. The MBNMS will continue to encourage these efforts with the agricultural and rural community as part of the MBNMS Agriculture and Rural Lands Plan, which encourages farmers, ranchers, and rural landowners to use conservation practices on their properties to reduce runoff in the form of sediments, nutrients and pesticides. The MBNMS will also work with others to prevent urban runoff and sedimentation into the watersheds. The MBNMS will also work with partners to explore tools to reduce entrapment of sediments by harbors, breakwaters, and other structures.

***Activity 3.3: Address Dredge Sediments Contamination***

Contamination is typically associated with fine-grain sediment where higher sand contents and larger grain sizes are relatively free of contamination. The physical characteristics of the sediment play a role in the strength of chemical adsorption and the active surface area of the particles. Contamination is a particularly acute problem in the sediments at Moss Landing. MBNMS will encourage partners to coordinate with the MBNMS Water Quality Protection Program to identify the upland sources of contaminated sediment and actively manage contamination, including pesticides, biological contaminants, PCB's, Butyltins, DDT, and other pollutants.

***Activity 3.4: Coastal and Estuarine Erosion and Sediment Flow***

In coordination with implementation of the Coastal Armoring Action Plan, the MBNMS will encourage partners to analyze coastal and estuarine erosion associated with harbor dredging and dredge disposal and to further characterize sediment flow. Further monitoring of dredging and disposal activities must be associated with future projects to evaluate the fate of sediments at Santa Cruz Harbor and Moss Landing Harbor and to evaluate potential exacerbation of tidal scour in Elkhorn Slough associated with dredging of Moss Landing Harbor.

**Strategy HDD-4: Disposal of Fine-Grained Material**

The disposal of fine-grained material is authorized at SF-12 and SF-14 and on a limited basis at the Santa Cruz Harbor/Twin Lakes disposal site. When determining if material is suitable for intertidal and subtidal disposal on local beaches adjacent to the harbors, EPA guidelines state that material for disposal must be at least 80 percent sand.

***Activity 4.1: Continue to Evaluate Grain Sizes of Dredged Material***

MBNMS will continue to coordinate with EPA/ACOE to evaluate sediment disposal suitability and coordinate on any project that would vary from EPA national guidelines on a case-by-case basis. The MBNMS will analyze any variances from those guidelines to ensure adequate protection of MBNMS resources and qualities and coordinate with other agencies to determine criteria for disposing dredged material that is less than 80 percent sand.

## **Strategy HDD-5: Alternative Disposal Methods**

Approximately 98 percent of harbor sediments appropriate for unconfined aquatic disposal have been authorized by the MBNMS for disposal in the marine environment. Occasionally, there may be other uses for dredged sediments that meet standards for the given beneficial use. The Santa Cruz Harbor and the Moss Landing Harbor both have areas adjacent to the harbors that have been designated as beach nourishment sites. Both harbors dispose dredged material below mean high water at those locations. Two additional areas at Moss Landing (Zmudowski Beach and the north jetty) are deemed beach nourishment sites. These sites are above mean high water and therefore outside of the MBNMS. These sites are not authorized by the MBNMS for subtidal disposal. Disposal at Zmudowski Beach and the north jetty has not taken place since MBNMS designation. Any future disposal there would need to be accomplished above mean high water. At this time there does not seem to be a need for additional beach nourishment sites within the MBNMS, except for possibly at Pillar Point Harbor. However, the MBNMS will work together with other state and federal agencies to evaluate the potential future need for beach nourishment at locations within the Sanctuary and will collaborate with other agencies to conduct long-term planning and analysis related to this issue.

### ***Activity 5.1: Evaluate Potential Beneficial Use of Dredged Materials***

MBNMS will work with partners to examine the potential beneficial uses for dredged material. Recognizing that littoral sand is a MBNMS resource for various habitat, recreation, access and shoreline protection reasons, MBNMS and other agencies should identify if, when and where beach nourishment is appropriate. As discussed in the Coastal Armoring Action, MBNMS may identify the criteria and data needed to make that determination, including an evaluation of sand transport and science needs and pursuit of a comprehensive research strategy. In addition, MBNMS will work with partners to assess individual and cumulative impacts to sand transport and shoreline dynamics due to existing harbors and artificial groins within the MBNMS. Studies should estimate the quantity of sand and sand-generating beach material that is trapped by such structures and assess means to bypass such material and replicate natural processes to the degree feasible. If investigations indicate that employment of additional beach nourishment sites using clean dredged harbor material would be possible and appropriate, MBNMS may examine whether revision of MBNMS regulations and Designation Document may be warranted; or if a beneficial program might occur via MBNMS permit or authorization in concert with other agencies.

