

## ***DRAFT***

# **EVALUATIONS OF BENEFITS TO MARINE MAMMALS FROM PROPOSED MARINE PROTECTED AREAS IN THE MLPA NORTH CENTRAL STUDY REGION, CALIFORNIA**

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May 18, 2008

The objective of this evaluation is to assess what benefits associated with Goals 1, 2 and 4 of the Marine Life Protection Act (MLPA) are achieved by the three MLPA North Central Coast Regional Stakeholder Group (NCCRSG) proposals and the Integrated Preferred Alternative (IPA) as they apply to marine mammals. Proposed marine protected areas (MPAs) are evaluated for potential benefits, specifically for pinnipeds. Pinnipeds, which include seals and sea lions, are a subset of marine mammals that congregate onshore at traditional locations to rest at “haul out sites” and breed at “rookeries”. These terrestrial sites fall within the intertidal or supratidal zone on the mainland and on islands. The terrestrial sites include a range of habitats such as hard rock, cobble and sand. Cetaceans are not included in these analyses because they generally range widely at a scale larger than would benefit from coastal MPAs. Gray whales, for example, might migrate through MPAs along the coast, but likely do not reside within any MPA for more than a few days. Nevertheless, nearshore cetaceans such as Gray whales likely would benefit from a statewide network of MPAs. The range of sea otters extends just to Half Moon Bay, within the south region, but there are no concentrations of otters within this subregion.

Pinnipeds would benefit from the placement of MPAs because of a reduction of disturbance from human activities on or adjacent to rookeries or haul out sites. Although MPAs do not restrict human access or vessel transit, the restrictions on allowable activities within MPAs are likely to result in fewer extractive users that access these areas. Vessel traffic, including motorized and non-motorized, can cause significant levels of disturbance to marine mammals (e.g., Allen et al. 1985, Suryan and Harvey 1999, Grigg et al. 2002). Vessel noise, such as from loud engines and generators, caused many disturbances to pinnipeds at the Farallon Islands in the past (PRBO Conservation Science and USFWS, unpubl. data). Disturbances can lead to reductions in productivity or site abandonment. Disturbances at foraging areas can disrupt feeding activities and cause animals to leave the area, further reducing feeding and leading to additional energy expenditures. Other likely benefits of MPAs to marine mammals include increased available food and reduced bycatch in fisheries (current and future).

## **METHODS**

Evaluations follow the methods described in “Methods Used to Evaluate MPA Proposals in the North Central Coast Study Region March 31, 2008”. The document analyzes benefits to 1) breeding areas, 2) resting areas, and 3) foraging areas. We also assess the benefits from “special closure areas” that were added to the proposals to reduce disturbance to some marine bird and mammal colonies by restricting access to the area surrounding the colony. The special closures were buffered areas around features such as islands or headlands at either a 300ft or 1000ft distance where all activities in addition to fishery activities would be restricted, such as kayaking or whale watching.

No rankings of level of benefit (e.g., high, medium, low, none) have been given because the variability in population sizes between species makes categorizations too subjective and potentially misleading. Additionally, the activities associated with lower levels of protection are so varied, ranging from salmon fishing to abalone harvesting from shore that assessing the potential effects on pinnipeds is not easily comparable and there are few data. The analyses, therefore, include only those pinniped haul out sites

and rookeries that fall within the very high level of protection (LOP) MPAs (state marine reserves (SMRs)) and do not include MPAs with lower levels of protection. This selection assumes that most potential activities that might affect pinnipeds would be reduced by the SMR designation. We recognize, however, that protection of an area as a SMR does not address all potential sources of human activities. We also recognize that lower LOP could also provide some measure of protection. These analyses, therefore, provide a summary of the added value to pinnipeds that would be achieved at the highest LOP under each proposal.

Population in this evaluation refers to the number of animals that use a site for breeding or resting. A haul out site is a location where seals come onshore to rest. A rookery is where seals come onshore to give birth, raise their young, and breed. Many sites serve as both haul outs and rookeries. A “hot spot” is an area where there is a major rookery or haul out area with high abundance and/or high diversity of species. For either rookery or haul out site, hot spots are identified that fall within each of the MPAs for each of the proposals.

### **BREEDING COLONIES**

Data used for these analyses were from rookery survey data in the draft NOAA Biogeographic Assessment for the National Marine Sanctuaries (NOAA 2007), Mark Lowry from NOAA Fisheries, a report by Bonnell et al. 1983, and unpublished data provided by the U.S. Fish and Wildlife Service for the Farallon Islands to the California Department of Fish and Game (CDFG) MLPA GIS team. For rookeries, species most likely to benefit from MPAs include Steller sea lions, northern fur seals, northern elephant seals and harbor seals. These species are sensitive to disturbance from human activities when breeding. California sea lions are not included because they do not breed in the area except for very small numbers on the Farallon Islands.

Numbers of breeding pinnipeds within each subregion are shown in attached Table 1. Evaluations include numbers of species (species diversity), numbers of pinnipeds, and percentages of subregional populations breeding within each MPA proposal and for the entire subregional array (Table 13). Percentages cited are the percentages of the subregional populations only.

### **HAUL OUT SITES**

Data used for analyses of haul out sites were from survey data in the draft NOAA Biogeographic Assessment for National Marine Sanctuaries, Mark Lowry from NOAA Fisheries (pers. com.), Bonnell et al. 1983, and data provided by the U.S. Fish and Wildlife Service for the Farallon Islands provided to the California Department of Fish and Game Marine Region GIS staff. For haul out sites, species likely to benefit from MPAs include California sea lions, Steller sea lions, northern elephant seals, and harbor seals. Fur seals are not included because they are mostly at sea during the non-breeding season.

Numbers of pinnipeds within each subregion are shown in attached Table 14. Evaluations include numbers of species (species diversity), numbers of pinnipeds, and percentages of subregional haul-out populations breeding within each MPA proposal and for entire proposal arrays (Table 4). Percentages cited are the percentages of the subregional populations.

### **FORAGING AREAS**

Harbor seals are the only focal species most likely to benefit from increases to forage base within or adjacent to an MPA. In nearshore areas, harbor seals forage near their haul out or rookery sites, and may repeatedly visit specific foraging areas (Jones 1981, Harvey and Torok 1994, Harvey et al. 1995, Thompson et al. 1998). Harbor seals forage on whatever is locally abundant, and they feed over a variety of habitats where they pursue rockfish, anchovies, squid, and a several other prey (Appendix 2).

Other marine mammal species were not considered because their foraging ranges are broad and often in pelagic waters beyond the 3-mile state limit. For example, Steller sea lion females that are nursing pups at the South Farallon Islands rookery likely forage for multiple days, mainly beyond the 3 mile limit, and averaging 15 miles on foraging trips. Northern elephant seals and northern fur seals forage over deep waters far offshore (Loughlin et al. 1987, Le Boeuf and Laws 1994). Nevertheless, several coastal marine mammals likely would benefit from a state-wide network of MPAs.

