

California Marine Life Protection Act Initiative
Summary of Central Coast MPAs as Adopted by the
California Fish and Game Commission
June 25, 2007

The draft *California Marine Life Protection Act Master Plan for Marine Protected Areas* (April 2007) contains guidelines to assist the planning and development process of creating alternative marine protected area (MPA) proposals. A key requirement of the Marine Life Protection Act (MLPA) specifies the importance of creating and managing a system of MPAs not only for individual biogeographical regions, but also as a statewide network. Specifically, goal 6 of the MLPA is to ensure that the system of MPAs is designed and managed, to the extent possible, as a statewide network.

One of the regional objectives for the central coast process associated with goal 6 was “to develop a mechanism to coordinate with future MLPA regional stakeholder groups in other regions to ensure that the statewide MPA network meets the goals of the MLPA.” As such, this document provides a summary of existing boundaries, regulations, habitat coverage, and physical and oceanographic characteristics for adopted MPAs in the MLPA Central Coast Study Region to inform the MLPA North Central Coast Regional Stakeholder Group while developing alternative proposals for a network of MPAs in the MLPA North Central Coast Study Region.

During the MLPA Central Coast Project, the Master Plan Science Advisory Team (SAT) and MLPA staff developed a process for evaluating proposed MPA packages against the scientific guidelines defined in the draft master plan, which are based on the goals of the MLPA. For the purposes of the MLPA Central Coast Project evaluation, the MLPA goals were divided into four groups:

- Goals pertaining to protection of habitats (MLPA goals 1 and 4)
- Goals pertaining to connectivity among MPAs in a network (MLPA goals 2 and 6)
- Goals pertaining to recreational, educational, and study opportunities provided by MPAs (MLPA goal 3)
- Goals not requiring scientific evaluation (MLPA goal 5)

Three tables (tables 1, 2, and 3) summarize key characteristics of the adopted state MPAs in the MLPA Central Coast Study Region, including area covered, alongshore span, depth range, and habitats represented.

Table 1: Overall Summary for Adopted MPAs in the MLPA Central Coast Study Region

Type of MPA	# MPAs	Area (mi ²)	% of Study Region
State Marine Reserve (SMR)	14	85.34 mi ²	7.42%
State Marine Conservation Area (SMCA)*	2	6.35 mi ²	0.55%
State Marine Conservation Area (SMCA)	13	112.19 mi ²	9.76%
All MPAs combined	29	203.88 mi ²	17.73%

* Two MPAs, Elkhorn Slough SMCA and Cambria SMCA, are proposed for SMP designation in the future and are considered separately in this analysis.

Table 2: Individual Adopted State MPAs in the MLPA Central Coast Study Region (from North to South)

MPA Name	Size (mi²)	Along-shore Span (mi^A)	Depth Range (feet)
Año Nuevo SMCA	11.07 mi ²	8.4 mi	0-175 ft
Greyhound Rock SMCA	11.81 mi ²	3.1 mi	0-216 ft
Natural Bridges SMR	0.58 mi ²	4.1 mi	3-21 ft
Elkhorn Slough SMR	1.48 mi ²	4.4 mi	0-10 ft
Elkhorn Slough SMCA*	0.09 mi ²	1.4 mi	0-10 ft
Moro Cojo SMR	0.46 mi ²	5.0 mi	0-10 ft
Soquel Canyon SMCA	23.41 mi ²	7.8 mi	274-2113 ft
Portuguese Ledge SMCA	10.91 mi ²	5.4 mi	302-4838 ft
Edward F. Ricketts SMCA	0.22 mi ²	1.0 mi	0-74 ft
Hopkins SMR	0.30 mi ²	1.0 mi	0-88 ft
Pacific Grove Marine Gardens SMCA	0.93 mi ²	1.5 mi	3-151 ft
Asilomar SMR	1.51 mi ²	2.3 mi	0-172 ft
Carmel Pinnacles SMR	0.53 mi ²	1.0 mi	69-223 ft
Carmel Bay SMCA	2.12 mi ²	3.1 mi	0-471 ft
Pt. Lobos SMR	5.36 mi ²	4.7 mi	0-408 ft
Pt. Lobos SMCA	8.85 mi ²	3.2 mi	268-1858 ft
Point Sur SMR	9.72 mi ²	5.4 mi	0-183 ft
Point Sur SMCA	9.96 mi ²	5.4 mi	139-624 ft
Big Creek SMCA	8.00 mi ²	2.5 mi	107-1964 ft
Big Creek SMR	14.47 mi ²	6.1 mi	0-2393 ft
Piedras Blancas SMR	10.4 mi ²	6.4 mi	0-157 ft
Piedras Blancas SMCA	8.76 mi ²	4.9 mi	94-337 ft
Cambria SMCA*	6.26 mi ²	5.8 mi	0-105 ft
White Rock (Cambria) SMCA	2.32 mi ²	3.5 mi	0-99 ft
Morro Bay SMRMA	3.01 mi ²	9.4 mi	0-22 ft
Morro Bay SMR	0.30 mi ²	1.4 mi	0-10 ft
Point Buchon SMR	6.66 mi ²	2.9 mi	0-208 ft
Point Buchon SMCA	11.55 mi ²	5.9 mi	191-377 ft
Vandenberg SMR	32.84 mi ²	14.3 mi	0-127 ft

