California MLPA Master Plan Science Advisory Team Evaluations of Benefits to Marine Birds from Proposed Marine Protected Areas and Special Closures in the South Coast Study Region

Approved June 18, 2009

Overview

In this document, proposed marine protected areas (MPAs) for the MLPA South Coast Study Region (SCSR) are evaluated for their potential benefits to marine birds. Evaluations follow the methods described in "Methods Used to Evaluate Draft MPA Proposals in the South Coast Study Region." Evaluations are subdivided by bioregions (North Mainland, South Mainland, East Channel Islands, Mid Channel Islands, West Channel Islands).

Eighteen species of seabirds breed within the study region, and over forty species use the region during the winter or as migrants. In addition, the Black Oystercatcher, while technically a shorebird, is often lumped with the seabirds because of its strictly coastal distribution and association with seabird breeding colonies. As upper trophic level predators, seabirds are important components of marine ecosystems. Seabird diets vary, but generally include various juvenile fish and invertebrates that are locally abundant. Seabirds have been recognized as an efficient monitoring tool for ocean conditions and, in some cases, for predicting stocks of important fisheries (e.g., Ainley and Boekelheide 1990, Cairns 1992, Sydeman et al. 2001, Mills et al. 2007, Roth et al. 2007). Ecologies of the different species of seabirds vary. For example, some species forage primarily at the ocean surface, while most species dive to various depths. Many species such as albatrosses, shearwaters, and petrels only come to land to breed, and spend the remainder of their lives at sea. Many other species, such as most pelicans, cormorants, and gulls, come to shore on a daily basis to rest, preen, or bathe. For pelicans and cormorants, trips ashore are essential for survival because their wettable plumage must be dried to avoid hypothermia. For most species, preferred breeding habitats are on offshore rocks, islands, or mainland cliffs free of mammalian predators.

Over 25 species of waterfowl (geese, ducks, loons, and grebes), six species of marsh birds (herons and egrets), and over 25 species of shorebirds (plovers, sandpipers, etc.) occur in the south coast study region. Most species occur as migrants or overwinter in the region. Nearshore outer coast waters or estuaries are the principal habitats of these birds. Loons, grebes and some of the "diving ducks" (e.g., scoters, scaup, bufflehead, mergansers) mainly dive for small fish. Many of the diving ducks prey on shellfish, worms and other benthic prey. Most shorebirds forage on intertidal mudflats where they prey on small shellfish, worms, and other benthic invertebrates. A few species, including the Black Turnstone, Ruddy Turnstone, Surfbird, Black Oystercatcher, and Wandering Tattler are primarily rocky intertidal species, while the Snowy Plover occurs on sandy beaches. The coastal estuaries and beaches of the south coast study region are recognized for high diversity and abundance of wintering and migrant shorebirds (Hubbard and Dugan 2003).

Seabirds and other waterbirds may benefit in several ways from marine protected areas in the south coast study region. For example, most species are known to be sensitive to human disturbance to varying degrees (summarized in Carney and Sydeman 1999). Impacts of human disturbance are known to be greatest at breeding sites, where reproduction can be dramatically affected. Because most seabirds are colonial breeders (e.g., nesting in high concentrations), high proportions of populations can be affected by severe or frequent

disturbances. Similarly, seabirds and other waterbirds often concentrate at resting sites ("roosts") and foraging areas where they can be sensitive to disturbance (Jaques et al. 1996, Kuletz 1996, Rodgers and Schwikert 2002, Jaques and Strong 2002, Speckman et al. 2004, Peters and Otis 2006). Because of these sensitivities, many observers have recommended disturbance-free "buffer zones" or other management actions around colonies, roosts, or important foraging areas (Carney and Sydeman 1999, Jaques and Strong 2002, Rodgers and Schwikert 2002, Ronconi and St. Clair 2002).

At breeding colonies, roosts, and foraging areas, impacts to birds tend to be most pronounced when humans enter the immediate area. Responses vary by species and location, but for many species, intrusion results in most if not all birds fleeing from the immediate area. Birds on nests often will flee, leaving the eggs or chicks behind. During that time, nest contents are susceptible to predators such as gulls. While some birds return to nests once an intruder has gone, others tend to abandon nesting efforts. For example, Brandt's Cormorants have been observed to abandon nests en masse from even single events of human intrusion to the colony (McChesney 1997). Many studies have documented reductions in breeding success and colony attendance, as well as colony abandonment, resulting from human intrusion (Carney and Sydeman 1999). Birds disturbed at foraging areas can incur high energetic costs, with high energy utilization spent while fleeing and reduced energy intake because of lost foraging time. Thus, disturbance can lead to low fitness of individual birds, leading to abandonment of popular foraging areas or starvation (Davidson and Rothwell 1993).

Although often not as easily identified, activities such as close approaches to colonies, roosts, and foraging areas or loud noises can evoke responses similar to direct human intrusions. Close approaches can include humans on foot, boats, low-flying aircraft, motor vehicles, surfers, or other sources (Jaques et al. 1996, Carney and Sydeman 1999, Jaques and Strong 2002). Studies of the effects of such disturbances on seabirds and other waterbirds have shown various results that often depend on species, location, habitat, and level of habituation to human activity. However, several studies have shown reductions in breeding success or population sizes as a result of such human disturbance (e.g., Wallace and Wallace 1998, Carney and Sydeman 1999, Thayer et al. 1999, Beale and Monaghan 2004, Bouton et al. 2005, Rojek et al. 2007). In some cases, reductions in breeding success from disturbance can occur in the absence of visible behavioral changes (Beale and Monaghan 2004).