To evaluate proposed MPAs, GIS software was used to create buffers along three miles of coast and to one mile offshore from rookeries in the North and South subregions (see also seabird foraging analyses). This was thought to encompass most of the harbor seal's foraging range. Three miles-by-one mile buffers were overlaid with proposed MPAs and the area of overlap determined. The proportions of the foraging range overlapping proposed MPAs were then weighted based on the proportion of the subregional population.

## RESULTS

Five species of pinnipeds occur in the region (Steller sea lion, California sea lion, northern elephant seal, harbor seal, and northern fur seal). The total number of mammals counted at @ 42 rookeries within the North Central Coast Study Region (NCCSR) is 9,296 and is broken down by species in Table 1. The total number of pinnipeds counted at @ 76 haul out areas in the study region is 17,887 and is broken down by species in Table 2. Harbor seals are the most abundant and wide spread species on the mainland and will be the species most likely to benefit from MPAs. Harbor seal numbers are almost equally divided between the north and south regions during the non-breeding season, but few harbor seals occur on the Farallon Islands. During the breeding season, harbor seals are more abundant in the southern region, using remote sites to breed such as at Double Point and Drakes and Limantour Esteros. Although California sea lions do not breed in the area except for a few animals on the South Farallon Islands, large numbers of non-breeders occur on the Farallon Islands, at Point Reyes Headland and Bodega Rock, and at several sites in the North Subregion. Northern elephant seals occur only at the Farallon Islands and Point Reyes Headland. Steller sea lions, a federally listed threatened species, breed mostly on the Farallon Islands, but small groups also breed in the north subregion on islets just north of Fort Ross. They also haul out at in small numbers at Fish Rocks in the north subregion and around Pillar Point in the south subregion.

The Farallon Islands and Point Reyes Headland are both highly significant to many species of marine mammals, including pinnipeds. At the Farallon Islands, five species of pinniped with several thousand animals haul out, and four species breed there, although the number of breeding animals is modest. The site is the only rookery for northern fur seals between the California Channel Islands and Alaska. The National Marine Fisheries Service (NMFS) recognizes the site as a rookery and critical habitat for Steller sea lions, the only one in the NCCSR. A small elephant seal rookery occurs on the South Farallon Islands and accounts for around 100 pups per year; however, several hundred to over 1000 use the site as a haul out during other times of year. At Point Reyes Headland, four species of pinniped occur with several thousand animals. Two species breed there, harbor seals and elephant seals. The elephant seal rookery at Point Reyes is the largest pinniped rookery in the entire study area with around 2,000 seals, accounting for 95% of all breeding elephant seals and 29% of all breeding seals in the NCCSR. Steller sea lions once bred there up through the 1970s but their numbers have declined along with the general contraction of their range. Several hundred to thousands of California sea lions (mostly male), occur there while migrating north and south during the non breeding season.

**Table 1.** Numbers of **breeding** pinnipeds of four species within each of the three bioregions of the NCCSR.

<b>Subregion</b>	<b>No. Species</b>	<b>Total</b>	<b>Hot spots</b>	<b>Steller sea lion</b>	<b>Fur seal</b>	<b>Elephant seal</b>	<b>Harbor seal</b>
North	2	2237	8	43	0	0	2194
South	2	6525	6	0	0	2000	4525
Farallon Is.	4	534	2	244	100	100	90
<b>Total</b>	<b>4</b>	<b>9296</b>	<b>16</b>	<b>287</b>	<b>100</b>	<b>2100</b>	<b>6809</b>

**Table 2.** Number of pinnipeds occurring at **haul out sites** within each of the three bioregions of the NCCSR.

<b>Subregion</b>	<b>No. Species</b>	<b>Total</b>	<b>Steller sea lion</b>	<b>Cal sea lion</b>	<b>Elephant seal</b>	<b>Harbor seal</b>
North	3	7157	125	2191	0	4841
South	4	7440	36	1075	2000	4329
Farallon Islands	5	3290	200	2000	1000	90
<b>Total</b>	<b>5</b>	<b>17887</b>	<b>361</b>	<b>5266</b>	<b>3000</b>	<b>9260</b>

Sixteen “hot spots” are distributed throughout the region (Table 16, Appendix 1). These sites are characterized by diverse and/or abundant species. Examples include the North and South Farallon Islands, Fish Rocks, Fort Ross Reef, Bodega Rock, and Point Reyes Headland. Several hot spots such as the Farallon Islands and Point Reyes Headland fall within the boundaries of MPAs in each of the proposals but some hot spots do not fall within any proposed MPA boundaries such as Fish Rocks, Fort Ross Reef, Bodega Rock, Double Point, or Tomales Point (Bird Rock). Bodega Rock and Tomales Point are examples of sites that are adjacent to harbors which would likely preclude inclusion in an MPA of any category. Fish Rocks and Fort Ross Reef did not fall within MPAs of any category. Double Point was assigned SMCA status by two of the proposals and did not fall within a special closure area. All of the proposals recommended that the Drakes Estero SMCA be given full SMR protection when the mariculture lease/reservation of use with the federal government expires in 2012.

All proposals included South Farallon Islands and North Farallon Islands within SMRs. In the north region, there was consistency in inclusion of Point Arena, some part of the Black Point area, and Bodega Head. The Russian River area was identified in 2 of 3 proposals. Of these locations, pinniped rookeries are mostly within the Black Point area and the Russian River. In the south region there was consistency in the selection of Point Reyes Headland, Limantour Estero, and Fitzgerald Marine Reserve.

In summary, there are several areas of agreement amongst the proposals.

- All proposals protected north and south Farallon Islands and Point Reyes Headland under the LOP SMR for 100% of the pinniped haul out sites and rookeries there. These three sites are the most significant to several marine mammals in the study area, and consequently, a large percentage of marine mammal species and number of animals benefit under the high level of protection (SMR) designation. Protection of these three areas accounts for 36% of the total animals hauling out in the study area and 30% of the total animals breeding in the study area.
- All proposals protected 43-55% of pinnipeds at rookeries in the south region

- All proposals benefited at least one pinniped species at the Stewarts Point-Black Point Area, Limantour Estero, and Fitzgerald Marine Reserve-Pillar Point area.

Areas of divergence include:

- Proposals differed in the amount of coverage of rookeries in the north region with a range of 14-34%. Proposal 4 protected the highest numbers of pinnipeds and with more sites designated as MPAs.
- Special closures varied amongst the proposals with Proposal 1-3 presenting 5 special closure areas that benefited marine mammals and Proposals 2XA and PA presenting three.
- Foraging areas for harbor seals varied widely amongst the proposals with Proposals 4 and 2XA accounting for the largest areas and Proposal PA the smallest.