A. Alongshore span measured as direct line from one end of the MPA to the other

* Elkhorn Slough SMCA and Cambria SMCA are proposed for SMP designation in the future and have regulations that limit commercial extraction.

Table 3: Habitat Representation in Adopted State MPAs in the MLPA Central Coast Study Region (from North to South)

Habitat Type	Percentage of habitats in the study region within existing MPA designations ^A			
	SMR	SMCA*	SMCA	Total, all MPAs
Intertidal				
Sandy or gravel beaches	16.27%	2.49%	9.15%	27.91%
Rocky intertidal and cliff	22.98%	1.80%	8.47%	33.25%
Coastal marsh	39.56%	3.89%	9.88%	53.33%
Tidal flats	44.81%	4.86%	19.59%	69.26%
Seagrass beds (0-30m): Surfgrass	24.70%	2.99%	12.41%	40.10%
Seagrass beds (0-30m): Eelgrass	28.89%	0.93%	70.82%	100.65%
Estuary	30.32%	1.02%	23.19%	54.53%
Soft bottom				
0-30 meters	12.57%	1.69%	3.68%	17.94%
30-100 meters	4.45%	0.08%	9.36%	13.89%
100-200 meters	1.56%	0.00%	21.49%	23.05%
>200 meters	6.67%	0.00%	12.92%	19.59%
Hard bottom				
0-30 meters	16.59%	1.82%	10.58%	29.00%
30-100 meters	11.59%	0.00%	15.71%	27.30%
100-200m	0.07%	0.00%	36.83%	36.90%
>200 meters	0.19%	0.00%	20.73%	20.92%
Kelp forest				
Average kelp ('89, '99, '02, '03)	22.46%	5.26%	8.19%	35.92%
Submarine canyon				
0-30 meters	12.39%	0.00%	24.78%	37.17%
30-100 meters	5.88%	0.00%	4.07%	9.95%
100-200 meters	4.79%	0.00%	14.03%	18.81%
>200 meters	7.41%	0.00%	14.99%	22.40%

A: Based on currently available mapping data.

* Two MPAs, Elkhorn Slough SMCA and Cambria SMCA, are proposed for SMP designation in the future and are considered separately in this analysis.

Protection Levels of Adopted MPAs

The level of protection afforded by an MPA varies according to its specific regulations, particularly on allowed take of marine resources. Preliminary levels of protection for existing MPAs were assigned, based on the criteria established in the central coast process (Table 4)

into the following categories: state marine reserve (SMR), state marine conservation area (SMCA) high, SMCA moderate, SMCA low, and state marine park (SMP) low.

The highest SAT protection level is “SMR” and corresponds to those MPAs that do not allow any take of marine life. “SMCA high” is the next highest protection level and generally includes MPAs that only allow take of pelagic finfish and prohibit bottom contact of any fishing gear. MPAs that are “SMCA moderate” may allow some bottom contact, such spot prawn traps, and may also allow some small scale hand harvest of kelp. The remaining categories, “SMCA low” and “SMP low,” are the lowest levels of protection and may allow take of groundfish, larger-scale kelp harvest, or other activities that may have significant effects on marine ecosystems.

