California Marine Life Protection Act Initiative

Regional Profile of the MLPA South Coast Study Region

(Point Conception to the California-Mexico Border)

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Contents

Executive Summary

The Marine Life Protection Act Initiative is a public-private partnership designed to help the State of California implement the Marine Life Protection Act (MLPA) using the best readily available science, as well as the advice and assistance of scientists, resource managers, experts, stakeholders and members of the public. The MLPA requires the state to redesign existing state marine protected areas (MPAs), and to establish a cohesive network of MPAs to protect, among other things, marine life, habitats, ecosystems and natural heritage, as well as to improve recreational, educational and study opportunities provided by marine ecosystems.

A regional approach is being used to redesign MPAs in state waters along California's 1100 mile coast. Implementation of the MLPA will occur in five study regions: the central coast, the north central coast, the south coast, the north coast, and San Francisco Bay. As part of the MLPA Initiative, a master plan was created to provide a framework to guide the planning process within individual study regions. The central coast study region (Pigeon Point to Point Conception) was the first study region for which the MLPA planning process was completed; the California Fish and Game Commission adopted 29 central coast MPAs in April 2007. Planning has also concluded for the north central coast study region (Alder Creek to Pigeon Point) and MPA proposals are under review with the California Fish and Game Commission. The south coast study region (Point Conception south to the California/Mexico border) is the third study region to for which the MLPA Initiative planning process has been started. After the south coast process, the MLPA Initiative will address the north coast study region (Alder Creek north to the border of Oregon), and finally the San Francisco Bay study region (from the Golden Gate Bridge to the Carquinez Bridge).

Marine protected areas within the MLPA South Coast Study Region will be evaluated and redesigned with input from a regional stakeholder group, a science advisory team, a blue ribbon task force, the California Department of Fish and Game (DFG), the California Department of Parks and Recreation, and other interested parties. This document, the *Regional Profile of the MLPA South Coast Study Region*, is intended to support the MPA planning process by providing background information and data on the biological, oceanographic, socioeconomic, and governance characteristics of the south coast study region. The regional profile has been reviewed and revised based on input from regional stakeholders. This profile will assist stakeholders and decision-makers in evaluating existing MPAs in the study region and developing alternative proposals for a network of MPAs which meet the goals of the MLPA and which form a component of the statewide MPA network.

Regional Overview

The MLPA South Coast Study Region spans a straight-line distance of approximately 557 miles of the California coastline (with about 1,046 miles of actual shoreline) from Point Conception in Santa Barbara County to the California/Mexico border. Encompassing 2,351 square miles of coastal waters, the study region extends from the shoreline (mean high tide) to a maximum depth of approximately 3,938 feet off the northeast corner of San Clemente Island. The study region includes state waters surrounding the Channel Islands and other offshore rocks. The population, broad range of interests, sensitive marine ecosystem, and the unique conditions of the Southern California Bight combine to create a complex setting. Some of the unique features of the study region include:

- the intersection between two major biogeographic regions at Point Conception (cold, temperate Oregonian province from the north and the warm, temperate San Diegan province from the south), in the northern portion of the study region;
- a complex system of oceanographic currents, including a large gyre known as the Southern California Eddy, which circulates in a counter-clockwise direction;

- diverse habitats ranging from sandy beaches and rocky coasts to soft- and hard-bottom deep habitat, with more than 30% of the study region shoreline composed of sandy beaches;
- deep offshore areas, including channels, basins, and canyons, interspersed by shallow ridges, situated on a broad continental shelf;
- kelp forests dominated by giant kelp and associated species assemblages;
- nearly 40 estuaries and lagoons with tidal influence, including Anaheim Bay, Upper Newport Bay, Bolsa Chica, and many others;
- high biodiversity, including 481 species of fish, 4 species of sea turtles, 195 species of birds, 7 species of pinnipeds, and more than 5000 species of invertebrates;
- the Channel Islands, which are made up of 8 major islands as well as smaller rocks and islets, and support large numbers of marine birds and mammals and provide for consumptive and non-consumptive recreational activities;
- several large urban centers, including Los Angeles and San Diego, located adjacent to the study region, whose populations utilize coastal resources for recreational activities and commercial industries, while presenting unique challenges for water quality;
- productive commercial and recreational fisheries, targeting a wide diversity of species, that help support economies of coastal communities and provide fresh seafood to the region and world;
- the majority of California's individuals participating in non-consumptive activities, such as diving, surfing, kayaking, beach-going, swimming, and shore and boat-based wildlife viewing; and
- nearly half the existing state MPAs in California, as well as several federally managed areas, including the Channel Islands National Marine Sanctuary, Channel Islands National Park, Santa Monica Mountains National Recreation Area, and Cabrillo National Monument.