*Action Plan Partners:* California Coastal Commission, US Army Corps of Engineers, Environmental Protection Agency, Regional Water Quality Control Board, California Department of Fish and Game, National Marine Fisheries Service, US Fish and Wildlife Service, Santa Cruz Port District, City of Monterey, Moss Landing Harbor District, San Mateo County Harbor District, Santa Cruz Harbor District, City of Santa Cruz

Table HDD.1: Measuring Performance of the Harbors and Dredge Disposal Action Plan

Desired Outcome(s) For This Action Plan:	
Increase interagency coordination to ensure protection of MBNMS resources while allowing harbors to remain open for navigation.	
Performance Measure	Explanation
By 2012, dredge disposal permits will be authorized for the same duration among the EPA, CCC, ACOE, and MBNMS, where appropriate.	MBNMS staff will work with the various agencies to align the permitting of dredging and disposal of material where appropriate in the four approved sites in the MBNMS.

Table HDD.2: Estimated Timelines for the Harbors and Dredge Disposal Action Plan

Harbors and Dredge Disposal Action Plan	YR 1	YR 2	YR 3	YR 4	YR 5
Strategy HDD-1: Improve Agency Coordination	●————●				
Strategy HDD-2: Review Offshore Dredge Disposal Activities	●————●				
Strategy HDD-3: Coordinate with Sediment Monitoring and Reduction Program			●————▶		
Strategy HDD-4: Disposal of Fine-Grained Material			●————●		
Strategy HDD-5: Alternative Disposal Methods			●————●		
Legend					
Year Beginning/Ending	: ●————●	Major Level of Implementation: _____			
Ongoing Strategy	: ●————▶	Minor Level of Implementation: .....			

Table HDD.3: Estimated Costs for the Harbors and Dredge Disposal Action Plan

Strategy	Estimated Annual Cost (in thousands)*				
	YR 1	YR 2	YR 3	YR 4	YR 5
<b>Strategy HDD-1: Improve Agency Coordination</b>	\$14	\$14	\$5	\$5	\$5
<b>Strategy HDD-2: Review Offshore Dredge Disposal Activities</b>	\$33.8	\$20	\$4	\$4	\$0
<b>Strategy HDD-3: Coordinate with Sediment Monitoring and Reduction Program</b>	\$16	\$122.9	\$18.9	\$14.9	\$14.9
<b>Strategy HDD-4: Disposal of Fine-Grained Material</b>	\$8	\$0	\$0	\$0	\$0
<b>Strategy HDD-5: Alternative Disposal Methods</b>	\$0	\$0	\$25.2	\$25.2	\$25.2
<b>Total Estimated Annual Cost</b>	<i>\$71.8</i>	<i>\$156.9</i>	<i>\$53.1</i>	<i>\$49.1</i>	<i>\$45.1</i>

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

## **Submerged Cables Action Plan**

### **Goal**

Provide clear guidance regarding installation, operation, or removal of submerged cables to protect the resources and qualities of the MBNMS.

### **Introduction**

Installation of submerged cables in the MBNMS alters the seabed, causing environmental impacts and potential hazards for fishing activities. Submerged cables are typically used for commercial, defense or research related activities. MBNMS regulations currently prohibit alteration of the seabed, yet allow, via permit or authorization, for some otherwise prohibited activities.

MBNMS regulations in effect prohibit the installation of submerged cables. Such regulatory prohibitions include those against: drilling into, dredging or otherwise altering the seabed of the MBNMS; constructing, placing or abandoning any structure, material or other matter on the seabed of the MBNMS; moving or injuring historical resources; and discharging or depositing any material or other matter in the MBNMS. Therefore, installing submerged cables would involve violations of MBNMS prohibitions. The NMSA prohibits destroying, causing the loss of, or injuring any MBNMS resource managed under law or regulations for that Sanctuary. Prohibited activities may be conducted under certain limited circumstances to the extent they are compatible with the resource protection mandate and meet regulatory and other requirements for a MBNMS permit or other authorization.