Table 4: Names, Regulations, and SAT Protection Level for Adopted MPAs in the MLPA Central Coast Study Region (from North to South)

MPA Name	Allowed Take	SAT Protection Level
Año Nuevo SMCA	Take of all living marine resources is prohibited except the commercial take of giant kelp (<i>Macrocystis pyrifera</i>) by hand harvest only.	SMCA Moderate
Greyhound Rock SMCA	Take of all living marine resources is prohibited except: only the following species may be taken recreationally: giant kelp (<i>Macrocystis pyrifera</i>) by hand harvest only, squid, salmon, and, by hook-and-line from shore only, other finfish. Only the following species may be taken commercially: giant kelp (<i>Macrocystis pyrifera</i>) by hand harvest only, salmon, and squid except that not more than five percent (5%) by landed weight of any commercial squid catch may be other species taken incidentally to squid.	SMCA Low
Natural Bridges SMR	Take of all living marine resources is prohibited.	SMR
Elkhorn Slough SMR	Take of all living marine resources is prohibited.	SMR
Elkhorn Slough SMCA	Take of all living marine resources is prohibited except: only the following species may be taken recreationally: finfish by hook-and-line only and clams. Clams may only be taken on the north shore of the slough in the area adjacent to the Moss Landing State Wildlife Area [subsection 550(a)].	SMCA Low (SMP low*)
Moro Cojo SMR	Take of all living marine resources is prohibited.	SMR
Soquel Canyon SMCA	Take of all living marine resources is prohibited except the commercial and recreational take of pelagic finfish [subsection 632(a)(3)].	SMCA High
Portuguese Ledge SMCA	Take of all living marine resources is prohibited except the commercial and recreational take of pelagic finfish [subsection 632(a)(3)].	SMCA High
Edward F. Ricketts SMCA	Take of all living marine resources is prohibited except: the recreational take of finfish by hook-and-line is allowed and the commercial take of giant kelp (<i>Macrocystis pyrifera</i>) and bull kelp (<i>Nereocystis</i> spp.) is allowed by hand in the area defined by subsection 165(c)(4)(D) under the following conditions: Any individual kelp harvester with a valid permit issued	SMCA Low

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MPA Name	Allowed Take	SAT Protection Level
	pursuant to Section 165 may take no more than 44 tons of kelp from the portion of Administrative Kelp Bed 220 within the Pacific Grove Marine Gardens State Marine Conservation Area in any calendar month. Duplicate landing records must be kept on board the harvest vessel in accordance with the requirements of Section 165.	
Hopkins SMR	Take of all living marine resources is prohibited.	SMR
Pacific Grove Marine Gardens SMCA	Take of all living marine resources is prohibited except: the recreational take of finfish is allowed and the commercial take of giant kelp (<i>Macrocystis pyrifera</i>) and bull kelp (<i>Nereocystis</i> spp.) by hand is allowed under the following conditions: Any individual kelp harvester with a valid permit issued pursuant to Section 165 may take no more than 44 tons of kelp from the portion of Administrative Kelp Bed 220 within the Pacific Grove Marine Gardens State Marine Conservation Area in any calendar month. Duplicate landing records must be kept on board the harvest vessel in accordance with the requirements of Section 165.	SMCA Low
Asilomar SMR	Take of all living marine resources is prohibited.	SMR
Carmel Pinnacles SMR	Take of all living marine resources is prohibited.	SMR
Carmel Bay SMCA	Take of all living marine resources is prohibited except: The recreational take of finfish is allowed, and the commercial take of giant kelp (<i>Macrocystis pyrifera</i>) and bull kelp (<i>Nereocystis</i> spp.) by hand is allowed under the following conditions: Any individual kelp harvester with a valid permit issued pursuant to Section 165 may take no more than 44 tons of kelp from the portion of Administrative Kelp Bed 219 within the Carmel Bay State Marine Conservation Area in any calendar month. Duplicate landing records must be kept on board the harvest vessel in accordance with the requirements of Section 165.	SMCA Low
Pt. Lobos SMR	Take of all living marine resources is prohibited.	SMR
Pt. Lobos SMCA	Take of all living marine resources is prohibited except the recreational and commercial take of salmon, albacore, and the commercial take of spot prawn.	SMCA Moderate
Point Sur SMR	Take of all living marine resources is prohibited.	SMR
Point Sur SMCA	Take of all living marine resources is prohibited except the commercial and recreational take of salmon and albacore.	SMCA High
Big Creek SMCA	Take of all living marine resources is prohibited except the commercial and recreational take of salmon, albacore, and the commercial take of spot prawn.	SMCA Moderate
Big Creek SMR	Take of all living marine resources is prohibited.	SMR
Piedras Blancas SMR	Take of all living marine resources is prohibited.	SMR