Other important points include:

- None of the proposals submitted a SMR or SMCA at the location of a small Steller sea lion rookery north of Fort Ross.
- None of the proposals submitted a SMR at Double Point, one of the largest harbor seal rookeries in the state. Proposals 1-3 and 4 proposed a SMCA at the site.
- The proposals provided little protection (7-14%) to the haul out sites in the north region. Harbor seals account for the majority (around 70%) of the pinniped haul out sites in the subregion, and Steller sea lions occur at three sites.
- Three of the proposals provided LOP SMR or SMCA to the Russian River area, but the Proposal PA did not include this area at any LOP.

The change in protection from Proposal 0 (no action) to the preferred alternative (PA) proposal is an overall increase from < 1% to 43% for pinniped haul out sites and an increase from 0 to 40% for rookeries. By subregion, Proposal PA protected pinnipeds at haul out sites and rookeries 100% at the Farallon islands, 8-14% of the north region and 43-51% of the south region.

## **PROPOSAL 0**

The total number of marine mammals at rookeries within existing SMRs is 0 (0% for the entire study area) and at haul out sites is 17 (0.02% for the entire study area), and is broken down by species in Tables 3 and 4. Only a small haul out site of harbor seals is protected in the north subregion.

Existing SMRs in the north subregion include 0% of the pinniped rookeries, and 0.2% of all haul out sites in that subregion. There are no existing SMRs in the south subregion protecting either rookeries or haul out sites. There are no existing SMRs on the Farallon Islands subregion for pinniped rookeries or haul out areas.

There is only one special closure area identified under the existing conditions that include marine mammal sites, located on South Farallon Islands (Table 15).

No foraging areas for harbor seals are protected within the existing conditions (Table 17).

## **PROPOSAL 1-3**

The total number of marine mammals at rookeries within all proposed SMRs is 4,404 (47.38% for the entire study area) and at haul out sites is 8198 (45.8% for the entire study area), and is broken down by species in Tables 5 and 6. Nearly half of the breeding animals are elephant seals at the Farallon Islands

and Point Reyes Headland (@2,100), and the other half is made up of mostly harbor seals distributed throughout the regions.

Proposed SMRs in the north subregion include 34% of the pinniped rookeries, and 11% of all haul out sites in that subregion. The proposed SMRs in the south subregion include 48% of the pinniped rookery numbers, and 55% of the haul out numbers for the south subregion. Proposed SMRs in the Farallon Islands subregion include 100% of the pinniped rookery and haul out numbers in that subregion.

Four of the five special closures sites identified in this proposal include marine mammal sites, none of which occur in the north region (Table 15). All of the special closures except Pescadero are identified as a “hot spot” for pinnipeds. The Farallon Islands and Point Reyes Headlands are significant hot spots with large and diverse pinniped colonies. California sea lions haul out intermittently at Stormy Stack, but the main harbor seal colony near Stormy Stack at Double Point does not fall within this special closure. Proposal 1-3 includes a total of 9 marine mammal “hot spots” of which 7 are within the boundaries of proposed SMRs, such as north and south Farallon Islands, Black Point Area, Russian River, Point Reyes Headland Reserve, Limantour Estero, and Fitzgerald Marine Reserve (Table 16).

The foraging areas for harbor seals within the proposal are largest around the Point Reyes Headland, followed by Fitzgerald Marine Reserve (Table 17). Despite the large number of SMRs, the harbor seal populations within each are mostly small.

## **PROPOSAL 2XA**

The total number of marine mammals at rookeries within all proposed SMRs is 3,677 (39.55% of the entire study area) and at haul out sites is 7,700 (43.05% of the entire study area), and is broken down by species (Tables 7 and 8). More than half of the breeding animals are elephant seals at the Farallon Islands and Point Reyes Headland (@2,100), and the other half are made up of mostly harbor seals distributed throughout the region.

Proposed SMRs in the north subregion include 14% of the pinniped rookeries, and 7% of all haul out sites in that subregion. The proposed SMRs in the south subregion include 43% of the pinniped rookery numbers, and 52% of the haul out numbers for the south subregion. Proposed SMRs in the Farallon Islands subregion include 100% of the pinniped rookery and haul out numbers in that subregion.

Three of the five special closures sites identified in this proposal include marine mammal sites, none of which occur in the north region (Table 15). All of these special closures are identified as “hot spot” for pinnipeds. The Farallon Islands and Point Reyes Headlands are significant hot spots with large and diverse pinniped colonies. California sea lions haul out intermittently at Stormy Stack, but the main harbor seal colony near Stormy Stack at Double Point does not fall within this special closure. Proposal 2XA includes a total of 8 marine mammal “hot spots” of which 6 are within the boundaries of proposed SMRs, such as north and south Farallon Islands, Black Point Area, Point Reyes Headland Reserve, Limantour Estero, and Montara (Table 16).

The foraging areas for harbor seals within the proposal are largest around the Point Reyes Headland, followed by Black Point Area (Table 17). Despite the large number of SMRs, the harbor seal populations within each are small for the most part.

## **PROPOSAL 4**

The total number of marine mammals at rookeries within all proposed SMRs is 4312 (46.4% of pinnipeds in the study area) and at haul out sites is 8312 (46.5% of pinnipeds in the study area), and is broken down by species (Tables 9 and 10). Nearly half of the breeding animals are elephant seals at the Farallon Islands and Point Reyes Headland (@2,100), and the other half is made up of mostly harbor seals distributed throughout the region.

Proposed SMRs in the north subregion include 29% of the pinniped rookeries, and 14% of all haul out sites in that subregion. The proposed SMRs in the south subregion include 48% of the pinniped rookery numbers, and 54% of the haul out numbers for the south subregion. Proposed SMRs in the Farallon Islands subregion include 100% of the pinniped rookery and haul out numbers in that subregion.

Three of the seven special closure areas identified in this proposal include marine mammal sites. None of these occur in the north region (Table 15). All three of these special closures are identified as “hot spots” for pinnipeds. The Farallon Islands and Point Reyes Headlands are significant hot spots with large and diverse pinniped colonies. California sea lions haul out intermittently at Stormy Stack, but the main harbor seal colony near Stormy Stack at Double Point does not fall within this special closure. Proposal 4 includes a total of 9 marine mammal “hot spots” of which 7 are within the boundaries of proposed SMRs, such as north and south Farallon Islands, Black Point Area, Russian River, Point Reyes Headland Reserve, Limantour Estero, and Fitzgerald Marine Reserve (Table 16).

The foraging areas for harbor seals within the proposal are largest around the Point Reyes Headland, followed by Fitzgerald Marine Reserve (Table 17). Despite the large number of SMRs, the harbor seal populations within each are small.