Currently submerged cable applications are reviewed on a case-by-case basis. Policy guidance for future applicants would provide for a more efficient permitting process and inform future applicants as to preferred alternatives prior to submitting an application. In 1999, due to expanding interest in constructing submerged telecommunications cables in national marine sanctuaries, including the MBNMS, the National Marine Sanctuaries Program (NMSP) initiated a process to consider guidance for cable projects proposed for national marine sanctuaries. Also, there has been a recent increase in interest to develop cabled observatories nationwide for research and monitoring purposes, including in the MBNMS. In implementation of this action plan, the MBNMS will develop a framework to identify sensitive areas of the seafloor within the MBNMS and provide clear structure with which to review future submerged cable development applications.

MBNMS regulations recognize certain activities that may benefit the MBNMS, such as education, research, or management; thus a submerged cable that provides these benefits could be permitted under existing regulations. A proposed research cable project must demonstrate the benefit that it would provide to MBNMS, as well as that the project would have only negligible, short-term, adverse effects on Sanctuary resources and qualities. In deciding whether to issue a permit, the Superintendent shall consider such factors as: the professional qualifications and financial ability of the applicant as related to the proposed activity, the duration of the activity, and the duration of its effects; and the appropriateness of the methods and procedures proposed

by the applicant for the conduct of the activity. In addition, the Superintendent may consider other factors, as he or she deems appropriate.

The MBNMS may allow construction and operation of a cable for commercial purposes, such as a trans-ocean fiber optic cable. The MBNMS may issue a Special Use permit to allow specific activities in the MBNMS if such authorization is necessary to establish conditions of access to and use of any MBNMS resource. A commercial submerged cable project's continued presence on the seabed during operation is considered a special use. (Special Use Permits may be issued for the narrow range of activities that are both prohibited by NMSP regulations and will result in no adverse effect to the MBNMS resource or qualities, and thus, must meet a higher standard than other categories of permits.) The MBNMS does not consider intrusive activities related to commercial submarine cables such as installation, removal, and maintenance/repair work to qualify for a Special Use permit. Those activities would require a permit or an authorization of another agency's permit. These authorizations, if approved, generally include a variety of conditions to minimize impacts to MBNMS resources and qualities.

The NMSA requires that Special Use permits shall:

- A. Authorize the conduct of an activity only if that activity is compatible with the purposes for which the MBNMS is designated and with protection of MBNMS resources
- B. Not authorize the conduct of any activity for a period of more than five years
- C. Require that activities carried out under the permit be conducted in a manner that does not destroy, cause the loss of, or injure MBNMS resources
- D. Require the permittee to purchase and maintain comprehensive general liability insurance, or post an equivalent bond, against claims arising out of activities conducted under the permit and to agree to hold the United States harmless against such claims

### **Existing Submerged Cables in MBNMS**

Projects that include submerged cables for research, military and commercial uses are already in place within MBNMS. Known cables include:

- A. San Francisco-Honolulu 1903 telegraph cable, decommissioned
- B. Pioneer Seamount Cable (formerly Acoustic Thermometry of Ocean Climate (ATOC)), presently under the responsibility of the National Oceanic and Atmospheric Administration (NOAA) Oceanic and Atmospheric Research Division, used for passive acoustic research, <http://oceanexplorer.noaa.gov/explorations/sound01/sound01.html>
- C. Pt. Sur cable, U.S. Navy, used for research
- D. Monterey Inter-Shelf Observatory (MISO) cable, owned and operated by the Naval Postgraduate School for oceanographic research, [www.oc.nps.navy.mil/~stanton/miso/](http://www.oc.nps.navy.mil/~stanton/miso/)
- E. Orpheus, National Marine Sanctuaries Program, video link to the Mystic Aquarium and Institute for Exploration, <http://www.mysticaquarium.org/index.cgi/1670>
- F. Monterey Acoustic Research System (MARS) Cable, Monterey Bay Aquarium Research Institute, <http://www.mbari.org>
- G. Unknown coaxial cable, near ATOC cable

## **Strategy SC-1: Identify Routing and Zones for Submerged Cable Projects**

The MBNMS recommends keeping submerged cables out of special management areas such as national marine sanctuaries and state marine protected areas. The MBNMS exercises a precautionary, comprehensive approach to installation of cables in the MBNMS. Before permitting any installation of a cable, the MBNMS will consult with the affected state and federal agencies and interested persons to determine the route which best meets the MBNMS requirements.