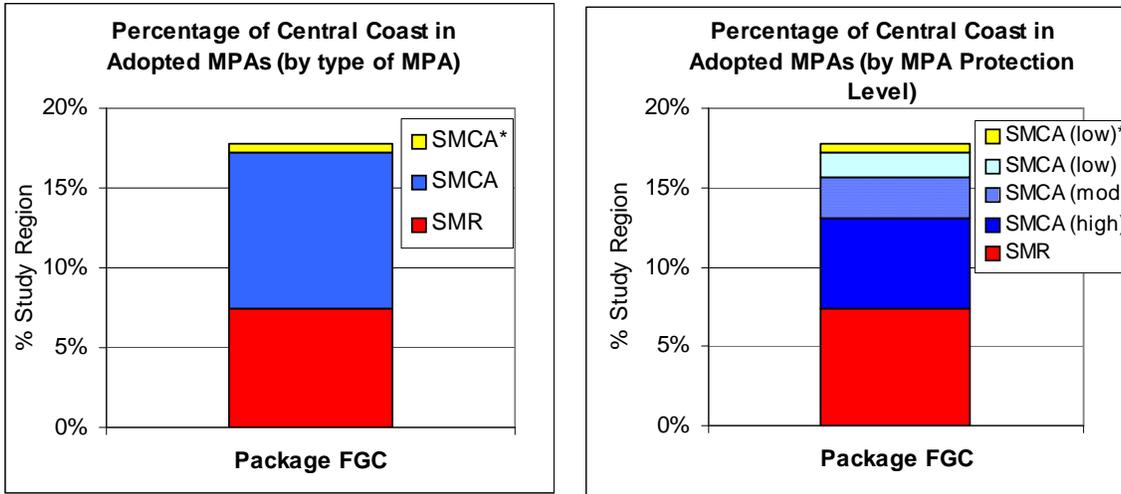
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MPA Name	Allowed Take	SAT Protection Level
Piedras Blancas SMCA	Take of all living marine resources is prohibited except the commercial and recreational take of salmon and albacore.	SMCA High (SMP low*)
Cambria SMCA	The commercial take of all living marine resources is prohibited. Recreational take is allowed.	SMCA Low
White Rock (Cambria) SMCA	Take of all living marine resources is prohibited except the commercial take of giant kelp (<i>Macrocystis pyrifera</i>) and bull kelp (<i>Nereocystis</i> spp.) under the following conditions: Any individual kelp harvester with a valid permit issued pursuant to Section 165 and holding a valid lease to Administrative Kelp Bed 208 may take no more than 125 tons of kelp from the portion of Administrative Kelp Bed 208 within the White Rock (Cambria) State Marine Conservation Area in any calendar month. Duplicate landing records must be kept on board the harvest vessel in accordance with the requirements of Section 165.	SMCA Moderate
Morro Bay SMRMA	Recreational hunting of waterfowl is allowed unless otherwise restricted by hunting regulations (sections 502, 550, 551, and 552). Take of all living marine resources is prohibited except the following activities are allowed north of latitude 35° 19.70' N: The recreational take of finfish, aquaculture of oysters (pursuant to a valid State water bottom lease and permit), and storing finfish taken outside the Morro Bay State Marine Recreational Management Area in a receiver for bait purposes.	SMCA High
Morro Bay SMR	Take of all living marine resources is prohibited.	SMCA Low
Point Buchon SMR	Take of all living marine resources is prohibited.	SMR
Point Buchon SMCA	Take of all living marine resources is prohibited except the commercial and recreational take of salmon and albacore.	SMR
Vandenberg SMR	Take of all living marine resources is prohibited except take incidental to base operations and commercial space launch operations identified by the Vandenberg Air Force Base Commander as mission critical.	SMCA High

* Elkhorn Slough SMCA and Cambria SMCA are proposed for SMP designation in the future and have regulations that limit commercial extraction.