## **PROPOSAL INTERGRATED PREFERRED ALTERNATIVE (IPA)**

The total number of marine mammals at rookeries within all proposed SMRs is 3,684 (39.6% of the entire study area) and at haul out sites is 7,690 (43% of the entire study area), and is broken down by species (Tables 11 and 12). More than half of the breeding animals are elephant seals at the Farallon Islands and Point Reyes Headland (@2,100), and the other half are made up of mostly harbor seals distributed throughout the region.

Proposed SMRs in the north subregion include 14% of the pinniped rookeries, and 7% of all haul out sites in that subregion. The proposed SMRs in the south subregion include 43% of the pinniped rookery numbers, and 52% of the haul out numbers for the south subregion. Proposed SMRs in the Farallon Islands subregion include 100% of the pinniped rookery and haul out numbers in that subregion.

Three of the 5 special closures sites identified in this proposal include marine mammal sites Table 15. All of these special closures are identified as “hot spot” for pinnipeds. The Farallon Islands and Point Reyes Headlands are significant hot spots with large and diverse pinniped colonies. California sea lions haul out intermittently at Stormy Stack, but the main harbor seal colony near Stormy Stack at Double Point does not fall within this special closure. Proposal PA includes a total of 6 of the 16 (38%) marine mammal “hot spots” in the study region, of which 5 are within the boundaries of proposed SMRs. The SMRs include north and south Farallon Islands, Point Reyes Headland Reserve, Limantour Estero, and Montara (Table 16).

The foraging area for harbor seals within the proposal is the smallest compared to the other three proposals, and the largest area is around the Point Reyes Headland, followed by Montara (Table 17). Despite the large number of SMRs, the harbor seal numbers within each are small for the most part.

**Table 3a.** Proposal 0 (Existing MPAs) - Marine mammal **haul out sites** within state marine reserves (SMR) and state marine conservation areas (SMCA)

	MPA Type	# Species	# Cal. sea lions	% Cal sea lions	# Steller sea lion	% Steller sea lion	# Elephant seals	% Elephant seals	# Harbor seal	% Harbor seals	Total # for subregion	Total % for subregion
<b>North subregion</b>												
Manchester Area	SMCA	1	0	0.0%	0	0.0%	0		10	0.2%	10	0.1%
Salt Point	SMCA	1	0	0.0%	0	0.0%	0		136	2.8%	136	1.9%
Fort Ross	SMCA	1	0	0.0%	0	0.0%	0		13	0.3%	13	0.2%
Bodega	SMR	1	0	0.0%	0	0.0%	0		17	0.4%	17	0.2%
Sonoma Coast	SMCA	1	0	0.0%	0	0.0%	0		17	0.4%	17	0.2%
<b>South subregion</b>												
Point Reyes Head	SMCA	4	763	71.0%	20	55.6%	2000	100.0%	400	9.2%	3183	42.8%
Limantour Estero	SMCA	1	0		0		0		509	11.8%	509	6.8%
Duxbury Reef	SMCA	1	0	0.0%	0	0.0%	0	0.0%	218	5.0%	218	2.9%
James V. Fitzgerald	SMP	3	86	8.0%	12	33.3%	0		233	5.4%	331	4.4%

**Table 3b.** Proposal 0 (Existing MPAs) - Subregional summary of marine mammal **haul outs** within state marine reserves (SMR)

Subregion	MPA Type	#Species	# Cal sea lion	% Ca sea lion	# Steller sea lion	% Steller sea lion	# Elephant seal	% Elephant seal	# Harbor seal	% Harbor seal	Total # sub region	Total % subregion
NCCSR North	SMR	1	0	0%	0	0%			17	0.4%	17	0.2%

**Table 4a.** Proposal 0 (Existing MPAs) - marine mammal **rookery sites** within state marine reserves (SMR) and state marine conservation areas (SMCA)

	<b>MPA Type</b>	<b># Harbor seal</b>	<b>% Harbor seals</b>	<b># Steller sea lion</b>	<b>% Steller sea lion</b>	<b># Elephant seals</b>	<b>% Elephant seals</b>	<b># Fur seals</b>	<b>% Fur seals</b>	<b>Total # for subregion</b>	<b>Total % for subregion</b>
<b>North sub region</b>											
Salt Point	SMCA	63	2.9%	0	0.0%					63	2.8%
<b>South sub region</b>											
Estero de Limantour	SMCA	509	23.2%	0	0.0%					509	7.8%
Point Reyes Head	SMCA	295	13.4%	0	0.0%			2000	100.0%	2295	35.2%
Fitzgerald Marine Res	SMP	299	13.6%	0	0.0%					299	4.6%

**Table 5a.** Proposal 1-3 marine mammal haul out sites within state marine reserves (SMR) and state marine conservation areas (SMCA)

Farallon Islands subregion	MPA Type	# Species	# Cal. sea lions	% Cal sea lions	# Steller sea lion	% Steller sea lion	# Elephant seals	% Elephant seals	# Harbor seal	% Harbor seals	Total # for subregion	Total % for subregion
South East Farallon Islands SMR	SMR	4	2000	100%	200	100%	1000	100%	90	100%	3290	100%
North Farallon Islands SMR	SMR	2			29	100%	0		0			100%
<b>North subregion</b>												
Point Arena SMR	SMR	1	0	0.0%	0	0.0%	0		130	2.6%	130	1.8%
Saunders Reef SMCA	SMCA	1	0	0.0%	0	0.0%	0		22	0.4%	22	0.3%
Rocky Point to Horseshoe Pt SMR	SMR	2	0	0.0%	2	1.6%	0		274	5.6%	276	3.8%
Russian River SMR	SMR	2	4	0.2%	0	0.0%	0		353	7.2%	357	5%
Bodega Head SMR	SMR	1	0	0.0%	0	0.0%	0		17	0.3%	17	0.2%
Bodega Head SMCA	SMCA	1	0	0.0%	0	0.0%	0		11	0.2%	11	0.1%
<b>South subregion</b>												
Drakes Estero SMCA	SMCA	1	0		0		0		743	17%	743	10%
Drakes Estero SMR	SMR	1	0		0		0		509	12%	509	7%
Point Reyes SMR	SMR	4	763	71%	20	56%	2000	100%	400	9%	3183	43%
Double Point SMCA	SMCA	2	100	9.3%	0	0%	0	0%	924	21%	1024	14%
Duxbury Reef SMCA	SMCA	1	0	0.0%	0	0%	0	0%	218	5%	218	3%
Montara SMCA	SMCA	1	0	0%	0	0%	0	0%	26	0.6%	26	0.3%
Fitzgerald SMR	SMR	3	86	8.0%	12	33%	0	0%	338	8%	436	6%

