

**California Marine Life Protection Act Initiative
Central Coast Project**

Candidate MPA Package C

OVERVIEW OF CANDIDATE MPA PACKAGES

Package Name: CCRSG PACKAGE C

Type of MPA	# Proposed	Area (sq. mi)	% of Study Region
State Marine Reserve	6	181.85	15.81%
State Marine Park	0	0.0	0.0%
State Marine Conservation Area	2	7.34	0.64%
All MPAs combined	8	189.19	16.45%

Individual MPAs in Package:

Año Nuevo State Marine Reserve (45.17 sq. mi.)
Piedras Blancas State Marine Reserve (27.80 sq. mi.)
Montaña de Oro State Marine Reserve (32.05 sq. mi.)
Point Sal State Marine Reserve (21.24 sq. mi.)
Purisima Point State Marine Reserve(16.60 sq. mi.)
Purisima Point State Marine Conservation Area (5.79 sq. mi.)
Arguello Promontory State Marine Reserve (39.00 sq. mi.)
Boathouse State Marine Conservation Area (1.54 sq. mi.)

External Package C: North Central Coast Study Region

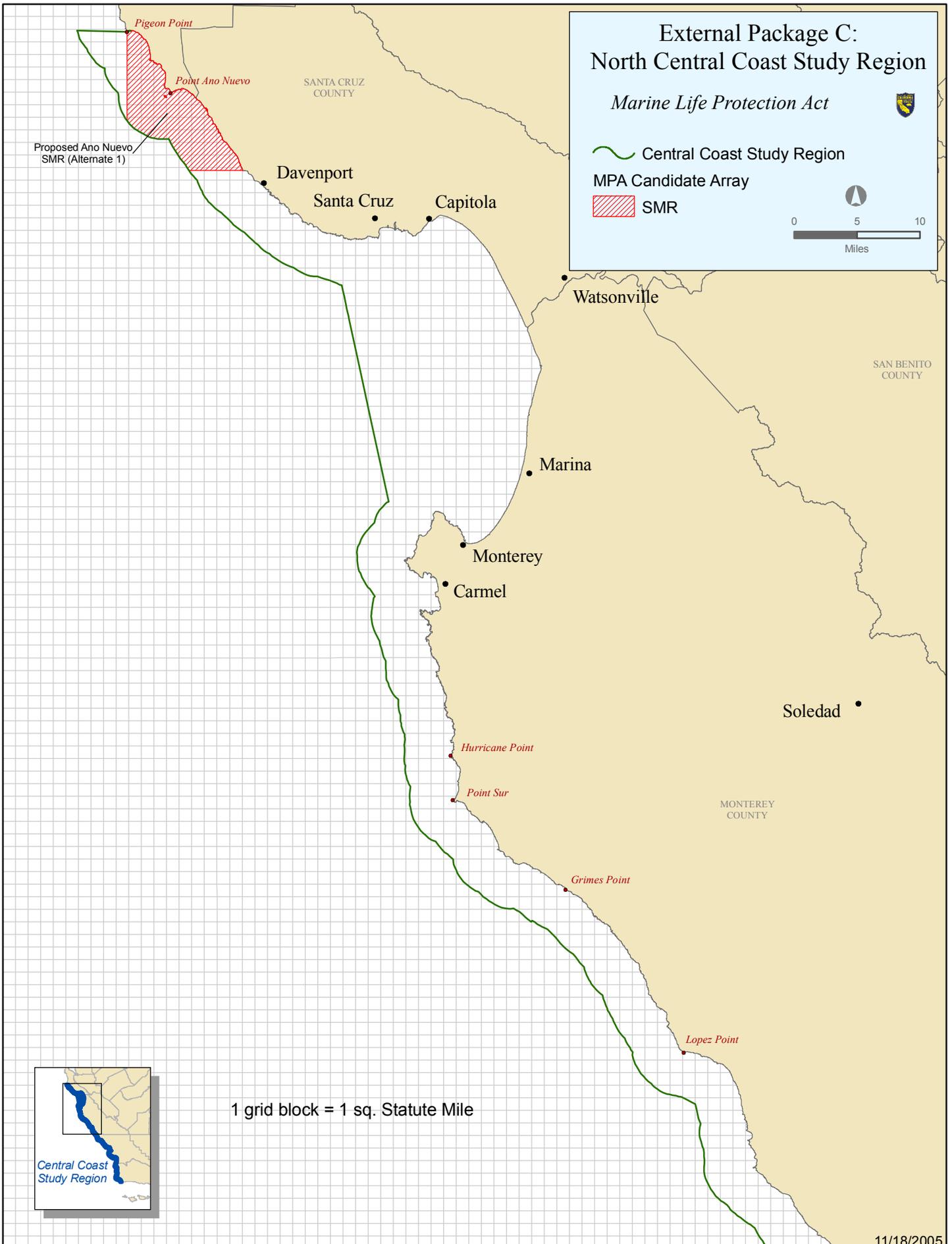
Marine Life Protection Act



Central Coast Study Region

MPA Candidate Array

SMR



1 grid block = 1 sq. Statute Mile

External Package C: South Central Coast Study Region

Marine Life Protection Act

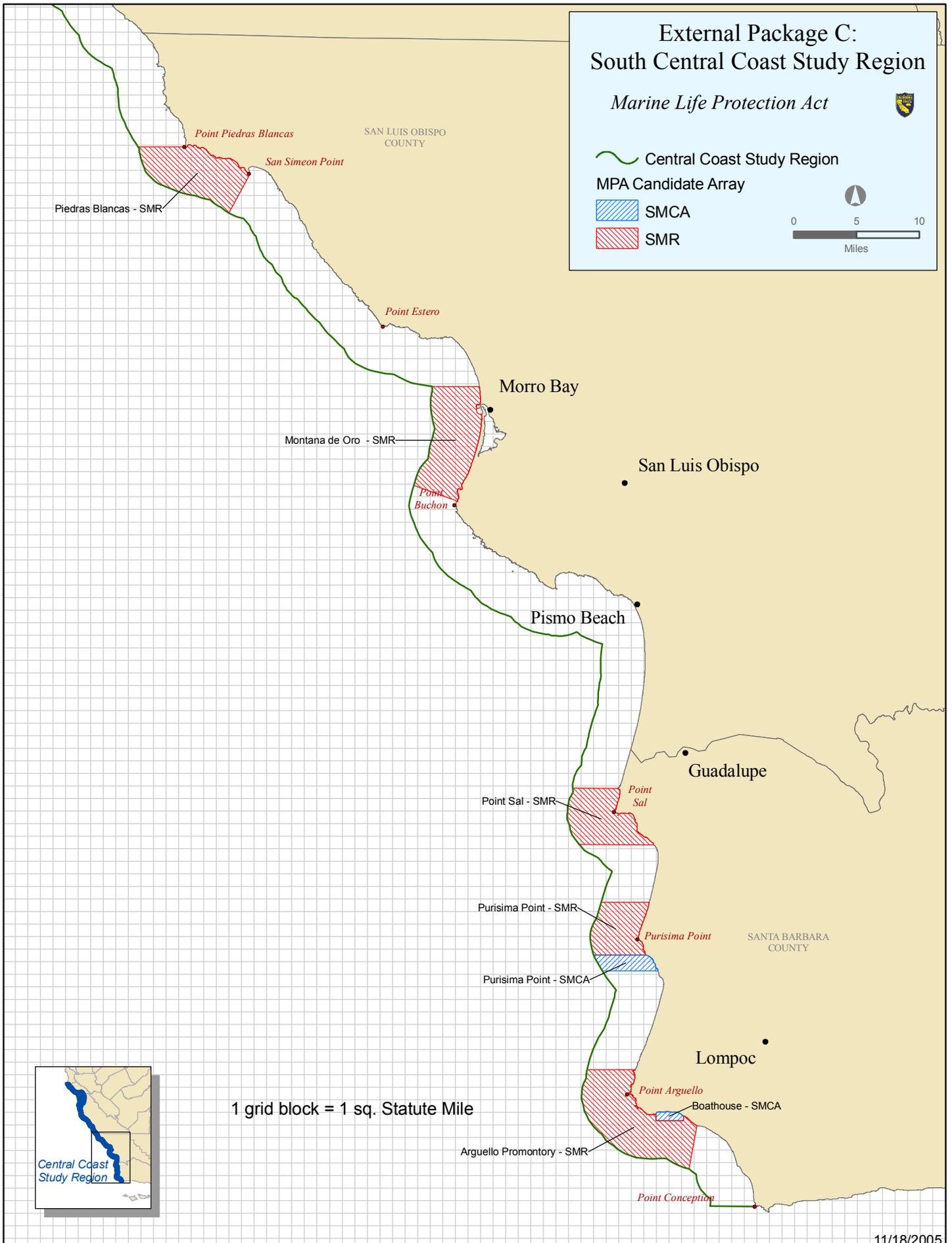


Central Coast Study Region

MPA Candidate Array

SMCA

SMR



1 grid block = 1 sq. Statute Mile

Summary of Marine Protected Areas (MPAs) in Candidate MPA External Package C

Number and Type of MPAs in Package: 6 State Marine Reserves (SMRs), 0 State Marine Parks (SMPs), 2 State Marine Conservation Areas (SMCAs), TOTAL: 8 MPAs
Total Area of MPAs in Package (sq. mi.): 189.2