Using these protection levels, it is possible to compare the percentage of the study region area within adopted MPAs as grouped by the three MPA designations and as grouped by SAT protection levels (Figure 1).

Figure 1: Area Covered by Adopted MLPA Central Coast MPAs by Designation and Protection Level

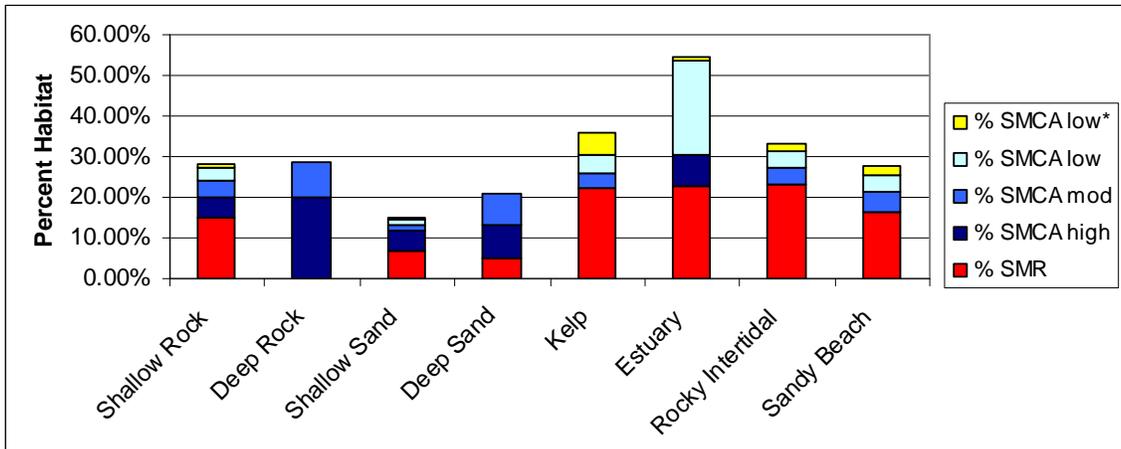


* Two MPAs, Elkhorn Slough SMCA and Cambria SMCA, are proposed for SMP designation in the future and are considered separately in this analysis.

Habitat Protection of Adopted MLPA Central Coast MPAs (Goals 1 and 4)

The degree to which the existing MPAs include representative habitats within the central coast was evaluated by determining the percentage of available habitat in the region and each subregion and evaluating how much of available habitat is included in MPAs. Figure 2 displays the percent of each habitat type (shallow rock, kelp habitat, intertidal, etc.) protected within adopted central coast MPAs according to the level of protection assigned to those MPAs; SMR and SMCA low, SMCA moderate, and SMCA high (note that two MPAs are proposed for SMP designation in the future).

Figure 2: Habitats Covered in the Adopted MPAs in the Central Coast Study Region



* Two MPAs, Elkhorn Slough SMCA and Cambria SMCA, are proposed for SMP designation in the future and are considered separately in this analysis.

Size and Spacing of Existing MPAs (Goals 2 and 6)

Size and spacing of MPAs will influence the degree of connectivity among MPAs. Size and spacing guidelines were established by the SAT for the central coast process. In general terms, larger MPAs are more likely to protect a greater proportion of the home-range for various species of interest and thus create areas where individuals can produce larvae that might be exported outside of the MPA. The distance between MPAs, among other factors, partially dictates how likely it is that exported larvae travel to another MPA. Considering the known home-ranges and larval dispersal distances for species of interest, the central coast SAT determined the following guidelines for size and spacing of MPAs:

- For an objective of protecting the diversity of species that live at different depths and to accommodate the ontogenetic movement of individuals to and from nursery or spawning grounds to adult habitats, MPAs should extend from the intertidal zone to deep waters offshore.
- For an objective of protecting adult populations, based on adult neighborhood sizes and movement patterns, MPAs should have an alongshore span of 5-10 km (3-6 mi or 2.5-5.4 nmi) of coastline, and preferably 10-20 km (6-12.5 mi or 5.4-11 nmi). Larger MPAs would be required to fully protect marine birds, mammals, and migratory fish.
- For an objective of facilitating dispersal and connectedness of important bottom dwelling fish and invertebrate groups among MPAs, based on currently known scales of larval dispersal, MPAs should be placed within 50-100 km (31-62 mi or 27-54 nmi) of each other.