### ***Activity 1.1: Identify Environmentally Sensitive Areas***

The MBNMS will develop, and update annually as more refined data become available, Geographic Information System (GIS) data layers of environmentally sensitive habitat areas on a broad, MBNMS-wide scale, using the best available data. The MBNMS's permitting staff will use this data as a guide to identify areas to avoid, as well as potential cable laying regions. Initially this map will include fragile habitats, known archaeological sites, and other areas of concern:

- A. High-relief rocky substrate and other hard bottom areas
- B. Sea grass communities
- C. Areas known or likely to have maritime heritage resources
- D. Kelp forests
- E. Critical habitat for endangered or threatened species
- F. Areas set aside as state or federal marine protected areas
- G. Known spawning aggregation areas
- H. Estuarine habitats
- I. Essential Fish Habitat
- J. Cold seep communities
- K. Marine trenches, valleys or canyons, regarding the likelihood of (a) cable breakage and resulting repair impacts and (b) suspensions and resulting entanglement risk

The map will also include:

- A. All known cables in the MBNMS, active, inactive and stored
- B. Other known structures, such as pipelines, outfalls, and buoys
- C. Known research sites where cable construction would interfere with the research
- D. Location of present and historic trawling areas within the MBNMS
- E. Characterization of the coast and landfalls (e.g. cliffs, dunes, sediment type)

This database system should become integrated with Sanctuary Integrated Monitoring Network (SIMoN) to facilitate use by other agencies and the public.

### ***Activity 1.2: Develop Guidelines for Siting Constraints for Submerged Cables***

Submerged cables will generally not be permitted in the environmentally sensitive habitat areas. However, the MBNMS may allow submerged cables to be built into or through these areas where they will have clear and demonstrable resource management, research, and/or educational value.

- A. The MBNMS may set restrictions for the number of cables that will be allowed in certain areas, as “corridors” for future cables. This is designed to establish clearer guidance for future cable applicants and more predictability about future routing of cables.
- B. The MBNMS will produce these guidelines after completing Activity 1.1 and consulting with interested parties and stakeholders.

These guidelines would be considered a work in progress, to be updated by MBNMS annually. MBNMS will continue to work to improve the level of understanding and knowledge about the laying and operation of submarine cables. As new information and technology develops, the policies and permit requirements and conditions will evolve accordingly.

### **Strategy SC-2: Develop Submerged Cable Project Permit Guidelines**

MBNMS regulatory prohibitions require issuance of a permit or authorization before any proposed submerged cable project can be built. If the MBNMS decides to allow a cable project, it may impose terms and conditions on such authorization consistent with the purposes for which the MBNMS is designated.

#### ***Activity 2.1: Refine and Implement Permit Pathway and Applicant Guidelines***

The following steps in the permit and application process will be refined and/or implemented.

##### ***A. Permit Process***

The MBNMS has distinct authorities to allow for the conduct of specific prohibited activities, such as cable installation, within national marine sanctuaries. The most commonly used authority is found in NMSP regulations (15CFR Part 922) to allow certain types of activities, such as, research, education and resource management, to occur in instances where it would otherwise be prohibited by the NMSP regulations. In addition NMSP regulations also allow “authorization” of other-agency permits for prohibited activities that do not qualify for a research or other permit. The other authority derives from Section 310 of the NMSA. This authority, named “special use permits” by the statute, is generally used for commercial activities requiring access to or use of sanctuary resources, whereas research permits are issued for bona fide research activities. The installation, maintenance, or removal of the cable would require a permit or an authorization, whereas the continued presence of a commercial cable could be permitted in appropriate circumstances with a Special Use Permit. Permits would be required by MBNMS for the following activities related to submerged cables:

- B. Discharging or depositing, from within the boundary of the MBNMS, any material or other matter

Drilling into, dredging or otherwise altering the seabed of the MBNMS; or constructing, placing or abandoning any structure, material or other matter on the seabed of the MBNMS

Taking any marine mammal, sea turtle or seabird in or above the MBNMS

##### ***C. Project Description***

The project applicant initially provides a complete and thorough application in order to facilitate the permit process. Specifics and detail enable MBNMS permitting staff to evaluate the proposed project more quickly.