**Table 5b.** Proposal 1-3 Subregional summary of marine mammal haul outs within state marine reserves (SMR)

Subregion	MPA Type	#Species	# Cal sea lion	% Ca sea lion	# Steller sea lion	% Steller sea lion	# Elephant seal	% Elephant seal	# Harbor seal	% Harbor seal	Total # sub region	Total % subregion
NCCSR Farallon Islands	SMR	4	2000	100%	200	100%	1000	100%	90	100%	3290	100%
NCCSR North	SMR	3	4	0.2%	2	1.6%			774	15.9%	780	10.9%
NCCSR South	SMR	4	849	79%	32	88.8%	2000	100%	1247	28.8%	4128	55.4%

**Table 6a.** Proposal 1-3 marine mammal **rookery sites** within state marine reserves (SMR) and state marine conservation areas (SMCA)

<b>Farallon Islands sub region</b>	<b>MPA Type</b>	<b># Harbor seal</b>	<b>% Harbor seals</b>	<b># Steller sea lion</b>	<b>% Steller sea lion</b>	<b># Elephant seals</b>	<b>% Elephant seals</b>	<b># Fur seals</b>	<b>% Fur seals</b>	<b>Total # for subregion</b>	<b>Total % for subregion</b>
North Farallon Islands SMR	SMR	0	0.0%	29	11.9%	0	0%	0	0.0%	29	5.4%
South East Farallon Islands SMR	SMR	90	100%	215	88.1%	100	100%	100	100%	505	95%
<b>North sub region</b>											
Rocky Point to Horseshoe Point SMR	SMR	319	14.5%	0	0%					319	14.3%
Russian River SMR	SMR	318	14.5%	0	0%					318	14.2%
Saunders Reef SMCA	SMCA	0	0%	0						0	0%
<b>South sub region</b>											
Double Point SMCA	SMCA	924	20.4%	0						924	14%
Drakes Estero SMCA	SMCA	743	16.4%	0						743	11.4%
Drakes Estero SMR	SMR	509	11.2%	0						509	7.8%
Fitzgerald SMR	SMR	299	6.6%	0	0%					299	4.6%
Point Reyes SMR	SMR	295	6.5%	0	0%	2000	100%			2295	35%

**Table 6b.** Proposal 1-3 subregional summary of marine mammal **rookeries** within state marine reserves (SMR)

<b>Subregion</b>	<b>MPA Type</b>	<b># Harbor seals</b>	<b>% Harbor seals</b>	<b># Steller sea lion</b>	<b>% Steller sea lion</b>	<b># Fur seal</b>	<b>% Fur seal</b>	<b># Elephant seal</b>	<b>% Elephant seal</b>	<b>Total # subregion</b>	<b>Total % subregion</b>
NCCSR Farallon Islands	SMR	90	100%	244	100%	100	100%	100	100%	534	100%
NCCSR North	SMR	767	35%	0	0%					767	34%
NCCSR South	SMR	1103	24%	0	0%			2000	100%	3103	48%

**Table 7a.** Proposal 2-XA marine mammal haul out sites within state marine reserves (SMR) and state marine conservation areas (SMCA)

Farallon subregion	MPA type	# Species	# Cal. sea lion	% Cal. sea lion	# Steller sea lion	% Steller sea lion	# Elephant seals	% Elephant seals	# Harbor seal	% Harbor seals	Total # for subregion	Total % for subregion
SE Farallon SMR	SMR	4	2000	100.0%	200	100.0%	1000	100%	90	100%	3290	100%
<b>North subregion</b>												
Pt Arena SMR	SMR	1	0	0%	0	0%	0		130	2.7%	130	1.8%
Black Point SMR	SMR	1	0	0%	0	0%	0		375	8%	375	5%
Russian River SMCA	SMCA	2	4	0.2%	0	0%	0		353	7.3%	357	5%
Bodega Head SMR	SMR	1	0	0%	0	0%	0		17	0.4%	17	0.2%
Bodega Head SMCA	SMCA	1	0	0%	0	0%	0		11	0.2%	11	0.2%
<b>South subregion</b>												
Pt Reyes Headland SMR	SMR	4	763	71%	20	56%	2000	100%	400	38%	4435	59.6%
Drakes Estero SMCA	SMCA	1	0		0		0		743	17%	743	11%
Estero de Limantour SMR	SMR	1	0		0		0		509	11%	509	7%
Montara SMR	SMR	3	14	1.3%	11	31%	0	0%	171	4%	196	2.6%
Pillar Point SMCA	SMCA	3	72	7%	1	2.8%	0	0%	167	4%	240	3.2%

**Table 7b.** Proposal 2-XA subregional summary of marine mammal haul outs within state marine reserves (SMR)

Subregion	MPA type	# Species	# Cal sea lion	% Ca sea lion	# Steller sea lion	% Steller sea lion	# Elephant seal	% Elephant seal	# Harbor seal	% Harbor seal	Total # sub region	Total % sub region
NCCSR Farallon Is	SMR	4	2000	100%	200	100%	1000	100%	90	100%	3290	100%
NCCSR North	SMR	1	0	0%	0	0%	0		522	11%	522	7%
NCCSR South	SMR	4	777	72%	31	86%	2000	100%	1080	25%	3888	52%

**Table 8a.** Proposal 2-XA marine mammal **rookery sites** within state marine reserves (SMR) and state marine conservation areas (SMCA)

		#		#	%	#	%	#	%	Total #	Total %
<b>Farallon Islands sub region</b>	<b>MPA Type</b>	<b>Harbor seal</b>	<b>Harbor seals</b>	<b>Steller sea lion</b>	<b>Steller sea lion</b>	<b>Elephant seals</b>	<b>Elephant seals</b>	<b>Fur seals</b>	<b>% Fur seals</b>	<b>for subregion</b>	<b>for subregion</b>
North Farallon SMR	SMR	0	0%	29	11.9%	0	0%	0	0%	29	5.4%
SE Farallon SMR	SMR	90	100%	215	88.1%	100	100%	100	100%	505	95%
<b>North sub region</b>											
Black Point SMR	SMR	312	14.4%	0	0.0%					312	14%
Russian River SMCA	SMCA	318	14.5%	0	0.0%					318	14%
<b>South sub region</b>											
Estero de Limantour SMR	SMR	509	11%	0						509	7.8%
Drakes Estero SMCA	SMCA	743	16.4%	0						743	11.4%
Pt Reyes Headlands SMR	SMR	295	6.5%	0		2000	100%			2295	35%
Montara SMR	SMR	27	0.6%	0						27	0.4%
Pillar Point SMCA	SMCA	143	3.2%	0						143	2.2%