MPA Name (concept file name)	Area (sq. mi.)	Alongshore span (mi)	Modification to Existing Central Coast MPA or new MPA?	Allowed/ Disallowed Uses	Regional Goals, Objectives, and Design Criteria toward which this MPA contributes
Año Nuevo State Marine Reserve (AñoNuevo_SMR)	45.17	14.3	Modification of existing MPA	No Take	Not Provided
Piedras Blancas State Marine Reserve (PiedrasBlancas_SMR)	27.80	5.7	New MPA	No Take	Not Provided
Montaña de Oro State Marine Reserve (MontañadeOro_SMR)	32.05	9.3	Modification of existing MPA	No Take	Not Provided
Point Sal State Marine Reserve (PointSal_SMR)	21.24	6.0	New MPA	No Take	Not Provided
Purisima Point State Marine Reserve (PurisimaPoint_SMR)	16.60	4.5	New MPA	No Take	Not Provided

MPA Name (concept file name)	Area (sq. mi.)	Alongshore span (mi)	Modification to Existing Central Coast MPA or new MPA?	Allowed/ Disallowed Uses	Regional Goals, Objectives, and Design Criteria toward which this MPA contributes
Purisima Point State Marine Conservation Area (PurisimaPoint_SMCA)	5.79	1.6	New MPA	Open to recreational fishing but closed to all other activities	Not Provided
Arguello Promontory State Marine Reserve (ArguelloPromontory_SMR)	39.00	8.5	Modification of existing MPA	No Take	Not Provided
Boathouse State Marine Conservation Area (Boathouse_SMCA)	1.54	2.2	New MPA	Prohibits all activities except: recreational fishing and diving, training for search and rescue groups, and activities relating to delivery of parts to VAFB.	Not Provided
Abbreviations: MPA: Marine Protected Area SMR: State Marine Reserve SMP: State Marine Park SMCA: State Marine Conservation Area					

DRAFT ANALYSIS OF CANDIDATE MPA PACKAGE C

	<i>How measured?</i>	<i>Total amount in Region</i>	<i>Total percent of Region</i>	<i>Amount in State Marine Reserves</i>	<i>Percent of Total in SMRs</i>	<i>Amount in State Marine Parks</i>	<i>Percent of Total in SMPs</i>	<i>Amount in State Marine Conservation Area</i>	<i>Percent of Total in SMCAs</i>	<i>Amount in all proposed MPAs in region</i>	<i>Percent of Total in existing MPAs</i>	<i>Spatial Data Source</i>
Area	Area (mi²)	1150.01	100%	181.88	15.82%	0.00	0.00%	7.10	0.62%	188.98	16.43%	GIS analysis
Number of MPAs	Count		NA	6		0		2		8		GIS analysis
HABITATS												
Intertidal												
Sandy or gravel beaches	Linear (mi)	223.66	52.3%	28.25	12.63%	0.00	0.00%	2.17	0.97%	30.42	13.60%	NOAA-ESI 2002
Rocky intertidal and cliff	Linear (mi)	209.21	48.9%	22.08	10.55%	0.00	0.00%	1.22	0.58%	23.30	11.14%	NOAA-ESI 2002
Coastal marsh	Linear (mi)	36.53	8.5%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	NOAA-ESI 2002
Tidal flats	Linear (mi)	23.48	5.5%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	NOAA-ESI 2002
Seagrass beds (0-30m): Surfgrass	Linear (mi)	161.09	37.7%	13.52	8.40%	0.00	0.00%	0.00	0.00%	13.52	8.40%	Minerals Management Service / Tenera Inc.
Seagrass beds (0-30m): Eelgrass	Area (mi²)	1.07	0.1%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Elkhorn Slough Foundation; Morro Bay National Estuary Program
Estuary	Area (mi²)	7.90	0.7%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Inventory; CNDDDB; USGS
Fine-scale Soft bottom												Fine-scale based on Kvitek et al multibeam and sidescan sonar; available for only about 25% of the region
0-30 meters	Area (mi²)	24.21	5.7%	6.71	27.70%	0.00	0.00%	0.48	1.98%	7.18	29.68%	Total amount is only that which has been mapped to date.
30-100 meters	Area (mi²)	93.72	21.9%	20.42	21.79%	0.00	0.00%	0.27	0.28%	20.69	22.07%	Total amount is only that which has been mapped to date.
100-200 meters	Area (mi²)	1.93	0.5%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Total amount is only that which has been mapped to date.
>200 meters	Area (mi²)	0.29	0.1%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Total amount is only that which has been mapped to date.
Coarse-scale Soft bottom												Greene et al 2004; coarse scale data overestimates soft substrata
0-30 meters	Area (mi²)	294.14	25.8%	51.27	17.43%	0.00	0.00%	1.61	0.55%	52.88	17.98%	Greene et al 2004

	<i>How measured?</i>	<i>Total amount in Region</i>	<i>Total percent of Region</i>	<i>Amount in State Marine Reserves</i>	<i>Percent of Total in SMRs</i>	<i>Amount in State Marine Parks</i>	<i>Percent of Total in SMPs</i>	<i>Amount in State Marine Conservation Area</i>	<i>Percent of Total in SMCAs</i>	<i>Amount in all proposed MPAs in region</i>	<i>Percent of Total in existing MPAs</i>	<i>Spatial Data Source</i>
30-100 meters	Area (mi ²)	575.78	50.6%	110.54	19.20%	0.00	0.00%	3.71	0.64%	114.25	19.84%	Greene et al 2004
100-200 meters	Area (mi ²)	58.46	5.1%	3.22	5.51%	0.00	0.00%	0.00	0.00%	3.22	5.51%	Greene et al 2004
>200 meters	Area (mi ²)	105.52	9.3%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Greene et al 2004
Fine-scale Rocky reef; hard bottom												Fine-scale based on Kvitek et al multibeam and sidescan sonar; available for only about 25% of the region
0-30 meters	Area (mi ²)	20.16	4.7%	5.84	28.95%	0.00	0.00%	0.84	4.18%	6.68	33.14%	Total amount is only that which has been mapped to date.
30-100 meters	Area (mi ²)	20.59	4.8%	2.14	10.38%	0.00	0.00%	0.12	0.58%	2.26	10.97%	Total amount is only that which has been mapped to date.
100-200m	Area (mi ²)	0.40	0.1%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Total amount is only that which has been mapped to date.
>200 meters	Area (mi ²)	0.01	< .01%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Total amount is only that which has been mapped to date.
Coarse-scale Rocky reef; hard bottom												Greene et al 2004; coarse scale data underestimates hard substrata
0-30 meters	Area (mi ²)	46.66	4.1%	13.96	29.92%	0.00	0.00%	1.65	3.54%	15.61	33.46%	Greene et al 2004
30-100 meters	Area (mi ²)	26.78	2.4%	2.01	7.51%	0.00	0.00%	0.12	0.45%	2.13	7.96%	Greene et al 2004
100-200 meters	Area (mi ²)	13.91	1.2%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Greene et al 2004
>200 meters	Area (mi ²)	16.16	1.4%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Greene et al 2004
Kelp forest												
1989 Kelp	Area (mi ²)	17.94	1.6%	1.27	7.06%	0.00	0.00%	0.00	0.00%	1.27	7.06%	1989 CDFG aerial survey
1999 Kelp	Area (mi ²)	2.56	0.2%	0.07	2.78%	0.00	0.00%	0.00	0.00%	0.07	2.78%	1999 CDFG aerial survey
2002 Kelp	Area (mi ²)	12.55	1.1%	1.02	8.12%	0.00	0.00%	0.00	0.00%	1.02	8.12%	2002 CDFG aerial survey
2003 Kelp	Area (mi ²)	9.53	0.8%	0.80	8.39%	0.00	0.00%	0.00	0.00%	0.80	8.39%	2003 CDFG aerial survey
Persistent Kelp	Area (mi ²); present in 3 of 4 years	3.18	0.3%	0.24	7.61%	0.00	0.00%	0.00	0.00%	0.24	7.61%	Present in 3 of 4 CDFG aerial survey datasets
Pinnacles *												
0-30 meters	Count	76.00		*		*		*		*		Bathymetry data
30-100 meters	Count	218.00		*		*		*		*		Bathymetry data
100-200 meters	Count	27.00		*		*		*		*		Bathymetry data