##### ***D. Site Characterization and pre-construction surveys***

Biological, cultural and habitat surveys along the proposed and alternative cable routes must be completed in advance by the project applicant. Project applicants may be required to collect baseline data in order to properly assess post-deployment impacts.

The site characterization shall include the percent of the route where the cable can be buried and expect to remain buried over the cable lifetime. This characterization should also include penetration depths of bottom fishing activities and expected anchor penetration depths of vessels using the area. Other factors such as wave energy intensity, bottom current strength, seasonal sand/sediment movement, coastal erosion rates of the shore landing relative to the cable project's life, landslide and other geological hazards should also be addressed.

- E. *National Environmental Policy Act (NEPA) Review and Interagency Cooperation*  
MBNMS will coordinate with other federal and state agencies throughout the permitting process. MBNMS will usually act as a Federal Lead Agency in the NEPA process, and as such will work with the State Lead Agency to produce a joint NEPA/CEQA document. For every project considered, the environmental impact analysis must evaluate, at a minimum, the following topics:

Potential cumulative impacts

Feasible alternatives to transiting MBNMS, including alternative routes over land

Potential impacts to habitat from laying the cable (e.g., trenching) and long-term placement of the cable in its location

Potential for impacts on sensitive, threatened and endangered species and their habitats

Potential impact on submerged cultural resources, and traditional cultural uses

Potential impacts of removing the cable at the end of its useful life

Potential socioeconomic impacts (e.g., fishing interests, ecotourism, etc.)

***Activity 2.2: Identify Development Standards***

MBNMS staff will identify development standards for the following issues:

A. *Cable Laying, Installation and Burial*

Required burial depth and preferred cable laying techniques will be identified. Cables shall be buried to a depth pre-determined by the project applicant and approved by the MBNMS Superintendent. Optimal burial depth is specific to site, other human uses, and bottom type. It accounts for the uses of seabed, including the cable, and is required to be at a depth sufficient to avoid conflicts with other ocean users and industries. Optimal burial depth also ensures that the natural sediment conditions will not unbury the cable with time. The project applicant shall also use the best available proven technology to bury the cable and to alleviate the potential for strumming when passing through rocky habitats. MBNMS will develop criteria to determine the preferred method of installation for a new conduit in a given location.

B. *Onshore Landing and Drilling*

All proposed sites for shore crossings and cable landings must first consider using any pre-existing available onshore conduits. If there are no pre-existing conduits, or available conduits do not suit the project, then a new conduit may be proposed. Additionally, proposed sites for shore crossings and cable landings must first consider utilizing co-landings or the installation of more than one cable in a single conduit through the nearshore environment. The use of co-landings would minimize the potential impacts associated with directional drilling or beach trenching operations.

C. *Cable Removal*

MBNMS regulations prohibit “drilling into, dredging, or otherwise altering the seabed of the MBNMS, or constructing, placing or abandoning any structure, material or other matter on the seabed of the MBNMS.” Therefore, per the regulations, the project applicant must remove all of the cable within MBNMS at the termination of the cable project. Upon the conclusion of the cable project, MBNMS may support the transfer of a cable to a new project applicant, provided that applicant is granted the necessary MBNMS permits. Permit review for a transfer would include a cable integrity analysis to evaluate the status and expected future viability of the cable and other information as required by MBNMS. New project applicants would have to agree to all existing terms of existing permits or authorizations, including cable removal. Storage of cable offshore, within the MBNMS boundary, would not be allowed.

D. *Cable Monitoring*

A monitoring strategy will be developed for both post-construction and for the life of the project. The project applicant will be required to monitor the cable throughout its permitted life for cable integrity, burial depth and its effects on the benthos. The feasibility of monitoring may be challenging and the costs associated with monitoring are likely to be high. MBNMS may also choose to monitor the cable, and if so, will notify the cable applicant and provide it with the results of the survey.