Ecological Setting

The MLPA South Coast Study Region is characterized by high productivity, high biodiversity, diverse habitat types, and the unique oceanographic conditions of the Southern California Bight. The biodiversity of this study region was one of the driving factors in the designation of the Channel Islands National Marine Sanctuary, the Channel Islands National Park, and the associated ten state marine reserves and two state marine conservation areas implemented in 2003.

All of the habitats listed in the MLPA or recommended by the science advisory team for representation within MPAs, with the exception of seamounts (which do not occur within state waters) are found within the study region. For most of these habitats, there are some mapped data available for use in the planning process.

The following are some notes on the habitat types and ecologically distinctive areas within the study region:

- Most of the study region is relatively shallow and is less than 330 feet in depth, although some areas, such as the basins, canyons, and areas near the southern Channel Islands, are much deeper.
- Intertidal zones include sandy beaches, rocky shores, tidal flats, coastal marsh and man-made structures.
- Estuaries, with their associated open water, soft bottom, coastal marsh, tidal mud flats, and eelgrass beds, exist throughout the study region. There are two types of estuaries in the south coast: those permanently or semi-permanently open to the ocean and those seasonally separated from the ocean by sand bars. While there are some large estuaries (Anaheim Bay

and upper Newport Bay) in the study region, most are small and are periodically closed to tidal influence. Some of the species that depend on these estuaries seasonally, or at some point in their life history, include the Pacific staghorn sculpin, bay pipefish, arrow goby, and sharks.

- Eelgrass (*Zostera sp*.) beds are found throughout the study region in estuaries (e.g., Mugu Lagoon) and along the coast (e.g., along the Santa Barbara coast). Surfgrass (*Phyllospadix sp*.) is common in the study region and is associated with open ocean habitat (e.g., northern Channel Islands and along the San Diego coast).
- Giant kelp (*Macrocystis pyrifera*) dominates the study region with dense canopies that support diverse marine life. Kelp beds have been mapped at a fine-scale resolution in six annual surveys (1989, 1999, 2002, 2003, 2004, and 2005) and are found off rocky headlands, including Point Conception, Point Dume, Palos Verdes, La Jolla, and other locations. Kelp forests are also abundant in waters surrounding the Channel Islands.
- Hard-bottom habitats (rocky reefs) are less common (7% of the total study region area) than soft-bottom habitats in the study region in all depth zones. The species composition for hard substrate varies with depth zone. Kelp forests are associated with shallow rock bottoms, while deep-sea corals and sponges are found in deep rock habitat.
- Sandy and soft-bottom habitats dominate both shorelines and subtidal substrates in the south coast study region. These habitats do not have the relief or structural complexity of hard-bottom habitats, but do host a number of unique species adapted to the dynamic environment and the low-relief physical characteristics. Invertebrates and bottom-dwelling fish are the most common species found in soft substrate.
- Underwater pinnacles are submerged rocky cones or outcrops that can be important areas where fish and other species aggregate. Underwater pinnacles exist in the study region, especially near the Channel Islands, but have not been well mapped. On substrata maps, these features are not categorized separately from hard-bottom habitats.
- Several submarine canyons exist within the study region. Notable canyons are found off Point Mugu, Palos Verdes Point, and La Jolla, among other areas. Canyons provide important habitat for deep-water communities and young rockfish, and provide foraging areas for seabirds and marine mammals.
- The Channel Islands, which include eight major islands and a number of rocks and smaller islets, provide a unique ecological setting. The northwestern islands are associated with cooler, nutrient-rich waters and the southeastern islands are associated with warmer waters. This dynamic oceanographic setting and existence of high-relief rocky habitats at a variety of depths allows for a high level of biodiversity.
- The Southern California Bight creates complex oceanographic conditions in the south coast study region and results in unique ecological assemblages. A large gyre circulates water counter-clockwise and a number of smaller eddies and countercurrents add to the complexity of the oceanographic setting. A large upwelling center exists near Point Conception and draws deep, nutrient-rich waters to the surface. In addition, plumes following storm events contribute fresh water, sediment, and pollutants to the coastal marine environment.

The diverse habitats of the south coast study region host a wide diversity of species that may benefit from MPAs. This document describes some of the species that have special relevance to the MPA planning process, including:

- Regionally important species that are likely to benefit from MPAs identified by the SAT;
- Depressed or overfished species, which include abalone, bocaccio, canary rockfish, cowcod, widow rockfish, and steelhead trout;

- Species targeted by commercial and/or recreational fisheries, which are an important component of the study region's economy, including California sheephead, California halibut, grunion, spiny lobster, and many others; and
- Special-status species that are protected under either state or federal law, including a number of pinnipeds, cetaceans, seabirds, and sea turtles, as well as steelhead trout, giant sea bass, garibaldi, and the tidewater goby (listed in Appendix C(ii)).