**Table 8b.** Proposal 2XA subregional summary of marine mammal **rookeries** within state marine reserves (SMR)

		#	%	#	%	#	%	#	%	Total #	Total %
<b>Subregion</b>	<b>MPA Type</b>	<b>Harbor seals</b>	<b>Harbor seals</b>	<b>Steller sea lion</b>	<b>Steller sea lion</b>	<b># Fur seal</b>	<b>% Fur seal</b>	<b>Elephant seal</b>	<b>Elephant seal</b>	<b>sub region</b>	<b>subregion</b>
NCCSR Farallon Islands	SMR	90	100.0%	244	100%	100	100%	100	100%	534	100%
NCCSR North	SMR	312	14.2%	0	0%	0		0		312	14%
NCCSR South	SMR	831	18.4%	0		0		2000	100%	2831	43.4%

**Table 9a.** Proposal 4 marine mammal **haul out sites** within state marine reserves (SMR) and state marine conservation areas (SMCA)

<b>Farallon sub region</b>	<b>MPA Type</b>	<b># Species</b>	<b># Cal. sea lions</b>	<b>% Cal. sea lions</b>	<b># Steller sea lion</b>	<b>% Steller sea lion</b>	<b># Elephant seals</b>	<b>% Elephant seals</b>	<b># Harbor seal</b>	<b>% Harbor seals</b>	<b>Total # for subregion</b>	<b>Total % for subregion</b>
Farallon SMR	SMR	4	2000	100.0%	200	100.0%	1000	100%	90	100%	3290	100%
<b>North sub region</b>												
Point Arena SMR	SMR	1	0	0.0%	0	0.0%			130	2.7%	130	1.8%
Saunders Reef SMCA	SMCA	1	0	0.0%	0	0.0%			22	0.5%	22	0.3%
Del Mar Landing SMR	SMR	1	0	0.0%	0	0.0%			174	3.6%	174	2.4%
Stewarts Point SMR	SMR	2	0	0.0%	2	1.6%			294	6.1%	296	4.1%
Salt Point SMP	SMP	1	0	0.0%	0	0.0%			174	3.6%	174	2.4%
Russian River SMR	SMR	2	4	0.2%	0	0.0%			353	7.3%	357	5.0%
Bodega SMR	SMR	1	0	0.0%	0	0.0%			28	0.6%	28	0.4%
<b>South sub region</b>												
Drakes Estero SMCA	SMCA	1	0		0				743	17.2%	743	11%
Drakes Estero SMR	SMR	1	0	0.0%	0	0.0%			509	11.8%	509	7%
Point Reyes SMR	SMR	4	763	71%	20	56%	2000	100%	400	9.2%	3183	43%
Double Point SMCA	SMCA	2	100	9.3%	0	0.0%			924	21.3%	1024	14%
Duxbury SMCA	SMCA	1	0	0.0%	0	0.0%			25	0.6%	25	0.3%
Agate Beach Intertidal SMCA	SMCA	1	0	0.0%	0	0.0%			193	4.5%	193	2.6%
Devils Slide SMCA	SMCA	1	0	0.0%	0	0.0%			131	3.0%	131	1.8%
Fitzgerald SMR	SMR	3	86	8.0%	12	33%			233	5.4%	331	4.4%
San Gregorio SMR	SMR	2	12	1.1%	0	0.0%			2	0.0%	14	0.2%

**Table 9b.** Proposal 4 subregional summary of marine mammal **haul outs** within state marine reserves (SMR)

<b>Subregion</b>	<b>MPA Type</b>	<b># Species</b>	<b># Cal sea lion</b>	<b>% Cal sea lion</b>	<b># Steller sea lion</b>	<b>% Steller sea lion</b>	<b># Elephant seal</b>	<b>% Elephant seal</b>	<b># Harbor seal</b>	<b>% Harbor seal</b>	<b>Total # sub region</b>	<b>Total % subregion</b>
NCCSR Farallon Islands	SMR	4	2000	100%	200	100%	1000	100%	90	100%	3290	100%
NCCSR North	SMR	3	4	0.18%	2	1.60%	0		979	20.2%	985	14%
NCCSR South	SMR	4	861	80%	32	89%	2000	100%	1144	26.4%	4037	54%

**Table 10a.** Proposal 4 marine mammal **rookery sites** within state marine reserves (SMR) and state marine conservation areas (SMCA)

<b>Farallon subregion</b>	<b>MPA Type</b>	<b># Harbor seal</b>	<b>% Harbor seals</b>	<b># Steller sea lion</b>	<b>% Steller sea lion</b>	<b># Elephant seals</b>	<b>% Elephant seals</b>	<b># Fur seals</b>	<b>% Fur seals</b>	<b>Total # for subregion</b>	<b>Total % for subregion</b>
North Farallon SMR	SMR	0	0.0%	29	11.9%	0	0.0%	0	0.0%	29	5.4%
SE Farallon SMR	SMR	90	100%	215	88.1%	100	100%	100	100%	505	95%
<b>North subregion</b>											
Russian River SMR	SMR	318	15%	0	0.0%					318	14.2%
Salt Point SMP	SMP	136	6.2%	0	0.0%					136	6.1%
Saunders Reef SMCA	SMCA	0	0.0%	0	0.0%					0	0.0%
Stewarts Point SMR	SMR	319	15%	0	0.0%					319	14.3%
<b>South subregion</b>											
Drakes Estero SMCA	SMCA	743	16.4%	0						743	11.4%
Drakes Estero SMR	SMR	509	11.2%	0						509	8%
Point Reyes SMR	SMR	295	6.5%	0				2000	100%	2295	35.2%
Double Point SMCA	SMCA	924	20.4%	0					0.0%	924	14.2%
Fitzgerald SMR	SMR	337	7.4%	0					0.0%	337	5.2%

**Table 10b.** Proposal 4 subregional summary of marine mammal **rookeries** within state marine reserves (SMR)

<b>Subregion</b>	<b>MPA Type</b>	<b># Harbor seals</b>	<b>% Harbor seals</b>	<b># Steller sea lion</b>	<b>% Steller sea lion</b>	<b># Fur seal</b>	<b>% Fur seal</b>	<b># Elephant seal</b>	<b>% Elephant seal</b>	<b>Total # sub region</b>	<b>Total % subregion</b>
NCCSR Farallon Islands	SMR	90	100%	244	100.0%	100	100%	100	100%	534	100.0%
NCCSR North	SMR	637	29%	0	0.0%					637	29%
NCCSR South	SMR	1141	25%	0	0%			2000	100.0%	3141	48%

**Table 11a.** Integrated Preferred Alternative (IPA) Proposal - marine mammal **haul out sites** within state marine reserves (SMR) and state marine conservation areas (SMCA)