Disturbance at breeding sites prior to or early in the breeding season can also preclude site use. For example, upon arriving at the colony site to breed, Brown Pelicans will abandon the site quickly if disturbed (Anderson and Keith 1980). Brandt's Cormorants also will abandon disturbed sites for long periods, sometimes lasting years (McChesney 1997, pers. obs.; Wallace and Wallace 1998). When protected from disturbance, seabirds can quickly colonize desirable habitats.

Seabirds and other waterbirds may benefit from MPAs if restrictions on fishing result in reduced boating activities and resulting disturbances at breeding colonies, roosts, and in some cases, foraging areas. For example, at study colonies in central California, most boats observed approaching close to colonies are recreational fishing boats that are either fishing or transiting between nearby fishing spots (USFWS unpubl. data; G. McChesney, pers. obs.). At

Point Reyes in 2007, 93% (n = 43) of vessels approaching within 1,500 feet of colonies were either private or charter fishing boats. Most boats remained beyond the limits of the Point Reyes Headlands Marine Conservation Area, which does not permit recreational fishing within 1,000 feet of most of the headlands. However, since MPAs do not restrict access, their utility for protecting seabird colonies may be limited.

Seabirds and other waterbirds also may benefit from MPAs if increases in their forage base occur as a result of the MPAs. Since those seabird species most likely to benefit forage mainly on juvenile fish, increased recruitment of prey species would be a needed result to benefit these seabird species. These species are sensitive to changes in prey availability that can have dramatic effects on breeding success, survivorship, and population status (Ainley and Boekelheide 1990, Nur and Sydeman 1999, Sydeman et al. 2001). For example, the Pelagic Cormorant and Pigeon Guillemot colonies at the South Farallon Islands have undergone declines in reproductive performance and population size, apparently due to decreased prey availability. These reductions are consistent with a decline in the numbers of juvenile rockfish fed to chicks that began in the early 1990s (Sydeman et al. 2001, Warzybok and Bradley 2007). For waterfowl, the eelgrass beds of the coastal estuaries provide food that is crucial for Brant and several species of dabbling ducks. Protection and restoration of eelgrass beds, and estuarine habitat in general, would provide direct benefits to these birds.

Methods

Evaluations follow the methods described in the “Draft Methods Used to Evaluate Marine Protected Area Proposals in the MLPA South Coast Study Region June 5, 2009”. The MLPA SCSR evaluation uses the five bioregions identified by the MLPA Master Plan Science Advisory Team. The evaluation includes analyzing the potential benefits to: 1) seabird breeding areas, 2) seabird roosting areas 3) nearshore seabird foraging areas, 4) neritic seabird foraging areas, and 5) estuary and coastal habitats used by shorebirds, marsh birds, and waterfowl.

Results

Seabird Breeding Colonies

The abundance and distribution of all seabird species breeding within the south coast study region are shown in Table 1. Thirteen of the 18 species are most abundant at the Middle and West Channel Islands, with the West Channel Islands containing almost half of the total breeding population for the study region. Terns and skimmers are the most abundant species breeding in the North and South Mainland bioregions, with the endangered California Least Tern showing the highest abundance in both.

The Seabird Breeding Colony Analysis investigated the eight highest ranking species on the south coast study region list of species likely to benefit from MPAs. These were the Ashy Storm-Petrel, Black Oystercatcher, Brandt’s Cormorant, Pelagic Cormorant, California Brown Pelican, Pigeon Guillemot, Xantus’s Murrelet, and California Least Tern. Only state marine reserves (SMRs) were included in this analysis because they are the most likely to decrease

boat traffic enough to reduce disturbance at seabird colonies. No special closure areas were included in any Round 2 proposals.

All proposals were identical in benefits offered within the Mid and West Channel Islands bioregions. These islands contain recently established MPAs that will not be changed during the MLPA process. Additionally, none of the MPAs proposed for the East Channel Islands included seabird colonies within this bioregion.

With the exception of Proposal 0 and External Proposal B, all proposals were similar in their potential benefits within the North Mainland bioregion. Proposal 0 and External Proposal B will not provide any benefits to seabirds breeding within this bioregion. All others would benefit 100% of the Black Oystercatcher, Pelagic Cormorant, and Pigeon Guillemot populations within the bioregion due to proposed SMRs at Point Conception. A small percentage (1.1%) of the California Least Tern population would receive benefits from the Opal and Topaz proposals due to the proposed Devereux Lagoon SMR.

With the exception of Proposal 0 and External Proposal B, all proposals were similar in their potential benefits within the South Mainland bioregion. Proposal 0 and External Proposal B will not provide any benefits to seabirds breeding within this bioregion. All others would benefit 100% of the Brandt's Cormorant population and 16% of the California Least Tern population within the bioregion. The entire Brandt's Cormorant bioregion population breeds within the proposed La Jolla SMR while 12% and 4% of the Least Tern bioregion population breeds within the proposed Batiquitos Lagoon and Tijuana Estuary SMRs, respectively.

Major Seabird Roosts

Data on California Brown Pelican roosting abundance and distribution were used in this analysis to identify major seabird roosts. California Brown Pelicans have been well studied in the south coast study region and use all habitats used by other roosting seabirds. Despite the attention pelicans have received, only data from the North and South Mainland bioregions have been compiled in a manner compatible with this analysis. Therefore, only the MPAs proposed within the North and South Mainland bioregions could be analyzed. As with the breeding colony analysis, only SMRs were considered for the roost analysis. All pelican roosts were placed in one of three categories dependent on the number of pelicans observed at the roosts when the data were collected. Roosts were placed in the 'high' category if >1,000 pelicans were consistently observed, 'medium' if 500-1,000 pelicans were consistently observed, and 'low' if 100-499 pelicans were consistently observed.

