California Marine Life Protection Act Initiative
Regional Profile Central Coast Study Region
(Pigeon Point to Point Conception, CA)

September 19, 2005 (v.3.0)

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# Appendix I: Spatial Data Layers Available for MPA Planning on the Central Coast - revised 9/8/05

<table>
<thead>
<tr>
<th>Data Category (Feature Class)</th>
<th>Data Layer Name</th>
<th>Description (but see metadata for full description)</th>
<th>Geographic Extent</th>
<th>Data Source</th>
<th>Available yet?</th>
<th>Uploaded to UCSB Gdb?</th>
<th>Uploaded to UCSB IMS?</th>
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<td><strong>Base</strong></td>
<td>Coastline</td>
<td>1:24,000 scale California coastline</td>
<td>statewide</td>
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<td>Yes</td>
<td>Yes</td>
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<td></td>
<td>California rocks</td>
<td>California rocks and islets; most part of CA Coastal National Monument</td>
<td>statewide</td>
<td>BLM</td>
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<td>Hillshade bathymetry</td>
<td>Undewater &quot;topography&quot; from Digital Elevation Model</td>
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<td>CDFG</td>
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<td>NOAA Nautical charts</td>
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<td>statewide</td>
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<td></td>
<td>Central Coast Study Region</td>
<td>Central Coast Study Region (mean high tide to 3nmi)</td>
<td>statewide</td>
<td>CDFG</td>
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<td></td>
<td>MBNMS study region</td>
<td>Monterey Bay National Marine Sanctuary study region</td>
<td>off Golden Gate to Pt. Conception</td>
<td>MBNMS</td>
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<td>State-Federal Study Area</td>
<td>Combined state and federal study areas</td>
<td>Pigeon Pt to Pt. Conception</td>
<td>MBNMS</td>
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<td>Counties</td>
<td>Coastal counties</td>
<td>statewide</td>
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<td>Ports</td>
<td>Ports and harbors</td>
<td>statewide</td>
<td>CDFG</td>
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<td>Harbors</td>
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<td>CC Study region</td>
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<td>Coastal points</td>
<td>Locations and names of headlands and points</td>
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<td><strong>Biological</strong></td>
<td>Kelp 1989</td>
<td>Kelp Coverage - 1989 (from aerial surveys)</td>
<td>statewide</td>
<td>CDFG</td>
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<td>Kelp Coverage - 1999 (from aerial surveys)</td>
<td>statewide</td>
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<td><strong>Kelp 2002</strong></td>
<td>Kelp Coverage - 2002 (from aerial surveys)</td>
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<td>CDFG</td>
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<td><strong>Kelp 2003</strong></td>
<td>Kelp Coverage - 2003 (from aerial surveys)</td>
<td>statewide</td>
<td>CDFG</td>
<td>Yes</td>
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<td><strong>Kelp Union</strong></td>
<td>Union of 3 years of kelp data (89,99,02)</td>
<td>statewide</td>
<td>Brian Kinlan/UCSB</td>
<td>Yes</td>
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<td><strong>Persistent kelp</strong></td>
<td>Present in 3 of 4 survey years</td>
<td>statewide</td>
<td>TNC</td>
<td>Yes</td>
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<td><strong>ESI Shoreline types</strong></td>
<td>Shoreline types (n=13) in linear segments (sandy beach, rocky shores, tidal flats, marsh)</td>
<td>statewide</td>
<td>NOAA-Environmental Sensitivity Index (as categorized by TNC)</td>
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<td><strong>Estuaries</strong></td>
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<td>statewide</td>
<td>Multiple sources compiled by TNC</td>
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<td><strong>Coastal marsh</strong></td>
<td>Coastal marsh - includes salt marsh and brackish marsh</td>
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<td>Multiple sources compiled by TNC</td>
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<td><strong>Eelgrass</strong></td>
<td>Eelgrass distribution</td>
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<td>Multiple sources compiled by TNC</td>
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<td><strong>Surfgrass</strong></td>
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<td>Central Coast</td>
<td>Digitized by Tenera</td>
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<td><strong>Seabird colonies</strong></td>
<td>Seabird colonies data from Sowls et al 1980; updated by Carter 1992. Colony location and counts of abundance of seabirds.</td>
<td>statewide</td>
<td>USFWS</td>
<td>Yes</td>
<td>Yes</td>
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<td><strong>Bird breeding colonies</strong></td>
<td>Major Marine bird breeding colonies</td>
<td>Pt Arena to Pt Sal</td>
<td>NOAA Bioge</td>
<td>Yes</td>
<td>Yes</td>
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<td><strong>Marine mammal haulouts</strong></td>
<td>Marine mammal haulout point locations</td>
<td>statewide</td>
<td>NOAA (Mark Lowry)</td>
<td>Yes</td>
<td>Yes</td>
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<td><strong>Marine mammal rookeries</strong></td>
<td>Marine mammal rookeries as point locations</td>
<td>statewide</td>
<td>NOAA (Mark Lowry)</td>
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<td>Salmonid stream outlets</td>
<td>Point locations for coastal stream outlets w/ steelhead, chinook, or coho currently present</td>
<td>statewide</td>
<td>TNC (from multiple sources)</td>
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<td>Cold seep communities</td>
<td>Chemosynthetic biological communities in Monterey Bay</td>
<td>Monterey Bay</td>
<td>MBARI</td>
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<td>Yes-draft</td>
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<td>Corals/Sponges/Anemones</td>
<td>Point locations of coral/sponge/anemone based on a variety of sources statewide</td>
<td>NMSF - EFH</td>
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<td>Total bird biomass</td>
<td>Marine bird biomass by season, all seasons in 5' cells (kg/km²) Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Bird biomass (Coldwater period)</td>
<td>Marine bird biomass during cold period (La Nina), 5' cell Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Bird biomass (Neutral period)</td>
<td>Marine bird biomass during neutral period, 5'cell Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Bird biomass (Davidson season)</td>
<td>Marine bird biomass by season, Davidson season, 5'cell Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Bird biomass (Oceanic season)</td>
<td>Marine bird biomass by season, oceanic season, 5'cell Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Yes</td>
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<td>Bird biomass (Upwelling season)</td>
<td>Marine bird biomass by season, upwelling season, 5'cell Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Bird biomass (Warm water period)</td>
<td>Marine bird biomass during warm period (El Nino), 5'cell Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Yes</td>
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<td>Bird density</td>
<td>Marine bird density by season, all seasons, (#/km²) Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
<td>Yes</td>
<td>Yes</td>
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<tr>
<td>Bird density (Cold water period)</td>
<td>Marine bird density during cold period (La Nina) Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Yes</td>
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<td>Bird density (Davidson season)</td>
<td>Marine bird density by season, Davidson season Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Bird density (Neutral period)</td>
<td>Marine bird density during neutral period</td>
<td>Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Bird density (Oceanic season)</td>
<td>Marine bird density by season, oceanic season</td>
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<td>NOAA Biogeo</td>
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<td>Bird density (Upwelling season)</td>
<td>Marine bird density by season, upwelling season</td>
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<td>Bird density (Warm water period)</td>
<td>Marine bird density during warm period (El Nino)</td>
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<td>Bird diversity</td>
<td>Marine bird diversity by season, all seasons, Shannon-Wiener Index (H')</td>
<td>Pt Arena to Pt Sal</td>
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<td>Bird diversity (Cold water period)</td>
<td>Marine bird diversity during cold period (La Nina)</td>
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<td>NOAA Biogeo</td>
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<td>Bird diversity (Davidson season)</td>
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<td>Bird diversity (Neutral period)</td>
<td>Marine bird diversity during neutral period</td>
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<td>Bird diversity (Oceanic season)</td>
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<td>Bird Diversity (Upwelling season)</td>
<td>Marine bird diversity by season, upwelling season</td>
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<td>Bird diversity (Warm water period)</td>
<td>Marine bird diversity during warm period (El Nino)</td>
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<td>NOAA Biogeo</td>
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<td>Bird diversity and density (top 20th%)</td>
<td>Diversity, density, hot spots marine birds (top 20th percentile)</td>
<td>Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Fish and Bird Density and Diversity (Top 20th%)</td>
<td>Integration of density &amp; diversity fishes &amp; birds (top 20th percentile)</td>
<td>Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Fish and Bird Diversity (Top 20th%)</td>
<td>Integration of density &amp; diversity fishes &amp; birds (Top 20th percentile)</td>
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<td>NOAA Biogeo</td>
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<td>Integration of density &amp; diversity fishes &amp; birds (top 20th percentile)</td>
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<td>NOAA Biogeo</td>
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<td>Fish and Bird Density</td>
<td>Diversity, density, hot spots demersal fishes (Top 20th percentile)</td>
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<td>NOAA Biogeo</td>
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<td>(Top 20th %)</td>
<td>Mean Species Diversity of demersal fish, 5'cell</td>
<td>Pt Arena to Pt Sal</td>
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<td>Fish Mean Diversity</td>
<td>Species Richness of demersal rockfish based on trawl data</td>
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<td>(Top 20th%)</td>
<td>Density of sea otters in linear coastal segments based on May 2002 counts</td>
<td>Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Rockfish Richness</td>
<td>Nov 2001 Northern sea otter counts</td>
<td>Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>(1977-2001)</td>
<td>May 2002 Northern sea otter counts</td>
<td>Pt Arena to Pt Sal</td>
<td>NOAA Biogeo</td>
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<td>Sea Otter Counts</td>
<td>Coarse-scale substrate data (hard and soft bottom, canyons/no canyons)</td>
<td>Pt Reyes to Pt Conception</td>
<td>NOAA Biogeo</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
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<td>Sea Otter Counts</td>
<td>Fine scale (high resolution, 1-2m) substrate data (hard and soft bottoms)</td>
<td>Pt Reyes to Pt Conception</td>
<td>NOAA Biogeo</td>
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<td>(Spring)</td>
<td>Coarse-scale substrate data (hard and soft bottom, canyons/no canyons)</td>
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<td>NOAA Biogeo</td>
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<td>Substrate</td>
<td>X Depth</td>
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<td>NOAA Biogeo</td>
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<td>Coarse-scale substrate</td>
<td>Fine scale (high resolution, 1-2m) substrate data (hard and soft bottoms)</td>
<td>Limited to Monterey Bay south to Pt. Sur</td>
<td>CSUMB, USGS, industry data compiled for nearshore region</td>
<td>Yes</td>
<td>Yes</td>
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<td>Category</td>
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<td>Nearshore finescale substrate x Depth</td>
<td>Fine scale (high resolution, 1-2m) substrate data (hard and soft bottoms), intercepted with depth zones Limited to Monterey Bay south to Pt. Sur</td>
<td>CSUMB, USGS and other sources</td>
<td>Yes Yes</td>
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<td>Pinnacles</td>
<td>Pinnacles</td>
<td>Central Coast</td>
<td>Bathymetry and Substrata data; GIS analysis Draft Yes</td>
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<td>Canyons</td>
<td>Submarine canyons</td>
<td>Central Coast</td>
<td>derived from Greene et al Yes Yes Yes</td>
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<td>Nearshore canyon heads</td>
<td>Point file of canyon heads within 20nmi of shore digitized</td>
<td>Central Coast</td>
<td>TNC from DEM Draft</td>
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<tr>
<td>Depth zones of Central California</td>
<td>Depth zones of Central California (0, 0-30m, 30-100m, 100-200m, 200-3000m, &gt;3000m)</td>
<td>Central Coast</td>
<td>EFH Depth polygons YES Yes yes</td>
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<td>Bathymetry (75m DEM)</td>
<td>Depths - geodas 75m centroids</td>
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<td>Bathymetry (5m)</td>
<td>Depths - 5m nearshore centroids</td>
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<td>Bathymetric rugosity; 200m</td>
<td>Bathymetric complexity - defined by standard deviation around mean bathymetry within 1km area of grid. statewide</td>
<td>TNC, from 200m DEM Yes Yes Yes</td>
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<td>Calwater 2.2</td>
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<td>California topography</td>
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<td>Submarine features</td>
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<td><strong>Oceanographic</strong></td>
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<td>Upwelled water based on SST Q1 (1985-2004)</td>
<td>St. Anthony's Pt. to Mussell Pt.</td>
<td>PFEL</td>
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<td>Upwelling areas</td>
<td>Upwelling - nearshore in 3 season from SEAWIFFs sea surface temperature data</td>
<td>Pigeon Pt to Pt. Conception</td>
<td>Bernardo Broitman</td>
<td>No</td>
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<td>Retention areas</td>
<td>Retention areas</td>
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<td>Bernardo Broitman</td>
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<td>Freshwater areas</td>
<td>Freshwater plumes in 4 seasons from Seawiffs data</td>
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<td>Warm water fronts</td>
<td>Oligotrophic warm water fronts</td>
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<td>PFEL</td>
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<td>Consumptive Use</td>
<td>Use</td>
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<td>Recreational Fishing (Commercial Passenger Fishing Vessel data 1987-1998, summarized by microblock)</td>
<td>Central Coast</td>
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<td>Yes</td>
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<td>Cencal dive sites</td>
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<td>Cencal spearfishing dive meet locations</td>
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<td>Confidential Data</td>
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<td>Trawl Areas</td>
<td></td>
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<td>Duncans Pt. to Pt. Conception</td>
<td>Confidential Data</td>
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<td>Commercial Fishing - Refinement of block data for 19 fisheries (will list when complete)</td>
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<td>Low priority dungenesscrab</td>
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<td>Low priority areas for dungeness crab (not necessarily for rock crab)</td>
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<td>Confidential Data</td>
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<td>Recreational dive sites</td>
<td>Dive sites (note - includes consumptive use sites as not possible to distinguish)</td>
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<td>Multiple sources - CCRSG members, REEF, Pt. Lobos, etc</td>
<td>Yes -draft</td>
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<td>Multiple sources - CCRSG members, REEF, Pt. Lobos, etc</td>
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<td>Monitoring sites</td>
<td>Scientific Monitoring Sites (PISCO, MARINe, LIMPET, CENCOOS)</td>
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<td>CalTrawl blocks (10minute grid)</td>
<td>CalTrawl microblocks (1 minute grid for fishery catch data records)</td>
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<td>Central California National Marine Sanctuary boundaries</td>
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<td>Code of Federal Regs;</td>
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<td>Description</td>
<td>Coverage</td>
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<td>ASBS</td>
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<td>Other</td>
<td>Pollution discharge points</td>
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<td>SWQCB, 2004 data</td>
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<td>Coastal watersheds</td>
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<td>Impaired water bodies</td>
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<td>SWQCB, 2005 TMDL list</td>
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<td>Hardened shoreline</td>
<td>Marinas/seawalls/riprap</td>
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<td>NOAA-Environmental Sensitivity Index</td>
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### Key to Acronyms

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<td>Areas of Special Biological Significance</td>
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<td>BLM</td>
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<td>CC</td>
<td>Central Coast</td>
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<td>CCAMP – B105</td>
<td>Central Coast Ambient Monitoring Program</td>
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<td>CCRSG</td>
<td>Central Coast Regional Stakeholder Group</td>
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<td>CDFG</td>
<td>California Department of Fish and Game</td>
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<td>CENCOOS</td>
<td>Central California Ocean Observing System</td>
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<td>CPFV</td>
<td>Commercial Passenger Fishing Vessel</td>
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<td>CRFS</td>
<td>California Recreational Fisheries Survey</td>
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<td>CSUMB</td>
<td>California State University, Monterey Bay</td>
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<td>DEM</td>
<td>Digital elevation model</td>
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<td>DOD – C120</td>
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<td>EEZ</td>
<td>Exclusive Economic Zone</td>
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<td>EFH</td>
<td>Essential Fish Habitat</td>
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<td>ESI</td>
<td>Environmental Sensitivity Index</td>
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<td>LIMPET</td>
<td>Longterm Monitoring Program and Experiential Training for Students</td>
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<td>MARINe</td>
<td>Multi-agency Rocky Intertidal Network</td>
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<td>MBARI</td>
<td>Monterey Bay Aquarium Research Institute</td>
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<td>Monterey Bay National Marine Sanctuary</td>
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<td>MLML</td>
<td>Moss Landing Marine Laboratories</td>
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<td>NOAA</td>
<td>National Oceanic and Atmospheric Administration</td>
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<td>PFMC – E118</td>
<td>Pacific Fisheries Management Council</td>
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<td>PISCO</td>
<td>Partnership for Interdisciplinary Studies of Coastal Oceans</td>
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<td>Reef Environmental Education Foundation</td>
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<td>SIMON</td>
<td>Sanctuary Integrated Monitoring Network</td>
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## Appendix II (a): List of Fishes Likely to Benefit from the Establishment of Marine Protected Areas in Central California

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<th>Species</th>
<th>Primary depth range in feet (x 0.305 = meters)</th>
<th>Primary geographic range within state using four regions</th>
<th>Habitat preference juveniles</th>
<th>Habitat preference adults</th>
<th>Unique or significant life-history characteristics</th>
<th>Larval type</th>
<th>Larval duration [potential larval dispersal]</th>
<th>Potential for adult dispersal</th>
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<td><strong>Butterfish (Pacific pompano)</strong></td>
<td>30-300</td>
<td>All</td>
<td>coastal pelagic</td>
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<td>a schooling species;</td>
<td>planktonic</td>
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<td><strong>Cabezon</strong></td>
<td>0-250</td>
<td>All regions, including islands</td>
<td>rocky reefs, break-waters, kelp beds, tide pools, open ocean</td>
<td>rocky reefs, kelp beds</td>
<td>eggs adhesive, attach to substrate, often macroalgae</td>
<td>planktonic</td>
<td>3-4 months</td>
<td>low</td>
</tr>
<tr>
<td><strong>Croaker, white</strong></td>
<td>0-420</td>
<td>All; most common Point Reyes to Mexico border</td>
<td>near bottom in shallow soft habitat</td>
<td>soft bottom, primarily nearshore and estuaries</td>
<td>schooling; multiple spawning each year; adults in deeper water than juveniles</td>
<td>planktonic</td>
<td>short</td>
<td>low</td>
</tr>
<tr>
<td><strong>Eel, wolf-</strong></td>
<td>Intertidal to 600</td>
<td>N, NC, SC</td>
<td>pelagic</td>
<td>rocky reefs, kelp beds</td>
<td>not a true eel; spawn Oct.-February</td>
<td>planktonic</td>
<td>1-2 months</td>
<td>moderate</td>
</tr>
<tr>
<td><strong>Flounder, starry</strong></td>
<td>Shallow - 900</td>
<td>N, NC, SC</td>
<td>estuaries and bays, nearshore soft bottom</td>
<td>soft bottom; estuaries and bays to upper slope</td>
<td>spawn near river mouths and estuaries and bay</td>
<td>planktonic</td>
<td>25-75 days</td>
<td>moderate</td>
</tr>
<tr>
<td><strong>Greenling, kelp</strong></td>
<td>0-150</td>
<td>N, NC, SC</td>
<td>rocky reefs, kelp beds</td>
<td>rocky reefs, kelp beds</td>
<td>eggs adhere to rocky substrate</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
</tr>
<tr>
<td><strong>Greenling, rock</strong></td>
<td>shallow</td>
<td>N, NC</td>
<td>rocky reefs, kelp beds</td>
<td>rocky reefs, kelp beds</td>
<td>eggs adhere to rocky substrate</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
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<tr>
<td><strong>Grunion</strong></td>
<td>0-60</td>
<td>SC, S</td>
<td>sandy</td>
<td>sandy</td>
<td>eggs deposited on</td>
<td>planktonic</td>
<td>low to</td>
<td>moderate</td>
</tr>
<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Primary geographic range</td>
<td>Habitat preference juveniles</td>
<td>Habitat preference adults</td>
<td>Unique/significant Life-history characteristics</td>
<td>Larval type</td>
<td>Larval duration</td>
<td>Potential for adult dispersal</td>
</tr>
<tr>
<td>-------------------------</td>
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</tr>
<tr>
<td>California</td>
<td>nearshore areas</td>
<td>nearshore areas</td>
<td>sandy beaches; lack filaments</td>
<td>moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Guitarfish, shovelnose</td>
<td>0-50</td>
<td>SC,S</td>
<td>as adults</td>
<td>shallow sand, mud, open coast, bays, and estuaries</td>
<td>live-bearing</td>
<td>benthic</td>
<td>none</td>
<td>moderate</td>
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<tr>
<td>Hagfish, Pacific</td>
<td>30-3096</td>
<td>All</td>
<td>?</td>
<td>estuaries, shallow open coast soft bottom</td>
<td>deposit egg cases</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
</tr>
<tr>
<td>Halibut, California</td>
<td>0-300</td>
<td>All</td>
<td>estuaries, shallow open coast soft bottom</td>
<td>estuaries and soft bottom open coast</td>
<td>distribution influenced by El Niño events</td>
<td>planktonic</td>
<td>&lt; 30 days</td>
<td>moderate</td>
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<tr>
<td>Jacksmelt</td>
<td>shallow</td>
<td>All</td>
<td>kelp and eel grass beds; sandy beaches; harbors</td>
<td>kelp and eel grass beds; sandy beaches; harbors</td>
<td>eggs with filaments for attachment to eel grass and shallow algal beds</td>
<td>planktonic</td>
<td>low</td>
<td>moderate</td>
</tr>
<tr>
<td>Lingcod</td>
<td>0-1400</td>
<td>All</td>
<td>rocky reefs, kelp beds, hard bottom, soft bottom</td>
<td>rocky reefs, kelp beds, hard bottom</td>
<td>Spawns nearshore on rocky reefs; males guard eggs</td>
<td>planktonic</td>
<td>3 months</td>
<td>high</td>
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<tr>
<td>Lizardfish, California</td>
<td>5-750</td>
<td>SC,S</td>
<td>primarily soft bottom</td>
<td>primarily soft bottom</td>
<td>rest on bottom using pelvic fins</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
</tr>
<tr>
<td>Midshipman, plainfin</td>
<td>0-1000</td>
<td>All</td>
<td>soft bottom</td>
<td>soft bottom; spawn on hard substrate</td>
<td>Eggs deposited on rocks and hard substrate</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
</tr>
<tr>
<td>Opaleye</td>
<td>0-95</td>
<td>SC,S</td>
<td>rocky intertidal</td>
<td>rocky reefs, kelp beds</td>
<td>regulates kelp growth by grazing</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
</tr>
<tr>
<td>Prickleback, monkeyface</td>
<td>0-80</td>
<td>N,NC,SC</td>
<td>rocky intertidal</td>
<td>rocky reefs, kelp beds</td>
<td>deposit eggs on rocky substrate</td>
<td>planktonic</td>
<td>low</td>
<td>low</td>
</tr>
<tr>
<td>Prickleback, rock</td>
<td>0-60</td>
<td>N,NC,SC</td>
<td>rocky intertidal</td>
<td>rocky reefs, shallow</td>
<td>deposit eggs on rocky substrate</td>
<td>planktonic</td>
<td>low</td>
<td>low</td>
</tr>
</tbody>
</table>
### Queenfish
- **Species**: Queenfish
- **Primary depth range**: 0-180
- **Primary geographic range**: SC, S
- **Habitat preference**: soft bottom
- **Habitat preference juveniles**: shallow water and sandy bottom; in bays and sloughs
- **Habitat preference adults**: shallow water and sandy bottom; in bays and sloughs
- **Spawning**: spawn at night from March to September
- **Larval type**: planktonic
- **Larval duration**: short
- **Potential for adult dispersal**: moderate

### Ray, bat
- **Species**: Ray, bat
- **Primary depth range**: 0-150
- **Primary geographic range**: All
- **Habitat preference**: shallow soft bottom; bays and estuaries
- **Habitat preference juveniles**: shallow sandy and rocky areas, including bays and estuaries; kelp beds
- **Habitat preference adults**: shallow sandy and rocky areas, including bays and estuaries; kelp beds
- **Spawning**: live-bearing
- **Larval type**: miniature adults
- **Larval duration**: none
- **Potential for adult dispersal**: moderate

### Rockfish, aurora
- **Species**: Rockfish, aurora
- **Primary depth range**: 600-1800
- **Primary geographic range**: All
- **Habitat preference**: soft bottom
- **Habitat preference juveniles**: hard and soft bottom
- **Habitat preference adults**: hard and soft bottom
- **Spawning**: live-bearing
- **Larval type**: planktonic
- **Larval duration**: moderate
- **Potential for adult dispersal**: moderate

### Rockfish, bank
- **Species**: Rockfish, bank
- **Primary depth range**: 102-810
- **Primary geographic range**: All
- **Habitat preference**: midwater
- **Habitat preference juveniles**: midwater over hard bottom, drop offs
- **Habitat preference adults**: midwater over hard bottom, drop offs
- **Spawning**: live-bearing
- **Larval type**: planktonic
- **Larval duration**: moderate
- **Potential for adult dispersal**: moderate

### Rockfish, black
- **Species**: Rockfish, black
- **Primary depth range**: 0-1200
- **Primary geographic range**: N, NC, SC
- **Habitat preference**: soft bottom
- **Habitat preference juveniles**: rocky reefs, kelp forests
- **Habitat preference adults**: rocky reefs, kelp forests
- **Spawning**: live-bearing
- **Larval type**: planktonic
- **Larval duration**: moderate
- **Potential for adult dispersal**: moderate

### Rockfish, black-and-yellow
- **Species**: Rockfish, black-and-yellow
- **Primary depth range**: 0-120
- **Primary geographic range**: NC, SC, S
- **Habitat preference**: shallow rocky reefs
- **Habitat preference juveniles**: shallow rocky reefs, kelp forests
- **Habitat preference adults**: shallow rocky reefs, kelp forests
- **Spawning**: live-bearing
- **Larval type**: planktonic
- **Larval duration**: Low to moderate
- **Potential for adult dispersal**: low

### Rockfish, blackgill
- **Species**: Rockfish, blackgill
- **Primary depth range**: 720-1800
- **Primary geographic range**: All
- **Habitat preference**: soft bottom
- **Habitat preference juveniles**: hard bottom, soft bottom, canyons, steep drop offs
- **Habitat preference adults**: hard bottom, soft bottom, canyons, steep drop offs
- **Spawning**: live-bearing
- **Larval type**: planktonic
- **Larval duration**: moderate
- **Potential for adult dispersal**: moderate

### Rockfish, blue
- **Species**: Rockfish, blue
- **Primary depth range**: 0-300
- **Primary geographic range**: All
- **Habitat preference**: rocky reefs, kelp forests, soft bottom
- **Habitat preference juveniles**: rocky reefs, kelp forests
- **Habitat preference adults**: rocky reefs, kelp forests
- **Spawning**: live-bearing
- **Larval type**: planktonic
- **Larval duration**: moderate
- **Potential for adult dispersal**: moderate

### Bocaccio
- **Species**: Bocaccio
- **Primary depth range**: 0-1050
- **Primary geographic range**: All
- **Habitat preference**: over hard and soft bottom
- **Habitat preference juveniles**: over hard and soft bottom
- **Habitat preference adults**: midwater over hard bottom
- **Spawning**: live-bearing
- **Larval type**: planktonic
- **Larval duration**: moderate
- **Potential for adult dispersal**: moderate