(See "Considerations in the Design of MPAs" in the Master Plan for Marine Protected Areas 2006)

An analysis on the size (area in square miles) of MPAs was conducted on MPA "clusters", MPAs that are adjacent to one another, to identify the number of MPA clusters that fell at or below the minimum size recommended by the SAT. In this analysis only MPA clusters that rated as a highly protected MPA cluster were included, 11 such cluster were included (Table 5). MPA clusters that have high level of protection include state marine reserves (SMRs) in which no take is allowed and state marine conservation areas (SMCAs) which only allow the take of pelagic finfish. Further, only SMCAs that allow the take of pelagic finfish and salmon in water depth greater than 50 meters were placed in this category.

Table 5 provides the number of MPA clusters with a high level of protection that fall at, below, or above the minimum SAT recommended size. In using the offshore extent of 3 miles and the SAT recommended minimum alongshore span of 3-6 miles, one gets a minimum MPA area of 9 mi² (if using the low end of that range 3 miles) or 18mi² (if using the high end of that range with 6 miles). The SAT also noted that an alongshore span of 6-12.5 miles would be preferable given current data on adult fish movement patterns. Nevertheless, this analysis utilizes the minimum recommended size criteria.

Table 5: Number of High Protection MPA Clusters that Fall Below, Meet, or Exceed the SAT Minimum Recommended Size, Based on Area (in square miles)

	# of MPA Clusters	Below Minimum (<9 mi ²)	At Minimum (9 mi ²)	Above Minimum (>9 mi ²)
Package FGC	11	4	3	4

In addition to the analysis on size an analysis on the SAT recommended MPA spacing was conducted. Based on known juvenile and larval dispersal distances the SAT established a guideline of a maximum range of 31-62 miles between MPAs. In this analysis the maximum distance between MPAs that include protected habitats (habitats contained in MPAs with a high protection level) was determined (Figure 5). Only four habitats exceeded the maximum recommended distance between MPAs. It should be noted however, that some of those habitats simply do not occur frequent enough to meet the SAT spacing guideline. The largest distance (gap) in coverage is 94 miles (Table 6), for MPAs protecting rock habitat between the depths of 30-100m (Figure 5). The average distance (gap) between MPAs containing similar habitat is 62 miles (Table 6). For habitats that occur with a high enough frequency in which it is possible to meet the SAT spacing guidelines the adopted MPAs overall, are spaced such that they meet the recommended maximum spacing criteria (see gaps > guideline in table 6).

Figure 5: SAT Recommended Maximum Distance between the Adopted MPAs for Each Habitat Type and the Recommended Maximum Range, High End and Low End of that Range, for Spacing (red dashed lines)