Table 10 shows the number of roosts captured by all proposed MPAs while Table 11 shows the number of roosts captured by SMRs for each proposal. Proposal 0 did not capture any important pelican roosts in the North Mainland bioregion and only one in the South Mainland. All other proposals captured one to seven roosts in the north and two to eleven roosts in the south, with the Topaz proposal capturing the highest number of roosts in both bioregions. Proposals containing the Point Conception SMR captured one high-use roost in the North Mainland bioregion while those containing the La Jolla SMR captured one high-use roost in the South Mainland bioregion. All other proposals did not protect any high-use roosts.

Nearshore Seabird Foraging Areas

The nearshore foraging analysis focused on five species with limited foraging ranges during the breeding season: Brandt's Cormorant, Pelagic Cormorant, Pigeon Guillemot, Bald Eagles, and California Least Terns. Only MPAs that met the criteria outlined in the methods document were included in this analysis. Weighted areas were calculated by multiplying seabird colony size with the amount of that colony's foraging area captured by a given MPA. Tables 12 through 18 show the weighted area captured by each proposed MPA. Table 19 compares all proposals based on the total weighted areas captured by MPAs that met the criteria for this analysis.

All proposals were similar in their benefits within the Middle and West Channel Islands bioregions. California Least Terns will receive the most benefit from the Opal proposal and External Proposal B, with Opal providing the most benefit in the South Mainland bioregion and External Proposal B providing the most benefit in the North Mainland bioregion. All proposals except Proposal 0 and External Proposal B provide similar protection to Pigeon Guillemots and Pelagic Cormorants within the North Mainland bioregion due to the Point Conception SMR. However, the Opal proposal will provide less benefit to these species due to the smaller proposed size for the Point Conception SMR. All proposals except Proposal 0 and External Proposal B will provide some benefit to Brandt's Cormorants in the East Channel Islands and South Mainland bioregions, with Lapis 1 providing the most overall benefit. Bald Eagles will benefit most from the Topaz proposal.

Neritic Foraging 'Hot Spots' (includes California sea lion and coastal bottlenose dolphin)

The neritic foraging analysis identified areas of persistent use by pelagic foraging seabirds and marine mammals and quantified the amount of these areas captured by proposed MPAs. Most of the identified 'hot spots' occurred within the North and South Mainland bioregions (Figure 1). Only MPAs that met the criteria outlined within the methods document were included in this analysis. Tables 20 through 26 show the areas captured by MPAs from each proposal. Table 27 compares the total protected 'hot spot' areas among proposals.

All proposals were identical in the benefits provided within the Middle and West Channel Islands bioregions. External Proposal B provides the least amount of benefit while Proposal 0 provides no benefit outside the Middle and West Channel Islands bioregions. All other proposals were similar with Topaz providing the most benefit overall.

Estuary and Coastal Habitats

The estuary and coastal habitats analysis quantified the amount of estuary, tidal flat, coastal marsh, and beach habitat protected by proposed MPAs. Table 28 compares the amount of each habitat type protected by each proposal. Only MPAs that met the criteria outlined in the methods document were used for this analysis. All proposals would provide little protection for all habitats. The Topaz proposal provides the most benefit in all categories, with the Opal

proposal providing similar benefit to beach habitat.

Summary

Overall, the Topaz proposal will provide the most benefit to marine birds in the south coast study region, providing the most protection to Least Tern breeding sites, Brown Pelican roost and foraging habitat, neritic foraging areas, and coastal and estuarine habitat. The Opal proposal provided the most benefit to Least Tern foraging areas in the South Mainland bioregion, External Proposal B for Least Tern foraging areas in the North Mainland bioregion, and Lapis 1 for Brandt's Cormorant foraging areas in the South Mainland bioregion. All proposals were identical with respect to benefits in the Middle and West Channel Islands bioregions due to existing MPAs within the Channel Islands National Marine Sanctuary. Additionally, no proposals captured seabird breeding colonies in the East Channel Islands bioregion. All proposals provided little benefit to Least Tern breeding colonies and estuary and coastal habitats.