### Rockfish, brown
- **Species**: Rockfish, brown
- **Primary depth range**: 0-420
- **Primary geographic range**: All
- **Habitat preference**: low-relief hard and soft
- **Habitat preference juveniles**: low-relief hard and soft
- **Habitat preference adults**: midwater over hard bottom
- **Spawning**: live-bearing
- **Larval type**: planktonic
- **Larval duration**: low to moderate
- **Potential for adult dispersal**: low
<table>
<thead>
<tr>
<th>Species</th>
<th>Depth Range</th>
<th>Location</th>
<th>Bottom Type</th>
<th>Habitat</th>
<th>Reproduction Type</th>
<th>Life Form</th>
<th>Recruitment</th>
<th>Growth Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rockfish, calico</td>
<td>60-840</td>
<td>SC,S</td>
<td>soft bottom</td>
<td>hard bottom, sand-rock and mud-rock interface</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, canary</td>
<td>0-900</td>
<td>N,NC,SC</td>
<td>soft bottom; sand-rock interface</td>
<td>midwater and near bottom over hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate to high</td>
<td></td>
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<tr>
<td>Chilipepper</td>
<td>0-1080</td>
<td>All</td>
<td>soft bottom</td>
<td>midwater over hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Rockfish, China</td>
<td>36-420</td>
<td>N,NC,SC</td>
<td>rocky reefs</td>
<td>rocky reefs, kelp forests</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>low to moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, copper</td>
<td>0-600</td>
<td>All</td>
<td>rocky reefs and soft bottom</td>
<td>rocky reefs, kelp forests</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Cowcod</td>
<td>68-1200</td>
<td>All</td>
<td>soft and hard bottom</td>
<td>hard bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, darkblotched</td>
<td>240-1800</td>
<td>All</td>
<td>soft bottom</td>
<td>soft and hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Rockfish, flag</td>
<td>100-600</td>
<td>SC,S</td>
<td>rocky reefs</td>
<td>rocky reefs, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>Moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, gopher</td>
<td>0-180</td>
<td>NC,SC,S</td>
<td>rocky reefs</td>
<td>rocky reefs, kelp forests</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>low to moderate</td>
<td>low</td>
</tr>
<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Primary geographic range</td>
<td>Habitat preference juveniles</td>
<td>Habitat preference adults</td>
<td>Unique/significant Life-history characteristics</td>
<td>Larval type</td>
<td>Larval duration</td>
<td>Potential for adult dispersal</td>
</tr>
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<tr>
<td>Rockfish, grass</td>
<td>0-150</td>
<td>All</td>
<td>shallow rocky reefs</td>
<td>shallow rocky reefs, kelp forests</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, greenblotched</td>
<td>200-1300</td>
<td>SC,S</td>
<td>soft bottom</td>
<td>hard and soft bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, greenstriped</td>
<td>200-1320</td>
<td>All</td>
<td>soft bottom</td>
<td>low relief hard bottom, soft bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
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<tr>
<td>Rockfish, greenspotted</td>
<td>160-660</td>
<td>NC,SC,S</td>
<td>soft bottom</td>
<td>hard bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, halfbanded</td>
<td>192-1320</td>
<td>SC,S</td>
<td>soft bottom</td>
<td>low relief hard and soft bottom, cobble</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
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</tr>
<tr>
<td>Rockfish, kelp</td>
<td>0-150</td>
<td>NC,SC,S</td>
<td>kelp forests and rocky reefs</td>
<td>kelp forests</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
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<tr>
<td>Rockfish, Olive</td>
<td>0-480</td>
<td>NC,SC,S</td>
<td>kelp forests, soft bottom</td>
<td>rocky reefs, kelp forests</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Pacific ocean perch</td>
<td>180-2100</td>
<td>All</td>
<td>midwater over hard bottom</td>
<td>midwater over hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Rockfish, pink</td>
<td>250-1200</td>
<td>NC,SC,S</td>
<td>soft bottom</td>
<td>hard bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, pinkrose</td>
<td>325-960</td>
<td>SC,S</td>
<td>soft bottom</td>
<td>hard bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
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<tr>
<td>Rockfish, quillback</td>
<td>75-900</td>
<td>N,NC</td>
<td>rocky reefs</td>
<td>rocky reefs</td>
<td>live-bearing</td>
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</tr>
<tr>
<td>Rockfish, redbanded</td>
<td>300-1560</td>
<td>All</td>
<td>soft bottom</td>
<td>soft and hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, redstripe</td>
<td>300-1200</td>
<td>N,NC</td>
<td>hard bottom</td>
<td>hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
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<td>geographic range</td>
<td>preference juveniles</td>
<td>preference adults</td>
<td>Life-history characteristics</td>
<td>type</td>
<td>duration</td>
<td>for adult dispersal</td>
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<tr>
<td>Rockfish, rosethorn</td>
<td>390-1800</td>
<td>N, NC, SC</td>
<td>soft and hard bottom</td>
<td>hard bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
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<tr>
<td>Rockfish, rosy</td>
<td>50-420</td>
<td>All</td>
<td>soft and hard bottom</td>
<td>hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
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<tr>
<td>Rockfish, sharpchin</td>
<td>300-1050</td>
<td>All</td>
<td>hard bottom</td>
<td>hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
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<tr>
<td>Rockfish, shortbelly</td>
<td>0-930</td>
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<td>midwater over hard bottom</td>
<td>live-bearing</td>
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<td>moderate</td>
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<tr>
<td>Rockfish, speckled</td>
<td>100-1200</td>
<td>All</td>
<td>hard bottom</td>
<td>hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
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</tr>
<tr>
<td>Rockfish, splitnose</td>
<td>700-1560</td>
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<td>soft bottom</td>
<td>hard bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Rockfish, squarespot</td>
<td>60-600</td>
<td>All</td>
<td>hard bottom</td>
<td>hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
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</tr>
<tr>
<td>Rockfish, starry</td>
<td>80-900</td>
<td>NC, SC, S</td>
<td>hard bottom</td>
<td>hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
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<tr>
<td>Rockfish, striptail</td>
<td>192-1320</td>
<td>All</td>
<td>soft bottom</td>
<td>soft and hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Rockfish, swordspine</td>
<td>250-1420</td>
<td>NC, SC, S</td>
<td>soft bottom</td>
<td>hard bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
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<tr>
<td>Rockfish, tiger</td>
<td>200-900</td>
<td>N, NC</td>
<td>hard bottom</td>
<td>hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, treefish</td>
<td>0-150</td>
<td>SC, S</td>
<td>rocky reefs</td>
<td>rocky reefs, kelp forests</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, vermilion</td>
<td>0-900</td>
<td>All</td>
<td>soft and hard bottom</td>
<td>wide depth range, rocky reefs, kelp forests, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, widow</td>
<td>0-1200</td>
<td>All</td>
<td>midwater over hard bottom</td>
<td>midwater over hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Geographic range</td>
<td>Preference juveniles</td>
<td>Preference adults</td>
<td>Life-history characteristics</td>
<td>Type</td>
<td>Duration for adult dispersal</td>
<td></td>
</tr>
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<td></td>
</tr>
<tr>
<td>Rockfish, yelloweye</td>
<td>150-1200</td>
<td>N, NC, SC</td>
<td>rocky reefs</td>
<td>hard bottom, canyons</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>low</td>
</tr>
<tr>
<td>Rockfish, yellowtail</td>
<td>0-1800</td>
<td>All</td>
<td>midwater</td>
<td>midwater over hard bottom</td>
<td>live-bearing</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Sanddab, Pacific</td>
<td>30-1800</td>
<td>All</td>
<td>soft bottom</td>
<td>soft bottom</td>
<td>may spawn twice a year</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
</tr>
<tr>
<td>Seabass, white</td>
<td>0-400</td>
<td>NC, SC, S</td>
<td>sandy area, estuaries, piers, jetties, kelp beds</td>
<td>kelp beds. Rocky reefs, offshore banks, open ocean</td>
<td>adults aggregate in spring-summer during spawning</td>
<td>planktonic</td>
<td>high</td>
<td></td>
</tr>
<tr>
<td>Shark, brown smoothhound</td>
<td>0-360</td>
<td>All</td>
<td>bays and estuaries</td>
<td>soft bottom, bays and estuaries, nearshore</td>
<td>live-bearing</td>
<td>miniature adults</td>
<td>zero</td>
<td>moderate</td>
</tr>
<tr>
<td>Shark, gray smoothhound</td>
<td>0-150</td>
<td>All</td>
<td>bays and estuaries</td>
<td>soft bottom, bays and estuaries, nearshore</td>
<td>live-bearing</td>
<td>miniature adults</td>
<td>zero</td>
<td>moderate</td>
</tr>
<tr>
<td>Shark, horn</td>
<td>0-492</td>
<td>S</td>
<td>rocky reefs, kelp beds</td>
<td>rocky reefs, kelp beds</td>
<td>lay egg cases</td>
<td>miniature adults</td>
<td>zero</td>
<td>moderate</td>
</tr>
<tr>
<td>Shark, Pacific angel</td>
<td>3-600</td>
<td>SC, S</td>
<td>flat, sandy bottoms;</td>
<td>flat, sandy bottoms; sand channels between reefs</td>
<td>live-bearing</td>
<td>miniature adults</td>
<td>zero</td>
<td>moderate</td>
</tr>
<tr>
<td>Shark, leopard</td>
<td>0-300</td>
<td>All</td>
<td>enclosed bays and sloughs; kelp beds; shallow sandy areas</td>
<td>enclosed bays and sloughs; kelp beds; shallow sandy areas near reefs</td>
<td>aggregate in very shallow water to release young; live-bearing</td>
<td>miniature adults</td>
<td>zero</td>
<td>moderate</td>
</tr>
<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Primary geographic range</td>
<td>Juveniles</td>
<td>Adults</td>
<td>Characteristics</td>
<td>Potential for adult dispersal</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Sheephead, California</td>
<td>0-180</td>
<td>SC, S</td>
<td>rocky reefs, kelp beds</td>
<td>rocky reefs, kelp beds</td>
<td>changes sex from female to male with size</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skate, big</td>
<td>10-360</td>
<td>N, NC, SC</td>
<td>soft bottom</td>
<td>soft bottom, occasionally rocky reefs</td>
<td>young hatch from eggs in cases</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skate, California</td>
<td>60-2200</td>
<td>All</td>
<td>soft bottom</td>
<td>soft bottom</td>
<td>young hatch from eggs in cases</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skate, longnose</td>
<td>180-2040</td>
<td>All</td>
<td>soft bottom</td>
<td>soft bottom</td>
<td>young hatch from eggs in cases</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smelt, night</td>
<td>0-420</td>
<td>N, NC, SC</td>
<td>soft bottom</td>
<td>shallow sandy coastal areas</td>
<td>spawn in surf zone at night</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smelt, surf</td>
<td>shallow</td>
<td>N, NC, SC</td>
<td>soft bottom</td>
<td>shallow sandy coastal areas</td>
<td>spawn in surf zone in daytime</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Smelt, whitebait</td>
<td>0-180</td>
<td>N, NC, SC</td>
<td>soft bottom</td>
<td>shallow sandy coastal areas, bays, and estuaries</td>
<td>spawn in sandy subtidal areas</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sole, Dover</td>
<td>60-3000</td>
<td>All</td>
<td>soft bottom, deep water</td>
<td>soft bottom, deep water</td>
<td>a portion of the stock migrates</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sole, English</td>
<td>60-1000</td>
<td>All</td>
<td>soft bottom, shelf</td>
<td>soft bottom</td>
<td>migrates, spawns at 200-360 ft</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sole, petrale</td>
<td>60-1500</td>
<td>All</td>
<td>soft and hard bottom, shelf</td>
<td>soft and hard bottom, shelf</td>
<td>migrates, spawns at 900-1200 ft</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sole, rex</td>
<td>60-2100</td>
<td>All</td>
<td>soft bottom, shelf and slope</td>
<td>soft bottom, shelf and slope</td>
<td>spawns at 300-900 ft</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sole, rock</td>
<td>50-1200</td>
<td>N, NC, SC</td>
<td>soft and hard bottom, shelf</td>
<td>soft and hard bottom, shelf</td>
<td>one of few flatfishes found on rocky bottom</td>
<td>moderate</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Primary geographic range</td>
<td>Habitat preference juveniles</td>
<td>Habitat preference adults</td>
<td>Unique/significant Life-history characteristics</td>
<td>Larval type</td>
<td>Larval duration</td>
<td>Potential for adult dispersal</td>
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</tr>
<tr>
<td>Sole, sand</td>
<td>5-312</td>
<td>N,NC,SC</td>
<td>Soft bottom, nearshore, estuaries</td>
<td>soft bottom, nearshore</td>
<td>one of few medium-large flatfish found</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
</tr>
<tr>
<td>Sole, slender</td>
<td>250-1700</td>
<td>All</td>
<td>Soft bottom, shelf and slope</td>
<td>Soft bottom, shelf and slope</td>
<td>relatively abundant offshore species</td>
<td>planktonic</td>
<td>moderate</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, barred</td>
<td>0-240</td>
<td>NC,SC,S</td>
<td>beaches</td>
<td>beaches</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, black</td>
<td>0-130</td>
<td>All</td>
<td>rocky reef, kelp beds</td>
<td>rocky reef, kelp beds</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, calico</td>
<td>0-30</td>
<td>All</td>
<td>beaches</td>
<td>beaches</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, pile</td>
<td>0-240</td>
<td>All</td>
<td>rocky reefs, kelp beds, soft bottom</td>
<td>rocky reefs, kelp beds, soft bottom</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, rainbow</td>
<td>0-130</td>
<td>All</td>
<td>rocky reef, kelp beds</td>
<td>rocky reef, kelp beds</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, redtail</td>
<td>0-60</td>
<td>N,NC</td>
<td>beaches</td>
<td>beaches</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, rubberlip</td>
<td>0-150</td>
<td>All</td>
<td>rocky reefs, kelp beds, soft bottom</td>
<td>rocky reefs, kelp beds, soft bottom</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, shiner</td>
<td>0-480</td>
<td>All</td>
<td>estuaries, soft bottom, kelp beds, rocky reef</td>
<td>estuaries, soft bottom, kelp beds, rocky reef</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate to high(?)</td>
</tr>
<tr>
<td>Surfperch, striped</td>
<td>0-55</td>
<td>All</td>
<td>rocky reef, kelp beds</td>
<td>rocky reef, kelp beds</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Surfperch, walleye</td>
<td>0-60</td>
<td>All</td>
<td>beaches</td>
<td>beaches</td>
<td>bear live, free-swimming young</td>
<td>not applicable</td>
<td>not applicable</td>
<td>moderate</td>
</tr>
<tr>
<td>Species</td>
<td>Size Range</td>
<td>Habitat</td>
<td>Behavior</td>
<td></td>
<td></td>
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</tr>
<tr>
<td><strong>Thornyhead, longspine</strong></td>
<td>1090-5000</td>
<td>All kelp beds, soft bottom</td>
<td>Swimming young, applicable able, lack swim bladder, may survive after surface and released, spawn gelatinous floating egg masses, planktonic unknown moderate to high</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>Thornyhead, shortspine</strong></td>
<td>84-5000+</td>
<td>All deep hard and soft bottom</td>
<td>Swimming young, applicable able, lack swim bladder, may survive after surface and released, spawn gelatinous floating egg masses, planktonic unknown moderate to high</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td><strong>Tomcod, Pacific</strong></td>
<td>0-720</td>
<td>N, NC, SC kelp and eel grass beds, sandy beaches, harbors</td>
<td>Broadcast spawners, high fecundity, planktonic unknown moderate</td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>Topsmelt</strong></td>
<td>shallow</td>
<td>All kelp and eel grass beds, sandy beaches, harbors</td>
<td>Spawns in eel grass and algal beds, possibly kelp beds, eggs attach to spawning substrate by adhesive filaments, planktonic low moderate</td>
<td></td>
<td></td>
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<td></td>
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</tr>
<tr>
<td><strong>Turbot, C-O</strong></td>
<td>shallow-966</td>
<td>All rocky reef, sand, shelf</td>
<td>One of few flatfishes to occur in kelp beds, planktonic unknown moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Turbot, curlfin</strong></td>
<td>25-1146</td>
<td>All soft bottom, shelf</td>
<td>Small mouth, difficult to catch with hook-and-line, planktonic unknown moderate</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Whitefish, ocean</strong></td>
<td>0-300</td>
<td>SC, S midwater over hard and soft bottom</td>
<td>Responds favorably to El Niño conditions, planktonic unknown moderate</td>
<td></td>
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</tr>
</tbody>
</table>
### Appendix II (b): List of Invertebrates and Plants Likely to Benefit from the Establishment of Marine Protected Areas in Central California

<table>
<thead>
<tr>
<th>Species</th>
<th>Primary depth range (feet) (x 0.305 = meters)</th>
<th>Primary Geographic range within state using four regions</th>
<th>Habitat preference juveniles</th>
<th>Habitat preference adults</th>
<th>Unique or significant life history characteristics</th>
<th>Larval type</th>
<th>Larval duration [potential larval dispersal]</th>
<th>Potential for adult dispersal (vagility)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crab, box</td>
<td>0-1800</td>
<td>All regions, including islands</td>
<td>rocky reef, submarine canyons</td>
<td>rocky reef, submarine canyons</td>
<td>unknown</td>
<td>planktonic</td>
<td>unknown</td>
<td>unknown</td>
</tr>
<tr>
<td>Crab, brown rock</td>
<td>0-300</td>
<td>All regions, including islands</td>
<td>rocky reefs, kelp beds,</td>
<td>rocky reefs, kelp beds,</td>
<td>rock crabs may live 5-6 years</td>
<td>planktonic</td>
<td>3-4 months</td>
<td>moderate</td>
</tr>
<tr>
<td>Crab, Dungeness</td>
<td>0-750</td>
<td>N, NC, SC</td>
<td>sand, sand-mud, estuaries</td>
<td>sand, sand-mud</td>
<td>larvae may be transported more than 50 miles offshore</td>
<td>planktonic</td>
<td>105-125 days</td>
<td>moderate</td>
</tr>
<tr>
<td>Crab, red rock</td>
<td>0-750</td>
<td>All regions, including islands</td>
<td>rocky reefs, submarine canyons</td>
<td>rocky reefs, submarine canyons</td>
<td>may co-occur with spot prawns</td>
<td>planktonic</td>
<td>3-4 months</td>
<td>moderate</td>
</tr>
<tr>
<td>Crab, sand</td>
<td>Intertidal</td>
<td>All regions, including islands</td>
<td>intertidal, shallow subtidal sand</td>
<td>intertidal, shallow subtidal sand</td>
<td>larvae often co-occur with Dungeness crab larvae</td>
<td>planktonic</td>
<td>unknown</td>
<td>low</td>
</tr>
<tr>
<td>Prawn, spot</td>
<td>150-1,600</td>
<td>All regions, including islands</td>
<td>shallower mud, mud-sand, sand/rock, rocky reef, submarine canyons</td>
<td>mud, mud-sand, sand/rock, rocky reef, submarine canyons</td>
<td>change sex from male to female during year 4</td>
<td>planktonic</td>
<td>unknown</td>
<td>moderate</td>
</tr>
<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Primary Geographic range</td>
<td>Habitat preference juveniles</td>
<td>Habitat preference adults</td>
<td>Life history characteristics</td>
<td>Larval type</td>
<td>Larval duration</td>
<td>Potential for adult dispersal</td>
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</tr>
<tr>
<td>Shrimp, ghost and mud shrimp (several species)</td>
<td>Intertidal</td>
<td>All regions</td>
<td>sand, sand/mud, sand/gravel</td>
<td>sand, sand/mud, sand/gravel</td>
<td>form permanent burrows or impermanent tunnels</td>
<td>planktonic</td>
<td>unknown</td>
<td>low</td>
</tr>
<tr>
<td>Shrimp, ocean</td>
<td>150-1200</td>
<td>N, NC, SC: Oregon border to Pt. Arguello</td>
<td>green mud, mud-sand</td>
<td>green mud, mud-sand</td>
<td>change sex from male to female during year 2</td>
<td>planktonic</td>
<td>2.5 to 3 months</td>
<td>moderate</td>
</tr>
<tr>
<td>Urchin, purple</td>
<td>0-300</td>
<td>All regions, including islands</td>
<td>rocky reefs, kelp beds, under canopy of adults</td>
<td>rocky reefs, kelp beds</td>
<td>require high densities for successful spawning</td>
<td>planktonic</td>
<td>6-8 weeks</td>
<td>low</td>
</tr>
<tr>
<td>Urchin, red</td>
<td>Intertidal to 500</td>
<td>All regions, including islands</td>
<td>rocky reefs, kelp beds, under canopy of adults</td>
<td>rocky reefs, kelp beds</td>
<td>require high densities for successful spawning</td>
<td>planktonic</td>
<td>6-8 weeks</td>
<td>low</td>
</tr>
<tr>
<td>Abalone, black</td>
<td>Intertidal, 0-20</td>
<td>NC, SC, S</td>
<td>crevices in rocky reefs, kelp beds</td>
<td>rocky reefs, kelp beds</td>
<td>susceptible to withering syndrome disease</td>
<td>planktonic</td>
<td>4-7 days</td>
<td>low</td>
</tr>
<tr>
<td>Abalone, flat</td>
<td>20-70</td>
<td>All regions, including islands</td>
<td>crevices in rocky reefs, kelp beds</td>
<td>rocky reefs, kelp beds</td>
<td>generally a cryptic species</td>
<td>planktonic</td>
<td>4-7 days</td>
<td>low</td>
</tr>
<tr>
<td>Abalone, pinto</td>
<td>Intertidal to 70</td>
<td>N, NC, SC</td>
<td>crevices in rocky reefs, kelp beds</td>
<td>rocky reefs, kelp beds</td>
<td>commonly found at approx. 4-inch length</td>
<td>planktonic</td>
<td>4-7 days</td>
<td>low</td>
</tr>
<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Geographic range</td>
<td>preference juveniles</td>
<td>preference adults</td>
<td>characteristics</td>
<td>Larval type</td>
<td>duration</td>
<td>for adult dispersal</td>
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</tr>
<tr>
<td>Abalone, red</td>
<td>Intertidal to 100</td>
<td>All regions, including islands</td>
<td>crevices in rocky reefs, kelp beds, boulder outcrops, under canopy of red urchins</td>
<td>rocky reefs, kelp beds, boulder outcrops</td>
<td>largest abalone species in the world</td>
<td>planktonic</td>
<td>4-7 days</td>
<td>low</td>
</tr>
<tr>
<td>Clam, California jackknife</td>
<td>Intertidal to</td>
<td>South, mainland and islands</td>
<td>sandy mud, estuaries</td>
<td>sandy mud, estuaries</td>
<td>occupies a permanent burrow</td>
<td>planktonic</td>
<td>unknown</td>
<td>low</td>
</tr>
<tr>
<td>Clam, chione (several species)</td>
<td>Intertidal to 165</td>
<td>South, mainland and islands</td>
<td>mud, sand, estuaries</td>
<td>mud, sand, estuaries</td>
<td>smooth chione subject to habitat loss due to harbor development</td>
<td>planktonic</td>
<td>unknown</td>
<td>low</td>
</tr>
<tr>
<td>Clam, littleneck (several species)</td>
<td>Intertidal</td>
<td>All regions, including islands</td>
<td>cobble beds</td>
<td>cobble beds</td>
<td>prized food item</td>
<td>planktonic</td>
<td>unknown</td>
<td>low</td>
</tr>
<tr>
<td>Clam, gaper (several species)</td>
<td>Intertidal to 150</td>
<td>All regions</td>
<td>sand, sand/mud, estuaries</td>
<td>sand, sand/mud, estuaries</td>
<td>may live to 17 years</td>
<td>planktonic</td>
<td>low</td>
<td></td>
</tr>
<tr>
<td>Clam, geoduck</td>
<td>0-360</td>
<td>All regions</td>
<td>sand/mud, estuaries</td>
<td>sand/mud, estuaries</td>
<td>individuals may exceed 10 pounds</td>
<td>planktonic</td>
<td>2 weeks</td>
<td>low</td>
</tr>
<tr>
<td>Clam, Manila</td>
<td>Intertidal</td>
<td>All regions</td>
<td>sand/mud, estuaries</td>
<td>sand/mud, estuaries</td>
<td>introduced from Japan; important recreational species</td>
<td>planktonic</td>
<td>3 weeks</td>
<td>low</td>
</tr>
<tr>
<td>Clam, Pismo</td>
<td>Intertidal to SC,S</td>
<td>exposed sand</td>
<td>exposed sand</td>
<td>primary prey</td>
<td>planktonic</td>
<td>pelagic</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Primary Geographic range</td>
<td>Habitat preference juveniles</td>
<td>Habitat preference adults</td>
<td>Life history characteristics</td>
<td>Larval type</td>
<td>Larval duration</td>
<td>Potential for adult dispersal</td>
</tr>
<tr>
<td>--------------------------</td>
<td>---------------------</td>
<td>--------------------------</td>
<td>-----------------------------</td>
<td>--------------------------</td>
<td>-----------------------------</td>
<td>------------</td>
<td>----------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>Clam, razor</td>
<td>Intertidal and shallow subtidal</td>
<td>N,NC,SC</td>
<td>exposed sand</td>
<td>exposed sand</td>
<td>individuals can bury themselves in 7 seconds</td>
<td>planktonic</td>
<td>8 weeks</td>
<td>Low</td>
</tr>
<tr>
<td>Clam, softshell</td>
<td>Intertidal</td>
<td>N,NC,SC</td>
<td>mud</td>
<td>mud</td>
<td>may have been introduced with eastern oyster</td>
<td>planktonic</td>
<td>unknown</td>
<td>Low</td>
</tr>
<tr>
<td>Clam, Washington (several species)</td>
<td>Intertidal to 100</td>
<td>All regions</td>
<td>sand/mud, estuaries</td>
<td>sand/mud, estuaries</td>
<td>known to concentrate paralytic shellfish poisoning toxin</td>
<td>planktonic</td>
<td>4 weeks</td>
<td>Low</td>
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<tr>
<td>Cockles</td>
<td>Intertidal to 660</td>
<td>All regions, including islands</td>
<td>sand, sand/mud, mud, estuaries</td>
<td>sand, sand/mud, mud, estuaries</td>
<td>one species may live to 16 years</td>
<td>planktonic</td>
<td>unknown</td>
<td>Low</td>
</tr>
<tr>
<td>Limpets</td>
<td>Intertidal to 100</td>
<td>All regions, including islands</td>
<td>rocky reefs</td>
<td>rocky reefs</td>
<td>some species may live 15 years</td>
<td>planktonic</td>
<td>less than 1 week</td>
<td>Low</td>
</tr>
<tr>
<td>Mussels (several species)</td>
<td>Intertidal to 130</td>
<td>All regions, including islands</td>
<td>rocky reefs, pilings</td>
<td>rocky reefs, pilings</td>
<td>bio-accumulator of toxins.</td>
<td>planktonic</td>
<td>1 month</td>
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<tr>
<td>Octopus (several species)</td>
<td>Intertidal to 660</td>
<td>All regions, including islands</td>
<td>rocky reefs, kelp beds, soft bottom</td>
<td>rocky reefs, kelp beds, soft bottom</td>
<td>eggs are attached to substrate and brooded by females</td>
<td>planktonic</td>
<td>1 month or less</td>
<td>Low</td>
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80 item of California sea otters phase 2-3 days
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<thead>
<tr>
<th></th>
<th>100 including islands</th>
<th>pier pilings, rock jetties</th>
<th>pier pilings, rock jetties</th>
<th>salinity less than 25 ppt</th>
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<tbody>
<tr>
<td><strong>Sea hare (two species)</strong></td>
<td>0-60</td>
<td>NC, SC, S</td>
<td>hard and soft bottom, kelp beds</td>
<td>large nerve ganglia make them useful for research</td>
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<td></td>
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<td></td>
<td>planktonic</td>
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<td></td>
<td></td>
<td>4-5 weeks</td>
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<td></td>
<td>Low</td>
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<tr>
<td><strong>Sea stars (many species)</strong></td>
<td>Intertidal to deepest canyons</td>
<td>All regions, including islands</td>
<td>rocky reefs, hard bottom, sand</td>
<td>some species adapted to exposure at low tides</td>
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<td></td>
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<td></td>
<td>planktonic</td>
</tr>
<tr>
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<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Low</td>
</tr>
<tr>
<td><strong>Snail, moon</strong></td>
<td>Intertidal to 500</td>
<td>All regions, including islands</td>
<td>soft bottom</td>
<td>has aquiferous system of spongy sinuses in foot</td>
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<td></td>
<td>planktonic</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>2 weeks</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>low</td>
</tr>
<tr>
<td><strong>Snail, turban (several species)</strong></td>
<td>Intertidal to 250</td>
<td>All regions, including islands</td>
<td>shallower rocky reefs, kelp beds, including canopy</td>
<td>feeds primarily on kelp and coralline algae</td>
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<td>planktonic</td>
</tr>
<tr>
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<td></td>
<td></td>
<td>unknown</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>low</td>
</tr>
<tr>
<td><strong>Worms (polychaetes)</strong></td>
<td>Intertidal to deepest canyons</td>
<td>All</td>
<td>rocky reefs in mussel beds, cobble beds, soft bottom</td>
<td>several species have toothed proboscis</td>
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<td></td>
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<td>planktonic</td>
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<td>low</td>
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<tr>
<td>Species</td>
<td>Primary depth range</td>
<td>Primary Geographic range</td>
<td>Habitat preference juveniles</td>
<td>Habitat preference adults</td>
</tr>
<tr>
<td>-------------------------</td>
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<td>--------------------------</td>
<td>------------------------------</td>
<td>---------------------------</td>
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<tr>
<td><strong>Algae</strong></td>
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<tr>
<td>Gelidium sp. (many species)</td>
<td>Intertidal, to 100</td>
<td>All regions, including islands</td>
<td>rocky reefs</td>
<td>rocky reefs</td>
</tr>
<tr>
<td>Gracilaria sp. (many species)</td>
<td>Intertidal to 50</td>
<td>All regions, including islands</td>
<td>soft bottoms</td>
<td>soft bottoms</td>
</tr>
<tr>
<td>Porphyra sp. (many species)</td>
<td>Intertidal to 100</td>
<td>All regions, including islands</td>
<td>rocky reefs</td>
<td>rocky reefs</td>
</tr>
<tr>
<td>Sea palm</td>
<td>Intertidal</td>
<td>N, NC, SC</td>
<td>exposed rocky reefs</td>
<td>exposed rocky reefs</td>
</tr>
<tr>
<td>Kelp, giant</td>
<td>20-120</td>
<td>NC, SC, S</td>
<td>on sand and rock substrate</td>
<td>on sand and rock substrate</td>
</tr>
<tr>
<td>Kelp, bull</td>
<td>10-70</td>
<td>N, NC, SC</td>
<td>on rock or cobble substrate</td>
<td>on rock or cobble substrate</td>
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</table>
### Appendix II (c): Special Status Species

This list compiled by NOAA staff and represents species expected to occur in the Monterey Bay National Marine Sanctuary.