	<i>How measured?</i>	<i>Total amount in Region</i>	<i>Total percent of Region</i>	<i>Amount in State Marine Reserves</i>	<i>Percent of Total in SMRs</i>	<i>Amount in State Marine Parks</i>	<i>Percent of Total in SMPs</i>	<i>Amount in State Marine Conservation Area</i>	<i>Percent of Total in SMCAs</i>	<i>Amount in all proposed MPAs in region</i>	<i>Percent of Total in existing MPAs</i>	<i>Spatial Data Source</i>
>200 meters	Count	4.00		*		*		*		*		Bathymetry data
Submarine canyon												
0-30 meters	Area (mi ²)	0.56	0.1%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Coarse-scale substrata (Greene et al 2004)
30-100 meters	Area (mi ²)	4.42	0.4%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Coarse-scale substrata (Greene et al 2004)
100-200 meters	Area (mi ²)	6.06	0.5%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Coarse-scale substrata (Greene et al 2004)
>200 meters	Area (mi ²)	42.77	3.8%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	Coarse-scale substrata (Greene et al 2004)

Pinpoint data extent is limited, asterisk indicates either zero count or no data available

**Marine Life Protection Act Initiative
Central Coast Project**

**Proponent Rationale
Candidate MPA Package C
November 21, 2005**

A Proposal for a Network of Six State Marine Reserves and Two State Marine Conservation Areas in the Central California MLPA Study Region

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Summary

The objective of this proposal is to establish a network of Marine Protected Areas (MPAs) throughout the central California MLPA study region. Fish and invertebrate species that will benefit from this MPA network are on state and federal lists of “overfished”, threatened, and endangered species (Table 1). Additionally, the MPA network will contain areas that are ‘hot spots’ for foraging seabirds and marine mammals and will therefore be protecting areas of high trophic transfer.

Creating a network of MPAs will address requirements of the Marine Life Protection Act (MLPA) by protecting the natural diversity and abundance of marine life and helping to sustain, conserve and protect populations of exploited species of the central California coast. Additionally, creating a network of multiple large MPAs across a large stretch of coast (as opposed to creating only one MPA along the same stretch of coast) will help protect the structure, function, and integrity of a coastal marine ecosystem. Furthermore, this network of MPAs will help fulfill the requirements of the Marine Mammal Protection Act by protecting critical foraging and haul-out habitat of harbor seals, elephant seals, Steller sea lions and California sea lions. Finally, it will help fulfill the requirements of the Endangered Species Act by protecting roost/haul-out and foraging habitat of the California Brown Pelican and Steller sea lion, breeding and foraging habitat of the California Least Tern and Western Snowy Plover, foraging habitat of the Southern sea otter and Marbled Murrelet, and coastal habitat of the Chinook salmon.

Setting

We propose establishing a network of MPAs consisting of six State Marine Reserves (SMRs) and two State Marine Conservation Areas (SMCAs) in the central California MLPA study region. Specifically, the proposed MPAs will be in the vicinities of Año Nuevo Island, Point Piedras Blancas, Montaña do Oro State Park, Point Sal, Purisima Point, and Point Arguello (Fig. 1). These MPAs will vary in size (ranging in area from 4 – 117 km²), degree of protection (SMR versus SMCA), and degree of spacing, with the five MPAs at the southern end of the study region being close together, the central two MPAs being an intermediate distances from each other and Point Sal, and the northernmost MPA being the most isolated. Thus, in addition to protecting important natural resources of the central California coast, this network will allow scientists to answer important questions about the efficacy of different MPA designs.

Representative Habitats and Oceanographic Features

The SMRs we are proposing are large compared to existing MPAs in the central California study region in order to account for the foraging ranges of top marine predators likely to benefit (see Table 2). The large areas will also allow the SMRs to protect a variety of important habitat types, including offshore islands and islets, rocky cliffs, estuarine areas, sandy and rocky intertidal habitats, rocky reefs and other hard bottom ocean substrates, and soft bottom ocean substrates. Under-protected target habitats that will benefit from the creation of these MPAs include waters surrounding marine mammal and seabird rookeries, persistent upwelling plumes and associated areas of high productivity, coastal promontories, kelp beds, and eelgrass beds.

Año Nuevo Island and the surrounding islets and cliffs provide breeding and haul-out habitat for over 18,000 marine mammals and 9,000 seabirds, including the threatened Steller Sea Lion and species of special concern such as Rhinoceros Auklet, Cassin's Auklet and Ashy Storm-Petrel. The coastal rocks and offshore islets adjacent to Point Piedras Blancas, Montaña de Oro, and Point Sal provide roosting and haul-out habitat for several thousand seabirds and marine mammals. The areas adjacent to Purisima Point and Point Arguello support approximately 1,800 breeding seabirds and provide roost and haul-out habitat for several thousand seabirds and marine mammals. Furthermore, Purisima Point provides breeding habitat for the endangered California Least Tern. All of the proposed areas provide vital roosting habitat for the endangered California Brown Pelican and critical kelp bed habitat for the endangered Southern sea otter. By establishing MPAs around these areas, the state will be creating a network of refuges aimed at protecting important seabird and marine mammal populations and the food-webs that support them.

The proposed Año Nuevo site is located inshore of two significant submarine canyons, Ascension and Canyons, extending in from the shelf break. The region in between Point Año Nuevo and these canyons is extremely productive due to coastal and bathymetric upwelling. A persistent upwelling plume supports and concentrates a diverse array of species from plankton to top predators. At-sea surveys show numerous birds and mammals utilizing this area, as many pelagic species use predictable oceanic features to forage. Bathymetric and shallow-water topography associations of upper trophic-level predators can help delineate sites of elevated trophic transfer.

The waters between Point Arguello and Point Conception experience intense seasonal upwelling and are a convergence area where currents flowing equatorward in the SMB collide with currents flowing poleward out of the Southern California Bight. Because of this, the SMB has received recent attention within the physical oceanography community (see Dever 2004, Ohashi and Wang 2004, and Dong and Oey 2005). However, there is still much to be learned about the biological consequences of these oceanographic conditions. The unique oceanographic and biological characteristics of this area warrant SMR designation.

Recent research has shown waters on the leeward sides of coastal promontories provide refuge for fish and invertebrate larvae against offshore transport during upwelling events (Wing et al. 1998). Thus, these habitats are unique because they have

the potential to enhance recruitment to fish and invertebrate populations. Our proposed SMRs are each associated with a coastal promontory. The promontories vary in size and likely the amount of refuge they provide for larval recruitment. Therefore, our proposed network of MPAs will allow scientists to answer important questions about the role of coastal promontories in the recruitment of important fish and invertebrate species.

Regional resource problems

Overfished groundfish such as rockfish and lingcod - Declines have been identified in a number of species of rockfishes in California, and while there is some debate over the current status of certain species of rockfishes there are others for which the evidence of serious decline is overwhelming. These declines threaten the health of individual stocks, as well as have an impact on the health of the marine ecosystem as a whole, both as prey for other species and as predators themselves. Both juvenile and adult rockfish comprise a large portion of marine bird and mammal diet in central California, and decreases in some populations and productivity of predators has been shown in the absence of rockfish. Rockfish declines also have significant negative impacts on commercial and sport fisheries.

Night-lighting by boats and other marine-based disturbance to marine bird and mammal rookeries - The potential for disturbance to rookeries, roosts and foraging areas has increased with increased fishing activity and boat traffic. This is especially true for Año Nuevo Island and the surrounding area that are important for breeding Steller sea lions and Southern sea otters (both threatened) and roosting and foraging Brown Pelicans (endangered). Salmon fishing is disturbing during some periods, when large groups of boats accumulate in the area. Direct disturbance issues generated by fishing vessels include being too close to breeding areas during day or night or interference with foraging animals at sea. Bright night-lighting from squid vessels can attract and disorient seabirds or expose nocturnal seabirds to predators, causing colony abandonment, injury, or death. Night lighting by other boats that use Año Nuevo Bay for overnight mooring may also disturb rookeries and cause seabird mortality. Nocturnal Rhinoceros and Cassin's Auklets and Ashy Storm-Petrels may be affected. Effects of squid fishing on marine bird and mammal rookeries in this area were not addressed by the Market Squid Fishery Management Plan.

Direct competition of fisheries with predatory marine fish, bird and mammal populations, including "fishing down the food chain" - In addition to night-lighting discussed above, the squid fishery has ecosystem impacts in terms of availability of squid as an important forage resource to upper trophic level wildlife. Additional issues involve commercial take of other forage species. Present day fisheries target several of the most important prey items for sea lions and seabirds and millions of metric tons of prey have been removed by fisheries in recent decades. Proposals have been put forth for commercially targeting krill. Take of such low trophic-level organisms may negatively affect populations of commercially valuable predatory species such as groundfish and salmon, as well as marine mammal and bird populations.