	MPA type	# Species	# Cal. sea lion	% Cal. sea lion	# Steller sea lion	% Steller sea lion	# Elephant seals	% Elephant seals	# Harbor seal	% Harbor seals	Total # for subregion	Total % for subregion
Farallon subregion												
SE Farallon SMR	SMR	4	2000	100.0%	200	100.0%	1000	100%	90	100%	3290	100%
<b>North subregion</b>												
Point Arena SMR	SMR	1	0	0.0%	0	0.0%	0		130	2.7%	130	1.8%
Saunders SMCA	SMCA	1	0	0.0%	0	0.0%	0		22	0.5%	22	0.3%
Del Mar Land SMR	SMR	1	0	0.0%	0	0.0%	0		174	3.6%	174	2.4%
Stewarts Point SMR	SMR	2	0	0.0%	2	1.6%	0		294	6.1%	296	4.1%
Salt Point SMP	SMP	1	0	0.0%	0	0.0%	0		174	3.6%	174	2.4%
Russian River SMCA	SMCA	2	4	0.2%	0	0.0%	0		353	7.3%	357	5.0%
Bodega Head SMR	SMR	1	0	0.0%	0	0.0%	0		17	0.4%	17	0.2%
Bodega Head SMCA	SMCA	1	0	0.0%	0	0.0%	0		11	0.2%	11	0.2%
<b>South subregion</b>												
Point Reyes SMR	SMR	4	763	71.0%	20	55.6%	2000	100.0%	409	38.2%	3192	42.9%
Estero Limantour SMR	SMR	1	0	0.0%	0	0.0%	0	0.0%	509	11.8%	509	6.8%
Drakes Estero SMCA	SMCA	1	0	0.0%	0	0.0%	0	0.0%	743	17.2%	743	10.0%
Montara SMR	SMR	3	14	1.3%	11	30.6%	0	0.0%	66	1.5%	91	1.2%
Pillar Point SMCA	SMCA	3	72	6.7%	1	2.8%	0	0.0%	167	3.9%	240	3.2%

**Table 11b.** Integrated Preferred Alternative (IPA) Proposal - subregional summary of marine mammal **haul outs** within state marine reserves (SMR)

Subregion	MPA type	# Species	# Cal sea lion	% Ca sea lion	# Steller sea lion	% Steller sea lion	# Elephant seal	% Elephant seal	# Harbor seal	% Harbor seal	Total # sub region	Total % sub region
NCCSR Farallon Is	SMR	4	2000	100%	200	100%	1000	100%	90	100%	3290	100%
NCCSR North	SMR	3	4	0.2%	2	1.6%			615	12.7%	621	9%
NCCSR South	SMR	4	777	72%	31	86%	2000	100%	975	23%	3783	51%

**Table 12a.** Integrated Preferred Alternative (IPA) Proposal - marine mammal **rookery sites** within state marine reserves (SMR) and state marine conservation areas (SMCA)

Farallon sub region	MPA Type	# Harbor seal	% Harbor seals	# Steller sea lion	% Steller sea lion	# Elephant seals	% Elephant seals	# Fur seals	% Fur seals	Total # for subregion	Total % for subregion
North Farallon SMR	SMR	0	0.0%	29	11.9%	0	0.0%	0	0.0%	29	5.4%
SE Farallon SMR	SMR	90	100%	215	88.1%	100	100%	100	100%	505	95%
<b>North subregion</b>											
Russian River SMCA	SMCA	318	14.5%	0	0.0%			0		318	14.2%
Salt Point SMP	SMP	136	6.2%	0	0.0%			0		136	6.1%
Saunders Reef SMCA	SMCA	0	0.0%	0	0.0%			0		0	0.0%
Stewarts Point SMR	SMR	319	14.5%	0	0.0%			0		319	14.3%
<b>South subregion</b>											
Drakes Estero SMCA	SMCA	743	16.4%							743	11.4%
Estero Limantour SMR	SMR	509	11.2%					0	0.0%	509	7.8%
Point Reyes SMR	SMR	295	6.5%					2000	100%	2295	35.2%
Montara SMR	SMR	27	0.6%					0	0.0%	27	0.4%
Drakes Estero SMCA	SMCA	743	16.4%							743	11.4%

**Table 12b.** Integrated Preferred Alternative (IPA) Proposal - subregional summary of marine mammal **rookeries** within state marine reserves (SMR)

Subregion	MPA Type	# Harbor seals	% Harbor seals	# Steller sea lion	% Steller sea lion	# Fur seal	% Fur seal	# Elephant seal	% Elephant seal	Total # sub region	Total % subregion
NCCSR Farallon Islands	SMR	90	100%	244	100.0%	100	100%	100	100%	534	100.0%
NCCSR North	SMR	319	14.5%	0	0.0%					319	14.3%
NCCSR South	SMR	831	18.4%	0	0%			2000	100%	2831	43.4%

**Table 13.** Comparison between proposals of numbers and percentages of pinnipeds **breeding** within proposed MPAs with the highest level of protection (SMR) in each subregion, North Central Coast Study Region. A harsh mark (-) means that the species does not breed in the region.<sup>1</sup>

Name	No. Species	Total Pinnipeds	Total Pinn Pct	Harbor Seal	Harbor Seal Pct	Steller Sea Lion	Steller Sea Lion Pct	Fur Seal	Fur Seal Pct	Elephant Seal	Elephant Seal Pct
<b>North subregion</b>											
Proposal 0	1	17	0.2%	17	0.4%	0	0%	-	-	-	-
Proposal 1-3	1	767	34%	767	35%	0	0%	-	-	-	-
Proposal 2XA	1	312	14%	312	14%	0	0%	-	-	-	-
Proposal 4	1	637	29%	637	29%	0	0%	-	-	-	-
Proposal PA	1	319	14%	319	15%	0	0%	-	-	-	-
<b>South subregion</b>											
Proposal 0	0	0	0%	0	0%	-	-	-	-	0	0%
Proposal 1-3	2	3103	48%	1103	24%	-	-	-	-	2000	100%
Proposal 2XA	2	2831	43%	831	18%	-	-	-	-	2000	100%
Proposal 4	2	3141	48%	1141	25%	-	-	-	-	2000	100%
Proposal PA	2	2831	43%	831	18%	-	-	-	-	2000	100%
<b>Farallon subregion</b>											
Proposal 0	0	0	0%	0	0%	0	0%	0	0%	0	0%
Proposal 1-3	4	534	100%	90	100%	244	100%	100	100%	100	100%
Proposal 2XA	4	534	100%	90	100%	244	100%	100	100%	100	100%
Proposal 4	4	534	100%	90	100%	244	100%	100	100%	100	100%
Proposal PA	4	534	100%	90	100%	244	100%	100	100%	100	100%

**Table 14.** Comparison between proposals of numbers and percentages of pinnipeds at **haul out sites** within proposed MPAs with the highest level of protection (SMR) in each subregion, North Central Coast Study Region. A harsh mark (-) means that the species does not haul out in the region.<sup>1</sup> Fur seals are not included because they are mostly at sea during the non-breeding season.