<table>
<thead>
<tr>
<th>Mammal Common Name</th>
<th>Scientific Name</th>
<th>ESA</th>
<th>CESA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blue whale</td>
<td><em>Balaenoptera musculus musculus</em></td>
<td>E (06-02-70)</td>
<td></td>
</tr>
<tr>
<td>Fin whale</td>
<td><em>Balaenoptera physalus</em></td>
<td>E (06-02-70)</td>
<td></td>
</tr>
<tr>
<td>Humpback whale</td>
<td><em>Megaptera novaeangliae</em></td>
<td>E (06-02-70)</td>
<td></td>
</tr>
<tr>
<td>North Pacific right whale</td>
<td><em>Eubalaena japonica</em></td>
<td>E (06-02-70)</td>
<td></td>
</tr>
<tr>
<td>Gray whale</td>
<td><em>Eschrichtius robustus</em></td>
<td>Delist (06-15-94)</td>
<td></td>
</tr>
<tr>
<td>Sei whale</td>
<td><em>Balaenoptera borealis</em></td>
<td>E (06-02-70)</td>
<td></td>
</tr>
<tr>
<td>Sperm whale</td>
<td><em>Physeter macrocephalus</em></td>
<td>E (06-02-70)</td>
<td></td>
</tr>
<tr>
<td>Killer Whale</td>
<td><em>Orcinus orca</em></td>
<td>PT (12-22-04); SC (NMFS)</td>
<td></td>
</tr>
<tr>
<td>Steller sea lion (Eastern stock)</td>
<td><em>Eumetopias jubatus</em></td>
<td>T (04-05-90)</td>
<td></td>
</tr>
<tr>
<td>Guadalupe fur seal</td>
<td><em>Arctocephalus townsendi</em></td>
<td>T (12-16-85)</td>
<td>T (06-27-71)</td>
</tr>
<tr>
<td>Southern sea otter</td>
<td><em>Enhydra lutris nereis</em></td>
<td>T (01-14-77)</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bird Common Name</th>
<th>Scientific Name</th>
<th>ESA</th>
<th>CESA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common loon</td>
<td><em>Gavia immer</em></td>
<td>SSC</td>
<td></td>
</tr>
<tr>
<td>Short-tailed Albatross</td>
<td><em>Phoebastria albatrus</em></td>
<td>E (08-30-00)</td>
<td>SSC</td>
</tr>
<tr>
<td>Black-footed albatross</td>
<td><em>Phoebastria nigripes</em></td>
<td>SC (FWS)</td>
<td></td>
</tr>
<tr>
<td>Ashy storm-petrel</td>
<td><em>Oceanodroma homochroa</em></td>
<td>SC (FWS)</td>
<td>SSC (SP)</td>
</tr>
<tr>
<td>Fork-tailed storm-petrel</td>
<td><em>Oceanodroma fucrata</em></td>
<td>SSC (FP)</td>
<td></td>
</tr>
<tr>
<td>Black storm-petrel</td>
<td><em>Oceanodroma melanio</em></td>
<td>SSC (TP)</td>
<td></td>
</tr>
<tr>
<td>California brown pelican</td>
<td><em>Pelecanus occidentalis californicus</em></td>
<td>E (10-13-70)</td>
<td>E (06-27-71)</td>
</tr>
<tr>
<td>American white pelican</td>
<td><em>Pelecanus erythrorhynchos</em></td>
<td>SSC (FP)</td>
<td></td>
</tr>
<tr>
<td>American bittern</td>
<td><em>Botaurus lentiginosus</em></td>
<td>SC (FWS)</td>
<td></td>
</tr>
<tr>
<td>Bird Common Name</td>
<td>Scientific Name</td>
<td>ESA</td>
<td>CESA</td>
</tr>
<tr>
<td>-----------------------</td>
<td>----------------------------------------</td>
<td>----------------------</td>
<td>----------</td>
</tr>
<tr>
<td>Least bittern</td>
<td><em>Ixobrychius exilis</em></td>
<td></td>
<td>SSC (TP)</td>
</tr>
<tr>
<td>White-faced ibis</td>
<td><em>Plegadis chihi</em></td>
<td>SC (FWS)</td>
<td></td>
</tr>
<tr>
<td>Harlequin duck</td>
<td><em>Histrionicus histrionicus</em></td>
<td>SC (FWS)</td>
<td>SSC (FP)</td>
</tr>
<tr>
<td>California black rail</td>
<td><em>Laterallus jamaicensis coturniculus</em></td>
<td>SC (FWS)</td>
<td>T (06-27-71)</td>
</tr>
<tr>
<td>Western snowy plover</td>
<td><em>Charadrius alexandrinus nivosus</em></td>
<td>T (04-05-93)</td>
<td>SSC</td>
</tr>
<tr>
<td>Black oystercatcher</td>
<td><em>Haematopus bachmani</em></td>
<td>SC (FWS)</td>
<td></td>
</tr>
<tr>
<td>Whimbrel</td>
<td><em>Numenius phaeopus</em></td>
<td>SC (FWS)</td>
<td></td>
</tr>
<tr>
<td>Long-billed curlew</td>
<td><em>Numenius americanus</em></td>
<td>SC (FWS)</td>
<td></td>
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<tr>
<td>Marbled godwit</td>
<td><em>Limosa fedoa</em></td>
<td>SC (FWS)</td>
<td></td>
</tr>
<tr>
<td>Black turnstone</td>
<td><em>Arenaria melanocephala</em></td>
<td>SC (FWS)</td>
<td></td>
</tr>
<tr>
<td>Red knot</td>
<td><em>Calidris canutus</em></td>
<td>SC (FWS)</td>
<td></td>
</tr>
<tr>
<td>Elegant tern</td>
<td><em>Sterna elegans</em></td>
<td>SC (FWS)</td>
<td>SSC (TP)</td>
</tr>
<tr>
<td>California least tern</td>
<td><em>Sterna antillarum browni</em></td>
<td>E (10-13-70)</td>
<td>E (06-27-71)</td>
</tr>
<tr>
<td>Marbled murrelet</td>
<td><em>Brachyramphus marmoratus marmoratus</em></td>
<td>T (09-30-92)</td>
<td>E (03-12-92)</td>
</tr>
<tr>
<td>Xantus's murrelet</td>
<td><em>Synthliboramphus hypoleucus</em></td>
<td>SC / Candidate (FWS)</td>
<td>T (12-22-04)</td>
</tr>
<tr>
<td>Cassin's auklet</td>
<td><em>Ptychoramphus aleuticus</em></td>
<td>SC (FWS)</td>
<td>SSC (SP)</td>
</tr>
<tr>
<td>Rhinoceros auklet</td>
<td><em>Cerorhinca monocerata</em></td>
<td></td>
<td>SSC (TP)</td>
</tr>
<tr>
<td>Tufted Puffin</td>
<td><em>Fratercula cirrhata</em></td>
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<td>SSC (FP)</td>
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<table>
<thead>
<tr>
<th>Reptile Common Name</th>
<th>Scientific Name</th>
<th>ESA</th>
<th>CESA</th>
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<tbody>
<tr>
<td>Leatherback sea turtle</td>
<td><em>Dermochelys coriacea</em></td>
<td>E (06-02-70)</td>
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<tr>
<td>Fish Common Name</td>
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<tr>
<td>-----------------------------------------</td>
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</tr>
<tr>
<td>Chinook salmon (spring run) Sac Rv and tributaries</td>
<td>Oncorhynchus tshawytscha</td>
<td>PT (06-14-04); T (11-15-99)</td>
<td>T (02-05-99)</td>
</tr>
<tr>
<td>Chinook salmon (fall/late fall run ) Sacramento river</td>
<td>Oncorhynchus tshawytscha</td>
<td>Candidate; SC (NMFS)</td>
<td>SSC</td>
</tr>
<tr>
<td>Chinook salmon (winter run) Sacramento River</td>
<td>Oncorhynchus tshawytscha</td>
<td>PT (06-14-04); E (02-03-94)</td>
<td>E (09-22-89)</td>
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<tr>
<td>Coho salmon (central CA coast ESU)</td>
<td>Oncorhynchus kisutch</td>
<td>PE (06-14-04); T (12-02-96)</td>
<td>E (12-31-95)</td>
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<tr>
<td>Steelhead (central CA coast ESU) Russian Rv to Soquel Creek</td>
<td>Oncorhynchus mykiss irideus</td>
<td>PT (06-14-04); T (10-17-97)</td>
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<tr>
<td>Steelhead (south/cen CA coast ESU) Pajaro Rv to Santa Maria Rv</td>
<td>Oncorhynchus mykiss irideus</td>
<td>PT (06-14-04); T (10-17-97)</td>
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<tr>
<td>Tidewater goby</td>
<td>Eucyclogobius newberry</td>
<td>E (02-04-94)</td>
<td>SSC (QE)</td>
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<tr>
<td>Pacific lamprey</td>
<td>Lampetra tridentata</td>
<td>SC (FWS)</td>
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<tr>
<td>White sturgeon</td>
<td>Acipenser transmontanus</td>
<td>E (09-06-94)</td>
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<tr>
<td>Green sturgeon</td>
<td>Acipenser medirostris</td>
<td>Candidate; SC (NMFS)</td>
<td>SSC (QT)</td>
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<td>Cowcod</td>
<td>Sebastes levis</td>
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<tr>
<td>Bocaccio</td>
<td>Sebastes paucispinis</td>
<td>SC (NMFS)</td>
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<tr>
<td>Eulachon</td>
<td>Thaleichthys pacificus</td>
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</table>

<table>
<thead>
<tr>
<th>Invertebrate Common Name</th>
<th>Scientific Name</th>
<th>ESA</th>
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</tr>
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<tbody>
<tr>
<td>Black abalone</td>
<td>Haliotis cracherodii</td>
<td>SC (NMFS)</td>
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</tr>
<tr>
<td>Pinto abalone</td>
<td>Haliotis kamtschatkana</td>
<td>SC (NMFS)</td>
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## Index of the listing codes used in the tables above

### FEDERAL LISTING CODES
**ESA: Endangered Species Act of 1973 Listing Codes**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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<tr>
<td>E</td>
<td>Federally listed as Endangered</td>
</tr>
<tr>
<td>T</td>
<td>Federally listed as Threatened</td>
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<tr>
<td>PE</td>
<td>Proposed for federal listing as Endangered</td>
</tr>
<tr>
<td>PT</td>
<td>Proposed for federal listing as Threatened</td>
</tr>
<tr>
<td>PD</td>
<td>Proposed for federal de-listing</td>
</tr>
<tr>
<td><strong>Candidate</strong></td>
<td>Candidate for federal listing as endangered or threatened</td>
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<tr>
<td>SC</td>
<td>Species of Concern</td>
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### STATE LISTING CODES
**CESA: California Endangered Species Act Listing Codes**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
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</tr>
<tr>
<td>T</td>
<td>State-listed as Threatened</td>
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<tr>
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<td>Candidate for state listing as Endangered</td>
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<tr>
<td>CT</td>
<td>Candidate for state listing as Threatened</td>
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<tr>
<td><strong>SSC</strong></td>
<td>Species of Special Concern</td>
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<td>Qualify as Endangered (fish list)</td>
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<tr>
<td>QT</td>
<td>Qualify as Threatened (fish list)</td>
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<tr>
<td>WL</td>
<td>Watch List (fish list)</td>
</tr>
<tr>
<td>FP</td>
<td>First Priority (bird list)</td>
</tr>
<tr>
<td>SP</td>
<td>Second Priority (bird list)</td>
</tr>
<tr>
<td>TP</td>
<td>Third Priority (bird list)</td>
</tr>
</tbody>
</table>
Appendix III: Profile of Commercial Fisheries for the Central Coast Study Region

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1. Summary of Monterey Bay Port Area Fisheries, 1999-2004
5. Monterey port area landings 1999-2004
6. Monterey port area ex-vessel values 1999-2004

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7. Pelagic wetfish (Sardine/mackerel/anchovy)
9. Squid
11. Dover sole/thornyhead/sablefish
14. Albacore and other tuna
16. King salmon (Chinook)
18. Other flatfish
20. Slope rockfish/grenadier
22. Shelf rockfish
24. California halibut
26. Dungeness crab
28. Nearshore rockfish/cabezon/greenling
31. Spot prawn
33. Swordfish
35. Shark
37. Jacksmelt
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45. Summary of Morro Bay Port Area Fisheries, 1999-2004
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Fishery Profiles Morro Bay port area

49. Dover sole/thornyhead/sablefish
52. Squid
54. Albacore and other tuna
56. Ocean shrimp
58. Slope rockfish/grenadier
60. Nearshore rockfish/cabezon/greenling
63. Other flatfish
65. Swordfish
67. King salmon (Chinook)
69. Rock crab
71. Spot prawn
73. Shelf rockfish
75. California halibut
77. Shark
78. Lingcod
80. Dungeness crab
82. Surfperch
84. White seabass
86. Red urchin
### SUMMARY OF MONTEREY BAY PORT AREA FISHERIES

(ranked by average value 1999-2004)

<table>
<thead>
<tr>
<th></th>
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<tbody>
<tr>
<td>Market squid</td>
<td>market squid</td>
<td>55</td>
<td>Seine, brail</td>
<td>5-30fms</td>
<td>Sand</td>
<td>State</td>
<td>12.2 million</td>
<td>$2.9 million</td>
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<td>Salmon</td>
<td>King (chinook)</td>
<td>279</td>
<td>troll hook-and-line</td>
<td>surface to 50fms</td>
<td>pelagic, open ocean</td>
<td>State and Federal</td>
<td>777k</td>
<td>$2.3 million</td>
<td>858k</td>
<td>$1.7 million</td>
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<td>Pelagic wetfish</td>
<td>Pacific sardine, northern anchovy, jack mackerel, Pacific mackerel</td>
<td>26</td>
<td>Seine</td>
<td>5-50fms</td>
<td>Sand</td>
<td>State</td>
<td>34 million</td>
<td>$1.2 million</td>
<td>26 million - sardines, 8.6 million - anchovy, 1 million - mackerel</td>
<td>619k - sardines, 390k - anchovy, 294k mackerel</td>
<td>3, 8, 24</td>
<td>9, 7, 4</td>
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<tr>
<td>Dover sole / thornyhead / sablefish</td>
<td>Dover sole, longspine thornyhead, shortspine thornyhead, sablefish</td>
<td>1-46 permits for 9 distinct types of gear-species combinations</td>
<td>Bottom trawl, longline (thornyheads and sablefish), gill nets and traps (sablefish)</td>
<td>150-700fms</td>
<td>soft bottom, low-relief mixed and hard bottom</td>
<td>Federal</td>
<td>580k - Dover sole, 199k - thornyheads, 509k - sablefish</td>
<td>$197k Dover sole, $351k thornyheads, $523k sablefish</td>
<td>$293k Dover sole, $480k thornyheads, $705k sablefish</td>
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<td>9, 7, 4</td>
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<td>Albacore / other tuna</td>
<td>Albacore, also bluefin, bigeye, yellowfin, skipjack tunas</td>
<td>114</td>
<td>troll hook-and-line, purse seine</td>
<td>surface and subsurface waters</td>
<td>open ocean, pelagic waters</td>
<td>Federal</td>
<td>395k Albacore, 4k other tuna</td>
<td>$326k Albacore, $11k other tuna</td>
<td>$843k Albacore, $631k other tuna</td>
<td>6, 17</td>
<td>5, 15</td>
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<td>Spot prawn trap</td>
<td>Spot prawn</td>
<td>7</td>
<td>Traps</td>
<td>100-150fms</td>
<td>canyon, hard, soft and mixed bottom</td>
<td>State and Federal</td>
<td>48k</td>
<td>$520k</td>
<td>54k</td>
<td>$511k</td>
<td>18</td>
<td>6</td>
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<td>California halibut</td>
<td>California halibut</td>
<td>trawl 34, hook-and-line 85</td>
<td>trawl, hook-and-line, gill and trammel net</td>
<td>2-50fms</td>
<td>sand</td>
<td>State and Federal</td>
<td>101k</td>
<td>$290k</td>
<td>88k</td>
<td>$202k</td>
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<tr>
<td>Dungeness crab</td>
<td>Dungeness crab</td>
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<td>circular traps</td>
<td>0-50fms</td>
<td>sand</td>
<td>State and Federal</td>
<td>169k</td>
<td>$321k</td>
<td>86k</td>
<td>$192k</td>
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<td>11</td>
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<tr>
<td>Nearshore finfish</td>
<td>Nearshore rockfish, cabezon, kelp greenling</td>
<td>58</td>
<td>Hook and line, trap</td>
<td>0-20fms</td>
<td>rocky reefs, State kelp</td>
<td>26k rockfish; 13k cabezon, 0.8k kelp greenling</td>
<td>$113k rockfish, $63k cabezon, $4,501 greenling</td>
<td>41k rockfish, 16k cabezon, 2k greenling</td>
<td>$168k rockfish, $67k cabezon, $11k greenling</td>
<td>20, 26, 30, 19, 27</td>
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<td></td>
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<tr>
<td>Other flatfishes</td>
<td>Pacific sanddab, Petrale and other soles, and flatfish</td>
<td>28 sanddab, 41 other flatfish</td>
<td>bottom trawl</td>
<td>30-700fms</td>
<td>low-relief soft bottom</td>
<td>159k sanddab, 232k other flatfish</td>
<td>$72k sanddab, $209k other flatfish</td>
<td>278k sanddab, 221k other flatfish</td>
<td>$86k sanddab, $162k other flatfish</td>
<td>10, 12, 18, 13</td>
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<tr>
<td>Swordfish</td>
<td>Swordfish</td>
<td>6</td>
<td>drift gill net, hook-and-line, near-harpoon surface and near-surface waters open ocean, pelagic waters</td>
<td>Federal</td>
<td>8k</td>
<td>$25k</td>
<td>49k</td>
<td>$127k</td>
<td>19</td>
<td>14</td>
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<tr>
<td>Shelf rockfish</td>
<td>24 species of shelf rockfish</td>
<td>Hook-and-line 53, trawl 22, gill net 1</td>
<td>bottom trawl, midwater trawl, longline, hook-and-line, gill net</td>
<td>30-200fms</td>
<td>deep rocky reefs, cobble and sand, edges of canyons</td>
<td>State and Federal</td>
<td>27k</td>
<td>$26k</td>
<td>181k</td>
<td>$102k</td>
<td>14</td>
<td>16</td>
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### 2003 Waters pounds volume value

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</thead>
<tbody>
<tr>
<td><strong>Slope rockfish / grenadier</strong></td>
<td>several &quot;slope&quot; rockfish species, grenadier</td>
<td>9-25 permits for 6 distinct gear/species combinations</td>
<td>bottom trawl, set longline</td>
<td>200-700fms</td>
<td>soft bottom on continental slope, submarine canyons</td>
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<tr>
<td><strong>White seabass</strong></td>
<td>White seabass</td>
<td>6</td>
<td>hook-and-line</td>
<td>0-40fms</td>
<td>kelp beds, reefs, offshore banks, open ocean</td>
</tr>
<tr>
<td><strong>Shark</strong></td>
<td>Thresher, mako, dogfish, other sharks</td>
<td>Hook-and-line, 18, trawl 19, gill net 5</td>
<td>Hook and line, trawl, gill nets</td>
<td>0-400fms</td>
<td>open ocean, pelagic, nearshore, soft bottom, hard bottom, rocky reefs, kelp forest</td>
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<tr>
<td><strong>Lingcod</strong></td>
<td>Lingcod</td>
<td>Hook-and-line, 95, trawl 27, trap 5, gill net 1</td>
<td>hook-and-line, 2-200fms trawl, gill net, trap</td>
<td>deep and shallow rocky reef, kelp beds, mixed substrate, hardbottom, canyons</td>
<td>State and Federal</td>
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<tr>
<td><strong>Butterfish</strong></td>
<td>Butterfish</td>
<td>4</td>
<td>seine</td>
<td>5-50fms</td>
<td>nearshore, pelagic waters</td>
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<tr>
<td>---------</td>
<td>-----------------------------------------------</td>
<td>---------------------------</td>
<td>--------------</td>
<td>---------------</td>
<td>------------------------</td>
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<tr>
<td>Rock crab</td>
<td>Several species of rock crab</td>
<td>13</td>
<td>Traps</td>
<td>15-40fms</td>
<td>State</td>
</tr>
<tr>
<td>Jacksmelt</td>
<td>Jacksmelt</td>
<td>5</td>
<td>seine</td>
<td>0-30fms</td>
<td>State</td>
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Monterey port area landings (pounds)

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<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
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<th>2003</th>
<th>2004</th>
<th>6-year average</th>
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<td><strong>FINFISH</strong></td>
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<td>Sardine</td>
<td>35,929,390</td>
<td>25,058,931</td>
<td>15,658,063</td>
<td>29,998,833</td>
<td>17,432,494</td>
<td>34,047,042</td>
<td>26,354,126</td>
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<tr>
<td>Anchovy</td>
<td>3,291,385</td>
<td>14,494,753</td>
<td>25,706,123</td>
<td>5,992,263</td>
<td>1,555,834</td>
<td>8,577,584</td>
<td>9,936,324</td>
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<tr>
<td>Dover sole</td>
<td>1,081,154</td>
<td>1,095,224</td>
<td>924,238</td>
<td>878,152</td>
<td>1,000,780</td>
<td>579,811</td>
<td>926,560</td>
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<tr>
<td>King salmon*</td>
<td>1,082,526</td>
<td>1,718,270</td>
<td>381,167</td>
<td>713,242</td>
<td>475,651</td>
<td>777,337</td>
<td>858,032</td>
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<td>Albacore</td>
<td>1,139,895</td>
<td>757,494</td>
<td>1,366,732</td>
<td>923,384</td>
<td>473,375</td>
<td>394,936</td>
<td>842,636</td>
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<td>Sablefish</td>
<td>726,326</td>
<td>709,963</td>
<td>570,765</td>
<td>526,019</td>
<td>673,999</td>
<td>508,517</td>
<td>619,265</td>
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<td>Thornyheads</td>
<td>500,926</td>
<td>464,804</td>
<td>311,631</td>
<td>452,469</td>
<td>409,648</td>
<td>199,283</td>
<td>389,794</td>
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<td>Mackerel</td>
<td>59,341</td>
<td>196,655</td>
<td>379,415</td>
<td>4,024</td>
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<td>1,079,949</td>
<td>294,717</td>
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<td>Sanddabs</td>
<td>471,791</td>
<td>98,200</td>
<td>90,765</td>
<td>205,537</td>
<td>640,612</td>
<td>159,143</td>
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<td>Grenadier</td>
<td>313,742</td>
<td>222,928</td>
<td>234,592</td>
<td>236,636</td>
<td>225,411</td>
<td>198,568</td>
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<td>Other flatfish</td>
<td>333,053</td>
<td>178,468</td>
<td>271,484</td>
<td>174,679</td>
<td>137,479</td>
<td>231,971</td>
<td>221,189</td>
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<td>Rockfish slope</td>
<td>182,707</td>
<td>157,911</td>
<td>185,753</td>
<td>102,961</td>
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<td>192,474</td>
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<td>291,760</td>
<td>183,785</td>
<td>101,979</td>
<td>10,021</td>
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<td>California halibut</td>
<td>198,817</td>
<td>45,454</td>
<td>45,830</td>
<td>84,135</td>
<td>52,313</td>
<td>100,618</td>
<td>87,861</td>
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<tr>
<td>Other tuna</td>
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<td>10,963</td>
<td>97,715</td>
<td>272</td>
<td>3,142</td>
<td>4,460</td>
<td>61,417</td>
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<td>Swordfish</td>
<td>236,171</td>
<td>29,247</td>
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<td>132</td>
<td>15,242</td>
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<td>Rockfish nearshore</td>
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<td>51,227</td>
<td>44,652</td>
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<td>34,545</td>
<td>7,036</td>
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<td>46,142</td>
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<td>58,460</td>
<td>67,881</td>
<td>8,251</td>
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<td>Rockfish other</td>
<td>105,102</td>
<td>10,328</td>
<td>5,389</td>
<td>2,566</td>
<td>3,487</td>
<td>1,716</td>
<td>21,432</td>
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<td>White seabass</td>
<td>4,252</td>
<td>24,448</td>
<td>54,692</td>
<td>23,333</td>
<td>7,685</td>
<td>180</td>
<td>19,098</td>
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<td>Lingcod</td>
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<td>7,700</td>
<td>10,702</td>
<td>20,813</td>
<td>16,792</td>
<td>26,245</td>
<td>18,327</td>
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<td>Cabezon</td>
<td>23,326</td>
<td>23,851</td>
<td>16,713</td>
<td>13,545</td>
<td>5,827</td>
<td>13,442</td>
<td>16,117</td>
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<td>Butterfish</td>
<td>307</td>
<td>2,969</td>
<td>8,983</td>
<td>43,008</td>
<td>17,545</td>
<td>12,199</td>
<td>14,169</td>
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<td>Kelp greenling</td>
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<td>3,433</td>
<td>1,672</td>
<td>1,903</td>
<td>716</td>
<td>821</td>
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* From DFG Ocean Salmon Project records

INVERTEBRATES

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<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>6-year</th>
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<tr>
<td>Market squid</td>
<td>558,960</td>
<td>15,421,113</td>
<td>55,263,371</td>
<td>52,631,176</td>
<td>21,299,049</td>
<td>21,876,986</td>
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<tr>
<td>Dungeness crab</td>
<td>25,027</td>
<td>25,691</td>
<td>24,260</td>
<td>107,446</td>
<td>163,020</td>
<td>169,041</td>
<td>85,748</td>
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<td>Spot prawn</td>
<td>52,980</td>
<td>37,248</td>
<td>48,398</td>
<td>81,880</td>
<td>58,236</td>
<td>47,804</td>
<td>54,423</td>
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<td>Rock crab</td>
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<td>9,421</td>
<td>2,916</td>
<td>954</td>
<td>2,054</td>
<td>2,787</td>
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Monterey port area ex-vessel value (dollars)

<table>
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<tr>
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<th>1999</th>
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<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>6-year</th>
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<tbody>
<tr>
<td>FINFISH</td>
<td>(preliminary)</td>
<td>average</td>
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<tr>
<td>King salmon*</td>
<td>1,896,701</td>
<td>673,267</td>
<td>2,258,987</td>
<td>1,652,464</td>
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<tr>
<td>Sardine</td>
<td>966,959</td>
<td>1,434,123</td>
<td>1,193,567</td>
<td>1,086,653</td>
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<td>Sablefish</td>
<td>673,935</td>
<td>699,211</td>
<td>523,408</td>
<td>705,225</td>
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<td>Albacore</td>
<td>772,862</td>
<td>616,683</td>
<td>326,099</td>
<td>630,852</td>
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<td>Thornyheads</td>
<td>582,709</td>
<td>360,476</td>
<td>350,741</td>
<td>480,007</td>
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*From DFG Ocean Salmon Project records

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Profile of Major Pelagic Wet Fish Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey  
Fishery: Pelagic wet fish

Species targeted: Pacific sardine (Sardinops sagax), northern anchovy (Engraulis mordax), jack mackerel (Trachurus symmetricus), Pacific mackerel (Scomber japonicus)

2004 preliminary landings (pounds): 43,704,575 (check totals)  
comprised of 34,047,042 lbs sardine, 8,577,584 lbs anchovy, 1,079,949 lbs mackerel  
2004 preliminary ex-vessel value: $1,536,850  
comprised of $1,193,567 sardine, $290,592 sardine, $52,691 mackerel

2003 landings: 18,637,244  
comprised of 17,432,494 lbs sardine, 1,155,834 lbs anchovy, 48,916 lbs mackerel  
2003 ex-vessel value: $755,745  
comprised of $ 667,100 sardine, $81,964 anchovy, $6,681 mackerel

1999-2004 average landings: 36,585,167  
comprised of 26,354,126 sardine, 9,936,324 anchovy, 294,717 mackerel  
1999-2004 average ex-vessel value: $1,434,576  
comprised of $1,086,653 sardine, $327,953 anchovy, $19,970 mackerel

Rank of average annual landings in port area 1999-2004:
Sardine (1)  
Anchovy (3)  
Mackerel (9)

Rank of average annual value in port area 1999-2004:
Sardine (3)  
Anchovy (8)  
Mackerel (24)

General trend in annual landings 1999-2004:
Sardine landings have varied by approximately two-fold, from approximately 16 million to 34 million lbs, with no trend. Anchovy landings have ranged from 1.5 million lbs to more than 25 million lbs with no trend. Mackerel landings have shown extreme variability, ranging from 4,000 lbs to more than 1 million lbs with no trend.

Comments: The availability of sardines or anchovies is variable and dependent upon water temperature and the success of the local squid fishery. During good squid seasons, boats will target squid only. When squid availability wanes, focus shifts to sardines, usually during the fall. The two major pelagic wet fish fleets operating in California are located in Monterey and San Pedro. Harvest of wet fish may be year round in San Pedro while it is seasonal in Monterey. Pacific mackerel is typically caught with sardines in San Pedro while the Monterey fleet rarely lands any, except for warm water years.
Sardines and northern anchovy are important bait, live and frozen, for most game fish. Fish caught for commercial purposes are generally exported for human consumption, bait, or tuna feed. Some is sold domestically for bait, pet food, and consumption.

**Number of fishermen making landings in 2003 and/or 2004 in port area:** 26

**Primary gear type(s):** purse seine, drum seine

**Primary depth range:** 5-50 fathoms

**Primary habitat type(s):** sand bottom

**Primary area of fishery:** State waters__X___ Federal waters_____

**Synopsis of regulations applicable to central coast study region:**
This fishery is federally managed with guidance from the Coastal Pelagic Species Management Plan. The plan dictates methods for stock assessment, quota limits, restricted access, and harvest allocation. The quota for the U.S. Pacific coast is divided into two sub-areas with a September reallocation of the remaining quota. The season for sardine is January 1 through December 31 and the season for Pacific mackerel is July 1 through June 30.

Sardine and mackerel may be harvested day or night and there are no closed areas other than as specified in particular MPAs.

The sardine harvest guideline for 2005 is 136,179 metric tons (mt). The July 04/ June 05 harvest guideline for Pacific mackerel is 13,268 mt.

**Logbook Required?:** No

**Relevant spatially-explicit data concerning location of fishery:** This process will rely on the expertise of local fishermen to provide this data, and, if time permits, by interviews conducted by EcoTrust.
Profile of Major Market Squid Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey
Name of fishery: Market squid

Species targeted: Market squid (*Loligo opalescens*)

2004 landings (pounds): 12,219,049
2004 ex-vessel value: $2,852,367

2003 landings: 30,691,176
2003 ex-vessel value: $7,920,422

1999-2004 average landings: 21,876,986
1999-2004 average ex-vessel value: $3,548,973

Rank of average annual landings in port area 1999-2004: 2
Rank of average annual value in port area 1999-2004: 1


Comments: The availability of squid is highly variable and is negatively correlated with El Niño events. International market conditions further influence annual catch. The life span of individual squid is less than 1 year, and squid are generally harvested during aggregations on known spawning grounds. There are three major fishing fleets; these are based out of Monterey, Ventura (this includes many out-of-state vessels), and San Pedro, and boats will travel between the spring-autumn fishery in the Monterey area and the autumn-spring fishery in southern California. The spawning grounds in the southern portion of Monterey Bay are the most important spawning grounds north of Pt. Conception and this area is of greatest importance to the Monterey area fishery.

Number of fishermen making landings in 2003 and/or 2004 in port area: 55

Primary gear type(s): purse seine, drum seine, brail

Primary depth range: 5-30 fathoms

Primary habitat type(s): sand bottom

Primary area of fishery: State waters___X____ Federal waters______
Synopsis of regulations applicable to central coast study region:
The Fish and Game Commission adopted a comprehensive Squid Fishery Management Plan (FMP) in August 2004. This is one of the few fisheries in California to have a FMP.

This is a restricted access fishery as of April 1, 2005. Between 1997 and 2000 there was a moratorium on new vessels entering the fishery. During this period separate vessel-based permit systems were established for squid vessels and for light boat owners.

Weekend closures are in effect year-round and state-wide. Squid may not be harvested from 1200 hours (noon) on Friday and 1200 hours (noon) on Sunday.

Vessels are limited to a 30,000-watt maximum for attracting lights and required light shields must cover the entire filament and be parallel to the deck of the vessel.

A harvest guideline of 118,000 tons statewide is established for the April 1 to March 31 fishing year.

There are no closed areas other than as specified in particular MPAs. Attracting lights from light boats may not be used north of Pigeon Point. No attracting light may be used within the Gulf of the Farallons NMS.