"Bycatch" of marine birds and mammals - On-board fishery observers found that four

Steller sea lions were killed by incidental take in fisheries between California and Washington from 1997-2001. Both Steller and California sea lions have been observed on Año Nuevo Island with fishing line or net tangled around their necks. On Southeast Farallon Island between 1976-1998, 27 Steller sea lions were observed entangled in synthetic material and 37% of those were adults entangled in salmon fishing gear. Rhinoceros Auklets, Brandt's Cormorants, and other seabirds have also been found tangled in fishing line on Año Nuevo Island, often resulting in mortality.

Oil and other contaminants - An estimated 1,566 Rhinoceros Auklets were killed or debilitated in the 1986 *Apex Houston* oil spill in central California (Page et al. 1990). More recent spills have also affected Rhinoceros and Cassin's Auklets, including chronic oiling from the sunken *SS Jacob Lukenbach* off the San Mateo County coast. Oiled birds continued to be recovered on Año Nuevo Island in 2005. Other contaminants may bioaccumulate up food chains, increasing mortality and/or reducing breeding success. Organochlorine and trace metal contaminant levels are elevated in central California Steller sea lions (Jarman et al 1996).

Acoustic disturbance (e.g., noise from boats and ships, aircraft, and military and industrial activities) - There is concern about the potential negative impacts of human-induced noise on pinnipeds and cetaceans, such as altering behavior and movement patterns.

Current Human Uses and Management of Human Activity

The total commercial fisheries catch within state waters for the areas we are proposing (both fish and invertebrate based on the California Department of Fish And Game's Commercial Fisheries Information System (CFIS) data for 1999-2004) is less than six percent of that for the entire central California MLPA study area (Table 3). Thus, the socio-economic impacts of establishing these MPAs will be minimal.

The proposed MPAs at Año Nuevo, Piedras Blancas, and Montaña do Oro are all adjacent to state parks. Thus, an existing management infrastructure exists in these areas and will need to be expanded to provide management of the new MPAs. The southernmost proposed MPAs are located along the coastal boundary of Vandenberg Air Force Base (VAFB). Public access to VAFB is restricted and VAFB has a resident game warden. Thus, enforcement of these MPAs will require little additional effort by the state.

The Proposal

Process Used to Develop the Proposal

This proposal was developed using a combination of unpublished data on the area as well as personal communication with scientists, unpublished reports and published scientific literature from the central California coast and marine protected areas in general. Dan Robinette, Julie Thayer, and Julie Lanser (PRBO Conservation Science, Vandenberg Field Station) compiled the information found within this document.

Unpublished Data

Commercial Fisheries Information System (CFIS) data for 1999-2004. Requested from California Department of Fish and Game, Marine Region GIS Lab.

PRBO Conservation Science unpublished data on seabird and marine mammal populations utilizing the coastal habitat of Año Nuevo Island and adjacent to Vandenberg Air Force Base.

Personal Communication

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Published and Unpublished Research

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Gap Analysis

A large portion of the hard bottom habitat in the central California MLPA study region is along the coast north of Monterey Bay. The majority of this habitat is unprotected. The only MPA in this area is the Año Nuevo Invertebrate Area Special Closure. This MPA prohibits the take of.... There are also two state parks in this area: Año Nuevo State Reserve and Big Basin State Park.

Though the area between Point Piedras Blancas and Montaña de Oro is predominately soft bottom, the rocky shores and associated shallow sub-tidal areas support vast kelp bed habitat. There are two existing MPAs in this area: the Atascadero Beach SMCA and the Morro Beach SMCA (Fig. 3). Both MPAs are within the proposed Montaña de Oro SMR and currently prohibit only the take of clams. There are also two

state parks adjacent to the proposed Montaña de Oro SMR (Morro Bay State Park and Montaña de Oro State Park) and one state park near the Piedras Blancas SMR (San Simeon State Park). Our proposed MPAs in this area will provide protection to a section of the central California study region that contains important unprotected rocky intertidal and kelp bed habitats as well as important soft bottom habitat for Pismo clams and other clam species.

The Santa Maria Basin (SMB) extends from Point Buchon in the north to Point Conception in the south. The bottom habitat of this region is primarily soft bottom with varying degrees of hard bottom adjacent to Point Sal, Purisima Point, and Point Arguello. There are two existing MPAs within the SMB: Pismo-Oceano Beach SMCA and Vandenberg SMR (Fig. 4). The Pismo-Oceano Beach SMCA consists solely of soft bottom habitat and prohibits the take of clams. No other organisms or habitats are protected by this MPA. The Vandenberg SMR contains a mixture of hard and soft bottom habitats (though predominately soft bottom) and is a 'No Take' reserve, prohibiting the take of all marine species. The majority of the hard bottom habitat in the SMB occurs adjacent to VAFB and is not protected by MPAs. Additionally, the kelp bed habitat in waters leeward of Point Sal, Purisima Point, and the Point Arguello Promontory are not protected by MPAs.

Our proposed MPAs will 1) protect important hard bottom habitat in the central California MLPA study region, 2) protect the unique habitats on the leeward sides of Point Año Nuevo, Point Piedras Blancas, Point Estero, Point Sal, Purisima Point, and the Point Arguello Promontory, and 3) provide replicates for scientific study.

Regional Goals and Objectives

The overall goals and objectives of establishing a network of MPAs in the central California study region are as follows:

- 1) To preserve the native marine species and habitats of the central California coast in their natural settings.
- 2) To protect the limited hard bottom and kelp bed habitat found within the central California study region.
- 3) To protect critical seabird breeding, roosting, and foraging habitat.
- 4) To protect critical marine mammal breeding, haul-out, and foraging habitat.
- 5) To protect the threatened and endangered marine species utilizing the central California study region, including the Chinook salmon, the Southern sea otter, the California Brown Pelican, the California Least Tern, the Marbled Murrelet, the Stellar sea lion, and the Western Snowy Plover .
- 6) To develop a network of differently sized and designated (i.e., SMR versus SMCA) MPAs to allow for scientific analysis of the efficacy of MPA establishment.
- 7) To develop protected areas to serve as baselines of comparison in the unfortunate event of an oil spill or other catastrophic event.

General Description of Preferred Proposal

Proposed management measures

- No fishing or invertebrate extraction.
- No night-lighting from boats within one mile of seabird colonies at Año Nuevo Island, Purisima Point, and the Point Arguello Promontory.
- Improve enforcement of regulations prohibiting the intentional take (e.g., shooting) of marine mammals.
- Reduce injury and mortality from entanglement in marine debris, particularly fishing gear. Efforts should include education outreach to fishing industry, abandoned gear recovery, and entanglement/stranding response teams.
- Work to improve water quality by reducing entry of possible infectious agents, chemical pollutants (e.g., organochlorines, butyltins, heavy metal) and marine debris into reserve waters through resource management and education outreach programs.

Proposed monitoring and research programs

A number of research programs are already in place, including long-term seabird and pinniped breeding studies (PRBO, UCSC, UCB), at-sea surveys of forage species, marine mammals and birds (CalCOFI, Cal Poly SLO, NMFS, PRBO, UCSC), nearshore coastal monitoring of vertebrates, invertebrates and marine plants (PISCO), watershed and estuarine studies of salmonids (NMFS). These well-studied sites also have counterparts outside MPA boundaries, to promote monitoring of MPA effectiveness. These include seabird and pinniped rookeries with, north, and south of the central California study region (PRBO, USFWS, NOAA/NMFS), studies of marine mammal and bird foraging concentrations at other upwelling plumes (PRBO) and within and adjacent to the existing Vandenberg SMR (PRBO), fish monitoring transects to within the central California study region (NMFS), PISCO intertidal and subtidal monitoring sites between Baja California and Alaska, watershed and estuarine studies of salmonids to the north Año Nuevo Island (NMFS), and fishery data from recreational and commercial landings (CDFG).

New monitoring and research efforts should expand on existing programs, thereby allowing these programs to be used as baselines for comparison. Additionally, new efforts should concentrate on the newly established MPAs. Research and monitoring of the population dynamics, breeding biology, foraging, and diet of top marine predators (i.e., large predatory fishes, seabirds, and marine mammals) can provide a cost-effective compliment to existing research and monitoring programs (see Anderson and Gress 1984, Abraham and Sydeman 2004, Miller and Sydeman 2004).

Proposed education programs

Visitor centers and some docent programs already exist at Año Nuevo State Reserve, Big Basin State Park, Long Marine Lab Seymour Center, San Simeon State Park, Morro Bay State Park, and Montaña de Oro State Park. A new, more comprehensive visitor center is planned at Año Nuevo State Reserve. These facilities could cooperatively provide education and outreach along with other federal, state and local agencies/organizations for the proposed MPA. For the southernmost MPAs, there is

potential for cooperation with the local Audubon chapters as well as Cabrillo High School (Lompoc Unified School District) which has a well-developed, student-managed marine aquarium and outreach program (<http://www.cabrilloaquarium.org/>).