***Activity 2.3: Identify Standard Permit Conditions***

In addition to developing a list of general and special permit conditions, MBNMS will work with other agencies to develop a comprehensive list of all permit requirements for submerged cable projects.

***Activity 2.4: Consider Standard Fee Structure for Submerged Cable Continued Presence on Seafloor and Operation***

MBNMS staff will consider a Special Use Permit standard fee structure for monitoring and operation of submerged cables within the MBNMS. Special Use Permits can be issued for appropriate commercial activities that require access to and use of any MBNMS resource. Pursuant to the NMSA, a fee may be assessed for any approved commercial submerged cable project. This fee includes:

- A. The costs incurred, or expected to be incurred by MBNMS, to issue the permit (including labor, printing costs, and contracts for the preparation of supporting documentation). The MBNMS Superintendent would provide a cost estimate once a project is defined. However, if additional environmental studies are required by MBNMS, the applicant is responsible for study costs.
- B. The costs incurred, or expected to be incurred by MBNMS, as a direct result of the conduct of the activity for which the permit is issued, including the costs of monitoring the conduct of the activity (includes amounts to fund monitoring projects designed to assess the success or failure of the permittee to comply with the terms and conditions of the permit. Costs may also include money to fund a compliance monitoring program and to recoup any costs incurred by the NMSP in enforcing permit terms and conditions). These costs on existing projects tend to be very high due to the challenging nature of monitoring a project on the ocean floor.

- C. An amount that represents the fair market value of the use of the MBNMS resource (calculated using economic valuation methods appropriate to the situation).

MBNMS will require the project applicant to post a bond to cover the costs of negative impacts resulting from the cables, to ensure permit condition compliance, and to provide for cable removal.

***Activity 2.5: Enforcement and Permit Compliance***

The MBNMS will inspect and evaluate permitted cable activities including cable laying, maintenance and removal, and follow up to ensure that permit conditions are met.

<p><i>Action Plan Partners:</i> National Marine Fisheries Service, California Department of Fish and Game, California Coastal Commission, California State Lands Commission</p>
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Table SC.1: Measuring Performance of the Submerged Cables Action Plan

Desired Outcome(s) For This Action Plan:	
To minimize impacts to MBNMS seafloor and habitats from installation, maintenance and removal of submerged cables.	
Performance Measure	Explanation
By 2009, complete mapping of best available data on sensitive areas to avoid for cable routes.	Performance toward meeting the objectives can be measured incrementally by identifying the amount of mapping that has been gathered, identified as sensitive and made available to the public.
By 2010, identify standard interagency list of permit conditions to minimize disturbance of sensitive habitats.	Staff will also track the development of permit conditions that will provide the public and applicant an understanding of standard requirements prior to project application.

Table SC.2: Estimated Timelines for the Submerged Cables Action Plan

Submerged Cables Action Plan	YR 1	YR 2	YR 3	YR 4	YR 5
<b>Strategy SC-1: Identify Routing and Zones for Submerged Cable Projects</b>	●————●				
<b>Strategy SC-2: Develop Submerged Cable Project Permit Guidelines</b>	●————●				
Legend					
Year Beginning/Ending	: ●————●	Major Level of Implementation: —————			
Ongoing Strategy	: ●————→	Minor Level of Implementation: .....			

Table SC.3: Estimated Costs for the Submerged Cables Action Plan

Strategy	Estimated Annual Cost (in thousands)*				
	YR 1	YR 2	YR 3	YR 4	YR 5
<b>Strategy SC-1: Identify Routing and Zones for Submerged Cable Projects</b>	\$56	\$115	\$101	\$4	\$4
<b>Strategy SC-2: Develop Submerged Cable Project Permit Guidelines</b>	\$27	\$13	\$11	\$4	\$4
<b>Total Estimated Annual Cost</b>	<b>\$83</b>	<b>\$128</b>	<b>\$112</b>	<b>\$8</b>	<b>\$8</b>
* Cost estimates are for both “programmatic” and “base” (salaries and overhead) expenses.					
** Contributions from outside funding sources also anticipated.					