Logbook Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
Logbook data containing specific set locations and catch have been aggregated by microblock (approx. 1 x 1 square miles) from 1999 to 2005 and will be available.
Profile of Major Dover Sole/Thornyhead/Sablefish Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey
Fishery: Dover sole/thornyhead/sablefish

Species targeted: Dover sole (*Microstomus pacificus*), longspine thornyhead (*Sebastolobus altivelis*), shortspine thornyhead (*S. alascanus*), sablefish (*Anoplopoma fimbria*)

2004 preliminary landings (pounds): 1,287,611
comprised of 579,811 lbs Dover sole, 199,283 thornyheads, 508,517 lbs sablefish

2004 preliminary ex-vessel value: $1,070,904
comprised of $196,755 Dover sole, $350,741 thornyheads, $523,408 sablefish

2003 landings: 2,084,427
comprised of 1,000,780 lbs Dover sole, 409,648 lbs thornyheads, 673,999 lbs sablefish

2003 ex-vessel value: $1,656,422
comprised of $322,641 Dover sole, $542,808 thornyheads, $790,973 sablefish

1999-2004 average landings: 1,935,619
comprised of 926,560 lbs Dover sole, 389,794 lbs thornyheads, 619,265 lbs sablefish

1999-2004 average ex-vessel value: $1,478,584
comprised of $293,352 Dover sole, $480,007 thornyheads, $705,225 sablefish

Rank of average annual landings in port area 1999-2004:
Dover sole (4)
Thornyheads (8)
Sablefish (7)

Rank of average annual value in port area 1999-2004:
Dover sole (9)
Thornyheads (7)
Sablefish (4)

General trend in annual landings 1999-2004:
Landings were fairly consistent from 1999 through 2003, then declined significantly in 2004, particularly for Dover sole and thornyheads.

Comments:
It is likely that the establishment of the Rockfish Conservation Area (RCA), a fishery management area closed to all bottom gear targeting finfish, resulted in some reduced effort for these species, even though their primary concentrations are in deeper water. In addition, trawl effort has been reduced recently due to a federal groundfish buyback program which has retired some trawl vessels. Thornyheads caught by longline gear are retained on board and sold in a live condition, increasing their market value in recent years.
Number of fishermen making landings in 2003 and/or 2004 in port area:
All species trawl: 27
Thornyhead and/or sablefish hook-and-line: 30
Dover sole trawl: 22
Thornyheads hook-and-line: 13
Thornyheads trawl: 25
Sablefish hook-and-line: 46
Sablefish trap: 19
Sablefish trawl: 25
Sablefish gill net: 1

Primary gear type(s): bottom trawl, longline (thornyheads and sablefish), gill nets (sablefish), trap (sablefish)

Primary depth range: 150-700 fathoms

Primary habitat type(s): soft bottom, low-relief mixed and hard bottom

Primary area of fishery: State waters_____ Federal waters__X____

Synopsis of regulations applicable to central coast study region:
Trawling is prohibited within 3 miles of shore.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Trawl limited entry:
Dover sole: two-month harvest limits.
Thornyheads: two-month harvest limits.
Sablefish: two-month harvest limits.

Trawl open access:
Dover sole: monthly harvest limits.
Thornyheads: may not be taken.
Sablefish: daily, weekly, and two-month harvest limits.

Fixed gear limited entry:
Dover sole: monthly harvest limits.
Thornyheads: two-month harvest limits.
Sablefish: daily, weekly, and two-month harvest limits.

Non-trawl open access:
Dover sole: monthly harvest limits.
Thornyheads: may not be taken
Sablefish: daily, weekly, and two-month harvest limits.

All trawl gear is permitted seaward of the RCA.

Log book Required?: Yes for trawl and sablefish trap
Relevant spatially-explicit data concerning location of fishery:
Although the fishery occurs primarily in federal waters, a small amount of effort occurs within state waters in the Monterey Bay area. The trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer. EcoTrust will provide information on the distribution of non-trawl sablefish fishing effort.
Profile of Major Albacore and other Tuna Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey
Fishery: Albacore/other tuna

Species targeted: albacore (*Thunnus alalunga*)
Other species harvested: bigeye tuna (*Thunnus obesus*), bluefin tuna (*T. thynnus*), yellowfin tuna (*T. albacares*), skipjack (*Euthynnus pelamis*)

2004 preliminary landings (pounds): 399,396
comprised of 394,936 lbs albacore, 4,460 other tuna
2004 preliminary ex-vessel value: $336,787
comprised of $326,099 albacore, $10,688 other tuna

2003 landings: 476,517
comprised of 473,375 lbs albacore, 3,142 lbs other tuna
2003 ex-vessel value: $333,544
comprised of $327,193 albacore, $6,351 other tuna

1999-2004 average landings: 904,053
comprised of 842,636 lbs albacore, 61,417 lbs other tuna
1999-2004 average ex-vessel value: $733,703
comprised of $630,852 albacore, $102,851 other tuna

Rank of average annual landings in port area 1999-2004:
Albacore (6)
Other tuna (17)

Rank of average annual value in port area 1999-2004:
Albacore (5)
Other tuna (15)

General trend in annual landings 1999-2004:
Albacore landings have declined steadily since 2001 from approximately 1.4 million lbs to 0.4 million lbs. Landings of other tuna exceeded one quarter million lbs in 1999, primarily due to bluefin tuna, but have not exceeded 5,000 lbs since 2001.

Comments:
The abundance of that portion of the Pacific Ocean’s albacore stocks available to the local fleet has fluctuated considerably over the last several decades, with strong and weak periods occurring intermittently.

Number of fishermen making landings in 2003 and/or 2004 in port area: 114

Primary gear type(s): troll hook-and-line, purse seine

Primary depth range: surface and subsurface waters
Primary habitat type(s): open ocean, pelagic waters

Primary area of fishery: State waters_____ Federal waters___X___

Synopsis of regulations applicable to central coast study region:
Must possess a federal Highly Migratory Species fishery permit.

Log book Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
The fishery occurs primarily in federal waters. Coupled with the high mobility of the species involved, spatially explicit data will be of little value to the MLPA Initiative process.
Profile of Major Salmon Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey  
Fishery: Salmon

Species targeted: king salmon (Chinook) (*Oncorhynchus tshawytscha*)

2004 preliminary landings (pounds): 777,337  
2004 preliminary ex-vessel value: $2,258,987

2003 landings: 475,651  
2003 ex-vessel value: $859,270

1999-2004 average landings: 858,032  
1999-2004 average ex-vessel value: $1,652,464

Rank of average annual landings in port area 1999-2004: 5  
Rank of average annual value in port area 1999-2004: 2

General trend in annual landings 1999-2004:  
Landings have varied by approximately four-fold during the period with no trend.

Comments:  
Landings are influenced by several important factors: 1) the availability of 3- and 4-year old fish from the Sacramento and San Joaquin River system runs; and 2) the length of the fishing season, which may be shortened to protect salmon from the Klamath River system (Klamath River stocks may mix with the stocks from central California). When the Klamath River stocks are relatively low, the commercial season is shorter statewide.

Number of fishermen making landings in 2003 and/or 2004 in port area: 279

Primary gear type(s): troll hook-and-line

Primary depth range: fishery occurs from the surface to 50 fathoms although the bottom depth may greatly exceed that.

Primary habitat type(s): pelagic, open ocean

Primary area of fishery: State waters__X____ Federal waters__X____
Synopsis of regulations applicable to central coast study region:
The area between Pt. Pinos and Pt. Sur is one of the Pacific Fishery Management Council’s (PFMC) salmon management areas.

The fishing season varies each year, and is set by National Marine Fisheries Service under recommendation of the PFMC. Considerations in shaping the chinook fisheries in this area include the protection of Endangered Species Act-listed Sacramento River winter and California coastal chinook, and achievement of fall chinook spawning escapement goals for the Klamath, Sacramento, and Oregon coastal rivers. California commercial seasons are based on preseason forecasts of ocean abundances of Klamath fall chinook by age and estimates of total California Central Valley fall chinook adult abundance. The commercial season may not open in this area earlier than May 1 and closes no later than September 30. In 2005, the season is open May 1-31, July 4- August 29, and September 1-30.

In 2005 minimum legal length is 27 inches in May and September, and 28 inches in July and August.

Single point, barbless hooks are required. No more than six fishing lines are allowed per vessel.

There are no closed areas within the study region other than existing State Marine Reserves.

Coho salmon may not be taken.

Log book Required?: No

Relevant spatially-explicit data concerning location of fishery:
Due to the combination of the high mobility of salmon, its widespread range, and its inter- and intra-annual variability in distribution, spatially explicit data will be less important to the MLPA Initiative process than that from other fisheries.
Profile of Major Flatfish Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey
Fishery: Other flatfishes

Species targeted: Pacific sanddab (*Citharichthys sordidus*), Petrale sole (*Eopsetta jordani*), rex sole (*Glyptocephalus zachirus*)
Other species landed: English sole (*Parophrys vetulus*), rock sole (*Lepidopsetta bilineata*), sand sole (*Psettichthys melanostictus*), slender sole (*Lyopsetta exilis*), starry flounder (*Platichthys stellatus*), turbot (*Pleuronichthys spp.*).

2004 preliminary landings (pounds): 391,114
comprised of 159,143 lbs sanddabs, 231,971 lbs other flatfish
2004 preliminary ex-vessel value: $281,144
comprised of $72,067 sanddabs, $209,077 other flatfish

2003 landings: 778,091
comprised of 640,612 lbs sanddabs, 137,479 lbs other flatfish
2003 ex-vessel value: $288,930
comprised of $72,067 sanddabs, $209,077 other flatfish

1999-2004 average landings: 498,864
comprised of 277,675 lbs sanddabs, 221,189 lbs other flatfish
1999-2004 average ex-vessel value: $247,682
comprised of $86,073 sanddabs, $161,609 other flatfish

Rank of average annual landings in port area 1999-2004:
Sanddabs (10)
Other flatfish (12)

Rank of average annual value in port area 1999-2004:
Sanddabs (18)
Other flatfish (13)

General trend in annual landings 1999-2004:
Other flatfish landings have varied by 2-3-fold during the period and show no trend. Sanddab landings have varied by more than 6-fold with the highest landings during the period occurring in 2003.

Comments:
With the establishment of the Rockfish Conservation Area in 2002, trawling was prohibited in 100-150 fathoms. This resulted in an effort shift into shallower and deeper water, and was in part responsible for the three-fold increase in landings of sanddabs (a shallow-water species) from 2002 to 2003. A 70% increase in flatfish landings from 2003 to 2004 is in part due to the increase in bimonthly trip limits for flatfish.
Number of fishermen making landings in 2003 and/or 2004 in port area:
Sanddabs: 28
Other flatfish: 41

Primary gear type(s): bottom trawl

Primary depth range: 30-700 fathoms

Primary habitat type(s): low-relief soft bottom

Primary area of fishery: State waters__X___ Federal waters__X___

Synopsis of regulations applicable to central coast study region:
Within the Rockfish Conservation Area (RCA) along the central coast, trawling is prohibited between 100 and 150 fathoms.

Trawling is prohibited within 3 miles of shore.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Two-month harvest limits are in effect for “other flatfish” which, under the definition of the Pacific Fishery Management Council, includes sanddabs. Within these limits, Petrale sole has its own limit.

Small footrope trawl gear is required shoreward of the RCA.

Log book Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
Although this fishery occurs more commonly in federal waters, this is the most significant trawl fishery occurring within the state waters of this portion of the study region, primarily in the area flanking the Monterey submarine canyon. The trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major Slope Rockfish/Grenadier Commercial Fisheries in Central Coast Study Region: Monterey Area

**Port area:** Monterey  
**Fishery:** Slope rockfish/grenadier  

**Species targeted:** slope rockfishes: splitnose (*Sebastes diploproa*), darkblotched (*S. crameri*)  
Grenadiers (Pacific rattail- *Coryphaenoides acrolepis*)

**Other rockfish species landed:** aurora (*S. aurora*), bank (*S. rufus*), blackgill (*S. melanostomus*), Pacific ocean perch (*S. alutus*), redbanded (*S. babcocki*), sharpchin (*S. zacentrus*)

**2004 preliminary landings (pounds):** 390,998  
comprised of 192,430 slope rockfish, 198,568 grenadier  
**2004 preliminary ex-vessel value:** $137,179  
comprised of $99,060 slope rockfish, $38,119 grenadier

**2003 landings:** 558,494  
comprised of 333,083 slope rockfish, 225,411 grenadier  
**2003 ex-vessel value:** $221,233  
comprised of $172,233 slope rockfish, $49,000 grenadier

**1999-2004 average landings:** 431,120  
comprised of 192,474 pounds slope rockfish, 238,646 pounds grenadier  
**1999-2004 average ex-vessel value:** $141,123  
comprised of $100,670 slope rockfish, $40,453 grenadier

**Rank of average annual landings in port area 1999-2004:**  
Slope rockfish (13)  
Grenadier (11)

**Rank of average annual value in port area 1999-2004:**  
Slope rockfish (17)  
Grenadier (20)

**General trend in annual landings 1999-2004:**  
Slope rockfish landings increased significantly in 2003 and declined in 2004 to earlier levels. Landings of grenadier have been fairly consistent throughout the period.

**Comments:**  
It is likely that the increased landings of slope rockfish were in part due to a shift in trawl fishing effort to deeper water with the establishment of the Rockfish Conservation Area (RCA) in continental shelf waters. The RCA is a long-term fishery closure to all bottom gear targeting rockfish. The slope rockfish/grenadier fishery occurs in the same general area as the Dover sole/sablefish/thornyhead fishery.
Number of fishermen making landings in 2003 and/or 2004 in port area:
All species trawl: 25
All species longline: 30
Rockfish trawl: 24
Rockfish longline: 22
Grenadier trawl: 9
Grenadier longline: 21

Primary gear type(s): bottom trawl, set longline

Primary depth range: 200-700 fathoms

Primary habitat type(s): soft bottom of continental slope and submarine canyons

Primary area of fishery: State waters____ Federal waters__X___

Synopsis of regulations applicable to central coast study region:
Trawling for rockfishes is prohibited within 3 miles of shore
Gill netting for rockfishes is prohibited in state waters.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Annual harvest limits and two-month trip limits are in effect.

All trawl gear is permitted seaward of the RCA.

Rockfishes landed must be sorted by species or species group prior to weighing.

Log book Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of non-trawl fishing effort. Trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major Shelf Rockfish Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey  
Fishery: Shelf rockfish  

Species targeted: shelf rockfishes: bocaccio (Sebastes paucispinis), canary (S. pinniger), chilipepper (S. goodei), shortbelly (S. jordani), widow (S. entomelas), and yelloweye (S. ruberrimus)  
Other species landed: shelf rockfishes: bronzespotted (S. gilli), cowcod (S. levis), flag (S. rubrivinctus), greenblotched (S. rosenblatti), greenspotted (S. chlorostictus), greenstriped (S. elongatus), halfbanded (S. semicinctus), pink (S. eos), pinkrose (S. simulator), redstripe (S. proriger), rosethorn (S. helvomaculatus), rosy (S. rosaceus), speckled (S. ovalis), squarespot (S. hopkinsi), starry (S. constellatus), stripetail (S. saxicola), swordspine (S. ensifer), tiger (S. nigrocinctus), vermilion (S. miniatus), yellowtail (S. flavidus)  

2004 preliminary landings (pounds): 27,369  
2004 preliminary ex-vessel value: $25,837  
2003 landings: 10,021  
2003 ex-vessel value: $10,686  
1999-2004 average landings: 181,254  
1999-2004 average ex-vessel value: $101,876  

Rank of average annual landings in port area 1999-2004: 14  
Rank of average annual value in port area 1999-2004: 16  

General trend in annual landings 1999-2004:  
Landings declined from almost one half million pounds in 1999 to approximately 10,000 pounds in 2003.  

Comments: This significant decline in landings was due primarily to the establishment of the Rockfish Conservation Area (RCA), a fishery management closure designed to help rebuild overfished stocks of the following rockfishes: bocaccio, canary, cowcod, darkblotched, Pacific ocean perch, widow, and yelloweye. Many other rockfish species associate with these overfished species, and the relatively small landings for shelf rockfish in general originate from outside of the RCA.  

Number of fishermen making landings in 2003 and/or 2004 in port area:  
Hook-and-line: 53  
Trawl: 22  
Gill net: 1  

Primary gear type(s): bottom trawl, midwater trawl, longline, hook-and-line, gill net  

Primary depth range: 30-200 fathoms  

Primary habitat type(s): deep rocky reefs, mixed-bottom substrate including cobble and sand, edges of submarine canyons
Primary area of fishery: State waters__X___  Federal waters__X____

Synopsis of regulations applicable to central coast study region:
Within the Rockfish Conservation Area (RCA), the taking of rockfishes, lingcod, California scorpionfish, and ocean whitefish is prohibited. Within the central coast study region (Pigeon Pt. to Pt. Conception), the RCA for commercial fishing is 20 to 150 fathoms for fixed gears (limited entry and open access) and from 75 to 150 fathoms for trawlers.

Trawling for rockfishes is prohibited within 3 miles of shore

Gill netting for rockfishes is prohibited in state waters.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Annual harvest limits and two-month trip limits are in effect, with a total closure on cowcod by trawl gear and for canary and yelloweye rockfishes and cowcod by fixed gears.

Small footrope trawl gear is required shoreward of the RCA.

Rockfishes landed must be sorted by species or species group prior to weighing.

Log book Required?: Yes for trawling

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of non-trawl fishing effort. Trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major California Halibut Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey
Fishery: California halibut

Species targeted: California halibut (*Paralichthys californicus*)

2004 preliminary landings (pounds): 100,618
2004 preliminary ex-vessel value: $289,563

2003 landings: 52,313
2003 ex-vessel value: $133,185

1999-2004 average landings: 87,861
1999-2004 average ex-vessel value: $201,626

Rank of average annual landings in port area 1999-2004: 15
Rank of average annual value in port area 1999-2004: 10

General trend in annual landings 1999-2004:
Landings have varied by approximately four-fold with no trend.

Comments: Gill netting for halibut in the region has ceased primarily due to increased restrictions on the use of this gear. Market conditions have developed such that trawling for halibut is not as economically feasible as it was in the past, and some of the major trawl vessels have left the fishery.

Number of fishermen making landings in 2003 and/or 2004 in port area:
Trawl: 34
Hook-and-line: 85
Gill or trammel net: 0

Primary gear type(s): trawl, hook-and-line, gill and trammel net

Primary depth range: 2 – 50 fathoms

Primary habitat type(s): sand bottom

Primary area of fishery: State waters__X____ Federal waters__X____
Synopsis of regulations applicable to central coast study region:
The Fish and Game Commission has authority over state-managed bottom trawl fisheries not managed under federal regulations, which includes regulations pertaining to California halibut.

Trawling for halibut is prohibited within 3 miles of shore, except in the area from Pt. Arguello south to Pt. Mugu greater than 1 nautical mile from shore.

Minimum mesh size for trawls in this area is 7.5 inches, and trawling is closed from March 15 to June 15.

In waters greater than 3 nautical miles from shore, trawling is permitted, and minimum mesh size is 4.5 inches.

Gill and trammel nets are prohibited in waters less than 60 fathoms deep from Pt. Reyes headlands in Marin county south to Pt. Arguello.

Where gill nets and trammel nets are legal, minimum mesh size is 8.5 inches. Gill and trammel nets may not exceed 1,500 fathoms (9,000 feet) in length except that in a portion of southern California south of a line extending due west from Pt. Arguello, gill and trammel nets may not exceed 1,000 fathoms (6,000 feet).

Halibut less than 22 inches may not be taken, possessed, or sold unless it weighs 4 lbs or more in the round, 3.5 lbs or more dressed with head on, or 3 lbs or more dressed with head off.

Log book Required?: Yes for trawlers – when/where fishing is permitted

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of non-trawl fishing effort.
Profile of Major Dungeness Crab Commercial Fisheries in Central Coast Study Region:
Monterey Area

Port area: Monterey
Fishery: Dungeness Crab

Species targeted: Dungeness crab (Cancer magister)

2004 preliminary landings (pounds): 169,041
2004 preliminary ex-vessel value: $320,610

2003 landings: 163,020
2003 ex-vessel value: $341,753

1999-2004 average landings: 85,748
1999-2004 average ex-vessel value: $192,041

Rank of average annual landings in port area 1999-2004: 16
Rank of average annual value in port area 1999-2004: 11

General trend in annual landings 1999-2004:
Landings were significantly greater during 2002-2004 compared with 1999-2001.

Comments: Landings in northern California have experienced repeated cycles at approximately 10-year intervals. Central California landings have been less cyclical but still highly variable. Due to heavy fishing pressure in the beginning of each season, the majority of the annual landings typically occur during the first two months of the season. The primary fishing grounds are generally considered to be north of the Monterey port area, but this fishery can be relatively important locally in some years.

Number of fishermen making landings in 2003 and/or 2004 in port area: 34

Primary gear type(s): Circular traps, each attached to a separate line and buoy.

Primary depth range: 0-50 fathoms

Primary habitat type(s): sand bottom

Primary area of fishery: State waters__X__ Federal waters__X__
Synopsis of regulations applicable to central coast study region:
Closed season July 1 through November 14. Open season may be extended as late as July 31 by order of DFG Director.

Minimum carapace width 6.25 inches.

Only males may be harvested.

This is a restricted access fishery with a vessel-based permit system.

There is no limit on the number of traps per vessel which may be used but legislation has been introduced to limit the maximum number of traps.

There are no closed areas other than as specified in particular MPAs.

Log book Required?: No

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major Nearshore Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey  
Fishery: Nearshore

Species targeted: nearshore rockfishes: black (Sebastes melanops), black-and-yellow (S. chrysomelas), blue (S. mystinus), brown (S. auriculatus), China (S. nebulosus), copper (S. caurinus), gopher (S. carnatus), grass (S. rastrelliger), kelp (S. atrovirens), olive (S. serranoides), treefish (S. serriceps) cabezon (Scorpaenichthys marmoratus), kelp greenling (Hexagrammos decagrammus).
(Several other species defined as “nearshore” are infrequently landed in this port area, including monkeyface prickleback (Cebidicthys violaceous), California sheephead (Semicossyphus pulcher), and quillback rockfish (S. maliger).

2004 landings (pounds): 40,476
comprised of 26,213 lbs nearshore rockfish, 13,442 lbs cabezon, 821 lbs kelp greenling
2004 ex-vessel value: $180,596
comprised of $112,981 nearshore rockfish, $63,114 cabezon, $4,501 kelp greenling

2003 landings: 25,823
comprised of 19,280 lb nearshore rockfish, 5,827 lbs cabezon, 716 lbs kelp greenling
2003 ex-vessel value: $107,438
comprised of $76,898 nearshore rockfish, $26,656 cabezon, $3,884 kelp greenling

1999-2004 average landings: 59,109
comprised of 40,850 lbs nearshore rockfish, 16,117 lbs cabezon, 2,142 lbs kelp greenling
1999-2004 average ex-vessel value: $245,219
comprised of $167,822 nearshore rockfish, $66,552 cabezon, $10,845 kelp greenling

Rank of average annual landings in port area 1999-2004:
Nearshore rockfish (20)
Cabezon (26)
Kelp greenling (30)

Rank of average annual value in port area 1999-2004:
Nearshore rockfish (12)
Cabezon (19)
Kelp greenling (27)

General trend in annual landings 1999-2004:
A significant decline occurred in 2003 when the fishery became restricted access with regional permits.
Comments: This is primarily a live-fish fishery, and the relatively high price-per-pound generated by these nearshore species resulted in a rapidly expanding fishery beginning in the late 1980’s. By the mid to late 1990’s landings had peaked and a series of increasingly restrictive regulations were imposed, significantly reducing harvest levels, which included Total Allowable Catch allocations levels and early closure of the cabezon and greenling fisheries starting in 2001 due to the attainment of those allocation amounts. This reduction continued into 2003 when the number of active permits was significantly reduced due to the implementation of a restricted access program.

Number of fishermen making landings in 2003 and/or 2004 in port area: 58
All species hook-and-line: 50
All species trap: 10
Nearshore rockfish hook-and-line: 48
Nearshore rockfish trap: 10
Cabezon hook-and-line: 38
Cabezon trap: 8
Kelp greenling hook-and-line: 34
Kelp greenling trap: 6

Primary gear type(s): hook-and-line, stick gear (hooks attached to short piece of pvc pipe or rebar), handline, trap

Primary depth range: 0 to 20 fathoms

Primary habitat type(s): shallow reefs, kelp beds, other hard bottom

Primary area of fishery: State waters ___X___ Federal waters _____

Synopsis of regulations applicable to central coast study region:
A comprehensive Nearshore Fishery Management Plan (FMP) was adopted by the Fish and Game Commission in May 2002. This is one of the few fisheries in California to have a FMP.

The FMP established four management areas for the nearshore fishery; the Monterey area (Pigeon Pt. to Pt. Sur) is entirely contained within the north-central coast management area.

This is a restricted access fishery, and nearshore fishery permits may only be used within the management area for which they were issued. This permit allows the take of only black-and-yellow, China, gopher, grass, and kelp rockfishes, and cabezon, greenlings, California scorpionfish, and California sheephead. To take other nearshore species, one must possess a deeper nearshore fisheries permit, which is not regionally restricted.

Fishing is prohibited within the Rockfish Conservation Area from 30 to 150 fathoms from January to April, from 20 to 150 fathoms from May to August, and from 30 to 150 fathoms from September to December.

There is a closed season which is variable from year to year; in 2005 the closed season is March and April.
Harvest guidelines have been established for black rockfish, other nearshore rockfish, cabezon, and greenlings (kelp and rock, the latter of which is rare in the Monterey area). Cumulative trip limits per permit are in effect, generally on a two-month basis. The season may be closed early if the harvest guidelines are met or exceeded.

Minimum total length limits are as follows:
- Black-and-yellow rockfish 10 inches
- China rockfish 12 inches
- Gopher rockfish 10 inches
- Grass rockfish 12 inches
- Kelp rockfish 10 inches
- Cabezon 15 inches
- Greenlings 12 inches

Log book Required?: No, however, a pilot program is underway in several port areas including Monterey in which selected nearshore fishermen are completing experimental logbooks on a daily basis. NOAA Fisheries’ Santa Cruz lab has obtained funding from their Economics and Social Research Division for this volunteer program. The program is administered jointly by NOAA Fisheries, CDFG, and Pacific States Marine Fisheries Commission.

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major Spot Prawn Trap Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey  
Fishery: Spot Prawn Trap

Species targeted: Spot prawn (*Pandalus platyceros*)

2004 landings (pounds): 47,804  
2004 ex-vessel value: $519,893

2003 landings: 58,236  
2003 ex-vessel value: $586,299

1999-2004 average landings: 54,423  
1999-2004 average ex-vessel value: $510,812

Rank of average annual landings in port area 1999-2004: 18  
Rank of average annual value in port area 1999-2004: 6

General trend in annual landings 1999-2004: Landings in the port area peaked in 2002 when a trawl fishery operated in the same area as the trap fishery.

Comments: The harvest of spot prawns using trawl gear was prohibited beginning in 2003. A relatively small number of trap fishermen operate in the Monterey area with a significant and fairly consistent harvest level. Additional effort is possible beginning in 2005 because the Fish and Game Commission approved up to 11 trawl-to-trap “conversion” permits statewide at the end of 2004 for former spot prawn trawl fishermen (nine were purchased). Spot prawns change sex from male to female at age 3; thus the larger prawns are all female. Spot prawns are maintained in tanks on board until landed and are sold in a live condition for $10.00 – $13.50/pound.

Number of fishermen making landings in 2003 and/or 2004 in port area: 7

Primary gear type(s): Plastic or wire mesh traps with a minimum mesh size of 7/8 by 7/8 inches. The traps are set in strings marked with a buoy at each end.

Primary depth range: 100-150 fathoms

Primary habitat type(s): submarine canyon; hard, soft, and mixed bottom

Primary area of fishery: State waters__X__ Federal waters__X__

Synopsis of regulations applicable to central coast study region:  
Restricted access fishery with a 3-tier structure. Total of 29 (17 + 3 + 9) permits statewide with no restrictions on geographical region of fishing.  
Tier 1 permits (17) are fully transferable. A permittee may use no more than 500 traps (only 300 in state waters north of Pt. Arguello), and has no restrictions on landings.  
Tier 2 permits (3) are not transferable. A permittee may use no more than 150 traps, and may land no more than 5,000 pounds of spot prawns in a calendar year.
Tier 3 (trawl-to-trap conversion) permits (9) are not transferable. A permittee may use no more than 500 traps (only 300 in state waters north of Pt. Arguello), and has no restrictions on landings.

Closed season north of Pt. Arguello is May 1 to July 31. Closed season south of Pt. Arguello is November 1 to January 31.

All species caught incidentally in spot prawn traps must be returned to the water immediately.

**Log book Required?**: Yes

**Relevant spatially-explicit data concerning location of fishery**: EcoTrust will provide information on the distribution of fishing effort. In addition, relative fishing effort by DFG fishing block is available for 1998-99. These years are before the restricted access fishery began and before the trawl closure was established and thus provide a better picture of the distribution of the resource.
Profile of Major Swordfish Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey
Fishery: Swordfish

Species targeted: Swordfish (Xiphias gladius)

2004 preliminary landings (pounds): 7,705
2004 preliminary ex-vessel value: $24,880

2003 landings: 15,242
2003 ex-vessel value: $41,740

1999-2004 average landings: 49,170
1999-2004 average ex-vessel value: $126,532

Rank of average annual landings in port area 1999-2004: 19
Rank of average annual value in port area 1999-2004: 14

General trend in annual landings 1999-2004:
Almost a quarter million pounds were landed in 1999. Since then annual landings have fluctuated from approximately 100 pounds to more than 29,000 pounds with no trend.

Comments:
Landings of swordfish off central California in general now are lower than historic landings, in part because one of the fishing areas which contributed to landings in the Monterey area is now closed to drift gill nets during the fall, a prime time for fishing, to protect sea turtles.

Number of fishermen making landings in 2003 and/or 2004 in port area: 6
Gill net: (4)
Hook-and-line: (1)
Harpoon: (1)

Primary gear type(s): drift gill net, hook-and-line, harpoon

Primary depth range: surface and near-surface waters

Primary habitat type(s): open ocean, pelagic waters

Primary area of fishery: State waters____ Federal waters___X___

Synopsis of regulations applicable to central coast study region:
A highly migratory species permit is required. The drift gill net fishery is a restricted access fishery.