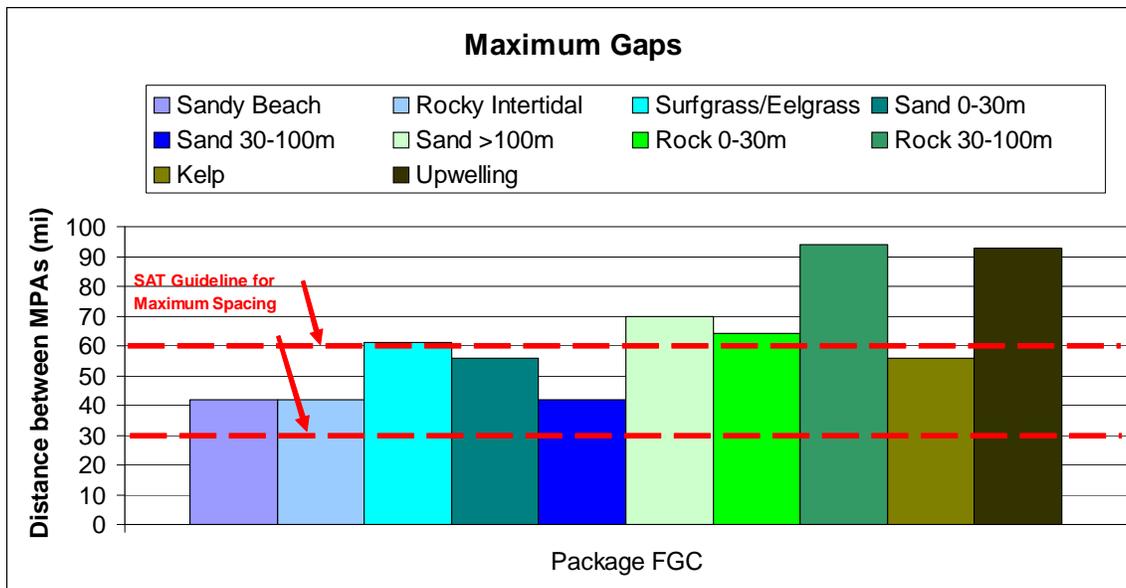


Table 6: Spacing Summary Indicating Average Distance between MPAs Containing Similar Habitat, the Largest Gap in Habitat Spacing, the Number of MPAs that Fail to Meet the SAT Spacing Guideline when that Guideline can Physically be Met

	Average Maximum Gap	Largest Gap	Gaps > Guideline*
Package FGC	62 miles	94 miles	0 miles

*Only includes those habitats that occur with a frequency such that it is physically possible to meet the spacing guideline

Replication of Habitats in Existing MPAs

The SAT also recommended that habitats be replicated within MPAs:

- For an objective of providing analytical power for management comparisons and to buffer against catastrophic loss of an MPA, at least three to five replicate MPAs should be designed for each habitat type ... within a biogeographical region.

(See “Considerations in the Design of MPAs” in the Master Plan for Marine Protected Areas 2006)

Note that the central coast study region is only part (approximately one-third) of the biogeographical region which extends from Oregon border to Point Conception. Figure 6 shows the replication of habitats within the adopted MPAs in the central coast study region.

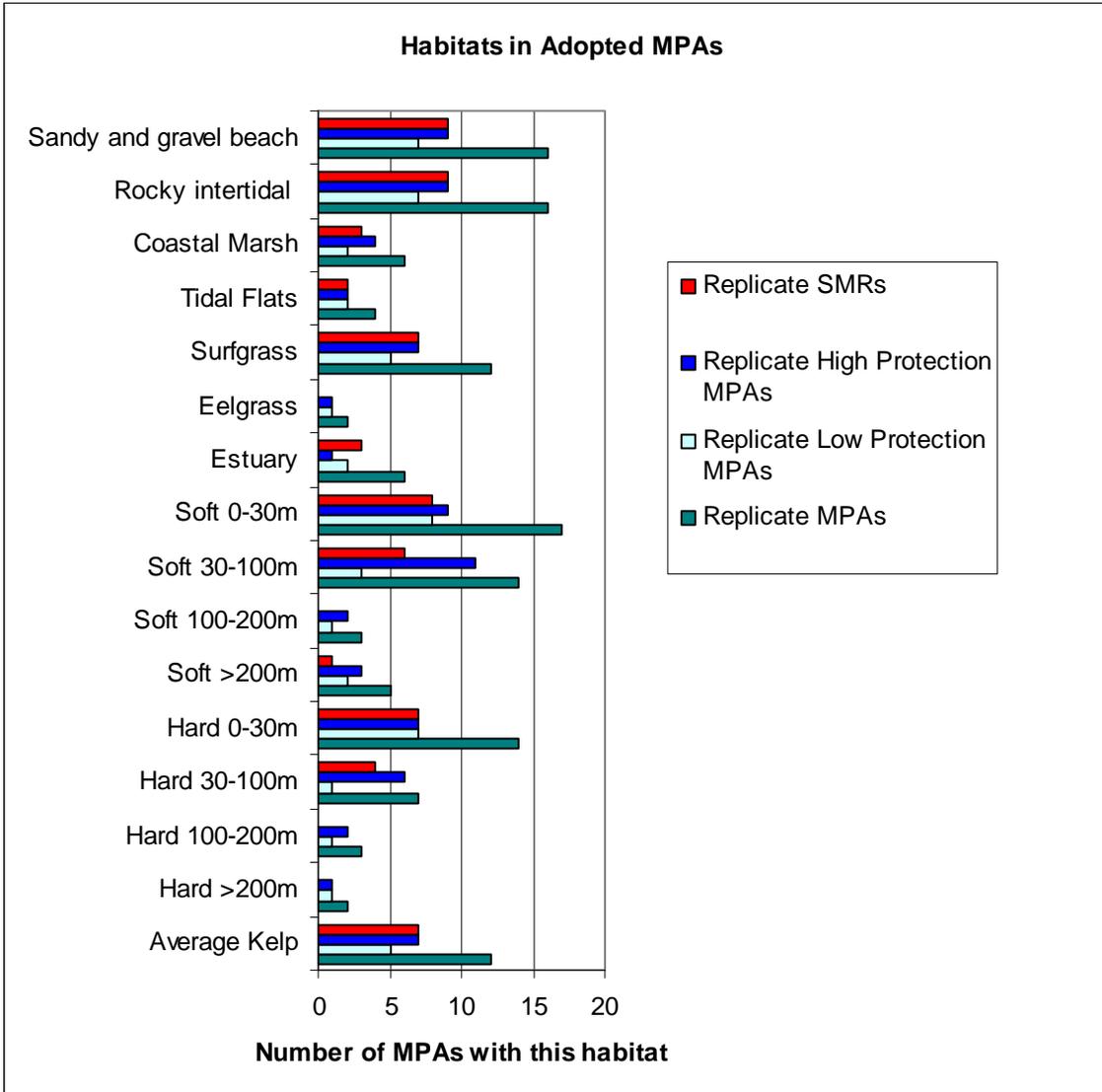
Summary and Relation to MLPA North Central Coast MPAs