Name	No. Species	Total Pinnipeds	Total Pinn Pct	California Sea Lion	California Sea Lion Pct	Steller Sea Lion	Steller Sea Lion Pct	Elephant Seal	Elephant Seal Pct	Harbor Seal	Harbor Seal Pct
<b>North subregion</b>											
Proposal 0	1	17	0.2%	0	0%	0	0%	-	-	17	0.4%
Proposal 1-3	3	780	11%	4	1%	2	2%	-	-	774	16%
Proposal 2-XA	1	522	7%	0	0%	0	0%	-	-	522	11%
Proposal 4	3	985	14%	4	1%	2	2%	-	-	979	20%
Proposal PA	2	617	9%	0	0%	2	2%	-	-	615	13%
<b>South subregion</b>											
Proposal 0	0	0	0%	0	0%	0	0%	0	0%	0	0%
Proposal 1-3	4	4128	55%	849	79%	32	89%	2000	100%	1247	29%
Proposal 2-XA	4	3888	52%	777	72%	31	86%	2000	100%	1080	25%
Proposal 4	4	4037	54%	861	81%	32	89%	2000	100%	1144	26%
Proposal PA	4	3783	51%	777	72%	31	86%	2000	100%	975	23%
<b>Farallon subregion</b>											
Proposal 0		0	0%	0	0%	0	0%	0	0%	0	0%
Proposal 1-3	4	3290	100%	2000	100%	200	100%	1000	100%	90	100%
Proposal 2-XA	4	3290	100%	2000	100%	200	100%	1000	100%	90	100%
Proposal 4	4	3290	100%	2000	100%	200	100%	1000	100%	90	100%
Proposal PA	4	3290	100%	2000	100%	200	100%	1000	100%	90	100%

**Table 15.** Special closure areas that include marine mammal haul out or rookery sites.

<b>Special Closure location</b>	<b>Proposal 0</b>	<b>Proposal 1-3</b>	<b>Proposal 2XA</b>	<b>Proposal 4</b>	<b>Preferred Alternative Proposal</b>
<b>North subregion</b>					
<b>South subregion</b>					
Point Reyes		1000 ft 4 species	1000 ft 4 species	1000 ft 4 species	1000 ft 4 species
Pescadero		300 ft 1 species			
<b>Farallon Islands subregion</b>					
North Farallon Islands		300 & 1000 ft 2 species	300 ft 2 species	300 & 1000 ft 2 species	300 ft 2 species
South Farallon Islands	300 ft 5 species	300 ft 5 species	300 ft 5 species	300 ft 5 species	300 ft 5 species

**Table 16.** Hot spots for pinnipeds in the North Central Coast Study Region included within the boundaries of MPA proposals.

<b>Hot Spot</b>	<b>Proposal 0</b>	<b>Proposal 1-3</b>	<b>Proposal 2XA</b>	<b>Proposal 4</b>	<b>Preferred Alternative Proposal</b>
<b>North subregion</b>					
Fish Rocks					
Black Point Area		SMR	SMR	SMR	
Fort Ross Reef/Rocks					
Russian Gulch					
Russian River		SMR	SMRMA	SMR	
Bodega Rock					
Tomales Bay – Clam Island					
Tomales Point-Bird Rock					
<b>South subregion</b>					
Point Reyes	SMCA	SMR	SMR	SMR	SMR
Drakes Bay		SMCA	SMCA	SMCA	SMCA
Limantour Estero	SMCA	SMR	SMR	SMR	SMR
Double Point		SMCA		SMCA	
Bolinas Lagoon					
Fitzgerald Marine Reserve	SMP	SMR	SMR	SMR	SMR
Cowell Ranch – Miramonte Pt					
<b>Farallon Islands subregion</b>					
North Farallon Islands		SMR	SMR	SMR	SMR
South Farallon Islands	SMR				SMR

**Table 17.** Proposals weighted contributions to foraging areas for harbor seals within each proposed SMR. MPAs not shown did not contribute to foraging area.

MPA Name	Harbor Seal
<b>Proposal 0 – no action</b>	
Bodega Head SMR	0.1
<b>Proposal 1-3</b>	
Point Arena SMR	0.1
Rocky Point to Horseshoe Point SMR	1.3
Russian River SMR	0.1
Bodega Head SMR	0.1
Limantour Estero SMR	0.8
Point Reyes SMR	13.7
Fitzgerald SMR	4.8
<b>Proposal 2-XA</b>	
Pt Arena SMR	0.1
Black Point SMR	8.2
Bodega Head SMR	0.1
Estero de Limantour SMR	0.6
Montara SMR	2.1
Pt Reyes Headlands SMR	13.6
<b>Proposal 4</b>	
Point Arena SMR	0.1
Stewarts Point SMR	2.4
Del Mar Landing SMR	0.1
Russian River SMR	0.1
Bodega SMR	0.1
Drakes Estero SMR	0.8
Point Reyes SMR	13.7
Fitzgerald SMR	4.8
<b>Proposal PA (Preferred Alternative)</b>	
Del Mar SMR	0.1
Stewarts Point SMR	0.9
Bodega Head SMR	0.1
Estero de Limantour SMR	0.4
Montara SMR	1.0
Pt Reyes Headlands SMR	4.5

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**Appendix 1.** List of “hot spots” for marine mammals in the north central California region. Hot spot designation is based on species diversity and/or abundance of a species at a specific location.

<b>Hot Spot</b>	<b>SubRegion</b>
North Farallon	Farallon Islands
South Farallon	Farallon Islands
Cowell Ranch	South
Fitzgerald Marine Reserve	South
Bolinas Lagoon	South
Double Point	South
Drakes Bay	South
Point Reyes Headland	South
Tomales Point/Bird Rock	North
Bodega Rock	North
Tomales Bay-Clam/Seal Is	North
Russian River	North
Russian Gulch	North
Fort Ross Reef/Rocks	North
Black Point Area	North
Fish Rocks	North

**Appendix 2.** Known important prey items of harbor seal in California.

**Fish**

Rockfish *Sebastes* spp.

Pacific sandlance *Ammodytes hexapterus*

Plainfin midshipman *Porichthys notatus*

Speckled sanddab *Citharichthys stigmaeus*

Northern anchovy *Engraulis mordax*

Pacific herring *Clupea pallasii*

Jack smelt *Atherinopsis californiensis*

Pacific staghorn sculpin *Leptocottus armatus*

Sculpin spp. (Cottidae)

Pacific tomcod *Microgadus proximus*

Pacific hake *Merluccius productus*

Shiner perch *Cymatogaster aggregata*

Spotted cusk-eel *Chilara taylori*

*Pleuronectid* spp. (Flatfish)

Salmon spp.

Lamprey *Lampetra tridentata*

Hagfish *Myxine glutinosa*

**Invertebrates**

Mysid shrimp *Spirontocaris* sp.

Market squid *Loligo opalescens*

Octopus spp. nearshore