Log book Required?: Yes
Relevant spatially-explicit data concerning location of fishery:
The fishery occurs primarily in federal waters. Coupled with the high mobility of the species involved, spatially explicit data will be of little value to the MLPA Initiative process.
Profile of Major Shark Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey
Fishery: Shark (this represents multiple fisheries which either target shark or harvest them incidentally)

Species targeted: thresher shark (*Alopias vulpinus*), shortfin mako shark (bonito shark) (*Isurus oxyrinchus*), spiny dogfish (*Squalus acanthias*), soupfin shark (*Galeorhinus zyopterus*),
Other species landed: brown smoothhound (*Mustelus henlei*), leopard shark (*Triakis semifasciata*), Pacific angel shark (*Squatina californica*)

2004 preliminary landings (pounds): 46,142
2004 preliminary ex-vessel value: $20,640

2003 landings: 10,845
2003 ex-vessel value: $10,528

1999-2004 average landings: 35,191
1999-2004 average ex-vessel value: $21,641

Rank of average annual landings in port area 1999-2004: 21
Rank of average annual value in port area 1999-2004: 22

General trend in annual landings 1999-2004:
Landings have varied by approximately one order of magnitude during the period, with no trend.

Comments:
The two years with the highest landings, 1999 and 2004, were due primarily to landings of spiny dogfish, which exceeded 40,000 pounds in each year. With the exception of 2004, thresher shark has been the number one or number two shark species landed. In 1999 and 2000, significant landings (exceeding 9,000 lbs) were categorized as unspecified shark.

Number of fishermen making landings in 2003 and/or 2004 in port area:
Hook-and-line: 18
Gill net: 5
Trawl: 19

Primary gear type(s):
Hook-and-line
Drift gill net (primarily for thresher and shortfin mako sharks)
Set gill net or trammel net (primarily for Pacific angel sharks)
Trawl (primarily for spiny dogfish)

Primary depth range: 0 to 400 fathoms

Primary habitat type(s): open ocean, pelagic waters, nearshore waters, soft bottom, hard bottom, rocky reefs, kelp beds.

Primary area of fishery: State waters___X____ Federal waters___X____
Synopsis of regulations applicable to central coast study region:
A Highly Migratory Species permit is required to take thresher and mako sharks.

Sharks may be taken with drift gill nets of mesh size 14 inches or greater under a revocable permit from DFG.

Longlines may not be used to take thresher and shortfish mako shark.

Pacific angel sharks have a minimum legal size of 42 inches for females and 40 inches for males.

Leopard sharks have a minimum legal size of 36 inches.

Sharkfins may not be landed without a corresponding carcass.

Spears, harpoons, and bow and arrows may not be used to take soupfin shark.

White shark (*Carcharodon carcharias*) may not be taken.

Basking (*Cetorhinus maximus*) and megamouth sharks may not be taken in federal waters.

Log book Required?: Yes, for the drift gill net fishery

Relevant spatially-explicit data concerning location of fishery:
With the exception of a portion of the trawl fishery, the fishery occurs primarily in federal waters. Those species which occur in nearshore waters are taken incidentally in other fisheries. Coupled with the high mobility of most of the targeted species, spatially explicit data other than that from trawl logbooks will be of little value to the MLPA Initiative process. The trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major Jacksmelt Commercial Fisheries in Central Coast Study Region:
Monterey Area

Port area: Monterey
Fishery: Jacksmelt

Species targeted: Jacksmelt (Atherinopsis californiensis)

2004 preliminary landings (pounds): 2,190
2004 preliminary ex-vessel value: $2,244

2003 landings: 8,251
2003 ex-vessel value: $3,068

1999-2004 average landings: 24,539
1999-2004 average ex-vessel value: $7,515

Rank of average annual landings in port area 1999-2004: 22
Rank of average annual value in port area 1999-2004: 29

General trend in annual landings 1999-2004:
Landings have shown high variability during the period, ranging from approximately 68,000 lbs in 2002 to less than 1,000 lbs in 1999, with no trend.

Comments:
This is an occasional or incidental fishery, and fluctuations observed in catch records reflect demand, not true abundance.

Number of fishermen making landings in 2003 and/or 2004 in port area: 5

Primary gear type(s): Seine
Primary depth range: 0-30 fathoms
Primary habitat type(s): nearshore, pelagic waters
Primary area of fishery: State waters___X___ Federal waters_____

Synopsis of regulations applicable to central coast study region:
There is no commercial limit on the take of jacksmelt.

Log book Required?: No

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major White Seabass Commercial Fisheries in Central Coast Study Region:
Monterey Area

Port area: Monterey
Fishery: White seabass

Species targeted: White seabass (*Atractoscion nobilis*)

2004 preliminary landings (pounds): 180
2004 preliminary ex-vessel value: $432

2003 landings: 7,685
2003 ex-vessel value: $15,516

1999-2004 average landings: 19,098
1999-2004 average ex-vessel value: $38,789

Rank of average annual landings in port area 1999-2004: 24
Rank of average annual value in port area 1999-2004: 21

General trend in annual landings 1999-2004:
Landings have shown extreme variability, ranging from more than 54,000 lbs in 2001 to less than 200 pounds in 2004.

Comments: The distribution and availability of this species is highly influenced by oceanographic conditions and changing water temperature. Much of the fish landed in this port area comes from just above Point Conception, where environmental conditions can be similar to southern California, an area white seabass frequent. However, ocean conditions in the Monterey Bay area in some years will be favorable for white seabass

Number of fishermen making landings in 2003 and/or 2004 in port area: 6
Gill net: 0
Hook-and-line: 6

Primary gear type(s):
Drift gill net
Hook-and-line

Primary depth range: 0 – 40 fathoms

Primary habitat type(s): kelp beds, reefs, offshore banks, open ocean

Primary area of fishery: State waters__X____ Federal waters__X____
Synopsis of regulations applicable to central coast study region:
There is a closed season south of Pt. Conception from March 15 to June 15, with an allowance for fish taken incidental to gill and trammel net fishing.

There is a minimum legal size of 28 inches.

Mesh size of gill nets must be not less than 6 inches.

White seabass may not be taken in roundhaul nets.

Log book Required?: Yes for gill net

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major Lingcod Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey  
Fishery: Lingcod  
Species targeted: Lingcod (Ophiodon elongatus). Lingcod are generally not specifically targeted but are so widespread that they are caught in most hard-bottom oriented fisheries targeting rockfishes, cabezon, and other species.

2004 preliminary landings (pounds): 26,245  
2004 preliminary ex-vessel value: $37,369

2003 landings: 16,792  
2003 ex-vessel value: $21,855

1999-2004 average landings: 18,327  
1999-2004 average ex-vessel value: $20,606

Rank of average annual landings in port area 1999-2004: 25  
Rank of average annual value in port area 1999-2004: 23

General trend in annual landings 1999-2004:  
Landings have varied by approximately four-fold with no trend.

Comments:  
Prior to 1999, the Acceptable Biological Catch for lingcod set by the National Marine Fisheries Service had undergone a series of significant reductions, and regional and statewide landings are substantially lower in this recent 6-year period compared with the previous two decades. Lingcod is now officially declared to be an overfished species; a rebuilding plan is implemented and allowable harvest levels are relatively low.

Number of fishermen making landings in 2003 and/or 2004 in port area:  
Hook-and-line: 95  
Trawl: 27  
Trap: 5  
Gill net: 1

Primary gear type(s):  
Hook-and-line  
Trawl  
Gill net  
Trap

Primary depth range: 2- 200 fathoms

Primary habitat type(s): deep and shallow rocky reef, kelp beds, low- to high-relief mixed substrate and hard bottom, submarine canyons.
Primary area of fishery: State waters__X___  Federal waters__X___

Synopsis of regulations applicable to central coast study region:
Within the Rockfish Conservation Area (RCA), the taking of rockfishes, lingcod, California scorpionfish, and ocean whitefish is prohibited. Within the central coast study region (Pigeon Pt. to Pt. Conception), the RCA for commercial fishing ranges from 20 to 150 fathoms for limited entry and open access fixed gears, and from 100 to 150 fathoms for trawlers.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Annual harvest limits and two-month cumulative trip limits are in effect.

Small footrope trawl gear is required shoreward of the RCA.

The minimum legal size for lingcod is 24 inches.

Log book Required?: Yes for trawling

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of non-trawl fishing effort. Trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major Butterfish Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey  
Fishery: Butterfish (Pacific pompano)  

Species targeted: Butterfish (Pacific pompano) (*Peprilus simillimus*)

2004 preliminary landings (pounds): 12,199  
2004 preliminary ex-vessel value: $16,773  

2003 landings: 17,545  
2003 ex-vessel value: $11,376  

1999-2004 average landings: 14,169  
1999-2004 average ex-vessel value: $14,731  

Rank of average annual landings in port area 1999-2004: 27  
Rank of average annual value in port area 1999-2004: 26

General trend in annual landings 1999-2004:  
Landings have shown high variability during the period, ranging from approximately 43,000 lbs in 2002 to 300 lbs in 1999, with no trend.

Comments: Generally this species is considered a very minor component in the commercial fisheries. However, it is marketed in the fresh fish markets and in local restaurants as a delicacy item.

Number of fishermen making landings in 2003 and/or 2004 in port area: Seine (4)  
Primary gear type(s): Seine  
Primary depth range: 5-50 fathoms  
Primary habitat type(s): nearshore, pelagic waters  
Primary area of fishery: State waters__X____ Federal waters_____

Synopsis of regulations applicable to central coast study region:  
There is no commercial limit on the take of butterfish.

Log book Required?: No  

Relevant spatially-explicit data concerning location of fishery:  
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major Rock Crab Commercial Fisheries in Central Coast Study Region: Monterey Area

Port area: Monterey
Fishery: Rock crab

Species targeted:
Brown rock crab (*Cancer antennarius*)
Red rock crab (*C. productus*)
Other species landed infrequently in port area:
Yellow rock crab (*C. anthonyi*)

2004 preliminary landings (pounds): 2,787
2004 preliminary ex-vessel value: $3,294

2003 landings: 2,054
2003 ex-vessel value: $5,701

1999-2004 average landings: 6,545
1999-2004 average ex-vessel value: $8,870

Rank of average annual landings in port area 1999-2004: 29
Rank of average annual value in port area 1999-2004: 28

General trend in annual landings 1999-2004:
A significant decline occurred from 1999 to 2001; landings have remained relatively low since then.

Comments:
Commercial landing records from 1999 through 2004 show that relatively few commercial fishermen targeted rock crab in the Monterey area; thus the decision of one or several fishermen to not fish in a particular year could have a significant impact on total landings for this port area. In addition, the area from Santa Cruz south to Pt. Conception is not within the range of commercial densities of rock crab, primarily due to the established presence of the southern sea otter. Landings into the port area generally originate from north of the Santa Cruz area.

Number of fishermen making landings in 2003 and/or 2004 in port area: 13

Primary gear type(s): Square traps, which are usually set singly (rarely in pairs) and attached to a line and buoy.

Primary depth range: 15-40 fathoms

Primary habitat type(s): kelp bed areas, rocky reefs, mixed substrate, sand bottom.

Primary area of fishery: State waters X Federal waters ____
Synopsis of regulations applicable to central coast study region:
Minimum carapace width of 4.25 inches.

Traps must be made of wire mesh and conform to minimum mesh size and escape port regulations. Each trap must have at least one approved self-destruct device.

A Northern Rock Crab Trap Permit is required north of Lopez Point in Monterey County, and a Southern Rock Crab Trap Permit south of that point. A northern rock crab trap permit may be issued to any licensed commercial fisherman who has a valid general trap permit that has not been suspended or revoked. The northern rock crab trap permit is a non-restrictive permit with no minimum landing requirements. The fee for either permit is $250, but there is qualifying landing criteria that the applicant must meet to purchase a southern permit.

Log book Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
## SUMMARY OF MORRO BAY PORT AREA FISHERIES
(ranked by average value 1999-2004)

- primarily in federal waters

<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Spot prawn</td>
<td>Spot prawn</td>
<td>2</td>
<td>traps</td>
<td>100-150fms</td>
<td>canyon, hard, soft, mixed bottom</td>
<td>State and Federal</td>
<td>12k</td>
<td>$120k</td>
<td>75k</td>
<td>605k</td>
<td>14</td>
<td>1</td>
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<tr>
<td>Nearshore finfish</td>
<td>Nearshore rockfish, cabezon, kelp greenling</td>
<td>87</td>
<td>Hook and line, trap, stick gear</td>
<td>0-20fms</td>
<td>rocky reefs, kelp, other hard bottom</td>
<td>State</td>
<td>97k rockfish; 53k cabezon, 2k kelp greenling</td>
<td>$168k rockfish, $251k cabezon, $12k kelp greenling</td>
<td>117k rockfish, 75k cabezon, 5k kelp greenling</td>
<td>$562k rockfish, $346k cabezon, $28k kelp greenling</td>
<td>11,13,26</td>
<td>2,3,22</td>
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<tr>
<td>Albacore / other tuna</td>
<td>Albacore, bigeye, bluefin, yellowfin, skipjack tunas</td>
<td>70</td>
<td>troll hook-and-line, seine</td>
<td>surface and subsurface waters</td>
<td>open ocean, Federal pelagic waters</td>
<td>State and Federal</td>
<td>37k albacore, 5k other tunas</td>
<td>$41k albacore, $7k other tunas</td>
<td>674k albacore, 37k other tuna</td>
<td>$527k albacore, $51k other tuna</td>
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<td>4,17</td>
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<tr>
<td>Swordfish</td>
<td>Swordfish</td>
<td>9</td>
<td>gill net</td>
<td>surface and near-surface waters</td>
<td>open ocean, Federal pelagic waters</td>
<td>21k</td>
<td>$73k</td>
<td>120k</td>
<td>$341k</td>
<td>9</td>
<td>5</td>
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<tr>
<td>Salmon</td>
<td>King (chinook) salmon</td>
<td>68</td>
<td>troll hook-and-line</td>
<td>surface to 50 fms</td>
<td>pelagic, open ocean</td>
<td>State and Federal</td>
<td>64k</td>
<td>$231</td>
<td>118K</td>
<td>$246K</td>
<td>10</td>
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<td>Ocean shrimp</td>
<td>Ocean shrimp</td>
<td>2</td>
<td>Trawls with fish excluders</td>
<td>40-125fms</td>
<td>green mud, mud/sand bottom</td>
<td>Federal</td>
<td>582k</td>
<td>$266k</td>
<td>511k</td>
<td>$224k</td>
<td>4</td>
<td>7</td>
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<tr>
<td>Dover sole / thornyhead / sablefish</td>
<td>Dover sole, longspine and shortspine thornyheads, sablefish</td>
<td>1-18 permits for 9 distinct gear/species combinations</td>
<td>bottom trawl, longline, gill nets, trap</td>
<td>150-700</td>
<td>soft bottom, low-relief mixed and hard bottom</td>
<td>Federal</td>
<td>687k sole, 314k thornyheads, 178k sablefish</td>
<td>$233k sole, $189k thornyheads, $170k sablefish</td>
<td>641k sole, 303k thornyheads, 139k sablefish</td>
<td>$219k sole, $197k thornyheads, $129k sablefish</td>
<td>3,5,8</td>
<td>8,9,13</td>
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<tr>
<td>Other flatfishes</td>
<td>Soles, sanddab, turbot</td>
<td>21</td>
<td>bottom trawl</td>
<td>30-700fms</td>
<td>low-relief soft bottom</td>
<td>Federal</td>
<td>375k</td>
<td>$433k</td>
<td>186k</td>
<td>$170k</td>
<td>7</td>
<td>10</td>
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<tr>
<td>Market squid</td>
<td>market squid</td>
<td>12</td>
<td>seine, brail</td>
<td>5-30fms</td>
<td>sand</td>
<td>State</td>
<td>2 million</td>
<td>$445k</td>
<td>738k</td>
<td>$150k</td>
<td>1</td>
<td>11</td>
</tr>
<tr>
<td>-------------------------</td>
<td>-------------------------------------------------------</td>
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<td>--------------------------</td>
<td>------------------------</td>
<td>------------------------</td>
</tr>
<tr>
<td>Slope rockfish / grenadier</td>
<td>several &quot;slope&quot; rockfish species, grenadier</td>
<td>6-14 permits for four distinct gear/species combinations</td>
<td>bottom trawl, set longline</td>
<td>200-700fms</td>
<td>soft bottom on continental slope, submarine canyons</td>
<td>Federal</td>
<td>215k slope rockfish, 0.1k grenadier</td>
<td>$134k slope rockfish, &lt;$1k grenadier</td>
<td>245k slope rockfish, 8kk grenadier</td>
<td>$145k slope rockfish, $1k grenadier</td>
<td>6,25</td>
<td>12,26</td>
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<tr>
<td>Rock crab</td>
<td>Brown, red, and yellow rock crab</td>
<td>19 traps</td>
<td>7-30fms</td>
<td>kelp beds, rocky reefs, mixed substrate, sand</td>
<td>State</td>
<td>48k</td>
<td>$110k</td>
<td>83k</td>
<td>$116k</td>
<td>12</td>
<td>14</td>
<td></td>
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<tr>
<td>California halibut</td>
<td>California halibut</td>
<td>Hook-and-line 38, trawl 9, gill net 1</td>
<td>Hook-and-line, trawl, gill net</td>
<td>2-50fms</td>
<td>sand</td>
<td>State and Federal</td>
<td>5k</td>
<td>$16k</td>
<td>36k</td>
<td>$93k</td>
<td>17</td>
<td>15</td>
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<tr>
<td>Dungeness crab</td>
<td>Dungeness crab</td>
<td>13 traps</td>
<td>0-50fms</td>
<td>sand</td>
<td>State and Federal</td>
<td>23k</td>
<td>$83k</td>
<td>17k</td>
<td>$58k</td>
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<td>16</td>
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<tr>
<td>White seabass</td>
<td>White seabass</td>
<td>Hook-and-line 17, gill net 2</td>
<td>Hook-and-line, gill net</td>
<td>0-40fms</td>
<td>kelp, reefs, offshore banks, open ocean</td>
<td>State and Federal</td>
<td>2k</td>
<td>$4k</td>
<td>15k</td>
<td>$33k</td>
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<tr>
<td>Surperch</td>
<td>Surperch</td>
<td>66 Hook-and-line 0-10fms</td>
<td>sand</td>
<td>State</td>
<td>26k</td>
<td>$51k</td>
<td>15k</td>
<td>$30k</td>
<td>21</td>
<td>19</td>
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<td></td>
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<tr>
<td>Shelf rockfish</td>
<td>24 species of shelf rockfish</td>
<td>Hook-and-line 76, trawl 4, gill net 1</td>
<td>Hook-and-line, trawl, gill net</td>
<td>30-200fms</td>
<td>deep rocky reefs, cobble and sand, canyon edges</td>
<td>State and Federal</td>
<td>12k</td>
<td>$20k</td>
<td>45k</td>
<td>$29k</td>
<td>15</td>
<td>20</td>
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<tr>
<td>Lingcod</td>
<td>Lingcod</td>
<td>Hook-and-line 88, trawl 11, trap 16, gill net 1</td>
<td>Hook-and-line, trawl, gill net, trap</td>
<td>2-200fms</td>
<td>deep and shallow rocky reef, kelp, low- to high-relief mixed substrate, canyons</td>
<td>State and Federal</td>
<td>25k</td>
<td>$40k</td>
<td>19k</td>
<td>$29k</td>
<td>19</td>
<td>21</td>
</tr>
<tr>
<td>Red urchin</td>
<td>Red urchin</td>
<td>2 hand harvest with scuba or hooka gear</td>
<td>2-15fms</td>
<td>rocky reefs, kelp, hard bottom</td>
<td>State</td>
<td>18k</td>
<td>$15k</td>
<td>14k</td>
<td>$11k</td>
<td>23</td>
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</table>
### Morro Bay port area landings (pounds)

<table>
<thead>
<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>6-year average</th>
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<tbody>
<tr>
<td><strong>FINFISH</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Albacore</td>
<td>319,493</td>
<td>871,342</td>
<td>1,884,361</td>
<td>536,568</td>
<td>393,881</td>
<td>67,342</td>
<td>673,748</td>
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<tr>
<td>Dover sole</td>
<td>984,563</td>
<td>506,999</td>
<td>265,381</td>
<td>628,223</td>
<td>775,472</td>
<td>686,769</td>
<td>641,235</td>
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<tr>
<td>Thornyheads</td>
<td>379,996</td>
<td>223,672</td>
<td>92,283</td>
<td>402,152</td>
<td>404,710</td>
<td>313,829</td>
<td>302,774</td>
</tr>
<tr>
<td>Rockfish slope</td>
<td>122,061</td>
<td>157,732</td>
<td>139,534</td>
<td>563,540</td>
<td>275,341</td>
<td>214,586</td>
<td>245,466</td>
</tr>
<tr>
<td>Other flatfish</td>
<td>130,401</td>
<td>101,631</td>
<td>224,236</td>
<td>90,139</td>
<td>193,203</td>
<td>375,450</td>
<td>185,843</td>
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<td>Sablefish</td>
<td>189,201</td>
<td>88,652</td>
<td>63,613</td>
<td>124,201</td>
<td>188,263</td>
<td>178,066</td>
<td>138,666</td>
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<td>Swordfish</td>
<td>203,852</td>
<td>292,250</td>
<td>118,975</td>
<td>56,160</td>
<td>27,773</td>
<td>21,284</td>
<td>120,049</td>
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<td>King salmon*</td>
<td>26,665</td>
<td>428,811</td>
<td>32,356</td>
<td>133,004</td>
<td>21,488</td>
<td>63,778</td>
<td>117,684</td>
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<tr>
<td>Rockfish nearshore</td>
<td>167,257</td>
<td>110,826</td>
<td>131,610</td>
<td>102,419</td>
<td>91,259</td>
<td>96,931</td>
<td>116,717</td>
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<td>Cabezon</td>
<td>129,423</td>
<td>95,512</td>
<td>72,968</td>
<td>50,854</td>
<td>50,277</td>
<td>52,698</td>
<td>75,289</td>
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<tr>
<td>Rockfish shelf</td>
<td>157,790</td>
<td>66,968</td>
<td>15,663</td>
<td>8,661</td>
<td>9,502</td>
<td>12,387</td>
<td>45,137</td>
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<tr>
<td>Other tuna</td>
<td>19,287</td>
<td>43,950</td>
<td>129,178</td>
<td>2,971</td>
<td>22,828</td>
<td>4,600</td>
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<td>California halibut</td>
<td>77,533</td>
<td>40,035</td>
<td>63,123</td>
<td>17,509</td>
<td>10,514</td>
<td>5,086</td>
<td>35,633</td>
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<tr>
<td>Shark</td>
<td>33,960</td>
<td>26,395</td>
<td>30,974</td>
<td>15,076</td>
<td>16,249</td>
<td>19,114</td>
<td>23,628</td>
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<td>Lingcod</td>
<td>28,499</td>
<td>5,986</td>
<td>13,300</td>
<td>18,484</td>
<td>20,714</td>
<td>25,041</td>
<td>18,671</td>
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<td>Surfperch</td>
<td>9,192</td>
<td>9,860</td>
<td>11,209</td>
<td>11,611</td>
<td>24,039</td>
<td>25,565</td>
<td>15,246</td>
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<td>White seabass</td>
<td>16,887</td>
<td>3,600</td>
<td>34,559</td>
<td>20,096</td>
<td>10,139</td>
<td>1,774</td>
<td>14,509</td>
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<td>Rockfish other</td>
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<td>6,920</td>
<td>4,321</td>
<td>2,297</td>
<td>1,241</td>
<td>1,899</td>
<td>10,739</td>
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<td>Grenadier</td>
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<td>2,521</td>
<td>4,738</td>
<td>7,229</td>
<td>4,717</td>
<td>158</td>
<td>8,046</td>
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<td>Kelp greenling</td>
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<td>8,340</td>
<td>4,989</td>
<td>5,255</td>
<td>3,772</td>
<td>1,949</td>
<td>4,589</td>
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*From DFG Ocean Salmon Project records

### INVERTEBRATES

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<tr>
<th></th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>6-year average</th>
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<tbody>
<tr>
<td>Market squid</td>
<td>39,512</td>
<td>9</td>
<td>174,994</td>
<td>785,177</td>
<td>1,433,503</td>
<td>1,996,713</td>
<td>738,318</td>
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<td>Ocean shrimp</td>
<td>278,024</td>
<td>303,273</td>
<td>247,412</td>
<td>743,999</td>
<td>913,116</td>
<td>581,646</td>
<td>511,245</td>
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<td>75,885</td>
<td>102,358</td>
<td>119,177</td>
<td>56,831</td>
<td>48,331</td>
<td>82,605</td>
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<td>126,000</td>
<td>130,047</td>
<td>77,839</td>
<td>98,222</td>
<td>5,225</td>
<td>11,551</td>
<td>74,814</td>
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<td>Dungeness crab</td>
<td>1,521</td>
<td>5,375</td>
<td>8,660</td>
<td>31,894</td>
<td>30,357</td>
<td>23,064</td>
<td>16,812</td>
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<td>6,274</td>
<td>0</td>
<td>9,122</td>
<td>16,922</td>
<td>31,586</td>
<td>18,349</td>
<td>13,709</td>
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## Morro Bay port area ex-vessel value (dollars)

<table>
<thead>
<tr>
<th>Year</th>
<th>1999</th>
<th>2000</th>
<th>2001</th>
<th>2002</th>
<th>2003</th>
<th>2004</th>
<th>6-year average</th>
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<tbody>
<tr>
<td><strong>FINFISH</strong> (preliminary)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Rockfish nearshore</td>
<td>616,245</td>
<td>523,373</td>
<td>598,234</td>
<td>520,988</td>
<td>494,608</td>
<td>618,339</td>
<td>561,965</td>
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<tr>
<td>Albacore</td>
<td>197,946</td>
<td>794,970</td>
<td>1,424,069</td>
<td>382,827</td>
<td>319,213</td>
<td>40,662</td>
<td>526,615</td>
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<tr>
<td>Cabezon</td>
<td>516,529</td>
<td>449,717</td>
<td>351,218</td>
<td>252,914</td>
<td>252,395</td>
<td>251,119</td>
<td>345,649</td>
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<tr>
<td>Swordfish</td>
<td>604,489</td>
<td>759,259</td>
<td>346,421</td>
<td>176,591</td>
<td>87,858</td>
<td>72,926</td>
<td>341,257</td>
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<tr>
<td>King salmon*</td>
<td>72,167</td>
<td>785,425</td>
<td>68,150</td>
<td>254,982</td>
<td>62,585</td>
<td>230,602</td>
<td>245,652</td>
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<tr>
<td>Dover sole</td>
<td>329,140</td>
<td>174,329</td>
<td>90,524</td>
<td>217,327</td>
<td>268,549</td>
<td>232,987</td>
<td>218,809</td>
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<td>Thornyheads</td>
<td>68,033</td>
<td>204,472</td>
<td>85,814</td>
<td>374,032</td>
<td>258,010</td>
<td>189,152</td>
<td>196,586</td>
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<tr>
<td>Other flatfish</td>
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<td>71,010</td>
<td>193,857</td>
<td>87,289</td>
<td>157,221</td>
<td>433,395</td>
<td>169,828</td>
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<td>Rockfish slope</td>
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*From DFG Ocean Salmon Project records

## INVERTEBRATES

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Profile of Major Dover Sole/Thornyhead/Sablefish Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: Dover sole/thornyhead/sablefish

Species targeted: Dover sole (*Microstomus pacificus*), longspine thornyhead (*Sebastolobus altivelis*), shortspine thornyhead (*S. alascanus*), sablefish (*Anoplopoma fimbria*)

2004 preliminary landings (pounds): 1,178,664
comprised of 686,769 lbs Dover sole, 313,829 lbs thornyheads, 178,066 lbs sablefish
2004 preliminary ex-vessel value: $591,885
comprised of $232,987 Dover sole, $189,152 thornyheads, $169,746 sablefish

2003 landings: 1,368,445
comprised of 775,472 lbs Dover sole, 404,710 lbs thornyheads, 188,263 lbs sablefish
2003 ex-vessel value: $719,093
comprised of $268,549 Dover sole, $258,010 thornyheads, $192,534 sablefish

1999-2004 average landings: 1,082,765
comprised of 641,235 lbs Dover sole, 302,774 lbs thornyheads, 138,666 lbs sablefish
1999-2004 average ex-vessel value: $544,437
comprised of $218,809 Dover sole, $196,586 thornyheads, $129,042 sablefish

Rank of average annual landings in port area 1999-2004:
Dover sole (3)
Thornyheads (5)
Sablefish (8)

Rank of average annual value in port area 1999-2004:
Dover sole (8)
Thornyheads (9)
Sablefish (13)

General trend in annual landings 1999-2004:
Landings for each group have varied by approximately three- to four-fold with no trend, although 2001 was the lowest year of landings for all groups within the period.

Comments:
Unlike the Monterey area, the establishment of the Rockfish Conservation Area (RCA) in continental shelf waters did not appear to have any negative impact of landings of the DTS complex in this area. Although statewide trawl effort has been reduced recently due to a federal groundfish buyback program which has retired some trawl vessels, this also seems to have had a minimal impact on Morro Bay area landings for these species. Thornyheads caught by longline gear are retained on board and sold in a live condition, increasing their market value in recent years.
Number of fishermen making landings in 2003 and/or 2004 in port area:
All species trawl: 18
Thornyheads and/or sablefish hook-and-line: 9
   Dover sole trawl: 15
   Thornyheads hook-and-line: 2
   Thornyheads trawl: 18
Sablefish hook-and-line: 9
Sablefish trap: 1
Sablefish trawl: 18
Sablefish gill net: 3

Primary gear type(s): bottom trawl, longline (thornyheads and sablefish), gill nets (sablefish), trap (sablefish)

Primary depth range: 150-700 fathoms

Primary habitat type(s): soft bottom, low-relief mixed and hard bottom

Primary area of fishery: State waters____ Federal waters__X____

Synopsis of regulations applicable to central coast study region:
Trawling is prohibited within 3 miles of shore.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Trawl limited entry:
   Dover sole: two-month harvest limits.
   Thornyheads: two-month harvest limits.
   Sablefish: two-month harvest limits.

Trawl open access:
   Dover sole: monthly harvest limits.
   Thornyheads: may not be taken.
   Sablefish: daily, weekly, and two-month harvest limits.

Fixed gear limited entry:
   Dover sole: monthly harvest limits.
   Thornyheads: two-month harvest limits.
   Sablefish: daily, weekly, and two-month harvest limits.

Non-trawl open access:
   Dover sole: monthly harvest limits.
   Thornyheads: may not be taken
   Sablefish: daily, weekly, and two-month harvest limits.

All trawl gear is permitted seaward of the RCA.