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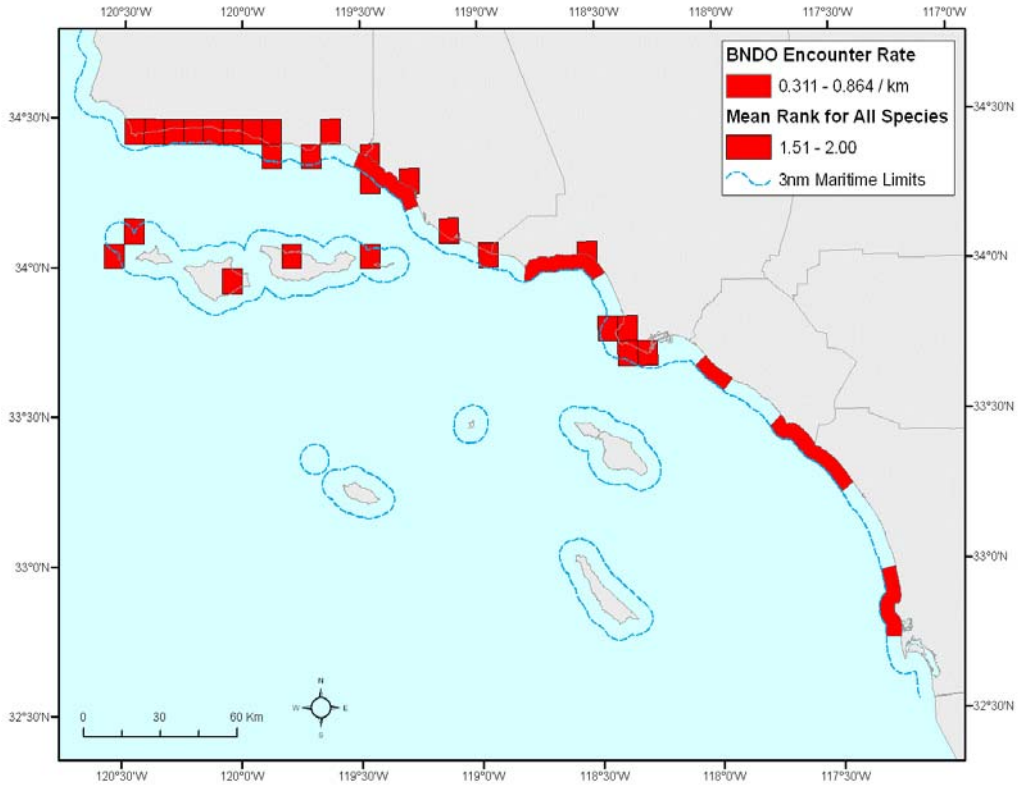
FIGURES AND TABLES

Figure 1. Neritic foraging 'hot spots' for Bottlenose Dolphins and other species



Note: BNDO = Coastal bottlenose dolphins.

Table 1. Numbers of breeding seabirds of 18 species within each of the five bioregions of the south coast study region

	Bioregion					
	North Mainland	**South Mainland**	**East Channel Islands**	**Mid Channel Islands**	**West Channel Islands**	**Total**
No. of Species	5	9	4	11	10	18
Total Breeding Population	753	16151	3460	16179	30818	67361
ASSP	0	0	0	373	801	1174
BLOY	2	0	6	36	53	97
BLSP	0	0	0	150	0	150
BLSK	0	395	0	0	0	395
BRCO	0	6	40	476	5400	5922
BRPE	0	0	0	2690	0	2690
CATE	0	1100	0	0	0	1100
CAAU	0	0	0	490	22020	22510
DCCO	0	0	0	266	150	416
ELTE	0	2900	0	0	0	2900
FOTE	0	2200	0	0	0	2200
LESP	0	0	0	0	4	4
LETE	714	9518	0	0	0	10232
PECO	6	0	0	62	362	430
PIGU	29	0	0	140	1010	1179
ROTE	0	8	0	0	0	8
WEGU	2	24	164	8313	3958	12461
XAMU	0	0	160	3183	150	3493

[1] *Species codes: ASSP – Ashy Storm-Petrel, BLOY – Black Oystercatcher, BLSP – Black Skimmer, BRCO – Brandt's Cormorant, BRPE – Brown Pelican, CATE – Caspian's Tern, CAAU – Cassin's Auklet, DCCO – Double-crested Cormorant, ELTE – Elegant Tern, FOTE – Forster's Tern, LESP – Least Storm-Petrel, LETE – California Least Tern, PECO – Pelagic Cormorant, PIGU - Pigeon Guillemot, ROTE – Royal Tern, WEGU – Western Gull, XAMU – Xantus's Murrelet.*

Table 2. Proposal 0 summary of numbers of breeding birds, percent of bioregional totals, and combined total for species likely to benefit

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
South Mainland																			
Bolsa Chica SMP[1]	7	3128	19.4 %	0	0.0%	0	0.0%	0	0.0%	0	0.0%	400	4.2%	0	0.0%	0	0.0%	0	0.0%
Upper Newport Bay SMP[1]	1	7	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	7	0.1%	0	0.0%	0	0.0%	0	0.0%
Batiquitos Lagoon SMP[1]	1	1142	7.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1142	12.0 %	0	0.0%	0	0.0%	0	0.0%
Laguna Beach SMCA[1]	1	100	0.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	100	1.1%	0	0.0%	0	0.0%	0	0.0%
La Jolla SMCA[1]	2	10	0.1%	0	0.0%	0	0.0%	6	100.0 %	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mid Channel Islands																			
Scorpion SMR	5	543	3.4%	40	10.7 %	2	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	6.4%	0	0.0%
Anacapa Island SMR	7	7669	47.4 %	0	0.0%	2	5.6%	4	0.8%	2516	93.5 %	0	0.0%	4	6.5%	10	7.1%	0	0.0%
Anacapa Island SMCA[1]	3	202	1.2%	0	0.0%	1	2.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	100.0 %	0.0003 14169	0.0%
Gull Island SMR	6	466	2.9%	2	0.5%	8	22.2 %	134	28.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.1%
West Channel Islands																			
Harris Point SMR	10	2450 0	72.3 %	601	75.0 %	7	12.7 %	1824	33.8%	0	0.0%	0	0.0%	216	59.7 %	560	55.4%	150	100.0%

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Carrington Point SMR	4	138	0.4%	0	0.0%	0	0.0%	54	1.0%	0	0.0%	0	0.0%	24	6.6%	0	0.0%	0	0.0%

See Table 1 for species codes.

[1]Not included in Table 9 because benefits to seabirds are reduced by allowed take activities.