Enforcement

Existing infrastructure of several of the local state parks is already in place which could be utilized in cooperation with other federal, state and local agencies/organizations to provide enforcement support. Additionally, public access to access to the southernmost MPAs will be restricted because their coastal margins will be on VAFB. Enforcement within these MPAs can be done cooperatively with VAFB and other federal and state agencies.

Socio-economic impacts

Of the MPAs we are proposing, only one (Montaña de Oro SMR) is adjacent to a major port (Morro Bay). Collectively, the waters surrounding our proposed MPAs contributed less than six percent of the total commercial fisheries catch for the central California MLPA study region from 1999-2004. Thus, establishing this network of MPAs should have minimal socio-economic impacts.

Individual MPAs

Año Nuevo State Marine Reserve (Fig. 2)

The Año Nuevo SMR is the largest MPA we are proposing and will protect a productivity and biodiversity hotspot in central California. The area between Pigeon Point and El Jarro Point contains multiple habitat types, including an important upwelling plume that provides nutrients for Monterey Bay, results in large amounts of primary and secondary production, and supports important fishes, marine mammals and seabirds further up the food web. Año Nuevo Island (ANI) and the surrounding islets and cliffs provide breeding and haul-out habitat for over 18,000 marine mammals and 9,000 seabirds, including the threatened Steller Sea Lion, endangered Brown Pelican, and species of special concern such as Rhinoceros Auklet, Cassin's Auklet and Ashy Storm-Petrel. California Current endemics Brandt's Cormorant and Western Gull also have large breeding colonies there. Coastal kelp forests, eelgrass beds, rocky reefs, and both hard and soft substrates in this area provide habitat for the threatened Southern sea otter and overfished groundfish species (*Sebastes* spp., lingcod), as well as foraging opportunities for other marine mammals, birds such as the endangered Marbled Murrelet, and listed White Sharks. An existing Invertebrate Area Special Closure at Año Nuevo would also be included in this MPA. The Gazos, Waddell and Scott Creek watersheds and estuaries support populations of the endangered Snowy Plover and Coho Salmon, and threatened Steelhead, species that are dependent on both healthy terrestrial and marine habitats. The total commercial fish and invertebrate catch within state waters (3 nm) in this area (CFIS data 1999-2004) represented 3.05% of that for the MLPA central California study region.

Boundaries: Northwest boundary extends directly south from Pigeon Point to the state 3nm boundary. Southern boundary extends directly west from El Jarro Point to the state 3nm boundary.

Area: 117 km²

Shoreline Length: 33 km

Expand Upon Existing MPA?: YES

Overall Goal of MPA: To protect critical seabird and marine mammal breeding habitat, to protect critical seabird and marine mammal roost/haul-out habitat, and to protect the prey of seabirds and marine mammals foraging in this area.

Species that will benefit from SMR establishment: See Tables 4 and 5.

Piedras Blancas State Marine Reserve (Fig. 3)

The Piedras Blancas SMR will protect a unique portion of the central California study region containing dense kelp beds and numerous offshore rocks. This area is a hotspot for eco-tourists attracted by its diverse wildlife. The coastal rocks provide vital roost/haul-out habitat for hundreds of endangered Brown Pelicans in addition to hundreds of Brandt's and Pelagic Cormorants, Western Gulls, California sea lions, and harbor seals. The kelp beds provide critical habitat for loafing and foraging Southern sea otters. The sandy beaches that perforate the rocky coastline provide critical haul-out habitat for Northern elephant seals. The rocky intertidal habitat provides important breeding and foraging habitat for numerous Black Oystercatchers, a species that is being considered for federal listing. The Point Piedras Blancas SMR will protect vital habitat for commercially important fish and invertebrate species as well as the top predators that prey on them. The total commercial fish and invertebrate catch within state waters (3 nm) in this area (CFIS data 1999-2004) represented 0.10% of that for the MLPA central California study region.

Boundaries: Point Piedras Blancas (north) to San Simeon Point (south) and offshore to 3 nm

Area: 72 km²

Shoreline Length: 12 km

Expand Upon Existing MPA?: NO

Overall Goal of MPA: To protect critical seabird and marine mammal roost/haul-out habitat, and to protect the prey of seabirds and marine mammals foraging in this area.

Species that will benefit from SMR establishment: See Tables 4 and 5.

Montaña de Oro State Marine Reserve (Fig. 3)

The Montaña de Oro SMR will connect the Atascadero Beach and Morro Beach SMCAs and elevate their status to 'fully protected'. The resulting SMR will protect vital habitat for commercially important fish and invertebrate species as well as the top predators that prey on them. The soft bottom habitat in this area supports an important Pismo clam population and provides important foraging habitat for the endangered Southern sea otter. The sandy beaches provide important foraging habitat for hundreds of shorebirds, including the threatened Western Snowy Plover. The coastal rocks provide vital roost/haul-out habitat for hundreds of endangered Brown Pelicans in addition to

hundreds of Brandt's and Pelagic Cormorants, Western Gulls, California sea lions, and harbor seals. The rocky intertidal habitat provides important breeding and foraging habitat for numerous Black Oystercatchers, a species that is being considered for federal listing. The total commercial fish and invertebrate catch within state waters (3 nm) in this area (CFIS data 1999-2004) represented 0.16% of that for the MLPA central California study region.

Boundaries: Northern boundary of the Atascadero Beach SMCA (north) to the southern coastal boundary of Montaña de Oro State Park (south) and offshore to 3 nm

Area: 83 km²

Shoreline Length: 18 km

Expand Upon Existing MPA?: YES

Overall Goal of MPA: To protect critical seabird and marine mammal roost/haul-out habitat, and to protect the prey of seabirds and marine mammals foraging in this area.

Species that will benefit from SMR establishment: See Tables 4 and 5.

Point Sal State Marine Reserve (Fig. 4)

The Point Sal SMR will protect vital habitat for commercially important fish and invertebrate species as well as the top predators that prey on them. The existing Point Sal State Beach and the adjacent large offshore rock (Lion Rock) provide vital roost/haul-out habitat for hundreds of endangered Brown Pelicans in addition to hundreds of Brandt's and Pelagic Cormorants, Western Gulls, and California sea lions. The sandy beaches along the southern section of coast provide roosting habitat for hundreds of Heerman's Gulls and foraging habitat for hundreds of shorebirds. The rocky intertidal habitat provides important breeding and foraging habitat for numerous Black Oystercatchers, a species that is being considered for federal listing. The kelp beds found in waters leeward of the point provide critical habitat for foraging Southern sea otters. Large foraging flocks consisting of the pelicans, cormorants, and gulls mentioned above as well as Sooty Shearwaters, Pacific Loons, Western Grebes, California Sea Lions, and bottlenose and common dolphins occur in this area as well. The total commercial fish and invertebrate catch within state waters (3 nm) in this area (CFIS data 1999-2004) represented 0.18% of that for the MLPA central California study region.

Boundaries: Mussel Rock (north) to Lion's Head (south) and offshore to 3 nm

Area: 55 km²

Shoreline Length: 13 km

Expand Upon Existing MPA?: NO

Overall Goal of MPA: To protect critical seabird and marine mammal roost/haul-out habitat and to protect the prey of seabirds and marine mammals foraging in this area.

Species that will benefit from SMR establishment: See Tables 4 and 5.

Purisima Point State Marine Reserve and State Marine Conservation Area (Fig. 4)

The Purisima Point SMR and SMCA will protect vital habitat for commercially important fish and invertebrate species as well as the top predators that prey on them. The area from Seal Beach to Lompoc Landing is a popular recreational fish spot that we

propose to keep open to recreational fishing but closed to all other activities (i.e., designate as a SMCA). The area from Seal Beach to San Antonio Creek should be closed to all activities (i.e., designate as a SMR).

The dune habitat adjacent to Purisima Point provides critical nesting habitat for approximately 160 endangered California Least Terns. These birds have been observed foraging in waters from San Antonio Creek in the north to Lompoc Landing in the south. Important prey for these terns include northern anchovies, juvenile cabezon, and juvenile rockfish. The coastal cliffs south of Purisima Point provide nesting habitat for approximately 120 Pigeon Guillemots and the rocky shores provide important breeding and foraging habitat for numerous Black Oystercatchers. The point itself provides vital roost/haul-out habitat for hundreds of endangered Brown Pelicans in addition to hundreds of Brandt's, Double-crested, and Pelagic Cormorants, California Gulls, Heerman's Gulls, Western Gulls, and harbor seals. The point also provides important foraging habitat for thousands of shorebirds including Black Oystercatchers, Black-bellied Plovers, Surfbirds, Sanderlings, Whimbrels, Wandering Tattlers, Black and Ruddy Turnstones and Spotted Sandpipers. The kelp beds found in waters leeward of the point provide critical foraging habitat for Southern sea otters. Large foraging flocks consisting of the pelicans, cormorants, and gulls mentioned above as well as Sooty Shearwaters, Pacific Loons, Western Grebes, California Sea Lions, and bottlenose and common dolphins occur in waters on both sides of the point. The total commercial fish and invertebrate catch within state waters (3 nm) in this area (CFIS data 1999-2004) represented 1.51% of that for the MLPA central California study region.