Log book Required?: Yes for trawl and sablefish trap
Relevant spatially-explicit data concerning location of fishery:
Although the fishery occurs primarily in federal waters, a small amount of trap effort occurs within state waters in submarine canyon areas. Although all trawling occurs outside state waters in this portion of the study region, trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer. EcoTrust will provide information on the distribution of non-trawl sablefish fishing effort.
Profile of Major Market Squid Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Name of fishery: Market squid

Species targeted: Market squid (Loligo opalescens)

2004 landings (pounds): 1,996,713
2004 ex-vessel value: $444,752

2003 landings: 1,433,503
2003 ex-vessel value: $357,252

1999-2004 average landings: 738,318
1999-2004 average ex-vessel value: $149,810

Rank of average annual landings in port area 1999-2004: 1
Rank of average annual value in port area 1999-2004: 11

General trend in annual landings 1999-2004:
Squid landings in this area experienced extreme variability, with virtually zero landings in 2000 and almost 2 million pounds in 2004.

Comments:
The availability of squid is highly variable and is negatively correlated with El Niño events. International market conditions further influence annual catch. The life span of individual squid is less than 1 year, and squid are generally harvested during aggregations on known spawning grounds. There are three major fishing fleets; these are based out of Monterey, Ventura (this includes many out-of-state vessels), and San Pedro, and boats will travel between the spring-autumn fishery in the Monterey area and the autumn-spring fishery in southern California.

Number of fishermen making landings in 2003 and/or 2004 in port area: 12

Primary gear type(s): purse seine, drum seine, brail

Primary depth range: 5-30 fathoms

Primary habitat type(s): sand bottom

Primary area of fishery: State waters___X___ Federal waters_____

Synopsis of regulations applicable to central coast study region:
The Fish and Game Commission adopted a comprehensive Squid Fishery Management Plan (FMP) in August 2004. This is one of the few fisheries in California to have a FMP.
This is a restricted access fishery as of April 1, 2005. Between 1997 and 2000 there was a moratorium on new vessels entering the fishery. During this period separate vessel-based permit systems were established for squid vessels and for light boat owners.
Weekend closures are in effect year-round and state-wide. Squid may not be harvested from 1200 hours (noon) on Friday and 1200 hours (noon) on Sunday.

Vessels are limited to a 30,000-watt maximum for attracting lights and required light shields must cover the entire filament and be parallel to the deck of the vessel.

A harvest guideline of 118,000 tons statewide is established for the April 1 to March 31 fishing year.

There are no closed areas other than as specified in particular MPAs. Attracting lights from light boats may not be used north of Pigeon Point. No attracting light may be used within the Gulf of the Farallons NMS.

Logbook Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
Logbook data containing specific set locations and catch have been aggregated by microblock (approx. 1 x 1 square miles) from 1999 to 2005 and will be available.
Profile of Major Albacore and other Tuna Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: Albacore/other tuna

Species targeted: albacore (*Thunnus alalunga*)
Other species harvested: bigeye tuna (*Thunnus obesus*), bluefin tuna (*T. thynnus*), yellowfin tuna (*T. albacares*), skipjack (*Euthynnus pelamis*)

2004 preliminary landings (pounds): 41,422
comprised of 36,842 lbs albacore, 4,600 other tuna

2004 preliminary ex-vessel value: $47,976
comprised of $40,662 albacore, $7,314 other tuna

2003 landings: 398,481
comprised of 393,881 lbs albacore, 4,600 lbs other tuna

2003 ex-vessel value: $326,527
comprised of $319,213 albacore, $7,314 other tuna

1999-2004 average landings: 710,884
comprised of 673,748 lbs albacore, 37,136 lbs other tuna

1999-2004 average ex-vessel value: $577,454
comprised of $526,615 albacore, $50,839 other tuna

Rank of average annual landings in port area 1999-2004:
Albacore (2)
Other tuna (16)

Rank of average annual value in port area 1999-2004:
Albacore (3)
Other tuna (17)

General trend in annual landings 1999-2004:
Albacore landings have declined steadily since 2001 from approximately 1.9 million lbs to less than 40,000 lbs. Landings of other tuna exceeded 125,000 lbs in 2001, primarily due to bluefin tuna, and have ranged from 3,000 to 23,000 lbs since then.

Comments:
The abundance of that portion of the Pacific Ocean’s albacore stocks available to the local fleet has fluctuated considerably over the last several decades, with strong and weak periods occurring intermittently.

Number of fishermen making landings in 2003 and/or 2004 in port area: 70

Primary gear type(s): troll hook-and-line, purse seine

Primary depth range: surface and subsurface waters
Primary habitat type(s): open ocean, pelagic waters

Primary area of fishery: State waters_____ Federal waters__X____

Synopsis of regulations applicable to central coast study region:
Must possess a federal Highly Migratory Species fishery permit

Log book Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
The fishery occurs primarily in federal waters. Coupled with the high mobility of the species involved, spatially explicit data will be of little value to the MLPA Initiative process.
Profile of Major Ocean Shrimp Commercial Fisheries in Central Coast Study Region:
Morro Bay Area

Port area: Morro Bay
Fishery: Ocean shrimp

Species targeted: Ocean shrimp (pink shrimp) \((Pandalus jordani)\)

2004 preliminary landings (pounds): 581,646
2004 preliminary ex-vessel value: $265,816

2003 landings: 913,116
2003 ex-vessel value: $302,177

1999-2004 average landings: 511,245
1999-2004 average ex-vessel value: $223,916

Rank of average annual landings in port area 1999-2004: 4
Rank of average annual value in port area 1999-2004: 7

General trend in annual landings 1999-2004:
Landings were almost three times higher from 2002 to 2004 compared with 1999 to 2001.

Comments: Ocean shrimp population abundance off California is determined by environmental conditions, which cause natural fluctuations in recruitment that are apparently unrelated or minimally related to commercial fishing effort. Concentrations of shrimp generally remain in well defined areas or beds in northern California from year-to-year. South of Pigeon Point there are not established beds. There are no longer any processors in California purchasing ocean shrimp and ex-vessel prices in Oregon are at an all time low. Small amounts of ocean shrimp may be sold directly to the public at harbor fish markets.

Number of fishermen making landings in 2003 and/or 2004 in port area: 2

Primary gear type(s): Double- and single-rigged otter trawls with fish excluders.

Primary depth range: 40 -125 fathoms

Primary habitat type(s): green mud, mud/sand bottom

Primary area of fishery: State waters_____ Federal waters__X____

Synopsis of regulations applicable to central coast study region:
This is a restricted access fishery and a regional permit is required.

The season is closed November 1 through March 31

A maximum count per pound of 160 is required (equivalent to an average minimum size)

The minimum mesh size for a trawl net is 1 and 3/8 inches.
An approved Bycatch Reduction Device (fish excluder) is required on all nets.

Trawling is prohibited within three miles of shore in this region.

Limits are in effect for the maximum amount of fish which may be landed incidental to ocean shrimp.

Spot prawns shall not be landed as incidental catch.

**Log book Required?**: Yes

**Location-specific catch data available from logbooks?** Standard block data.

**Years of data included here**: Logbook data for 2004-2005 have been entered in a database. Previous years have never been entered into a database.
Profile of Major Slope Rockfish/Grenadier Commercial Fisheries in Central Coast Study Region: Morro Bay Area

**Port area:** Morro Bay  
**Fishery:** Slope rockfish/grenadier

**Species targeted:** slope rockfishes: splitnose (*Sebastes diploproa*), darkblotched (*S. crameri*)  
Grenadiers (*Coryphaenoides acrolepis*)

Other rockfish species landed: aurora (*S. aurora*), bank (*S. rufus*), blackgill (*S. melanostomus*), Pacific ocean perch (*S. alutus*), redbanded (*S. babcocki*), sharpchin (*S. zacentrus*)

**2004 preliminary landings (pounds):** 214,744  
comprised of 214,586 lbs slope rockfish, 158 lbs grenadier  
**2004 preliminary ex-vessel value:** $133,726  
comprised of $133,694 slope rockfish, $32 grenadier

**2003 landings:** 280,058  
comprised of 275,341 lbs slope rockfish, 4,717 lbs grenadier  
**2003 ex-vessel value:** $218,439  
comprised of $217,621 slope rockfish, $818 grenadier

**1999-2004 average landings:** 253,511  
comprised of 245,466 lbs slope rockfish, 8,046 lbs grenadier  
**1999-2004 average ex-vessel value:** $146,449  
comprised of $145,380 slope rockfish, $1,069 grenadier

**Rank of average annual landings in port area 1999-2004:**  
Slope rockfish (6)  
Grenadier (25)

**Rank of average annual value in port area 1999-2004:**  
Slope rockfish (12)  
Grenadier (26)

**General trend in annual landings 1999-2004:**  
Slope rockfish landings increased dramatically from 1999 through 2002. Landings in 2002 and 2003 were 2-3 times those of 2001. Landings of grenadier, although historically not at high levels, declined significantly after 1999 and in 2004 were insignificant.

**Comments:**  
It is likely that the increased landings of slope rockfish were in part due to a shift in trawl fishing effort to deeper water with the establishment of the Rockfish Conservation Area (RCA) in continental shelf waters. The RCA is a long-term fishery closure to all bottom gear targeting rockfish. The slope rockfish/grenadier fishery occurs in the same general area as the Dover sole/sablefish/thornyhead fishery.
Number of fishermen making landings in 2003 and/or 2004 in port area:
All species trawl: 15
Rockfish trawl: 14
Rockfish longline: 14
Grenadier trawl: 6
Grenadier longline: 0

Primary gear type(s): bottom trawl, set longline

Primary depth range: 200-700 fathoms

Primary habitat type(s): soft bottom of continental slope and submarine canyons

Primary area of fishery: State waters____ Federal waters__X___

Synopsis of regulations applicable to central coast study region:
Trawling for rockfishes is prohibited within 3 miles of shore

Gill netting for rockfishes is prohibited in state waters.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Annual harvest limits and two-month trip limits are in effect.

All trawl gear is permitted seaward of the RCA.

Rockfishes landed must be sorted by species or species group prior to weighing.

Log book Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of non-trawl fishing effort. Trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major Nearshore Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: Nearshore

Species targeted: nearshore rockfishes: black (*Sebastes melanops*), black-and-yellow (*S. chrysomelas*), blue (*S. mystinus*), brown (*S. auriculatus*), China (*S. nebulosus*), copper (*S. caurinus*), gopher (*S. carnatus*), grass (*S. rastrelliger*), kelp (*S. atrovirens*), olive (*S. serranoides*), treefish (*S. serriceps*), cabezon (*Scorpaenichthys marmoratus*), kelp greenling (*Hexagrammos decagrammus*). Several other species defined as “nearshore” are infrequently landed in this port area, including calico rockfish (*Sebastes dalli*), monkeyface prickleback (*Cebidichthys violaceus*), California sheephead (*Semicossyphus pulcher*), and quillback rockfish (*S. maliger*).

2004 landings (pounds): 151,578
comprised of 96,931 lbs nearshore rockfish, 52,698 lbs cabezon, 1,949 lbs kelp greenling
2004 ex-vessel value: $ 881,869
comprised of $618,339 nearshore rockfish, $251,119 cabezon, $12,411 kelp greenling

2003 landings: 145,308
comprised of 91,259 lb nearshore rockfish, 50,277 lbs cabezon, 3,772 lbs kelp greenling
2003 ex-vessel value: $771,404
comprised of $494,608 nearshore rockfish, $252,395 cabezon, $24,401 kelp greenling

1999-2004 average landings: 196,595
comprised of 116,717 lbs nearshore rockfish, 75,289 lbs cabezon, 4,589 lbs kelp greenling
1999-2004 average ex-vessel value: $935,115
comprised of $561,965 nearshore rockfish, $345,649 cabezon, $27,501 kelp greenling

Rank of average annual landings in port area 1999-2004:
Nearshore rockfish (11)
Cabezon (13)
Kelp greenling (26)

Rank of average annual value in port area 1999-2004:
Nearshore rockfish (2)
Cabezon (3)
Kelp greenling (22)

General trend in annual landings 1999-2004:
Landings in 2004 were 50 to 60% of those in 1999.
Comments: This is primarily a live-fish fishery, and the relatively high price-per-pound generated by these nearshore species resulted in a rapidly expanding fishery beginning in the late 1980’s. By the mid to late 1990’s landings had peaked and a series of increasingly restrictive regulations were imposed, significantly reducing harvest levels which included Total Allowable Catch allocations levels and early closure of the cabezon and greenling fisheries starting in 2001 due to the attainment of those allocation amounts. This reduction continued into 2003 when the number of active permits was reduced due to the implementation of a restricted access program.

Number of fishermen making landings in 2003 and/or 2004 in port area: 87
All species hook-and-line: 87
All species trap: 27
Nearshore rockfish hook-and-line: 87
Nearshore rockfish trap: 26
Cabezon hook-and-line: 58
Cabezon trap: 26
Kelp greenling hook-and-line: 49
Kelp greenling trap: 23

Primary gear type(s): hook-and-line, stick gear (hooks attached to short piece of pvc pipe or rebar), handline, trap

Primary depth range: 0 to 20 fathoms

Primary habitat type(s): shallow reefs, kelp beds, other hard bottom

Primary area of fishery: State waters__X___ Federal waters_____

Synopsis of regulations applicable to central coast study region:
A comprehensive Nearshore Fishery Management Plan (FMP) was adopted by the Fish and Game Commission in May 2002. This is one of the few fisheries in California to have a FMP.

The FMP established four management areas for the nearshore fishery; the Morro Bay area (Pt. Sur to Pt. Conception) includes one entire regional management area (south-central, from Lopez Pt. to Pt. Conception), and part of another, the north-central.

This is a restricted access fishery, and nearshore fishery permits may only be used within the management area for which they were issued. This permit allows the take of only black-and-yellow, China, gopher, grass, and kelp rockfishes, and cabezon, greenlings, California scorpionfish, and California sheephead. To take other nearshore species, one must possess a deeper nearshore fisheries permit, which is not regionally restricted.

Fishing is prohibited within the Rockfish Conservation Area from 30 to 150 fathoms from January to April, from 20 to 150 fathoms from May to August, and from 30 to 150 fathoms from September to December.

There is a closed season which is variable from year to year; in 2005 the closed season is March and April.
Harvest guidelines have been established for black rockfish, other nearshore rockfish, cabezon, and greenlings (kelp and rock, the latter of which is rare in the Morro Bay area). Cumulative trip limits per permit are in effect, generally on a two-month basis.

The season may be closed early if the harvest guidelines are met or exceeded.

Minimum total length limits are as follows:
- Black-and-yellow rockfish 10 inches
- China rockfish 12 inches
- Gopher rockfish 10 inches
- Grass rockfish 12 inches
- Kelp rockfish 10 inches
- Cabezon 15 inches
- Greenlings 12 inches

Log book Required?: No, however, a pilot program is underway in several port areas including Morro Bay in which selected nearshore fishermen are completing experimental logbooks on a daily basis. NOAA Fisheries’ Santa Cruz lab has obtained funding from their Economics and Social Research Division for this volunteer program. The program is administered jointly by NOAA Fisheries, CDFG, and Pacific States Marine Fisheries Commission.

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major other Flatfish Commercial Fisheries in Central Coast Study Region:
Morro Bay Area

Port area: Morro Bay
Fishery: Other flatfishes

Species targeted: Petrale sole (Eopsetta jordani)
Other species landed: English sole (Parophrys vetulus), rock sole (Lepidopsetta bilineata), Pacific sanddab (Citharichthys sordidus), rex sole (Glyptocephalus zacherus), sand sole (Psettichthys melanostictus), slender sole (Lyopsetta exilis), starry flounder (Platichthys stellatus), turbot (Pleuronichthys spp.).

2004 preliminary landings (pounds): 375,450
2004 preliminary ex-vessel value: $433,395

2003 landings: 193,203
2003 ex-vessel value: $157,221

1999-2004 average landings: 185,843
1999-2004 average ex-vessel value: $169,828

Rank of average annual landings in port area 1999-2004: 7
Rank of average annual value in port area 1999-2004: 10

General trend in annual landings 1999-2004:
Other flatfish landings increased by more than four-fold from 2002 to 2004; Petrale, English, and rex sole comprised 87% of the 2004 landings. Unlike the Monterey area, sanddabs are of minor importance in the flatfish fishery.

Comments:
With the establishment of the Rockfish Conservation Area in 2002, trawling was prohibited in 75-150 fathoms or 100-150 fathoms, depending on time of year. However, in trawlable areas outside of the RCA, bimonthly trip limits were increased for flatfishes in 2004.

Number of fishermen making landings in 2003 and/or 2004 in port area: 21

Primary gear type(s): bottom trawl
Primary depth range: 30-700 fathoms
Primary habitat type(s): low-relief soft bottom
Primary area of fishery: State waters_____ Federal waters__X____

Synopsis of regulations applicable to central coast study region:
Within the Rockfish Conservation Area (RCA) along the central coast, trawling is prohibited between 75 and 150 fathoms from November through February, and from 100 and 150 fathoms the rest of the year.

Trawling is prohibited within 3 miles of shore.
A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Two-month harvest limits are in effect for “other flatfish” which, under the definition of the Pacific Fishery Management Council, includes sanddabs. Within these limits, Petrale sole has its own limit.

Small footrope trawl gear is required shoreward of the RCA.

**Log book Required?:** Yes

**Relevant spatially-explicit data concerning location of fishery:**
The fishery occurs primarily in federal waters; however, some flatfish other than halibut are taken incidentally in non-trawl fisheries. Although all trawling occurs outside state waters in this portion of the study region, trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major Swordfish Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay  
Fishery: Swordfish

Species targeted: Swordfish (Xiphias gladius)

2004 preliminary landings (pounds): 21,284  
2004 preliminary ex-vessel value: $72,926

2003 landings: 27,773  
2003 ex-vessel value: $87,858

1999-2004 average landings: 120,049  
1999-2004 average ex-vessel value: $341,257

Rank of average annual landings in port area 1999-2004: 9  
Rank of average annual value in port area 1999-2004: 5

General trend in annual landings 1999-2004:  
Landings reached a high of more than 292,000 lbs in 2000 during this period and declined steadily to approximately 21,000 lbs in 2004.

Comments:  
Landings of swordfish off central California in general now are lower than historic landings, in part because one of the fishing areas which contributed to landings in the Morro Bay area is now closed to drift gill nets during the fall, a prime time for fishing, to protect sea turtles.

Number of fishermen making landings in 2003 and/or 2004 in port area: 9  
Gill net: (9)  
Hook-and-line: (0)  
Harpoon: (0)

Primary gear type(s): drift gill net, hook-and-line, harpoon

Primary depth range: surface and near-surface waters

Primary habitat type(s): open ocean, pelagic waters

Primary area of fishery: State waters_____ Federal waters__X___

Synopsis of regulations applicable to central coast study region:  
A highly migratory species permit is required. This is a restricted access fishery.

Log book Required?: Yes
Relevant spatially-explicit data concerning location of fishery:
The fishery occurs primarily in federal waters. Coupled with the high mobility of the species involved, spatially explicit data will be of little value to the MLPA Initiative process.
Profile of Major Salmon Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: Salmon

Species targeted: king salmon (Chinook) (Oncorhynchus tshawytscha)

2004 preliminary landings (pounds): 63,778
2004 preliminary ex-vessel value: $230,602

2003 landings: 21,488
2003 ex-vessel value: $62,585

1999-2004 average landings: 117,684
1999-2004 average ex-vessel value: $245,652

Rank of average annual landings in port area 1999-2004: 10
Rank of average annual value in port area 1999-2004: 6

General trend in annual landings 1999-2004:
Landings have varied by more than 10-fold during the period with no trend.

Comments:
Landings are influenced by several important factors: 1) the availability of 3- and 4-year old fish from the Sacramento and San Joaquin River system runs; and 2) the length of the fishing season, which may be shortened to protect salmon from the Klamath River system,(Klamath River salmon may mix with stocks from central California). When the Klamath River stocks are relatively low, the commercial season is shorter statewide. When ocean salmon are more abundant in general, they may be more available in the Morro Bay area and occasionally will be found in southern California as well.

Number of fishermen making landings in 2003 and/or 2004 in port area: 68

Primary gear type(s): troll hook-and-line

Primary depth range: fishery occurs from the surface to 50 fathoms although the bottom depth may greatly exceed that.

Primary habitat type(s): pelagic, open ocean

Primary area of fishery: State waters__X___ Federal waters__X___

Synopsis of regulations applicable to central coast study region:
The Morro Bay sub-region of the central coast study area lies entirely within one of the Pacific Fishery Management Council's (PFMC) salmon management areas (Pt. Sur to US/Mexican border).
The fishing season varies each year, and is set by National Marine Fisheries Service under recommendation of the PFMC. Considerations in shaping the chinook fisheries in this area include the protection of Endangered Species Act-listed Sacramento River winter and California coastal chinook, and achievement of fall chinook spawning escapement goals for the Klamath, Sacramento, and Oregon coastal rivers. California commercial seasons are based on preseason forecasts of ocean abundances of Klamath fall chinook by age and estimates of total California Central Valley fall chinook adult abundance. The commercial season may not open in this area earlier than May 1 and closes no later than September 30. In 2005, the season is open May 1-31, July 4- August 29, and September 1-30.

In 2005 minimum legal length is 27 inches in May and September, and 28 inches in July and August.

Single point, barbless hooks are required. No more than six fishing lines are allowed per vessel.

There are no closed areas within the study region other than existing State Marine Reserves.

Coho salmon may not be taken.

**Log book Required?: No**

**Relevant spatially-explicit data concerning location of fishery:**
Due to the combination of the high mobility of salmon, its widespread range, and its inter- and intra-annual variability in distribution, spatially explicit data will be less important to the MLPA Initiative process than that from other fisheries.
Profile of Major Rock Crab Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay  
Fishery: Rock crab

Species targeted:
Brown rock crab \((C.\ antennarius)\)  
Red rock crab \((C.\ productus)\)  
Other species landed infrequently in port area:  
Yellow rock crab \((C.\ anthonyi)\)

2004 preliminary landings (pounds): 48,331  
2004 preliminary ex-vessel value: $110,342

2003 landings: 56,831  
2003 ex-vessel value: $73,931

1999-2004 average landings: 82,605  
1999-2004 average ex-vessel value: $115,553

Rank of average annual landings in port area 1999-2004: 12  
Rank of average annual value in port area 1999-2004: 14

General trend in annual landings 1999-2004:  
Landings were fairly stable through 2002 but have declined by more than 50% since then.

Comments:  
Most of the rock crab landed in the Morro Bay port area originate from south of the central coast study region, primarily the northern Santa Barbara Channel Islands and the mainland coastal waters of Santa Barbara County. The established presence of the southern sea otter effectively precludes a commercial or recreational fishery in the Morro Bay port area. The decline in recent landings is due primarily to a decrease in fishing effort.

Number of fishermen making landings in 2003 and/or 2004 in port area: 19

Primary gear type(s): Rectangular traps, which are usually set individually (rarely in pairs), with a line and marker buoy.

Primary depth range: 7- 30 fathoms

Primary habitat type(s): kelp bed areas, rocky reefs, mixed substrate, sand bottom.

Primary area of fishery: State waters__X___ Federal waters_____  
Synopsis of regulations applicable to central coast study region:  
Minimum carapace width of 4.25 inches.
Rectangular traps of 2” X 4” or 2” X 2” wire mesh, with 1 or 2 escape port(s) (depending on mesh size) and at least one approved self-destruct device are predominantly used. Molded plastic traps are used by some fishermen.

Permit system: A permit system and a control date were initiated in the 2005-2006 fishing season. A Northern Rock Crab Trap Permit is required north of Lopez Point in Monterey County, and a Southern Rock Crab Trap Permit south of that point. The fee for either permit is $250, but there is qualifying landing criteria that the applicant must meet to purchase a southern permit.

Log book Required?: No

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major Spot Prawn Trap Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay  
Fishery: Spot Prawn Trap

Species targeted: Spot prawn (*Pandalus platyceros*)

2004 landings (pounds): 11,551  
2004 ex-vessel value: $120,245

2003 landings: 5,225  
2003 ex-vessel value: $51,530

1999-2004 average landings: 74,814  
1999-2004 average ex-vessel value: $604,549

Rank of average annual landings in port area 1999-2004: 14  
Rank of average annual value in port area 1999-2004: 1

General trend in annual landings 1999-2004: Landings in the port area peaked in 2000 when a trawl fishery operated in the same area as the trap fishery.

Comments: The harvest of spot prawns using trawl gear was prohibited beginning in 2003. A relatively small number of trap fishermen operate in the Morro Bay area, but with a significant harvest. Additional effort is possible beginning in 2005 because the Fish and Game Commission approved up to 11 trawl-to-trap"conversion" permits statewide at the end of 2004 for former spot prawn trawl fishermen (nine were purchased). Spot prawns change sex from male to female at age 3; thus the larger prawns are all female. Spot prawns are maintained in tanks on board before landing and sold in a live condition for $10.00 –$13.50/pound.

Number of fishermen making landings in 2003 and/or 2004 in port area: 2

Primary gear type(s): Plastic or wire mesh traps with a minimum mesh size of 7/8 by 7/8 inches. The traps are set in strings marked with a buoy at each end.

Primary depth range: 100 -150 fathoms

Primary habitat type(s): submarine canyon; hard, soft, and mixed bottom

Primary area of fishery: State waters__X__  Federal waters__X__
Synopsis of regulations applicable to central coast study region:
Restricted access fishery with a 3-tier structure. Total of 29 (17 + 3 + 9) permits statewide with no restrictions on geographical region of fishing.

Tier 1 permits (17) are fully transferable. A permittee may use no more than 500 traps (only 300 in state waters north of Pt. Arguello), and has no restrictions on landings.

Tier 2 permits (3) are not transferable. A permittee may use no more than 150 traps, and may land no more than 5,000 pounds of spot prawns in a calendar year.

Tier 3 (trawl-to-trap conversion) permits (9) are not transferable. A permittee may use no more than 500 traps (only 300 in state waters north of Pt. Arguello), and has no restrictions on landings.

Closed season north of Pt. Arguello is May 1 to July 31. Closed season south of Pt. Arguello is November 1 to January 31.

All species caught incidentally in spot prawn traps must be returned to the water immediately.

Log book Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
In addition, relative fishing effort by DFG fishing block is available for 1998-99. These years are before the restricted access fishery began and before the trawl closure was established and thus provide a better picture of the distribution of the resource.
Profile of Major Shelf Rockfish Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: Shelf rockfish

Species targeted: shelf rockfishes: bocaccio (Sebastes paucispinis), canary (S. pinniger), chilipepper (S. goodei), shortbelly (S. jordani), widow (S. entomelas), and yelloweye (S. ruberrimus)
Other species landed: shelf rockfishes: bronzespotted (S. gilli), cowcod (S. levis), flag (S. rubrivinctus), greenblotched (S. rosenblatti), greenspotted (S. chlorostictus), greenstriped (S. elongatus), halfbanded (S. semicinctus), pink (S. eos), pinkrose (S. simulator), redstripe (S. proriger), rosethorn (S. helvomaculatus), rosy (S. rosaceus), speckled (S. ovalis), squarespot (S. hopkinsi), starry (S. constellatus), stripetail (S. sxicola), swordspine (S. ensifer), tiger (S. nigrocinctus), vermilion (S. miniatus), yellowtail (S. flavidus)

2004 preliminary landings (pounds): 12,238
2004 preliminary ex-vessel value: $19,802

2003 landings: 9,502
2003 ex-vessel value: $12,342

1999-2004 average landings: 45,137
1999-2004 average ex-vessel value: $29,237

Rank of average annual landings in port area 1999-2004: 15
Rank of average annual value in port area 1999-2004: 20

General trend in annual landings 1999-2004:
Beginning in 2001 landings have been only 15 to 30% of those in 1999.

Comments: This significant decline in landings was due primarily to the establishment of the Rockfish Conservation Area (RCA), a fishery management closure designed to help rebuild overfished stocks of the following rockfishes: bocaccio, canary, cowcod, darkblotched, Pacific ocean perch, widow, and yelloweye. Many other rockfish species associated with these overfished species, and the relatively small landings for shelf rockfish in general originate from outside of the RCA. However, the average ex-vessel value increased significantly in 2003-2004 compared with earlier years due to the higher market value of hook-and-line caught fish.

Number of fishermen making landings in 2003 and/or 2004 in port area:
Hook-and-line: 76
Trawl: 4
Gill net: 1

Primary gear type(s): bottom trawl, midwater trawl, longline, hook-and-line, gill net

Primary depth range: 30-200 fathoms

Primary habitat type(s): deep rocky reefs, mixed-bottom substrate including cobble and sand, edges of submarine canyons
Primary area of fishery: State waters ___X___ Federal waters ___X___

Synopsis of regulations applicable to central coast study region:
Within the Rockfish Conservation Area (RCA), the taking of rockfishes, lingcod, California scorpionfish, and ocean whitefish is prohibited. Within the central coast study region (Pigeon Pt. to Pt. Conception), the RCA for commercial fishing is 20 to 150 fathoms for fixed gears (limited entry and open access) and from 75 to 150 fathoms for trawlers.

Trawling for rockfishes is prohibited within 3 miles of shore

Gill netting for rockfishes is prohibited in state waters.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Annual harvest limits and two-month trip limits are in effect, with a total closure on cowcod by trawl gear and for canary and yelloweye rockfishes and cowcod by fixed gears.

Small footrope trawl gear is required shoreward of the RCA.

Rockfishes landed must be sorted by species or species group prior to weighing.

Log book Required?: Yes for trawling

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of non-trawl fishing effort. Trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major California Halibut Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: California halibut

Species targeted: California halibut (*Paralichthys californicus*)

2004 preliminary landings (pounds): 5,086
2004 preliminary ex-vessel value: $16,369

2003 landings: 10,514
2003 ex-vessel value: $29,384

1999-2004 average landings: 35,633
1999-2004 average ex-vessel value: $92,944

Rank of average annual landings in port area 1999-2004: 17
Rank of average annual value in port area 1999-2004: 15

General trend in annual landings 1999-2004:
Landings have declined steadily from approximately 63,000 lbs in 2001 to approximately 5,000 lbs in 2004.

Comments: The number of gillnet boats making at least one halibut landing in the Morro Bay area decreased from a high of 13 in 2001 to only one in 2003 and 2004, primarily due to increased restrictions on the use of this gear. This, coupled along with a reduction of trawlers (17 in 1999 to a low of four in 2004), accounts for the substantial decrease. Market conditions have developed such that trawling for halibut is not as economically feasible as it was in the past, and some of the major trawl vessels have left the fishery.