Table 3. Lapis 1 summary of numbers of breeding birds, percent of bioregional totals, and combined total for species likely to benefit

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
North Mainland																			
Point Conception/Humqaq SMR	4	39	5.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0%	29	100.0%	0	0.0%
Mugu Lagoon SMRMA[1]	1	4	0.5%	0	0.0%	0	0.0%	0		0		4	0.6%	0	0.0%	0	0.0%		
South Mainland																			
Bolsa Chica SMP[1]	7	3128	19.4%	0	0.0%	0	0.0%	0	0.0%	0		400	4.2%	0		0	0.0%		
Batiquitos Lagoon SMR	1	1142	7.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1142	12.0%	0	0.0%	0	0.0%	0	0.0%
San Diego River SMCA[1]	1	40	0.2%									40	0.4%						
La Jolla SMR 1	2	10	0.1%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ha Sil (South San Deigo Bay) SMP[1]	6	4041	25.0%	0	0.0%	0	0.0%	0	0.0%	0		166	1.7%	0		0	0.0%		
Tijuana Estuary SMR	1	376	2.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	376	4.0%	0	0.0%	0	0.0%	0	0.0%
East Channel Islands																			
Blue Cavern SMR	1	52	14.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Mid Channel Islands																			
Scorpion SMR	5	543	3.4%	40	10.7%	2	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	6.4%	0	0.0%
Anacapa Island SMR	7	7669	47.4%	0	0.0%	2	5.6%	4	0.8%	2516	93.5%	0	0.0%	4	6.5%	10	7.1%	0	0.0%
Anacapa Island SMCA[1]	3	202	1.2%	0	0.0%	1	2.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	<0.1%
Gull Island SMR	6	466	2.9%	2	0.5%	8	22.2%	134	28.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.1%
West Channel Islands																			
Harris Point SMR	10	24500	72.3%	601	75.0%	7	12.7%	1824	33.8%	0	0.0%	0	0.0%	216	59.7%	560	55.4%	150	100.0%
Carrington Point SMR	4	138	0.4%	0	0.0%	0	0.0%	54	1.0%	0	0.0%	0	0.0%	24	6.6%	0	0.0%	0	0.0%

See Table 1 for species codes.

[1]Not included in Table 9 because benefits to seabirds are reduced by allowed take activities.

Table 4. Lapis 2 summary of numbers of breeding birds, percent of bioregional totals, and combined total for species likely to benefit

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
North Mainland																			
Point Conception/Humqaq SMR	4	39	5.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0%	29	100.0%	0	0.0%
Mugu Lagoon SMRMA[1]	1	4	0.5%	0	0.0%	0	0.0%	0		0		4	0.6%	0	0.0%	0	0.0%		
South Mainland																			
Bolsa Chica SMP[1]	7	3128	19.4%	0	0.0%	0	0.0%	0	0.0%	0		400	4.2%	0		0	0.0%		

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Batiquitos Lagoon SMR	1	1142	7.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1142	12.0%	0	0.0%	0	0.0%	0	0.0%
San Diego River SMCA[1]	1	40	0.2%									40	0.4%						
La Jolla SMR	2	10	0.1%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Ha Sil (South San Deigo Bay) SMP[1]	6	4041	25.0%	0	0.0%	0	0.0%	0	0.0%	0		166	1.7%	0		0	0.0%		
Tijuana Estuary SMR	1	376	2.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	376	4.0%	0	0.0%	0	0.0%	0	0.0%
East Channel Islands																			
Blue Cavern SMR	1	52	14.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mid Channel Islands																			
Scorpion SMR	5	543	3.4%	40	10.7%	2	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	6.4%	0	0.0%
Anacapa Island SMR	7	7669	47.4%	0	0.0%	2	5.6%	4	0.8%	2516	93.5%	0	0.0%	4	6.5%	10	7.1%	0	0.0%
Anacapa Island SMCA[1]	3	202	1.2%	0	0.0%	1	2.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	<0.1%
Gull Island SMR	6	466	2.9%	2	0.5%	8	22.2%	134	28.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.1%
West Channel Islands																			
Harris Point SMR	10	24500	72.3%	601	75.0%	7	12.7%	1824	33.8%	0	0.0%	0	0.0%	216	59.7%	560	55.4%	150	100.0%
Carrington Point SMR	4	138	0.4%	0	0.0%	0	0.0%	54	1.0%	0	0.0%	0	0.0%	24	6.6%	0	0.0%	0	0.0%

See Table 1 for species codes.

[1]Not included in Table 9 because benefits to seabirds are reduced by allowed take activities.

Table 5. Opal summary of numbers of breeding birds, percent of bioregional totals, and combined total for species likely to benefit

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
North Mainland																			
Point Conception SMR	4	39	5.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0%	29	100.0%	0	0.0%
Devereux Lagoon SMR	1	8	1.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8	1.1%	0	0.0%	0	0.0%	0	0.0%
Point Mugu Estuary SMRMA[1]	1	4	0.5%									4	0.6%						
South Mainland																			
Bolsa Chica SMP[1]	7	3128	19.4%	0		0		0	0.0%	0		400	4.2%	0		0	0.0%		
Batiquitos Lagoon SMR	1	1150	7.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1150	12.1%	0	0.0%	0	0.0%	0	0.0%
La Jolla SMR	2	10	0.1%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
South San Diego Bay SMCA[1]	6	4041	25.0%	0		0		0	0.0%	0		166	1.7%	0		0	0.0%		
Tijuana River Estuary SMR	1	376	2.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	376	4.0%	0	0.0%	0	0.0%	0	0.0%
Mid Channel Islands																			
Scorpion SMR	5	543	3.4%	40	10.7%	2	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	6.4%	0	0.0%
Anacapa Island SMR	7	7669	47.4%	0	0.0%	2	5.6%	4	0.8%	2516	93.5%	0	0.0%	4	6.5%	10	7.1%	0	0.0%
Anacapa Island SMCA[1]	3	202	1.2%	0	0.0%	1	2.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	<0.1%
Gull Island SMR	6	466	2.9%	2	0.5%	8	22.2%	134	28.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.1%
West Channel Islands																			

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Harris Point SMR	10	24500	72.3%	601	75.0%	7	12.7%	1824	33.8%	0	0.0%	0	0.0%	216	59.7%	560	55.4%	150	100.0%
Carrington Point SMR	4	138	0.4%	0	0.0%	0	0.0%	54	1.0%	0	0.0%	0	0.0%	24	6.6%	0	0.0%	0	0.0%

See Table 1 for species codes.