Boundaries

SMR: San Antonio Creek mouth (north) to Seal Beach (south) and offshore to 3 nm.

SMCA: Seal Beach (north) to Lompoc Landing (south) and offshore to 3 nm.

Area

SMR: 43 km²

SMCA: 15 km²

Shoreline Length

SMR: 8 km

SMCA: 3 km

Expand Upon Existing MPA?: NO

Overall Goal of MPA: To protect critical seabird breeding habitat, to protect critical seabird and marine mammal roost/haul-out habitat, and to protect the prey of seabirds and marine mammals foraging in this area.

Species that will benefit from SMR and SMCA establishment: See Tables 4 and 5.

Arguello Promontory State Marine Reserve and Boathouse State Marine Conservation Area (Fig. 4)

The Arguello Promontory consists of four major points: Point Pedernales, Point Arguello, and North and South Rocky Points. Currently, the Vandenberg State Marine Reserve extends from Point Pedernales to just east of South Rocky Point and offshore to a depth of 60 ft. The Arguello Promontory SMR is the second largest of the MPAs we are

proposing. Within the SMR, the wharf area associated with the VAFB Boathouse is a popular recreational fishing and diving spot as well as a training area for search and rescue groups. The wharf also provides a docking area where rocket parts can be delivered to VAFB. Therefore, we would like to designate the waters adjacent to the Boathouse as a SMCA open to the activities listed above.

The Arguello Promontory SMR and Boathouse SMCA will protect vital habitat for commercially important fish and invertebrate species as well as the top predators that prey on them. The cliffs and rocky shores of this area provide critical nesting habitat for approximately 1,100 Pigeon Guillemots, 120 Pelagic Cormorants, 130 Brandt's Cormorants, 18 Black Oystercatchers, and 80 Western Gulls. The cliffs and numerous offshore rocks provide vital roost/haul-out habitat for hundreds of endangered Brown Pelicans in addition to hundreds of Brandt's, Double-crested, and Pelagic Cormorants, Heerman's Gulls, Western Gulls, California sea lions, and harbor seals. The kelp beds found in waters leeward of the promontory provide critical foraging habitat for Southern sea otters. Large foraging flocks consisting of the pelicans, cormorants, and gulls mentioned above as well as Sooty Shearwaters, Pacific Loons, Western Grebes, California Sea Lions, and bottlenose and common dolphins occur in waters on both sides of the point. The softbottom habitat surrounding the promontory attracts hundreds of foraging Surf Scoters and numerous foraging California gray whales. The total commercial fish and invertebrate catch within state waters (3 nm) in this area (CFIS data 1999-2004) represented 0.92% of that for the MLPA central California study region.

Boundaries

SMR: Point Pedernales (north) to Sudden Canyon (south) and offshore to 3 nm.

SMCA: a 4 km² area extending 1.0 km south and 3.5 km east of the Boathouse jetty.

Area

SMR: 101 km²

SMCA: 4 km²

Shoreline Length

SMR: 15 km

SMCA: 4 km

Expand Upon Existing MPA?: YES

Overall Goal of MPA: To protect critical seabird breeding habitat, to protect critical seabird and marine mammal roost/haul-out habitat, and to protect the prey of seabirds and marine mammals foraging in this area.

Species that will benefit from SMR and SMCA establishment: See Tables 4 and 5.

Table 1: Marine species on the Federal and California lists of species that are endangered, threatened or of special concern.

Species	Listing
Brown Pelican	Federally Endangered
Marbled Murrelet	Federally Endangered, CA Threatened
Western Snowy Plover	Federally Endangered
Rhinoceros Auklet	CA Species of Special Concern
Cassin's Auklet	CA Species of Special Concern
Ashy Storm-petrel	CA Species of Special Concern
Steller sea lion	Federally Threatened
Southern sea otter	Federally Threatened
Coho salmon	Federally Endangered
steelhead	Federally Threatened
Chinook salmon	CA Species of Special Concern

Table 2: Approximate foraging or home ranges of some top predators

Species	Range
Marbled Murrelet (breeding)	1-13km
Cassin's Auklet (breeding)	1-30km
Rhinoceros Auklet (breeding)	1-90km
Brandt's Cormorant (breeding)	1-20km
Pigeon Guillemot (breeding)	1-10km
Stellar Sea Lion (lactating female)	1-35km
California Sea Lion (lactating female)	1-50km
Lingcod	2-20km
California Halibut	1-10km
Olive Rockfish	1-1,500m
Gopher or Black-and-Yellow Rockfish	1-15m

Table 3: Total commercial fisheries catch and percent of total catch for the central California MLPA study region for areas around each MPA as determined using CFIS data from 1999-2004. Note: market squid dominated the catches of all areas but Montaña de Oro and Point Sal.

Area	CFIS Blocks Used	Total Pounds Caught	Percent of Total Central California Catch	Percent of Catch Made Up of Squid
Año Nuevo	501 and 502	8,688,818.45	3.05%	95%
Piedras Blancas	560 and 561	276,219.76	0.10%	60%
Montaña de Oro	607 and 615	467,924.40	0.16%	39%
Point Sal	631 and 632	516,110.31	0.18%	40%
Purísima Point	637 and 638	4,288,197.25	1.51%	80%
Point Arguello	643 and 644	2,620,331.25	0.92%	76%
Total Central CA	501-502, 507-510, 516-518, 526-527, 532, 538-539, 547-548, 553-554, 560-561, 601-602, 607-608, 614-615, 622-624, 631-632, 637-638, 643-644, 657-658	284,857,646.50		

Table 4: List of seabird and marine mammal species that will benefit most from the development of each MPA in the proposed network. AN= Año Nuevo, PB=Piedras Blancas, MO= Montaña de Oro, PS=Point Sal, PP=Purisima Point, PA=Point Arguello.

Species	AN	PB	MO	PS	PP	PA
Brown Pelican	X	X				
Marbled Murrelet	X					
Western Snowy Plover	X	X	X			
Rhinoceros Auklet	X				X	X
Cassin's Auklet	X					
Ashy Storm-petrel	X					
Brandt's Cormorant	X	X	X	X	X	X
Pelagic Cormorant	X	X	X	X	X	X
Western Gull	X	X	X	X	X	X
Heerman's Gull	X	X	X	X	X	X
California Gull	X	X	X	X	X	X
Pigeon Guillemot	X				X	X
Pacific Loon	X	X	X	X	X	X
Western Grebe	X	X	X	X	X	X
Clark's Grebe	X	X	X	X	X	X
Sooty Shearwater	X	X	X	X	X	X
Brant	X	X	X	X	X	X
Surf Scoter	X	X	X	X	X	X
Red Phalarope	X	X	X	X	X	X
Black Oystercatcher	X	X	X	X	X	X
Ruddy Turnstone	X	X	X	X	X	X
Black Turnstone	X	X	X	X	X	X
Wandering Tattler	X	X	X	X	X	X
Surfbird	X	X	X	X	X	X
Sanderling	X	X	X	X	X	X
Whimbrel	X	X	X	X	X	X
Steller sea lion	X					
California sea lion	X	X	X	X	X	X
Harbor seal	X	X	X		X	X
Northern elephant seal	X	X				X
Southern sea otter	X	X	X	X	X	X
California gray whale	X	X	X	X	X	X
Pacific common dolphin	X	X	X	X	X	X

Table 5: List of fish and invertebrate species commercially fished within each MPA of the proposed network from 1999-2004. List includes targeted species and bycatch. See Table 3 for CFIS blocks used and Table 4 for MPA definitions.