Number of fishermen making landings in 2003 and/or 2004 in port area:
Trawl: 9
Hook-and-line: 38
Gill or trammel net: 1

Primary gear type(s): trawl, hook-and-line, gill and trammel net

Primary depth range: 2 – 50 fathoms

Primary habitat type(s): sand bottom

Primary area of fishery: State waters____X___ Federal waters____X___
**Synopsis of regulations applicable to central coast study region:**
The Fish and Game Commission has authority over state-managed bottom trawl fisheries not managed under federal regulations, which includes regulations pertaining to California halibut.

Trawling for halibut is prohibited within 3 miles of shore, except in the area from Pt. Arguello south to Pt. Mugu greater than 1 nautical mile from shore. Minimum mesh size for trawls in this area is 7.5 inches, and trawling is closed from March 15 to June 15.

In waters greater than 3 nautical miles from shore, trawling is permitted, and minimum mesh size is 4.5 inches.

Gill and trammel nets are prohibited in waters less than 60 fathoms deep from Pt. Reyes headlands in Marin county south to Pt. Arguello.

Where gill nets and trammel nets are legal, minimum mesh size is 8.5 inches. Gill and trammel nets may not exceed 1,500 fathoms (9,000 feet) in length, except that in a portion of southern California south of a line extending due west from Pt. Arguello, gill and trammel nets may not exceed 1,000 fathoms (6,000 feet).

Halibut less than 22 inches may not be taken, possessed, or sold unless it weighs 4 lbs or more in the round, 3.5 lbs or more dressed with head on, or 3 lbs or more dressed with head off.

**Log book Required?:** Yes for trawlers – when/where fishing is permitted

**Relevant spatially-explicit data concerning location of fishery:**
EcoTrust will provide information on the distribution of non-trawl fishing effort.
Profile of Major Shark Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: Shark (this represents multiple fisheries which either target shark or harvest them incidentally)

Species targeted: thresher shark (*Alopias vulpinus*), shortfin mako shark (bonito shark) (*Isurus oxyrinchus*), spiny dogfish (*Squalus acanthias*), soupfin shark (*Galeorhinus zyopterus*)
Other species landed: brown smoothhound (*Mustelus henlei*), leopard shark (*Triakis semifasciata*), Pacific angel shark (*Squatina californica*)

2004 preliminary landings (pounds): 19,144
2004 preliminary ex-vessel value: $18,308

2003 landings: 16,249
2003 ex-vessel value: $17,998

1999-2004 average landings: 23,628
1999-2004 average ex-vessel value: $22,440

Rank of average annual landings in port area 1999-2004: 18
Rank of average annual value in port area 1999-2004: 23

General trend in annual landings 1999-2004:
Landings have varied by approximately two-fold during the period, with the latter 3 years showing lower landings.

Comments:
Thresher shark has consistently been the number one species landed. Mako shark landings have declined steadily from more than 8,000 lbs in 1999 to less than 1,500 lbs in 2004. Soupfin shark landings have declined significantly from almost 8,000 lbs in 2001 to 400 pounds in 2004. Pacific angel shark has followed a similar trend. Spiny dogfish are a much less important component of shark landings compared with the Monterey area.

Number of fishermen making landings in 2003 and/or 2004 in port area:
Hook-and-line: 14
Gill net: 11
Trawl: 5

Primary gear type(s):
Hook-and-line
Drift gill net (primarily for thresher and shortfin mako sharks)
Set gill net or trammel net (primarily for Pacific angel sharks)
Trawl (primarily for spiny dogfish)

Primary depth range: 0 to 400 fathoms

Primary habitat type(s): open ocean, pelagic waters, nearshore waters, soft bottom, hard bottom, rocky reefs, kelp beds.
Primary area of fishery: State waters______ Federal waters__X____

Synopsis of regulations applicable to central coast study region:
A Highly Migratory Species permit is required to take thresher sharks.

Sharks may be taken with drift gill nets of mesh size 8 inches or greater under a revocable permit from DFG.

Longlines may not be used to take thresher and shortfish mako shark.

Pacific angel sharks have a minimum legal size of 42 inches for females and 40 inches for males.

Leopard sharks have a minimum legal size of 36 inches

Sharkfins may not be landed without a corresponding carcass.

Spears, harpoons, and bow and arrows may not be used to take soupfin shark

White shark (Carcharodon carcharias) may not be taken.

Log book Required?: No

Relevant spatially-explicit data concerning location of fishery:
The fishery occurs primarily in federal waters. Those species which occur in nearshore waters are taken incidentally in other fisheries. Coupled with the high mobility of most of the targeted species, spatially explicit data will be of little value to the MLPA Initiative process.
Profile of Major Lingcod Commercial Fisheries in Central Coast Study Region: Morro Bay Area

**Port area:** Morro Bay  
**Fishery:** Lingcod

**Species targeted:** Lingcod (*Ophiodon elongatus*). Lingcod are generally not specifically targeted but are so widespread that they are caught in most hard-bottom oriented fisheries targeting rockfishes, cabezon, and other species.

**2004 preliminary landings (pounds):** 25,041  
**2004 preliminary ex-vessel value:** $39,883

**2003 landings:** 20,714  
**2003 ex-vessel value:** $35,218

**1999-2004 average landings:** 18,671  
**1999-2004 average ex-vessel value:** $28,635

**Rank of average annual landings in port area 1999-2004:** 19  
**Rank of average annual value in port area 1999-2004:** 21

**General trend in annual landings 1999-2004:**  
Landings have varied by approximately four- to five-fold with no trend.

**Comments:**  
Prior to 1999, the Acceptable Biological Catch for lingcod set by the National Marine Fisheries Service had undergone a series of significant reductions, and regional and statewide landings are substantially lower in this recent 6-year period compared with the previous two decades. Lingcod is now officially declared to be an overfished species; a rebuilding plan is implemented and allowable harvest levels are relatively low.

**Number of fishermen making landings in 2003 and/or 2004 in port area:**  
Hook-and-line: 88  
Trawl: 11  
Trap: 16  
Gill net: 1

**Primary gear type(s):**  
Hook-and-line  
Trawl  
Gill net  
Trap

**Primary depth range:** 2- 200 fathoms

**Primary habitat type(s):** deep and shallow rocky reef, kelp beds, low- to high-relief mixed substrate and hard bottom, submarine canyons.
Primary area of fishery: State waters__X___  Federal waters__X___

Synopsis of regulations applicable to central coast study region:
Within the Rockfish Conservation Area (RCA), the taking of rockfishes, lingcod, California scorpionfish, and ocean whitefish is prohibited. Within the central coast study region (Pigeon Pt. to Pt. Conception), the RCA for commercial fishing is from 20 to 150 fathoms for fixed gears (limited entry and open access) and from 75 to 150 fathoms for trawlers.

A federal permit is required to fish outside of the RCA. There are four types of federal permits: trawl limited entry, trawl open access, fixed gear limited entry, non-trawl open access.

Annual harvest limits and two-month trip limits are in effect.

Small footrope trawl gear is required shoreward of the RCA.

The minimum legal size for lingcod is 24 inches.

Log book Required?: Yes for trawling

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of non-trawl fishing effort. Trawl tows recorded on logbooks have been compiled (assuming straight-line tows between start and end points) from 1997 to 2003 and will be available as a GIS data layer.
Profile of Major Dungeness Crab Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: Dungeness Crab

Species targeted: Dungeness crab (*Cancer magister*)

2004 preliminary landings (pounds): 23,064
2004 preliminary ex-vessel value: $72,854

2003 landings: 30,357
2003 ex-vessel value: $91,670

1999-2004 average landings: 16,812
1999-2004 average ex-vessel value: $57,524

Rank of average annual landings in port area 1999-2004: 20
Rank of average annual value in port area 1999-2004: 16

General trend in annual landings 1999-2004:
Landings increased dramatically from 1999 to 2002 then declined by more than 50%.

Comments: Landings in northern California have experienced repeated cycles at approximately 10-year intervals. Central California landings have been less cyclical but still highly variable. Due to heavy fishing pressure in the beginning of each season, the majority of the annual landings typically occur during the first two months of the season. The primary fishing grounds are generally considered to be north of the Monterey port area, but this fishery can be relatively important locally in some years.

Number of fishermen making landings in 2003 and/or 2004 in port area: 13

Primary gear type(s): Circular traps, each attached to a separate line and buoy.

Primary depth range: 0-50 fathoms

Primary habitat type(s): sand bottom

Primary area of fishery: State waters___X__ Federal waters___X___
Synopsis of regulations applicable to central coast study region:
Closed season July 1 through November 14. Open season may be extended as late as July 31 by order of DFG Director.

Minimum carapace width 6.25 inches.

Only males may be harvested.

This is a restricted access fishery with a vessel-based permit system.

There is no limit on the number of traps per vessel which may be used but legislation has been introduced to limit the maximum number of traps.

There are no closed areas other than as specified in particular MPAs.

Log book Required?: No

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major Surfperch Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: Surfperch

Species targeted: Barred surfperch (*Amphistichus argenteus*)
Other species landed: Calico surfperch (*Amphistichus koelzi*); shiner surfperch (*Cymatogaster aggregata*)

2004 preliminary landings (pounds): 25,565
2004 preliminary ex-vessel value: $51,286

2003 landings: 24,039
2003 ex-vessel value: $48,254

1999-2004 average landings: 15,246
1999-2004 average ex-vessel value: $29,719

Rank of average annual landings in port area 1999-2004: 21
Rank of average annual value in port area 1999-2004: 19

General trend in annual landings 1999-2004:
Landings have increased steadily from approximately 9,000 lbs in 1999 to more than 25,000 lbs in 2004.

Comments:
With an average ex-vessel value of approximately $2.00 per pound, this fishery has seen an increase in effort in recent years in the Morro Bay area.

Number of fishermen making landings in 2003 and/or 2004 in port area: 66

Primary gear type(s): hook-and-line

Primary depth range: 0 – 10 fathoms

Primary habitat type(s): sand bottom, exposed beaches

Primary area of fishery: State waters___X___ Federal waters_____

Synopsis of regulations applicable to central coast study region:
Fishing season is closed May 1 through July 31 for all species except shiner surfperch, which may be taken year-round.

South of Pt. Arguello, barred, redtail (*Amphisticus rhodoterus*) (not found in Morro Bay area), and calico surfperch may not be taken.

Log book Required?: No
Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major White Seabass Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: White seabass

Species targeted: White seabass (*Atractoscion nobilis*)

2004 preliminary landings (pounds): 1,774
2004 preliminary ex-vessel value: $4,224

2003 landings: 10,139
2003 ex-vessel value: $23,934

1999-2004 average landings: 14,509
1999-2004 average ex-vessel value: $32,527

Rank of average annual landings in port area 1999-2004: 22
Rank of average annual value in port area 1999-2004: 18

General trend in annual landings 1999-2004:
Landings have shown high variability, ranging from more than 34,000 lbs in 2001 to less than 1,800 pounds in 2004.

Comments: The distribution and availability of this species is highly influenced by oceanographic conditions and changing water temperature.

Number of fishermen making landings in 2003 and/or 2004 in port area: 19
Gill net: 2
Hook-and-line: 17

Primary gear type(s):
Drift gill net
Hook-and-line

Primary depth range: 0 – 40 fathoms

Primary habitat type(s): kelp beds, reefs, offshore banks, open ocean

Primary area of fishery: State waters X Federal waters X
Synopsis of regulations applicable to central coast study region:
There is a closed season south of Pt. Conception from March 15 to June 15, with an allowance for fish taken incidental to gill and trammel net fishing.

There is a minimum legal size of 28 inches.

Mesh size of gill nets must be not less than 6 inches.

White seabass may not be taken in roundhaul nets.

Log book Required?: Yes for gill net

Relevant spatially-explicit data concerning location of fishery:
EcoTrust will provide information on the distribution of fishing effort.
Profile of Major Red Urchin Commercial Fisheries in Central Coast Study Region: Morro Bay Area

Port area: Morro Bay
Fishery: red urchin

Species targeted: red urchin (Strongylocentrotus franciscanus)

2004 preliminary landings (pounds): 18,349
2004 preliminary ex-vessel value: $14,660

2003 landings: 31,586
2003 ex-vessel value: $24,332

1999-2004 average landings: 13,709
1999-2004 average ex-vessel value: $11,321

Rank of average annual landings in port area 1999-2004: 23
Rank of average annual value in port area 1999-2004: 25

General trend in annual landings 1999-2004:
Landings have been highly variable, from 0 lbs to more than 31,000 pounds, and have been above average for the last three years of this six-year period.

Comments: The red urchins landed in the Morro Bay port area are harvested outside of the central coast study region, primarily from the northern Channel Islands. Southern California landings in general declined steadily from 1990 to 1999; urchin abundance and availability are influenced by El Niño events and a weakening Japanese currency.

Number of fishermen making landings in 2003 and/or 2004 in port area: 2

Primary gear type(s): hand harvest using rakes, with scuba or hookah gear

Primary depth range: 2 -15 fathoms

Primary habitat type(s): shallow rocky reefs, kelp beds, hard bottom

Primary area of fishery: State waters__X___ Federal waters_____
Synopsis of regulations applicable to central coast study region:
This is a restricted access fishery with an urchin diving permit required. There are no landing requirements to renew the permit.

The season is open 7 days per week from November 1 through March 31. The season is open 4 days a week in April, May, September and October, 3 days a week in June and August, and 2 days a week in July.

Urchins harvested south of the Monterey-San Luis Obispo County line may not have a test diameter between 1½ and 3¼ inches, except that not more than 30 may be landed incidentally within this size range. (Urchins less than 1½ inches in diameter are not targeted, but are often landed incidentally as they typically use the spine canopies of larger urchins as shelter.

Log book Required?: Yes

Relevant spatially-explicit data concerning location of fishery:
The fishery occurs outside of the central coast study region. Thus there are no spatial data relevant to the MLPA Initiative process.
Appendix IV: Profile of Major Recreational Fisheries in the Central Coast Study Region

Contents

1. Profile of Major Recreational Fisheries in the Central Coast Study Region: By Commercial Passenger Fishing Vessel

4. Profile of Major Recreational Fisheries in the Central Coast Study Region: Private and Rental Skiff Fishing

7. Profile of Major Recreational Fisheries in the Central Coast Study Region: Bank and Beach Fishing

9. Profile of Major Recreational Fisheries in the Central Coast Study Region: Fishing from manmade structures

12. Profile of Major Recreational Fisheries in the Central Coast Study Region: Bank and Beach Fishing
Profile of Major Recreational Fisheries in the Central Coast Study Region: Fishing via Commercial Passenger Fishing Vessel

**Fishing mode**: commercial passenger fishing vessel (CPFV)

**Port area**: Monterey and Morro Bay

**Species targeted**: King salmon (chinook) (*Oncorhynchus tshawytscha*), rockfishes (*Sebastes* sp.), lingcod (*Ophiodon elongatus*), California halibut (*Paralichthys californicus*), albacore (*Thunnus alalunga*), Pacific sanddab (*Citharichthys sordidus*)

**Estimated number of angler trips in 2004 in study region by target species**:  
- King salmon: 21,000
- Rockfishes: 34,000
- California halibut: 3,000
- Albacore: 0
- Other (sanddabs): 1,000

**2004 estimated catch (number of fish)**:  
- King salmon: (22,000)
- Rockfishes: 298,000
- Lingcod: 1,000
- Cabezon: 0
- Kelp greenling: 2,000
- California halibut: 1,000
- Albacore: 0
- Pacific sanddabs: 37,000

**2004 estimated catch (pounds of fish)**:  
- King salmon: (not available)
- Rockfishes: 360,600
- Lingcod: 13,400
- Cabezon: 0
- Kelp greenling: 2,200
- California halibut: 9,000
- Albacore: 0
- Pacific sanddabs: 13,400

**Comments**: Seasonal restrictions are in effect to keep the catch of nearshore groundfish species within harvest guidelines. Depth restrictions are in place primarily to reduce the incidental take of canary rockfish. In part due to these restrictions, relatively more effort was directed towards sanddabs in 2004. Annual catch of albacore fluctuates widely due to the availability of fish within a reasonable distance from harbors and launch ramps. Significant effort occurred for albacore in 2003 but not in 2004.

**Primary fishing depth range**: 0 – 20 fathoms (Monterey area) or 0-40 fathoms (Morro Bay area) for rockfishes, lingcod, cabezon, kelp greenling, California halibut, Pacific sanddabs, king salmon (rockfish, lingcod, and cabezon fishing could occur at greater depths if permitted)  
0 – 5 fathoms for albacore
Primary habitat type(s): Rockfishes, lingcod, cabezon, kelp greenling; kelp beds, rocky reef, hard bottom
California halibut, Pacific sanddabs: sand, other soft bottom
King salmon: nearshore surface waters
Albacore: offshore surface waters

Primary area of fishery: State waters__X___ (all but albacore)
Federal waters__X___ (albacore)

Synopsis of regulations applicable to central coast study region:

Rockfishes, cabezon, kelp greenling, and lingcod: In 2005, north of Lopez Point, the season for rockfishes, cabezon, and kelp greenling is closed January 1 through June 30; the season for lingcod is closed January 1 through June 30 and December 1-31.
South of Lopez Point, the season is closed January 1 through April 30 and October 1 through December 31.
Season may be closed early if harvest guidelines are reached.

North of Lopez Point, fishing is prohibited in depths greater than 20 fathoms.
South of Lopez Point, fishing is prohibited in depths greater than 40 fathoms.

The following rockfishes may not be taken: canary, cowcod, yelloweye.
The bag limit for rockfishes, cabezon, and kelp greenling is 10 fish in combination, all of which may be the same species, except no more than 1 cabezon, 1 kelp greenling, and 1 bocaccio may be taken within this overall bag limit.
The bag limit for lingcod is 2 fish.
On CPFVs there is a bag limit for the boat, excluding the vessel operator and crew. The boat bag limit is the number of anglers on board multiplied by the individual bag limit.

Minimum legal size: rockfish: none, except bocaccio10 inches; cabezon 15 inches; kelp greenling 12 inches; lingcod 24 inches.

Not more than two hooks and one line may be used.

Salmon: Two salmon per day of any species except silver (coho). Steelhead trout may not be taken or possessed.
In 2005, season is closed January 1 through April 1 and September 26 through December 31.

The bag limit is 2 fish.
On CPFVs there is a bag limit for the boat, excluding the vessel operator and crew. The boat bag limit is the number of anglers on board multiplied by the individual bag limit.

Minimum legal size: 20 inches

No sinkers or weights exceeding 4 pounds may be used, except that a fishing line may be attached to a sinker or weight of any size if such sinker or weight is suspended by a separate line and the fishing line is released automatically by a mechanical device from the sinker or weight when any fish is hooked.
No more than 2 single-point, single-shank barbless hooks and no more than 1 rod per angler may be used when trolling. No more than 2 single-point, single-shank barbless circle hooks and no more than 1 rod per angler may be used when mooching.
California halibut: The bag limit in waters north of Point Sur is 3 fish. The bag limit in waters south of Point Sur is 5 fish.
On CPFVs there is a bag limit for the boat, excluding the vessel operator and crew. The boat bag limit is the number of anglers on board multiplied by the individual bag limit.

Minimum legal size: 22 inches

Pacific sanddabs: There is no bag limit.

Up to 12 No. 2 or smaller hooks and up to 2 pounds of weight may be used.

Albacore: There is no bag limit.

Relevant spatially-explicit data concerning location of fishery:
The Department has compiled spatially-explicit data within the MLPA Initiative central coast study region from an 11-year onboard observer program involving the CPFV industry from 1987 to 1988. These data will be presented on microblock (one minute of latitude by one minute of longitude) maps with colors representing the total number of sampled trips to each microblock. This will provide an estimate of the relative amount of fishing effort in discrete locations, which is in turn an estimate of the relative value of particular locations to the CPFV industry. An accompanying data base will be available on the MLPA IMS web site, and will be available at Regional Stakeholder Group meetings through our GIS technician. This data base will contain estimates of overall average catch per hour of the most frequently observed species in each microblock.
Profile of Major Recreational Fisheries in the Central Coast Study Region: Private and Rental Skiff Fishing

**Fishing mode:** private and rental skiff  
**Port area:** Monterey and Morro Bay

**Species targeted:** King salmon (chinook) (*Oncorhynchus tshawytscha*), rockfishes (*Sebastes* sp.), lingcod (*Ophiodon elongatus*), California halibut (*Paralichthys californicus*), albacore (*Thunnus alalunga*), Pacific sanddab (*Citharichthys sordidus*)

**Estimated number of fishing trips in 2004 in study region by target species:**
- King salmon: 32,000  
- Rockfishes: 18,000  
- Lingcod: 3,000  
- California halibut: 8,000  
- Albacore: 1,000  
- Other: 5,000  
- Anything: 3,000

**2004 estimated catch (number of fish):**
- King salmon: (22,000)  
- Rockfishes: 110,000  
- Lingcod: 3,000  
- Cabezon: 1,000  
- Kelp greenling: 1,000  
- California halibut: 2,000  
- Albacore: 1,000  
- Pacific sanddabs: 100,000

**2004 estimated catch (pounds of fish):**
- King salmon: (not available)  
- Rockfishes: 170,200  
- Lingcod: 29,100  
- Cabezon: 4,500  
- Kelp greenling: 1,500  
- California halibut: 26,900  
- Albacore: 24,600  
- Pacific sanddabs: 33,600

**Comments:** Seasonal restrictions are in effect to keep the catch of nearshore groundfish species within harvest guidelines. Depth restrictions are in place primarily to reduce the incidental take of canary rockfish. In part due to these restrictions, relatively more effort was directed towards sanddabs in 2004. Annual catch of albacore fluctuates widely due to the availability of fish within a reasonable distance from harbors and launch ramps. The 2004 albacore catch was much lower than that in 2003.

**Primary fishing depth range:** 0 – 20 fathoms (Monterey area) or 0-40 fathoms (Morro Bay area) for rockfishes, lingcod, cabezon, kelp greenling, California halibut, Pacific sanddabs, king salmon (rockfish, lingcod, and cabezon fishing could occur at greater depths if permitted)
Primary habitat type(s): Rockfishes, lingcod, cabezon, kelp greenling: kelp beds, rocky reef, hard bottom
California halibut, Pacific sanddabs: sand, other soft bottom
King salmon: nearshore surface waters
Albacore: offshore surface waters

Primary area of fishery: State waters__X___ (all but albacore)
Federal waters__X___ (albacore)

Synopsis of regulations applicable to central coast study region:
Rockfishes, cabezon, kelp greenling, and lingcod: In 2005, north of Lopez Point, the season for rockfishes, cabezon, and kelp greenling is closed January 1 through June 30; the season for lingcod is closed January 1 through June 30 and December 1-31.
South of Lopez Point, the season is closed January 1 through April 30 and October 1 through December 31.
Season may be closed early if harvest guidelines are reached.
North of Lopez Point, fishing is prohibited in depths greater than 20 fathoms.
South of Lopez Point, fishing is prohibited in depths greater than 40 fathoms.

The following rockfishes may not be taken: canary, cowcod, yelloweye.
The bag limit for rockfishes, cabezon, and kelp greenling is 10 fish in combination, all of which may be the same species, except no more than 1 cabezon, 1 kelp greenling, and 1 bocaccio may be taken within this overall bag limit.
The bag limit for lingcod is 2 fish.

Minimum legal size: rockfish: none, except bocaccio10 inches; cabezon 15 inches; kelp greenling 12 inches; lingcod 24 inches.

Not more than two hooks and one line may be used.

Salmon: Two salmon per day of any species except silver (coho). Steelhead trout may not be taken or possessed.
In 2005, season is closed January 1 through April 1 and September 26 through December 31.

The bag limit is 2 fish.

Minimum legal size: 20 inches
No sinkers or weights exceeding 4 pounds may be used, except that a fishing line may be attached to a sinker or weight of any size if such sinker or weight is suspended by a separate line and the fishing line is released automatically by a mechanical device from the sinker or weight when any fish is hooked. No more than 2 single-point, single-shank barbless hooks and no more than 1 rod per angler may be used when trolling. No more than 2 single-point, single-shank barbless circle hooks and no more than 1 rod per angler may be used when mooching.

**California halibut:** The bag limit in waters north of Point Sur is 3 fish. The bag limit in waters south of Point Sur is 5 fish.

Minimum legal size: 22 inches

**Pacific sanddabs:** There is no bag limit.

Up to 12 No. 2 or smaller hooks and up to 2 pounds of weight may be used.

**Albacore:** There is no bag limit.

**Relevant spatially-explicit data concerning location of fishery:**
The Department has compiled spatially-explicit data within the MLPA Initiative central coast study region from 2004, the first year of the California Recreational Fisheries Survey program. While these data are depth-limited in scope for bottom-oriented fishes due to regulations, they are the only data available with this degree of resolution for private and rental boat fishing. These data will be presented on microblock (one minute of latitude by one minute of longitude) maps with colors representing the total number of sampled trips to each microblock. A composite will be presented with all targeted trips combined, and separate map sets will be available for the following target groups: king salmon, rockfish/lingcod, California halibut, sanddabs, and albacore. It is important to note that these data include fishing trips in which no catch occurred. The microblocks compiled in this data set are those reported by the fishermen to the samplers.
Profile of Major Recreational Fisheries in the Central Coast Study Region: Bank and Beach Fishing

Fishing mode: beach and bank (shore-based)
Port area: Monterey and Morro Bay

Primary species harvested: barred surfperch (*Amphistichus argenteus*), jacksmelt (*Atherinopsis californiensis*), striped surfperch (*Embiotoca lateralis*), black surfperch (*E. jacksoni*), walleye surfperch (*Hyperprosopon argenteum*), grass rockfish (*Sebastes rastrelliger*)

Estimated number of angler trips in 2004 in study region: 39,000

2004 estimated catch of most frequently observed species (number of fish):
- Barred surfperch: 59,000
- Jacksmelt: 4,000
- Striped surfperch: 4,000
- Black surfperch: 2,000
- Walleye surfperch: 2,000
- Grass rockfish: 1,000

2004 estimated catch of most frequently observed species (pounds of fish):
- Barred surfperch: 44,800
- Jacksmelt: 2,200
- Striped surfperch: 4,500
- Black surfperch: 4,500
- Walleye surfperch: 900
- Grass rockfish: 2,200

Comments: There are no seasonal restrictions on fishing from shore, except as related to the take of lingcod (see below). The majority of the catch is reported under the target species classifications of “surfperches”, “anything” or “other”. Catches are often opportunistic and may also reflect seasonal availability of some species.

Primary fishing depth range: 0 – 2 fathoms

Primary habitat type(s): Intertidal and shallow subtidal areas of sandy beaches and rocky shoreline.

Primary area of fishery: State waters__X___Federal waters_____

Synopsis of regulations applicable to central coast study region:
Rockfishes, cabezon, kelp greenling, and lingcod: When rockfish or lingcod are in possession, only one line with not more than two hooks may be used.

Fishing for lingcod from shore is prohibited in January, February, March, and December.

The bag limit for rockfishes, cabezon, and kelp greenling is 10 fish in combination, all of which may be the same species, except no more than 1 cabezon, 1 kelp greenling, and 1 bocaccio may be taken within this overall bag limit.

The bag limit for lingcod is 2 fish.
Minimum legal size: rockfish: none, except bocaccio 10 inches; cabezon 15 inches; kelp greenling 12 inches; lingcod 24 inches.

Not more than two hooks and one line may be used.

**Surfperch:** The bag limit is 5 in any combination of species, except that the daily bag limit for shiner surfperch is 20.

**California halibut:** The bag limit in waters north of Point Sur is 3 fish. The bag limit in waters south of Point Sur is 5 fish.

Minimum legal size: 22 inches

**Pacific sanddabs:** There is no bag limit.

Up to 12 No. 2 or smaller hooks and up to 2 pounds of weight may be used.

**Jacksmelt:** There is no bag limit.

**Relevant spatially-explicit data concerning location of fishery:**
Beach and bank fishing locations will be depicted on maps as predetermined sampling areas in 2004 by the CRFS program, with the shoreline color-coded by relative angler effort (average number of anglers encountered per sampling day).
Profile of Major Recreational Fisheries in the Central Coast Study Region: Fishing from Manmade Structures

**Fishing mode:** manmade structures (piers and jetties)
**Port area:** Monterey and Morro Bay

**Primary species harvested:** jacksmelt (*Atherinopsis californiensis*), northern anchovy (*Engraulis mordax*), Pacific sardine (*Sardinops sagax*), shiner surfperch (*Cymatogaster aggregata*), barred surfperch (*Amphistichus argenteus*), walleye surfperch (*Hyperprosopon argenteum*), white croaker (*Genyonemus lineatus*), rockfishes (*Sebastes* sp.), Pacific sanddab (*Citharichthys sordidus*), blue rockfish (*Sebastes mystinus*), gopher rockfish (*S. carnatus*)

**Estimated number of angler trips in 2004 in study region:** 260,000

2004 estimated catch of most frequently observed species (number of fish):
- Anchovy: 111,000
- Jacksmelt: 95,000
- Shiner surfperch: 32,000
- Pacific sardine: 29,000
- Barred surfperch: 29,000
- White croaker: 23,000
- Walleye surfperch: 17,000
- Surfperch sp.: 15,000
- Pacific sanddab: 8,000
- Blue rockfish: 4,000
- Gopher rockfish: 4,000

2004 estimated catch of most frequently observed species (pounds of fish):
- Anchovy: 2,200
- Jacksmelt: 42,600
- Shiner surfperch: 2,200
- Pacific sardine: 2,200
- Barred surfperch: 15,700
- White croaker: 9,000
- Walleye surfperch: 4,500
- Surfperch sp.: 6,600
- Pacific sanddab: 1,800
- Blue rockfish: 900
- Gopher rockfish: 2,600

**Comments:** There are no seasonal restrictions on fishing from manmade structures, except as related to the take of lingcod and salmon (see below). The majority of the catch is reported under the target species classifications of “anything” or “other”. Catches are often opportunistic and may also reflect seasonal availability of some species. More than 50% of effort occurs during May through August.