[1]Not included in Table 9 because benefits to seabirds are reduced by allowed take activities.

Table 6. Topaz summary of numbers of breeding birds, percent of bioregional totals, and combined total for species likely to benefit

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
North Mainland																			
Point Conception SMR	4	39	5.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0%	29	100.0%	0	0.0%
Devereux Lagoon SMR	1	8	1.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8	1.1%	0	0.0%	0	0.0%	0	0.0%
Magu/ Muwu Lagoon SMRMA[1]	1	4	0.5%	0		0	0.0%	0		0		4	0.6%	0	0.0%	0	0.0%		
South Mainland																			
Bolsa Chica SMP[1]	7	3128	19.4%	0		0		0	0.0%	0		400	4.2%	0		0	0.0%		
Batiquitos Lagoon SMR	1	1150	7.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1150	12.1%	0	0.0%	0	0.0%	0	0.0%
San Diego River/Famosa Slough SMCA	1	40	0.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	40	0.4%	0	0.0%	0	0.0%	0	0.0%
La Jolla North SMR	2	10	0.1%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
South San Diego Bay SMCA[1]	6	4241	26.3%	0		0		0	0.0%	0		366	3.8%	0		0	0.0%		

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Tijuana Estuary SMR	1	376	2.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	376	4.0%	0	0.0%	0	0.0%	0	0.0%
East Channel Islands																			
Blue Cavern SMR	1	52	14.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mid Channel Islands																			
Scorpion SMR	5	543	3.4%	40	10.7%	2	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	6.4%	0	0.0%
Anacapa Island SMR	7	7669	47.4%	0	0.0%	2	5.6%	4	0.8%	2516	93.5%	0	0.0%	4	6.5%	10	7.1%	0	0.0%
Anacapa Island SMCA[1]	3	202	1.2%	0	0.0%	1	2.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	<0.1%
Gull Island SMR	6	466	2.9%	2	0.5%	8	22.2%	134	28.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.1%
West Channel Islands																			
Harris Point SMR	10	24500	72.3%	601	75.0%	7	12.7%	1824	33.8%	0	0.0%	0	0.0%	216	59.7%	560	55.4%	150	100.0%
Carrington Point SMR	4	138	0.4%	0	0.0%	0	0.0%	54	1.0%	0	0.0%	0	0.0%	24	6.6%	0	0.0%	0	0.0%

See Table 1 for species codes.

[1]Not included in Table 9 because benefits to seabirds are reduced by allowed take activities.

Table 7. External A summary of numbers of breeding birds, percent of bioregional totals, and combined total for species likely to benefit

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
North Mainland																			
Point Conception SMR	4	39	5.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0%	29	100.0%	0	0.0%
South Mainland																			

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Bolsa Chica SMP[1]	7	3128	19.4%	0		0		0	0.0%	0		400	4.2%	0		0	0.0%		
Batiquitos Lagoon SMR	1	1076	6.7%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1076	11.3%	0	0.0%	0	0.0%	0	0.0%
La Jolla SMR	2	10	0.1%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Oneonta Slough SMR	1	376	2.3%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	376	4.0%	0	0.0%	0	0.0%	0	0.0%
East Channel Islands																			
Bird Rock SMCA[1]	1	52	14.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mid Channel Islands																			
Scorpion SMR	5	543	3.4%	40	10.7%	2	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	6.4%	0	0.0%
Anacapa Island SMR	7	7669	47.4%	0	0.0%	2	5.6%	4	0.8%	2516	93.5%	0	0.0%	4	6.5%	10	7.1%	0	0.0%
Anacapa Island SMCA[1]	3	202	1.2%	0	0.0%	1	2.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	<0.1%
Gull Island SMR	6	466	2.9%	2	0.5%	8	22.2%	134	28.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.1%
West Channel Islands																			
Harris Point SMR	10	24500	72.3%	601	75.0%	7	12.7%	1824	33.8%	0	0.0%	0	0.0%	216	59.7%	560	55.4%	150	100.0%
Carrington Point SMR	4	138	0.4%	0	0.0%	0	0.0%	54	1.0%	0	0.0%	0	0.0%	24	6.6%	0	0.0%	0	0.0%

See Table 1 for species codes.

[1]Not included in Table 9 because benefits to seabirds are reduced by allowed take activities.