A total of 29 MPAs were adopted in the central coast study region (see Figure 7). Through the network of these 29 MPAs a variety of habitats across a range of depths are protected with varying levels of protection. Numerous design criteria, guidance, and information were considered in the adopted network, including status of the resources, individual MPA size, spacing, habitat replication, and regulations. These criteria represent a combination of tools used to meet the goals and objectives of the MLPA, the regional network of MPAs, and the objectives of individual MPAs.

The north central coast study region is not independent and should not be thought of independent of the central coast study region, particularly when considering a network of MPAs. A continuation of the statewide network of MPAs must consider adjacent MPAs and MPAs that influence the current study region.

Although the entire central coast study region’s network of MPAs should be considered in developing alternative proposals, the three northern most MPAs in the MLPA Central Coast Study Region should be considered at a minimum to effectively maintain the statewide network design. These MPAs from north to south are Año Nuevo SMCA, Greyhound Rock SMCA, and Natural Bridges SMR.

Figure 6: Number of MPAs Containing Specified Habitats



The two northern most MPAs, Año Nuevo SMCA and Greyhound Rock SMCA, are adjacent to each other and include very similar habitat types; sandy beach, rocky intertidal, surfgrass, shallow hard and soft bottom, and kelp beds consisting of both giant and bull kelp. These two areas also have a similar composition of marine species of fishes, invertebrates, mammals, and birds. Additionally, the Año Nuevo SMCA has a major elephant seal rookery. Año Nuevo also lies in the lee of a headland and is an important upwelling zone, which is essential in supporting trophic structure along the coast. Natural Bridges SMR lies just north of Santa Cruz and was designated to protect rocky and soft bottom intertidal habitat along with the species associated with those areas such as limpets, mussels, clams, snails, algae.

These MPAs and the entire central coast study region's network of MPAs along with the associated resources should be considered during the development of alternative proposals for the north central coast. Alternative proposals for a network of MPAs in the MLPA North Central Coast Study Region should link biologically and administratively to the network of MPAs in the MLPA Central Coast Study Region.

Figure 7. Adopted MPAs in the MLPA Central Coast Study Region



SMCA = state marine conservation area SMP = state marine park
 SMR = state marine reserve SMRMA = state marine recreational management area