**Primary fishing depth range:** 0 – 2 fathoms

**Primary habitat type(s):** sand, other soft bottom around piers and breakwaters, and the microhabitats of the structures themselves.
Primary area of fishery: State waters__X___Federal waters_____

Synopsis of regulations applicable to central coast study region:
A license is not required to fish from a public pier, public jetty, or a public breakwater in ocean or bay waters. On public piers no person shall use more than two rods and lines or two hand lines.

Rockfishes, cabezon, kelp greenling, and lingcod: Fishing for rockfishes, cabezon, and kelp greenling is permitted year-round from manmade structures. When rockfish or lingcod are in possession, only one line with not more than two hooks may be used.

Fishing for lingcod from shore is prohibited in January, February, March, and December.

The bag limit for rockfishes, cabezon, and kelp greenling is 10 fish in combination, all of which may be the same species, except no more than 1 cabezon, 1 kelp greenling, and 1 bocaccio may be taken within this overall bag limit.

The bag limit for lingcod is 2 fish.

Minimum legal size: rockfish: none, except bocaccio 10 inches; cabezon 15 inches; kelp greenling 12 inches; lingcod 24 inches.

Not more than two hooks and one line may be used.

Surfperch: The bag limit is 5 in any combination of species, except that the daily bag limit for shiner surfperch is 20.

Salmon: Two salmon per day of any species except silver (coho). Steelhead trout may not be taken or possessed. In 2005, season is closed January 1 through April 1 and September 26 through December 31.

The bag limit is 2 fish.

Minimum legal size: 20 inches

Salmon may not be taken by snagging.

California halibut: The bag limit in waters north of Point Sur is 3 fish. The bag limit in waters south of Point Sur is 5 fish.

Minimum legal size: 22 inches

Pacific sanddabs: There is no bag limit.

Up to 12 No. 2 or smaller hooks and up to 2 pounds of weight may be used.

Other species: There is no bag limit on the following species which are likely to be taken from manmade structures in central California: anchovy, jacksmelt, topsmelt, jack mackerel, Pacific mackerel, Pacific staghorn sculpin, and Pacific sardine.

The bag limit for white croaker is 10 fish.
Relevant spatially-explicit data concerning location of fishery:
Manmade structures used for fishing within the MLPA Initiative central coast study region will be indicated on the same maps which summarize beach and bank recreational fishing effort from 2004.
Profile of Major Recreational Fisheries in the Central Coast Study Region: Fishing via Scuba Diving/Free Diving

Fishing mode: scuba diving and free diving
Port area: Monterey and Morro Bay

Species targeted: rockfishes (Sebastes sp.), lingcod (Ophiodon elongatus), California halibut (Paralichthys californicus), cabezon (Scorpaenichthys marmoratus), kelp greenling (Hexagrammos decagrammus), rubberlip surfperch (Rhacochilus toxotes), striped surfperch (Embiotoca lateralis), black surfperch (E. jacksoni), California halibut (Paralichthys californicus)

Estimated number of diver trips in 2004 in study region: (not available at present)

2004 estimated catch of most frequently observed species (number of fish): (not available at present)

Comments:
Primary depth range: 0 – 15 fathoms
Primary habitat type(s): kelp beds and nearshore rocky reefs, nearshore sand bottom (for halibut)
Primary area of fishery: State waters___X___Federal waters_____

Synopsis of regulations applicable to central coast study region:
Rockfishes, cabezon, kelp greenling, and lingcod: Diving and spearfishing are permitted during seasonal closures to hook-and-line gear. Except for spearfishing gear, all other types of fishing gear are prohibited to be aboard the vessel or non-motorized watercraft while spearfishing for the purpose of retaining groundfish and associated species.

Fishing for lingcod is prohibited in January, February, March, and December.

The bag limit for rockfishes, cabezon, and kelp greenling is 10 fish in combination, all of which may be the same species, except no more than 1 cabezon, 1 kelp greenling, and 1 bocaccio may be taken within this overall bag limit.
The bag limit for lingcod is 2 fish.

Minimum legal size: rockfish: none, except bocaccio10 inches; cabezon 15 inches; kelp greenling 12 inches; lingcod 24 inches.

Surfperch: The bag limit is 5 in any combination of species, except that the daily bag limit for shiner surfperch is 20.

California halibut: The bag limit in waters north of Point Sur is 3 fish. The bag limit in waters south of Point Sur is 5 fish.

Minimum legal size: 22 inches
Relevant spatially-explicit data concerning location of fishery:
A small data base from the CRFS program interviews of private and rental boat fishermen (the interviews included divers using spears) will be available using the microblock maps within the MLPA Initiative central coast study region. Another set of maps will be provided showing locations of Central California Council of Divers competitive free-diving meets, which the Department has monitored since the late 1950's. These maps will depict access points for the meets and the approximate area in which fishing effort occurred from each access point. Additional sources of data concerning consumptive diving will be provided by diver representatives.
Appendix V: Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

Contents

Monterey County

1. Elkhorn Slough State Marine Reserve
3. Hopkins State Marine Reserve
4. Pacific Grove State Marine Conservation Area
5. Carmel Bay State Marine Conservation Area
7. Point Lobos State Marine Reserve
9. Julia Pfeiffer Burns State Marine Conservation Area
11. Big Creek State Marine Reserve

San Luis Obispo County

13. Atascadero Beach State Marine Conservation Area
14. Morro Beach State Marine Conservation Area
15. Pismo State Marine Conservation Area
16. Pismo-Oceano State Marine Conservation Area

Santa Barbara County

17. Vandenberg State Marine Reserve
Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

MONTEREY COUNTY

Site name: Elkhorn Slough State Marine Reserve

Year established: 1980

Approximate Area: 1.7 nm$^2$  
Approximate Shoreline length: 2.7 nm

Approximate Depth range (feet): 0 to 10

Habitat types: Estuary with soft bottom

Surrounding habitat types: Similar estuarine soft bottom habitat.

Summary of existing regulations: No take is allowed both through State regulations and designation as a Federal National Estuarine Research Reserve.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas. The Elkhorn Slough Ecological Reserve was established to protect sensitive salt marsh, mudflat, and open water habitats, and to provide a quality, undisturbed estuarine site for education, restoration, research and monitoring.

Existing enforcement: The area is easily-observed, well-known, almost surrounded by land, and has a Department of Fish and Game facility on site.

Baseline and ongoing monitoring and research studies: Monthly volunteer water quality monitoring since 1988 at 24 sites around the Slough, including the Reserve. Continuous water quality monitoring, using four sites (two on the Reserve), to measure temperature, salinity, turbidity, dissolved oxygen and pH. Hyperspectral images are being used to map the distribution of plant communities of interest (nuisance algae, eelgrass, pickleweed, native grasses, and noxious weeds). Tidal erosion rates at about 40 intertidal stations along the main channel and in the MPA are monitored annually. Abundance, feeding rates, and reproductive success of herons, egrets, and cormorants in rookeries are assessed by volunteers. Caspian Tern breeding success is being monitored. Distribution, abundance, and diversity of shorebirds and waterbirds at seven ponds and tidal lagoons in the MPA are monitored to detect long-term changes or short-term anomalies. Native and invasive crabs are monitored along the estuarine gradient, in areas of different land use. Tracking of shark and ray abundances occurs at one site in the MPA.

Current research includes: 1) Investigation of use of mudflats and other intertidal habitats by shorebirds, and the influence of tidal and seasonal dynamics. 2) Comparison of invertebrate communities associated with native oyster beds vs. invasive tubeworm beds. 3) Experiments and time series analysis to determine whether invasive upland plants are invading the ecotone and high marsh
Basic Evaluation: With on-site presence of Department staff, and with a history of baseline monitoring and research studies, the site functions well as one of the few fully-protected estuarine areas in the state.

Published references related to effectiveness of this MPA: 214, 217
Unpublished references related to effectiveness of this MPA: 21
Published references related to use of this MPA as a research tool: 20, 67, 188, 202
Site name: Hopkins State Marine Reserve

Year established: 1984
Approximate Area: 0.15 nm²
Approximate Shoreline length: 0.95 nm
Approximate Depth range (feet): 0 to 60

Habitat types: Mostly granite reef; smaller portions of sand, especially on outside edge

Surrounding Habitat types: Similar

Summary of existing regulations: No take is allowed.

Primary objectives: The primary purpose is to allow for research in an area that is free of disturbance due to exploitation.

Existing enforcement: The area is easily-observed from shore, well-known, marked on the seaward boundary by buoys, and staff from the Hopkins Marine Station is on site every day.

Baseline and ongoing monitoring and research studies: Numerous studies of algae, invertebrates, and fish have taken place. Long-term monitoring of the intertidal zone dates back to the 1930s. The Department carried out relatively intensive fish counts, and some re-monitoring of those counts has taken place. A recent study was completed comparing counts and sizes of benthic fishes in and adjacent to the MPA. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Basic Evaluation: The area contains one of the oldest fully-protected marine research sites in the state and contains a variety of shallow habitat types within a relatively small area. It is a classic example of how a small but fully protected MPA can function well by providing a multitude of research opportunities with populations of marine organisms occurring at natural densities and size frequencies. While it is relatively small, studies have documented significantly greater biomass and size frequencies of nearshore fishes compared with adjacent fished areas. This site is overlapped by a State Water Quality Protection Area designation.

Published references related to effectiveness of this MPA: 31, 112, 117, 137, 141, 171, 174, 22
Unpublished references related to effectiveness of this MPA: 136
Published references related to use of this MPA as a research tool: 16, 40, 53, 75, 113, 170, 177, 183, 191, 192, 203, 209
Unpublished references related to use of this MPA as a research tool: 4, 52, 76
The Hopkins Marine Station web site presently lists more than 150 student papers dating back to 1964, most of which involved at least some field work or collection or organisms with HMLR. The web site address is: http://www.marine.stanford.edu/HMSwebmarine-indexes.html
Site name: Pacific Grove State Marine Conservation Area

Year established: 1984
Approximate Area: 1.2 nm²  Approximate Shoreline length: 2.5 nm
Approximate Depth range (feet): 0 to 60

Habitat types: Mostly granite reef; smaller portions of sand, especially on outside edge. Rock reefs in deeper water have been surveyed by submersibles.

Surrounding habitat types: Similar, except higher proportion of sand bottom offshore.

Summary of existing regulations:
Only the following species may be taken recreationally: finfish, and invertebrates other than mollusks or crustaceans.

Only the following species may be taken commercially by ring net, lampara net, or bait net: sardines, mackerel, anchovies, squid, and herring.

Primary objectives: Established by legislative action, the primary objective is to provide protection from exploitation for certain fishes and invertebrates.

Existing enforcement: The area is easily-observed from shore by law enforcement personnel as well as private citizens, is well-known, and benefits from an increased community awareness of the need to protect marine resources. During daylight hours thousands of people pass by or visit the area on a daily basis.

Baseline and ongoing monitoring and research studies: Many researchers from Department and several academic institutions have conducted life-history studies, recruitment studies, and tagging studies in this region. Tenera Environmental completed a study in 2003 which investigated the effects of visitor use on the intertidal area and established baseline levels of the more common intertidal species. Submersible studies of deeper-water fishes have also been carried out offshore of this site.

Basic Evaluation: The area presently offers some resource protection since regulations prohibit commercial finfishing (except for pelagic species) and allow the harvest of only certain invertebrates. Among the invertebrate species permitted for take, the presence of the sea otter precludes most harvest by man for some of these (e.g. urchin). However, the area does function well as an MPA by providing recreational opportunities, allowing a low but sustainable level of kelp and recreational finfish harvest, and providing a safe and local site for scientific collecting for research and public education. This area contains extensive intertidal and subtidal reef habitat and provides easy access to intertidal areas from shore. It also provides a source of kelp for local aquaculture businesses. Part of this site is overlapped by a State Water Quality Protection Area designation.

Unpublished references related to effectiveness of this MPA: 99, 100, 101, 118, 142, 195
Published references related to use of this MPA as a research tool: 130
Unpublished references related to use of this MPA as a research tool: 196
Site name: Carmel Bay State Marine Conservation Area

Year established: 1976
Approximate Area: 1.9 nm²  Approximate Shoreline length: 5.8 nm
Approximate Depth range (feet): 0 to 465

Habitat types: Granite reef along rocky shores; extensive areas of sand offshore; some granite pinnacles; head of Carmel submarine canyon

Surrounding habitat types: Similar except for the submarine canyon, which has greater depths than in the MPA.

Summary of existing regulations: Take of all living marine resources is prohibited except the recreational take of finfish by hook-and-line or spear and the commercial take of kelp under specific conditions.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: The area is adjacent to population centers, and is therefore easily observed from shore. Pleasure boats, dive boats, and party boats frequent the area. Department provides enforcement presence on the water as well as from land.

Baseline and ongoing monitoring and research studies: The area near Pescadero Point, Stillwater Cove, and Arrowhead Point is the focus of a number of marine ecological studies, mostly through Moss Landing Marine Labs. San Francisco State University has conducted life-history and recruitment studies of fish in this area. A high school class carries out an ongoing monitoring program. There have also been submersible studies in the surrounding area. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Basic Evaluation: This area contains reef and sand habitat, a kelp bed, and includes the head of a submarine canyon. It provides opportunities for recreational angling and diving as well as limited commercial kelp harvest but is adjacent to the fully-protected area at Point Lobos. The existing degree of protection is probably consistent with its uses, and the site appears to function well as an MPA with limited harvest. The Department has documented its long term use as a fishing area for recreational anglers on Commercial Passenger Fishing Vessels and in skiffs as well as from extractive free divers (CenCal competitive free-diving competitions). This level of use appears to be sustainable in the absence of commercial fishing for finfish and invertebrates. The presence of the submarine canyon head provides a source of spot prawn recruitment to the commercial trap fishery in the adjacent area. This site is overlapped by a State Water Quality Protection Area designation.
Published references related to effectiveness of this MPA: 57, 175
Unpublished references related to effectiveness of this MPA: 43, 99, 100, 101, 104, 105, 115, 118, 175, 195
Published references related to use of this MPA as a research tool: 36, 66, 69, 70, 71, 74, 86, 90, 151, 181, 194, 204, 207
Unpublished references related to use of this MPA as a research tool: 4, 6, 23, 129, 180
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Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

Site name: Point Lobos State Marine Reserve

Year established: 1973
Approximate Area: 0.8 nm²  Approximate Shoreline length: 6.7 nm
Approximate Depth range (feet): 0 to 195

Habitat types: Mostly granite reef dropping form shore to sand bottom. Reef habitat with many crevices and pinnacles. Extensive kelp beds

Surrounding habitat types: Carmel submarine canyon is nearby. Extensive hard bottom offshore, as determined from submersible studies.

Summary of existing regulations: No take is allowed.

Primary objectives: This area was originally designated as an ecological reserve. Fish and Game Code Section 1580 (ecological reserves) states that "the policy of the state is to protect threatened or endangered native plants, wildlife, or aquatic organisms or specialized habitat types, both terrestrial and nonmarine aquatic, or large heterogeneous natural gene pools for the future use of mankind through the establishment of ecological reserves." Although the language does not specifically refer to ecological reserves in marine areas, the Fish and Game Commission has extended this policy to those areas.

Existing enforcement: State Park rangers within the adjacent terrestrial reserve monitor access from shore, and monitor approaches by boats. The presence of visitors every day of the year in the adjacent terrestrial reserve provides an additional deterrent to potential violators of regulations.

Baseline and ongoing monitoring and research studies: UC Santa Cruz students found slightly greater abundances of benthic fish in the MPA than in adjacent areas. Department has conducted habitat-based surveys of fish abundance within the MPA. Submersible surveys have been carried out offshore of the MPA. In addition, the Partnership for Interdisciplinary Studies of Coastal Oceans (PISCO) has had permanent intertidal and subtidal monitoring sites here for several years.

Basic Evaluation: This site contains a complex variety of habitats, primarily hard bottom, and contains high densities of large, adult bottom fishes such as rockfishes and lingcod. Although relatively small, the MPA functions well as a fully protected area because of its high species diversity and variety of habitat, and it is effectively enforced. Studies by the Department and others have documented high population densities and large sizes of economically important nearshore fish species, in particular rockfishes, lingcod, cabezon, and greenlings, with population densities and size frequencies significantly greater than in adjacent and more distant fished areas. In addition, the site is a prime destination for non-extractive scuba divers, and use is limited by local policy. This site is overlapped by a State Water Quality Protection Area designation.

Published references related to effectiveness of this MPA: 12, 72, 111, 137, 167, 198
Unpublished references related to effectiveness of MPAs: 25, 44, 46, 99, 100, 101, 102, 103, 131, 136, 152, 154, 190
Published references related to use of this MPA as a research tool: 58, 59, 78
Unpublished references related to use of this MPA as a research tool: 24
Site name: Julia Pfeiffer Burns State Marine Conservation Area

Year established: 1970
Approximate Area: 2.1 nm²       Approximate Shoreline length: 4.0 nm
Approximate Depth range (feet): 0 to 710 for MPA boundary, which extends 6000 feet offshore, but site-specific regulations apply to the harvest of invertebrates only within 1000 feet from shore, which is approximately 60 feet deep.

Habitat types: Hard and soft bottom. Five sub-categories of habitat: 1) Giant kelp beds; 2) pinnacles and underwater cliffs; 3) Diopatra (worm) tube beds; 4) unstable gravel and boulder fields; 5) surge channels; Some pinnacles have up to 75 ft of vertical relief in over 50 ft horizontally.

Surrounding habitat types: Similar habitats are found to south. To the north, Partington Canyon extends close to shore. Offshore is a mixture of hard and soft bottom, with some depths exceeding 300 fathoms (1,800 ft) within 3 miles of shore.

Summary of existing regulations:
Only the following species may be taken recreationally: finfish, chiones, clams, cockles, rock scallops, native oysters, crabs, lobsters, ghost shrimp, sea urchins, mussels and marine worms except that no worms may be taken in any mussel bed unless taken incidentally to the take of mussels.

Only the following species may be taken commercially: finfish, crabs, ghost shrimp, jackknife clams, sea urchins, squid, kelp and worms except that no worms may be taken in any mussel bed, nor may any person pick up, remove, detach from the substrate any other organisms, or break up, move or destroy any rocks or other substrate or surfaces to which organisms are attached.

Primary objectives: This site was established to protect unique habitat primarily due to prevalence of outstanding wall and pinnacle communities. It contains the most extensive series of pinnacles and underwater cliffs along the Big Sur Coast.

Existing enforcement: Enforcement is aided by the lack of access to intertidal and subtidal area from shore (although fishing from shore occurs at Partington Point) due to park requirements to stay on trails. Department of Park and recreation staff provide on site presence. Department of Fish and Game provides on-water presence. Commercial and recreational harvest restrictions pertain to invertebrates only, and for those which might be taken illegally, access is difficult at best.

Baseline and ongoing monitoring and research studies: Moss Landing Marine Laboratories-extensive diving surveys from 1987 to 1989 with some follow-up in mid 1990’s, related to impacts of the massive landslide and subsequent manipulations by Caltrans in 1983-84. Extensive qualitative surveys of plant, invertebrate, and fish communities in five sub-habitat types have been completed. Contacts: John Oliver, MLML, and Jim Barry, Department of Parks and Recreation. Side-scan sonar maps and data are available from the Department of Fish and Game. Surveys were completed by Rick Kvitek in 1994, 1995, 1997, and 1998.

Basic Evaluation: The area presently offers little in the way of resource protection since only certain invertebrates are protected from harvest. Among the allowable species, the presence of the sea otter
precludes most harvest by man for some of these (e.g. crab, urchin) or the species is not found here (lobster). However, the area does function well by providing recreational opportunities. The Department of Parks and Recreation has a long-term data base here, including information on habitat, fishes, invertebrates, and algae. At present, except for Big Creek State Marine Reserve, there are no other complete no-take areas between Pt. Lobos State Marine Reserve, and Vandenberg State Marine Reserve. The northern Boundary of Big Creek State Marine Reserve is about 5 miles from southern boundary of Julia Pfeiffer Burns State Marine Conservation Area. This site is overlapped by a State Water Quality Protection Area designation.

Unpublished references related to effectiveness of this MPA: 18, 100, 101, 104, 178
Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

Site name: Big Creek State Marine Reserve

Year established: 1994  
Approximate Area: 1.9 nm\(^2\)  
Approximate Shoreline length: 2.7 nm  
Approximate Depth range (feet): 0 to 300

Habitat types: Soft intertidal: est. 10%; Hard intertidal: est. 90%; Soft subtidal: est. 18%; Hard subtidal: est. 82%; Soft shelf: est. 88%; Hard shelf: 12%; Kelp beds; many wash rocks and pinnacles.

Surrounding habitat types: To the north and south a mixture of hard and soft bottom with scattered kelp beds. Several heads of submarine canyons adjacent on seaward side.

Summary of existing regulations: No take is allowed. No disturbance of the bottom; no boats, diving or other use (boat transit only); public entry restricted.

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast. The Big Creek State Marine Reserve (originally named the Big Creek Marine Resources Protection Act Ecological Reserve) was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was "to provide for scientific research related to the management and enhancement of marine resources".

Existing enforcement: Full-time reserve manager provides on-site presence. Local users of adjacent areas (skiff fishermen), who are allowed access through the MPA, assist in insuring compliance with regulations. Department provides on-water enforcement presence.

Baseline and ongoing monitoring and research studies: Benthic habitat mapping and characterization: baseline information for entire reserve (Yoklavich, VenTresca). Mapping ocean currents and related hydrographic studies: ongoing research (C. Collins, F. Schwing). Benthic fish surveys: baseline research; deep (Yoklavich), subtidal (VenTresca, Paddock). Benthic Invertebrates; some baseline; intertidal (Pearse); subtidal (Mira Parks). Local Fishery (social aspects; Pomeroy, Smiley). PISCO long-term subtidal monitoring site (Carr)

Basic Evaluation: This site contains a variety of habitats with hard and soft substrates, including kelp beds, and is one of the few existing MPAs which extend to 50 fm depth. This site functions well as a completely protected area while allowing research, particularly the documentation of population densities of nearshore and offshore fishes. Studies by the Department, National Marine Fisheries Service, and others have quantified density and size frequency of populations of rockfishes, lingcod, cabezon, and other economically important finfishes within and outside the MPA boundaries, and have found significant numbers of large, reproductively mature fishes within as well as adjacent to this site. Populations of fishes in adjacent areas are of higher density than within fished areas closer to ports, primarily due to the remoteness of the areas and their difficult access from shore. If fishing pressure increases in the future in adjacent areas, the MPA will continue to serve as a baseline for indices of natural populations. The MPA benefits from the presence of an on-site manager and has excellent enforcement.
Published references related to effectiveness of this MPA: 54, 137, 144, 145, 198, 201, 215, 216
Unpublished references related to effectiveness of this MPA: 58, 59, 60, 64, 102, 103, 106, 115, 136, 139, 143, 152, 153, 154, 155, 156, 157, 158, 182, 196, 197, 210, 216
Published references related to use of this MPA as a research tool: 145, 146
Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

SAN LUIS OBISPO COUNTY

Site name: Atascadero Beach State Marine Conservation Area

Year established: 1985
Approximate Area: 3.9 nm²  Approximate Shoreline length: 1.5 nm
Approximate Depth range (feet): 0 to 115

Habitat types: 100% soft bottom

Surrounding Habitat types: similar

Summary of existing regulations: Take of clams is prohibited. Take of other living marine resources is allowed.

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: Department provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Between 1990 and 1994, sea otters established themselves within the area containing the three Pismo clam state marine conservation areas (SMCA) in San Luis Obispo County. Foraging on the larger clams by otters reduced the availability of legal-sized clams (minimum 4.5 inches greatest shell diameter) to recreational harvesters. Department clam transects and interviews of recreational clam harvesters, conducted annually in the Pismo Beach to Morro Bay area, documented this event. For example, in 1990, 32 of 224 clammers interviewed on Pismo Beach harvested 204 legal-sized clams (6.4 per person). In 1994 and subsequent years, department transects yielded virtually no clams over 3 inches in diameter.

For these reasons, the three state marine conservation areas designed to protect and augment the population of legal-sized Pismo clams no longer meet their original objective.

Published references related to effectiveness of this MPA: 140
Unpublished references related to effectiveness of this MPA: 138
Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

Site name: Morro Beach State Marine Conservation Area

Year established: 1985
Approximate Area: 4.9 nm²  
Approximate Shoreline length: 1.9 nm
Approximate Depth range (feet): 0 to 115

Habitat types: 100% soft bottom

Surrounding habitat types: similar

Summary of existing regulations: Take of clams is prohibited. Take of other living marine resources is allowed.

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: Department provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Between 1990 and 1994, sea otters established themselves within the area containing the three Pismo clam state marine conservation areas (SMCA) in San Luis Obispo County. Foraging on the larger clams by otters reduced the availability of legal-sized clams (minimum 4.5 inches greatest shell diameter) to recreational harvesters. Department clam transects and interviews of recreational clam harvesters, conducted annually in the Pismo Beach to Morro Bay area, documented this event. For example, in 1990, 32 of 224 clammers interviewed on Pismo Beach harvested 204 legal-sized clams (6.4 per person). In 1994 and subsequent years, department transects yielded virtually no clams over 3 inches in diameter.

For these reasons, the three state marine conservation areas designed to protect and augment the population of legal-sized Pismo clams no longer meet their original objective.

Published references related to effectiveness of this MPA: 140
Unpublished references related to effectiveness of this MPA: 138
Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

Site name: Pismo State Marine Conservation Area

Year established: 1977
Approximate Area: 0.05 nm²
Approximate Shoreline length: 0.3 nm
Approximate Depth range (feet): 0 to 16

Habitat types: 100% soft bottom

Surrounding habitat types: similar

Summary of existing regulations: Take of all invertebrates and marine aquatic plants is prohibited except the commercial take of algae other than giant kelp and bull kelp. Take of finfish is allowed.

Primary objectives: To establish baseline for sea otter impact to clam population

Existing enforcement: Department provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled by The Department in winter to monitor recruitment of young.

Basic Evaluation: Between 1990 and 1994, sea otters established themselves within the area containing the three Pismo clam state marine conservation areas (SMCA) and the one invertebrate SMCA in San Luis Obispo County. Foraging on the larger clams by otters reduced the availability of legal-sized clams (minimum 4.5 inches greatest shell diameter) to recreational harvesters. Department clam transects and interviews of recreational clam harvesters, conducted annually in the Pismo Beach to Morro Bay area, documented this event. For example, in 1990, 32 of 224 clammers interviewed on Pismo Beach harvested 204 legal-sized clams (6.4 per person). In 1994 and subsequent years, department transects yielded virtually no clams over 3 inches in diameter.

While the primary purpose of this invertebrate conservation area was to protect and enhance populations of Pismo clams, the general objective was to provide protection from human harvest to all invertebrates. While this SMCA no longer meets its objective related to Pismo clams, it does provide a long-term index of intertidal and shallow subtidal soft-bottom invertebrate populations in the absence of fishing. For this reason it would be useful to retain this small MPA to continue this long-term index.

Published references related to effectiveness of this MPA: 140
Unpublished references related to effectiveness of this MPA: 138
Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

Site name: Pismo-Oceano State Marine Conservation Area

Year established: 1985  
Approximate Area: 11.9 nm²  
Approximate Shoreline length: 4.6 nm  
Approximate Depth range (feet): 0 to 115  

Habitat types: 100% soft bottom  
Surrounding habitat types: similar

Summary of existing regulations: Take of clams is prohibited. Commercial take of giant kelp and bull kelp is prohibited. Take of other living marine resources is allowed.

Primary objectives: Protect Pismo clams from over harvest

Existing enforcement: Department provides enforcement from shore. The primary purpose of enforcement would be to prevent harvest of sub-legal size clams.

Baseline and ongoing monitoring and research studies: Transects sampled in winter by The Department to monitor recruitment of young.

Basic Evaluation: Between 1990 and 1994, sea otters established themselves within the area containing the three Pismo clam state marine conservation areas (SMCA) in San Luis Obispo County. Foraging on the larger clams by otters reduced the availability of legal-sized clams (minimum 4.5 inches greatest shell diameter) to recreational harvesters. Department clam transects and interviews of recreational clam harvesters, conducted annually in the Pismo Beach to Morro Bay area, documented this event. For example, in 1990, 32 of 224 clammers interviewed on Pismo Beach harvested 204 legal-sized clams (6.4 per person). In 1994 and subsequent years, department transects yielded virtually no clams over 3 inches in diameter.

For these reasons, the three state marine conservation areas designed to protect and augment the population of legal-sized Pismo clams no longer meet their original objective.

Published references related to effectiveness of this MPA: 140  
Unpublished references related to effectiveness of this MPA: 138
Descriptions and Preliminary Evaluations of Existing California Marine Protected Areas in the Central Coast (Department of Fish and Game, 2005)

SANTA BARBARA COUNTY

Site name: Vandenberg State Marine Reserve

Year established: 1994
Approximate Area: 2.0 nm²  Approximate Shoreline length: 4.5 nm
Approximate Depth range (feet): 0 to 60

Habitat types: The area contains a mixture of hard and soft bottom. This is a high energy area that is likely heavily scoured.

Surrounding habitat types: Fairly similar to the north, south, and offshore, although a higher percentage of soft bottom to the north.

Summary of existing regulations: No take is allowed. No disturbance of bottom; no boats, diving or other use (boat transit only); public entry restricted. In offshore area outside boundaries a recent ban on gill nets was enacted legislatively.

Primary objectives: To satisfy requirements of the Marine Resources Protection Act of 1990 the Fish and Game Commission was required to establish four ecological reserves along the mainland coast. The Vandenberg State Marine Reserve (originally named the Vandenberg Marine Resources Protection Act Ecological Reserve) was one of the reserves established pursuant to the Act. The Act specified that the specific purpose of these reserves was “to provide for scientific research related to the management and enhancement of marine resources”.

Existing enforcement: Access from land is restricted via Vandenberg Air Force Base security restrictions. This is a very remote location that is publicly inaccessible from land and sea.

Baseline and ongoing monitoring and research studies:

Basic Evaluation: This site contains primarily shallow soft-bottom substrate but includes some low-relief subtidal reef. Based on Department surveys in the late 1990s, the site and the immediately adjacent area appear to function well in protecting high population densities of black abalone. The adjacent area, while not within an MPA, benefits from military-imposed restricted access. No other sites along the southern California mainland contain high densities of black abalone. An existing military closure near the area (Safety Zone 4) is enforced as a no-stopping area by the Air Force.

Unpublished references related to effectiveness of this MPA: 55
Published references related to use of this MPA as a research tool: 56, 205