Species	AN	PB	MO	PS	PP	PA
<i>Cartilagenous Fishes</i>						
Shovelnose guitarfish			X	X	X	X
Leopard shark	X		X		X	X
Pacific angel shark			X	X	X	X
Shortfin mako		X			X	X
Soupin shark	X		X	X	X	X
Spiny dogfish			X		X	X
Thresher shark	X		X	X	X	X
Skate sp.	X	X	X	X	X	X
<i>Bony Fishes</i>						
Norther anchovy	X					X
California barracuda		X	X	X	X	X
Giant sea bass		X	X		X	
Pacific bonito	X	X				
Pacific pompano	X			X		
Cabazon	X	X	X	X	X	X
White croaker	X		X			X
Monkeyface eel	X	X	X		X	
Escolar			X			
Flounder sp.	X	X	X	X	X	X
Kelp greenling	X	X	X	X	X	X
California halibut	X	X	X	X	X	X
Jacksmelt	X					
Lingcod	X	X	X	X	X	X
Louver				X		X
Pacific mackerel			X			
Opah						X
Opaleye			X			
Queenfish	X					
Rockfish sp.	X	X	X	X	X	X
Sablefish	X	X	X	X	X	X
Chinook salmon	X	X	X	X	X	X
Sanddab sp.	X		X	X		X
Pacific sardine	X				X	X
California scorpionfish				X		
Staghorn sculpin	X					
White seabass	X	X	X	X	X	X
Shad sp.			X			

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California sheephead		X	X	X	X	X
Smelt sp. (Family Osmeridae)			X			
Sole sp.	X		X	X	X	X
Surfperch sp.		X	X	X	X	X
Swordfish		X		X		X
Thornyhead sp.	X		X	X	X	X
Albacore tuna	X	X	X		X	
Bluefin tuna			X	X		
Yellowfin tuna			X			X
Ocean whitefish			X			
<i>Invertebrates</i>						
Dungeness crab	X		X	X	X	X
King crab						X
Rock crab sp.	X	X	X	X	X	X
Spider crab	X		X	X	X	X
California spiny lobster		X	X	X	X	X
Octopus sp.					X	X
Ridgeback prawn		X	X	X	X	X
Spot prawn	X	X	X	X	X	X
Sea cucumber sp.	X			X		X
California sea hare			X			
Bay shrimp	X					
Mantis shrimp				X		X
Pacific Ocean shrimp				X		
Moon snail				X		
Market squid	X	X	X	X	X	X
Red urchin		X	X		X	
Kellet's whelk			X	X	X	X

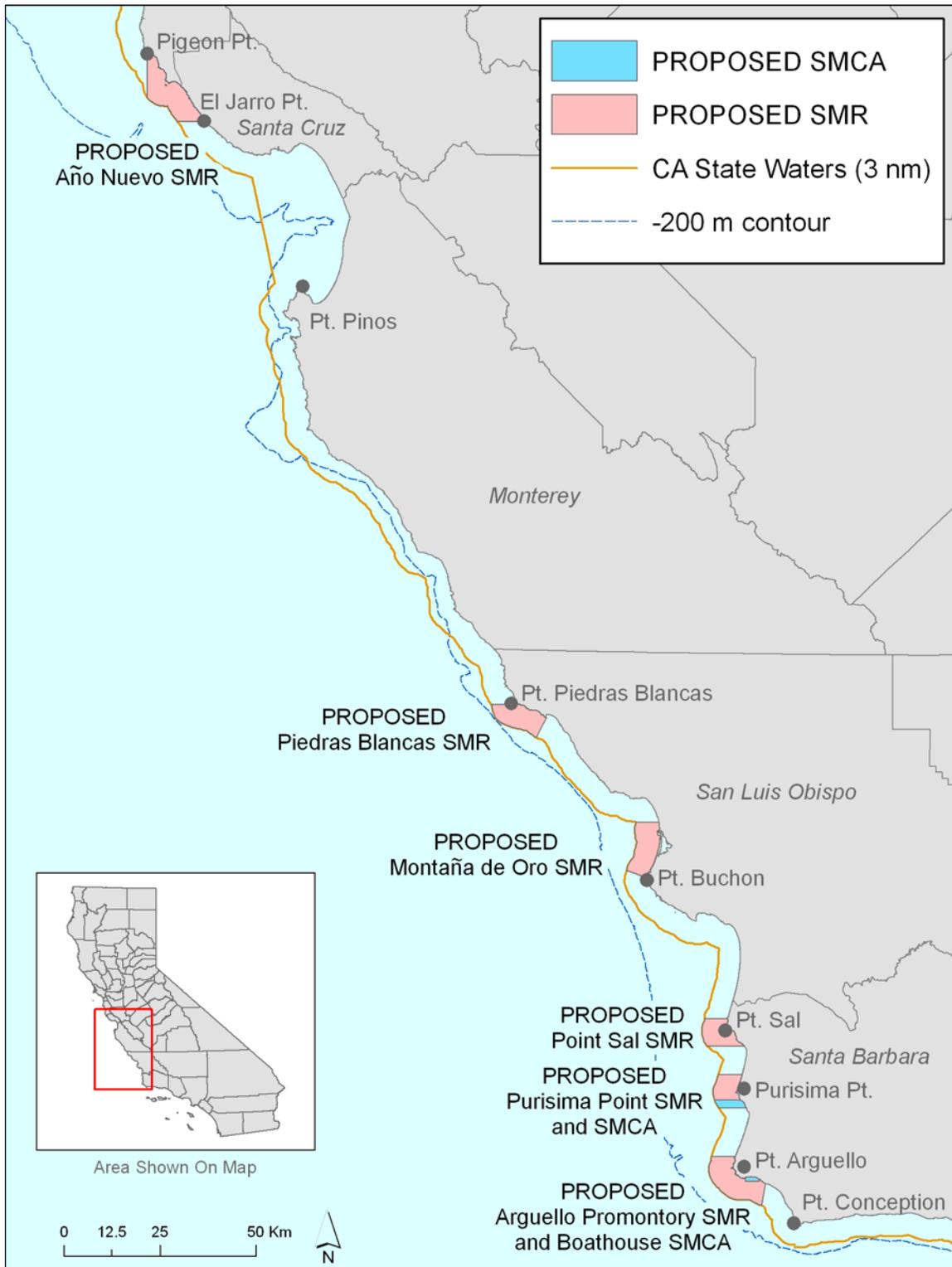


Figure 1: Map of the central California MLPA study area showing proposed MPAs as well as landmarks mentioned within this document.

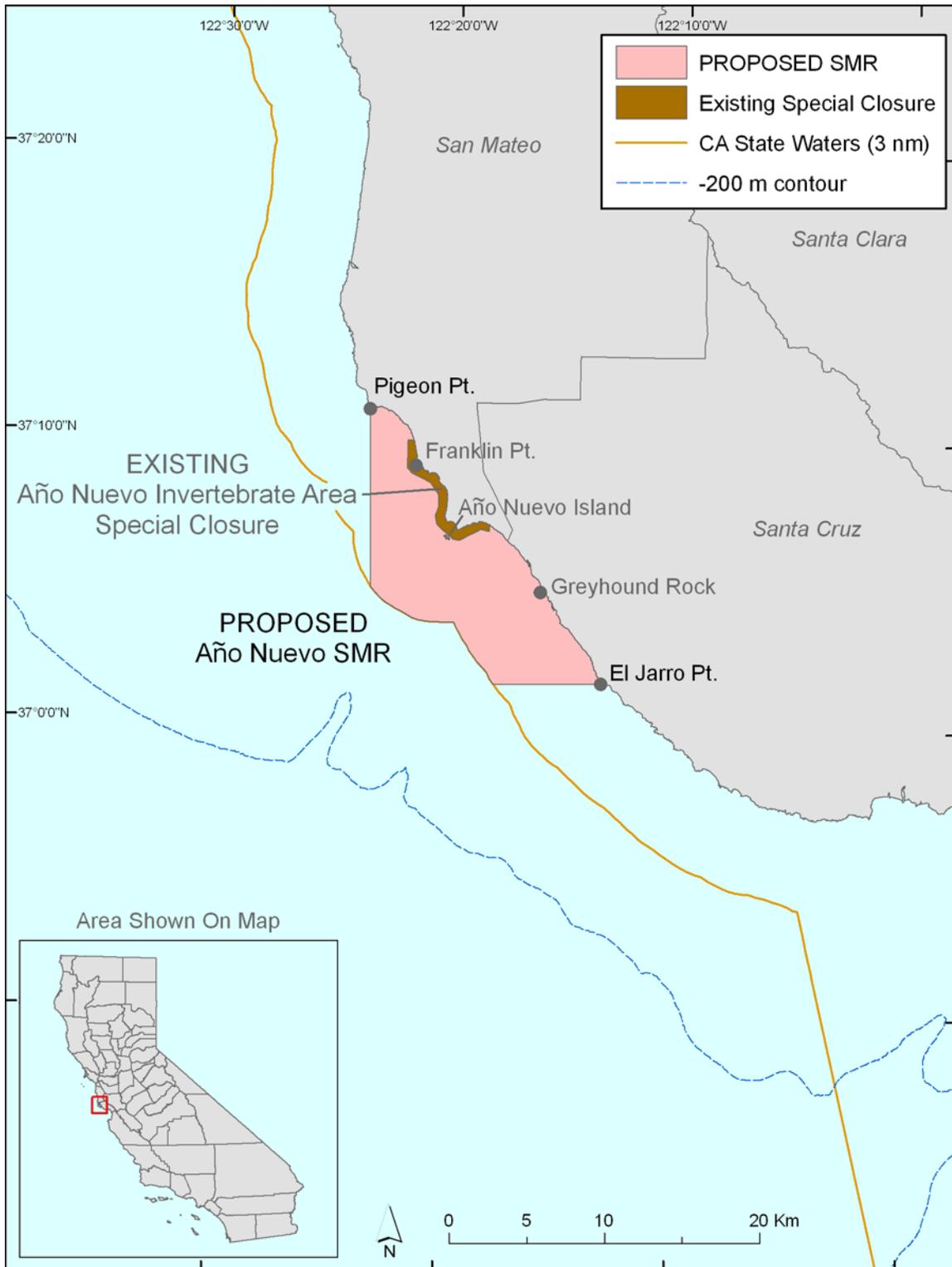


Figure 2: Map of the proposed Año Nuevo State Marine Reserve including the existing Año Nuevo Invertebrate Area as well as landmarks mentioned within this document.