Land-Sea Interaction

Ecological linkages between the marine and terrestrial environments include:

- Fish that live offshore but move to estuaries, bays, and other more sheltered habitats to reproduce. Plainfin midshipman, staghorn sculpin, and leopard sharks are among the species that depend on the marine and coastal habitats for their life histories.
- Anadromous and catadromous fish that migrate between the ocean and coastal rivers in their life history for spawning, rearing, and dying. Steelhead (anadromous) and striped mullet (catadromous) are found within the study region.
- Shorebirds and waterfowl that inhabit coastal lagoons, estuaries, and salt marshes (estuaries and bays of the study region form part of the Pacific Flyway, one of the four principal bird migration routes in North America).
- Marine mammals, including the California sea lions, northern elephant seals, and harbor seals, which use coastal rocks, sandy beaches, tidal flats, and estuaries as haul-outs and for rookery sites.
- Coastal and estuarine vegetation and nutrients, which are carried to the open ocean, where they provide temporary food and shelter to species including juvenile fish.

Terrestrial activities can have significant impacts on coastal water quality and habitat condition. Nearly 8,366 square miles of land in 19 major watersheds drain directly to the ocean. Some of the most important water quality issues include:

- Impaired rivers and waterbodies that have been identified under Section 303(d) of the federal Clean Water Act and have a total maximum daily load (TMDL) for pollutants;
- Recognized water quality management areas including state water quality protection areas (SWQPAs), areas of special biological significance (ASBSs), and California critical coastal areas (CCAs);
- The highest number of beach closures in California, mostly due to high bacteria levels from sewage spillages;
- Sediment contamination, with 94% of the study region sediments being affected by one or more contaminants. Contamination can be linked to pollutants transported via urban runoff and released into the ocean from outlets, industrial discharges, wastewater discharges, and port activities, the most notable example being the Palos Verdes shelf, where a superfund site was established due to high levels of dichloro-diphenyl-trichloroethane (DDT) and Polychlorinated biphenyl (PCBs) from decades of wastewater discharge;
- Point sources of pollution that empty into the coastal environment at specific locations and may cause localized impacts. Examples of point sources of pollution in the study region are wastewater treatment facilities, desalination plants, and stormwater outfalls;
- Nonpoint source pollution, which is a leading cause of degraded water quality and eutrophication in the study region, but it is difficult to identify sources as it derives from diffuse locations. Five major sources of nonpoint source pollution are agriculture, urban areas, resource extraction, hydromodification, and ports and associated vessels; and

- Coastal energy which involves development, extraction, and transportation of energy-related resources in coastal waters, as well as offshore. Projects include oil drilling, liquid natural gas, and coastal power plants.

Socioeconomic Setting

The MLPA South Coast Study Region has a complex socioeconomic setting which includes a large population, certainly highly urbanized areas, and industries and economic sectors dependent on marine resources. Recreational and commercial fishing, tourism and non-consumptive activities make significant contributions to coastal economies in the five counties of the study region. Several types of socioeconomic information are included in this regional profile:

- Brief descriptions of the five coastal counties in the study region (Santa Barbara, Ventura, Los Angeles, Orange, and San Diego counties), including overall economic and population statistics and the wages paid in ocean-based economies.
- Commercial fishing statistics. Major commercial fisheries within the study region include Market squid, sea urchin, spiny lobster, coastal pelagic finfish, spot prawn, California halibut, and others. Over the past decade, average annual landings in the study region totaled nearly 254 million pounds with average annual ex-vessel revenue being $67.6 million. However, the overall number of commercial fishing vessels has decreased in recent years. The three major commercial fishing port complexes in the study region, as defined by DFG, are Santa Barbara, Los Angeles, and San Diego. Individual ports and harbors include Santa Barbara Harbor, Ventura, Port Hueneme, San Pedro, Terminal Island, Dana Point, Newport Beach, San Diego, Point Loma, and many others.
- Locations of kelp harvest and aquaculture leases in the study region. Administrative kelp beds exist throughout the study region, while aquaculture sites occur only in Santa Barbara County and San Diego County. Forty-eight kelp beds exist in the study region, of which 23 are open, 3 are closed, and 22 are leaseable. Land-based aquaculture operations include raising abalone, mussels, keyhole limpets, and fishes. Shellfish aquaculture operations with active state water-bottom leases cover a total area of 241 acres. White seabass are also reared within the study region at a number of locations.
- Recreational fishing statistics. Some of the major recreational fisheries within the study region include basses, rockfish, yellowtail, white seabass, surfperch, Pacific mackerel, Pacific sardine, and silversides. Common fishing modes include boat-based (Commercial Passenger Fishing Vessels, kayak angling and private/rental vessels), shore-based (beach/ bank fishing and from manmade structures), and other (spearfishing, clamming). In 2007, fishing from manmade structures was the most common mode and accounted for 1,341,343 recorded angler days. The second most common mode was beach and bank fishing with 766,709 angler days.
- Information on scientific collecting, for which approximately 1,950 permits were issued in 2007 by DFG.
- Information on coastal tourism, including coastal park visitation rates. Los Angeles County experienced the highest travel spending for the study region. Five of California's ten most visited state parks are located in the study region adjacent to the coast; they include Huntington, Bolsa Chica, San Onofre, Doheny, and Cardiff state beaches.
- Descriptions of non-consumptive activities, including beachgoing, surfing, boating, scuba diving, kayaking, tidepooling, and wildlife viewing.
- Information on alterations to the coast. Alterations include beach nourishment, beach grooming, dredging, coastal armoring, and coastal lighting. In the study region, coastal alterations are common with over 600 nourishment projects, more than 100 miles (160 km) of groomed beaches, and 298 miles of armored coast.