Table 8. External B summary of numbers of breeding birds, percent of bioregional totals, and combined total for species likely to benefit

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
North Mainland																			
Devereux Lagoon SMR	1	8	1.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8	1.1%	0	0.0%	0	0.0%	0	0.0%
Mugu Lagoon SMRMA[1]	1	4	0.5%									4	0.6%						
South Mainland																			
Batiquitos Lagoon SMP[1]	1	334	2.1%	0		0		0	0.0%	0		334	3.5%	0		0	0.0%		
Bolsa Chica SMP[1]	7	3128	19.4%	0		0		0	0.0%	0		400	4.2%	0		0	0.0%		
La Jolla SMCA[1]	2	10	0.1%	0		0		6	100.0%	0		0	0.0%	0		0	0.0%		
South San Diego Bay SMP[1]	6	3941	24.4%	0		0		0	0.0%	0		66	0.7%	0		0	0.0%		
East Channel Islands																			
Charles F Holder Catalina SMCA[1]	2	152	41.1%	0		0	0.0%	0	0.0%	0		0		0		0	0.0%	100	62.5%
Bird Rock SMCA[1]	1	52	14.1%	0		0	0.0%	0	0.0%	0		0		0		0	0.0%		
Mid Channel Islands																			
Scorpion SMR	5	543	3.4%	40	10.7%	2	5.6%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	9	6.4%	0	0.0%
Anacapa Island SMR	7	7669	47.4%	0	0.0%	2	5.6%	4	0.8%	2516	93.5%	0	0.0%	4	6.5%	10	7.1%	0	0.0%

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Anacapa Island SMCA[1]	3	202	1.2%	0	0.0%	1	2.8%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	1	<0.1%
Gull Island SMR	6	466	2.9%	2	0.5%	8	22.2%	134	28.2%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	2	0.1%
West Channel Islands																			
Harris Point SMR	10	24500	72.3%	601	75.0%	7	12.7%	1824	33.8%	0	0.0%	0	0.0%	216	59.7%	560	55.4%	150	100.0%
Carrington Point SMR	4	138	0.4%	0	0.0%	0	0.0%	54	1.0%	0	0.0%	0	0.0%	24	6.6%	0	0.0%	0	0.0%

See Table 1 for species codes.

[1]Not included in Table 9 because benefits to seabirds are reduced by allowed take activities.

Table 9. Comparison between proposals of numbers and percentages of marine birds breeding within proposed MPAs in each bioregion and overall

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
North Mainland																			
Proposal 0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Lapis 1	4	39	5.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0%	29	100.0%	0	0.0%
Lapis 2	4	39	5.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0%	29	100.0%	0	0.0%
Opal	5	47	6.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	8	1.1%	6	100.0%	29	100.0%	0	0.0%
Topaz	5	47	6.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	8	1.1%	6	100.0%	29	100.0%	0	0.0%
External A	4	39	5.2%	0	0.0%	2	100.0%	0	0.0%	0	0.0%	0	0.0%	6	100.0%	29	100.0%	0	0.0%
External B	1	8	1.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	8	1.1%	0	0.0%	0	0.0%	0	0.0%
South Mainland																			
Proposal 0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Lapis 1	3	1528	9.5%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	1518	15.9%	0	0.0%	0	0.0%	0	0.0%
Lapis 2	3	1528	9.5%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	1518	15.9%	0	0.0%	0	0.0%	0	0.0%
Opal	3	1536	9.5%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	1526	16.0%	0	0.0%	0	0.0%	0	0.0%
Topaz	3	1576	9.8%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	1566	16.5%	0	0.0%	0	0.0%	0	0.0%
External A	3	1462	9.1%	0	0.0%	0	0.0%	6	100.0%	0	0.0%	1452	15.3%	0	0.0%	0	0.0%	0	0.0%
External B	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
East Channel Islands																			
Proposal 0	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Lapis 1	1	52	25.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Lapis 2	1	52	25.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Opal	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Topaz	1	52	25.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
External A	1	52	25.1%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
External B	0	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%
Mid Channel Islands																			
Proposal 0	10	8678	53.6%	42	11.3%	12	33.3%	138	29.0%	2516	93.5%	0	0.0%	4	6.5%	19	13.6%	2	0.1%
Lapis 1	10	8678	53.6%	42	11.3%	12	33.3%	138	29.0%	2516	93.5%	0	0.0%	4	6.5%	19	13.6%	2	0.1%
Lapis 2	10	8678	53.6%	42	11.3%	12	33.3%	138	29.0%	2516	93.5%	0	0.0%	4	6.5%	19	13.6%	2	0.1%
Opal	10	8678	53.6%	42	11.3%	12	33.3%	138	29.0%	2516	93.5%	0	0.0%	4	6.5%	19	13.6%	2	0.1%
Topaz	10	8678	53.6%	42	11.3%	12	33.3%	138	29.0%	2516	93.5%	0	0.0%	4	6.5%	19	13.6%	2	0.1%
External A	10	8678	53.6%	42	11.3%	12	33.3%	138	29.0%	2516	93.5%	0	0.0%	4	6.5%	19	13.6%	2	0.1%
External B	10	8678	53.6%	42	11.3%	12	33.3%	138	29.0%	2516	93.5%	0	0.0%	4	6.5%	19	13.6%	2	0.1%
West Channel Islands																			

NAME	No. of Species	Total Birds	Total Birds Pct.	ASSP	ASSP Pct.	BLOY	BLOY Pct.	BRCO	BRCO Pct.	BRPE	BRPE Pct.	LETE	LETE Pct.	PECO	PECO Pct.	PIGU	PIGU Pct.	XAMU	XAMU Pct.
Proposal 0	10	24638	72.7%	601	75.0%	7	12.7%	1878	34.8%	0	0.0%	0	0.0%	240	66.3%	560	55.4%	150	100.0%
Lapis 1	10	24638	72.7%	601	75.0%	7	12.7%	1878	34.8%	0	0.0%	0	0.0%	240	66.3%	560	55.4%	150	100.0%
Lapis 2	10	24638	72.7%	601	75.0%	7	12.7%	1878	34.8%	0	0.0%	0	0.0%	240	66.3%	560	55.4%	150	100.0%
Opal	10	24638	72.7%	601	75.0%	7	12.7%	1878	34.8%	0	0.0%	0	0.0%	240	66.3%	560	55.4%	150	100.0%
Topaz	10	24638	72.7%	601	75.0%	7	12.7%	1878	34.8%	0	0.0%	0	0.0%	240	66.3%	560	55.4%	150	100.0%
External A	10	24638	72.7%	601	75.0%	7	12.7%	1878	34.8%	0	0.0%	0	0.0%	240	66.3%	560	55.4%	150	100.0%
External B	10	24638	72.7%	601	75.0%	7	12.7%	1878	34.8%	0	0.0%	0	0.0%	240	66.3%	560	55.4%	150	100.0%