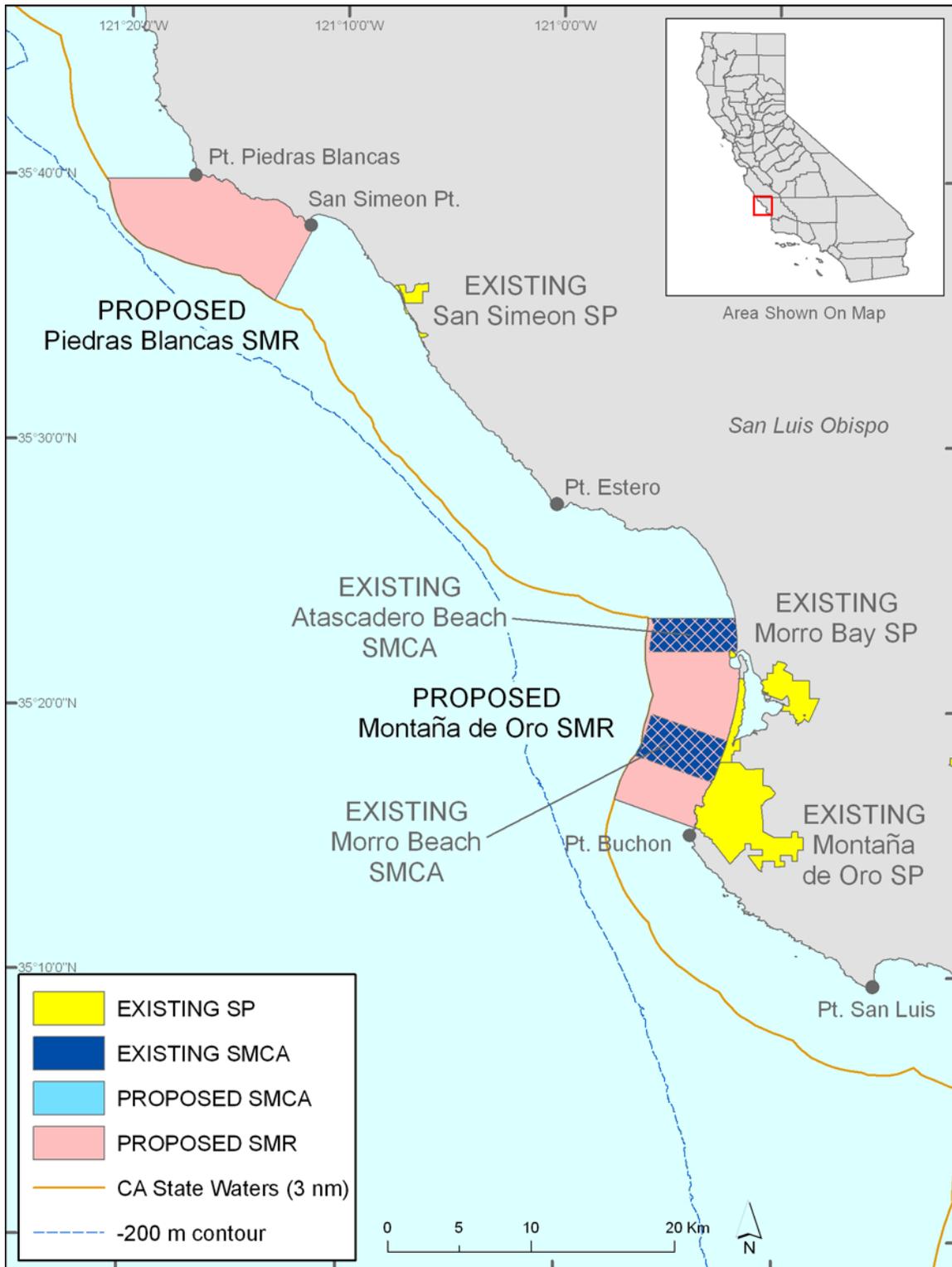


Figure 3: Map of the proposed Piedras Blancas and Montaña de Oro State Marine Reserves including the existing Atascadero Beach and Morro Beach State Marine Conservation Areas as well as landmarks mentioned within this document.

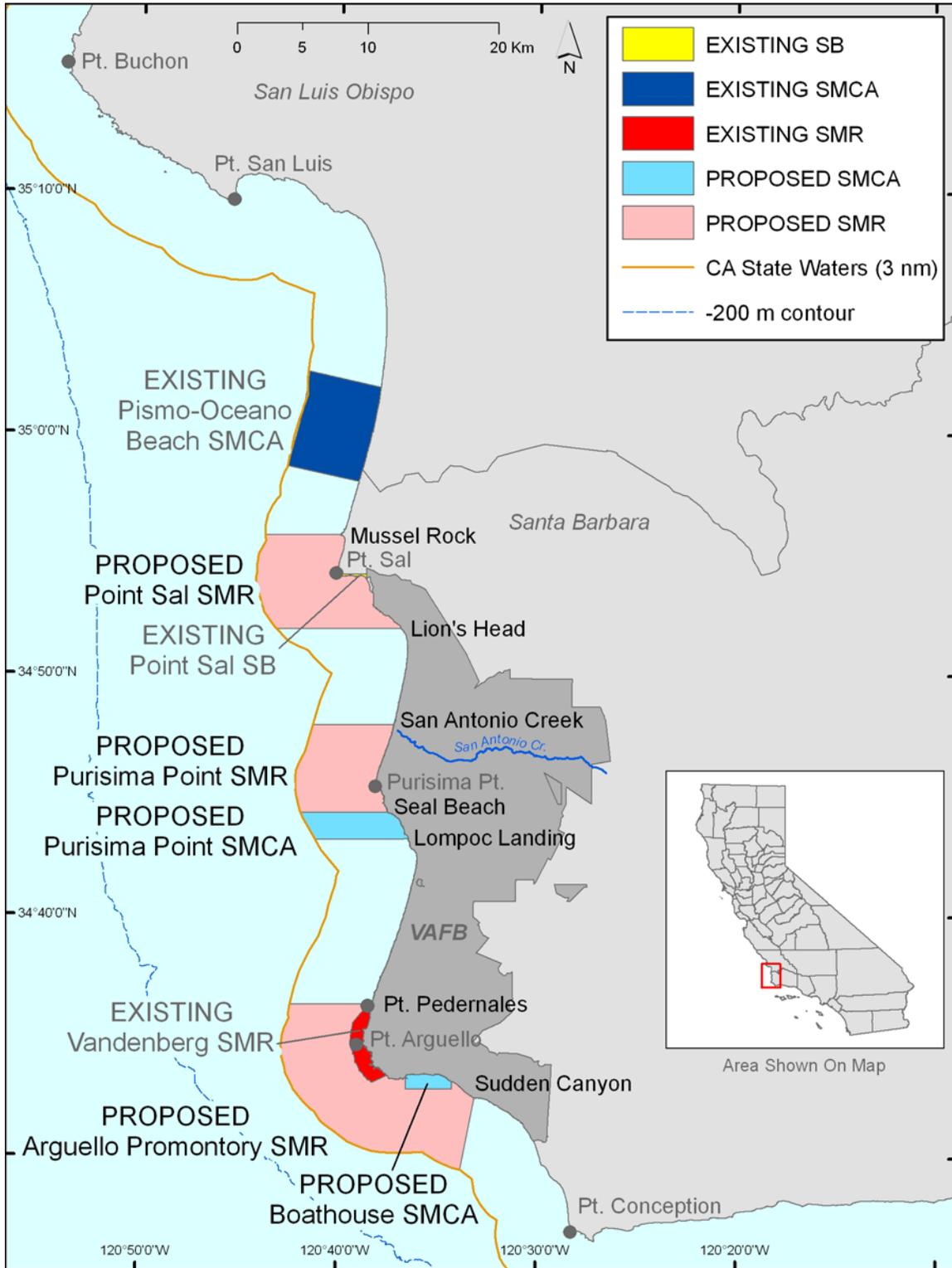


Figure 4: Map of the Santa Maria Basin showing existing and proposed MPAs as well as landmarks mentioned within this document.