- Vessel traffic. The south coast study region includes three of the busiest port complexes in the country: the Port of Los Angeles, the Port of Long Beach, and San Diego Harbor. Transportation of oil and petroleum products is a major activity of vessels traveling in and out of these ports.

Institutions for Research, Public Outreach, and Education

There are a number of institutions with marine research or educational objectives in the study region. The locations of major research institutions and scientific collecting/monitoring sites (including Partnership for Interdisciplinary Studies of Coastal Oceans and Multi-agency Rocky Intertidal Network sites) have been mapped. In addition, information on monitoring and educational programs and organizations has been compiled in this regional profile, demonstrating potential opportunities for future research and education associated with MPAs.

Jurisdiction and Management

Numerous federal, state and local government bodies have jurisdiction in the study region. A large percentage of terrestrial lands adjacent to the study region are owned and operated by the California Department of Parks and Recreation and the U.S. Department of Defense. In addition, 19 federally recognized Native American tribes, as well as numerous federally unrecognized groups of Native American people, are located within coastal areas adjacent to the study region.

Existing MPAs, Marine Managed Areas, and Coastal Protected Areas

Existing state MPAs, marine managed areas, fishery closures, and other coastal protected areas are described for the region, including:

- Descriptions of the 42 existing state MPAs and 3 special closures, which cover 7.7% of the total study region area;
- Information on other marine managed areas within or adjacent to the study region (such as national marine sanctuaries) and fishery closures (such as the rockfish conservation areas and no-trawl or no-bottom-contact zones established for the protection of groundfish essential fish habitat);
- Information on areas of limited access due to military operations or power plant closures; and
- Information on terrestrial protected areas, such as national monuments, national parks, wildlife refuges, state beaches and parks, and county beaches, which may have relevance to MPAs for public access and management purposes.

Conclusion

The MLPA South Coast Study Region contains a diverse array of habitats located in a dynamic oceanographic setting at the intersection of two major biogeographic regions. Complex bathymetry, including deep submarine canyons and offshore ridges and islands on a broad continental shelf make this region unlike any other in California. These underlying geographic, geologic, and oceanographic characteristics have contributed to the creation of biologically productive marine ecosystems that support hundreds of species. Rocky reefs, sandy beaches, giant kelp forests, and numerous estuaries each support unique assemblages, along with many other habitats. Point Conception, Santa Monica Bay, Point Loma, and the Channel Islands are just a few of the areas of ecological significance. Such abundant marine resources are important for both recreational and commercial activities, both of which are important to the economies of the five counties located

adjacent to the study region. The study region's biological productivity and high degree of human use have been driving factors in the designation of management areas on the federal level, such as the Channel Islands National Marine Sanctuary, and on the state level, such as the large number of state MPAs. This document summarizes key information relating to the study region, so that these state MPAs may be efficiently redesigned to better protect California's marine heritage in accordance with the Marine Life Protection Act.

Appendices

Eight appendices provide more detailed information on many aspects of the study region. The MLPA South Coast Study Region has been divided into seven subregions for ease of data display and to facilitate identification of important local issues. Appendix A summarizes the main ecological, socioeconomic, and management attributes of each subregion. The seven subregions are:

- Point Conception (Government Point) to Rincon Point (subregion 1)
- Rincon Point to Point Dume (subregion 2)
- Point Dume to Newport Beach (subregion 3)
- Newport Beach to Agua Hedionda (subregion 4)
- Agua Hedionda to California - Mexico border (subregion 5)
- Northern Channel Islands (subregion 6)
- Southern Channel Islands (subregion 7).

The appendices also include comprehensive lists of available spatial data layers, species likely to benefit from MPAs and special-status species found in the study region, species referenced in the regional profile, impaired water bodies in the study region, and academic research and education institutions with a focus on coastal and marine ecosystems. The appendices also include detailed statistics on major commercial fisheries by county and characteristics and statistics on recreational fisheries in the south coast study region.