Table 10. Major brown pelican roosts by roost size category within proposed mainland MPAs

Note: Draft MPAs not containing major Brown Pelican roosts are not shown.

MPA Name	Roost Category	Number of Roosts	MPA Name	Roost Category	Number of Roosts
North Mainland			**South Mainland con't**		
Proposal 0			*Lapis 2*		
None	N/A	0	Abalone Cove SMCA[1]	Medium	1
Lapis 1			Bolsa Chica SMP[1]	Low	1
Point Conception/ Humqaq SMR	High	1	Newport Beach SMCA 1[1]	Low	1
Point Conception/ Humqaq SMR	Medium	1	Laguna SMR	Medium	1
Point Conception/ Humqaq SMR	Low	1	Laguna SMR	Low	1
Carpinteria Estuary SMR	Medium	1	Newport Beach SMCA 2[1]	Low	1
Mugu Lagoon SMRMA[1]	High	1	Dana Point SMR	Low	1
Point Dume SMR	Medium	1	Doheny SMCA[1]	Medium	1
Lapis 2			San Elijo Lagoon SMR	Low	1
Point Conception/ Humqaq SMR	High	1	La Jolla SMR	High	1
Point Conception/ Humqaq SMR	Medium	1	Point Loma SMCA[1]	Medium	1
Point Conception/ Humqaq SMR	Low	1	Point Loma SMCA[1]	Low	1
Carpinteria Estuary SMR	Medium	1	Ha Sil (South San Deigo Bay) SMP[1]	Low	1
Mugu Lagoon SMRMA[1]	High	1	Tijuana Estuary SMR	Medium	1
Opal			*Opal*		
Point Conception SMR	Medium	1	Point Vicente SMR	Medium	1
Point Conception SMR	Low	1	Bolsa Chica SMP[1]	Low	1
Devereux Lagoon SMR	Medium	1	Laguna North SMCA[1]	Low	1
Point Dume SMCA[1]	Medium	1	Laguna SMR	Medium	1
Topaz			Laguna SMR	Low	1
Point Conception SMR	High	1	Laguna South SMCA[1]	Low	2
Point Conception SMR	Medium	1	La Jolla SMR	High	1
Point Conception SMR	Low	1	Little Bird Rock SMR	Medium	1
Devereux Lagoon SMR	Medium	1	Ocean Beach SMCA[1]	Low	1
Helo SMR	Low	1	Sunset Cliffs SMR	Medium	1

MPA Name	Roost Category	Number of Roosts
Carpinteria Salt Marsh SMR	Medium	1
Ventura River Mouth SMCA	Low	1
Magu/Muwu Lagoon SMRMA[1]	High	1
Point Dume SMCA	Medium	1
External A		
Point Conception SMR	High	1
Point Conception SMR	Medium	1
Point Conception SMR	Low	1
External B		
Devereux Lagoon SMR	Medium	1
Mugu Lagoon SMRMA[1]	High	1
South Mainland		
Proposal 0		
Abalone Cove SMP[1]	Medium	1
Bolsa Chica SMP[1]	Low	1
Irvine Coast SMCA[1]	Low	1
Crystal Cove SMCA[1]	Low	1
Laguna Beach SMCA[1]	Medium	1
Laguna Beach SMCA[1]	Low	2
Heisler Park SMR	Medium	1
Dana Point SMCA[1]	Low	1
San Elijo Lagoon SMP[1]	Low	1
La Jolla SMCA[1]	High	1
Mia J Tegner SMCA[1]	Medium	1
Lapis 1		
Palos Verdes SMR	Low	1
Bolsa Chica SMP[1]	Low	1
Newport Beach SMCA[1]	Low	1
Laguna Beach SMR	Medium	1
Laguna Beach SMR	Low	2
Dana Point SMR	Low	1
Cabrillo SMR	Medium	1
Tijuana River Estuary SMR	Medium	1
Topaz		
Palos Verdes SMR	Low	1
Bolsa Chica SMP[1]	Low	1
Crystal Cove SMCA[1]	Medium	1
Crystal Cove SMCA[1]	Low	1
Laguna SMR	Medium	1
Laguna SMR	Low	2
Dana Point SMCA[1]	Low	1
Doheny Beach SMCA[1]	Medium	1
San Elijo Lagoon SMR	Low	1
La Jolla North SMR	High	1
La Jolla South SMR	Medium	1
Ocean Beach SMCA[1]	Low	2
Ocean Beach SMR	Medium	1
Cabrillo SMR	Medium	1
South San Diego Bay SMCA[1]	Low	1
Tijuana Estuary SMR	Medium	1
External A		
Portuguese Bend SMCA[1]	Medium	1
Bolsa Chica SMP	Low	1
Crystal Cove SMCA[1]	Low	1
Laguna SMR	Medium	1
Laguna Coast SMCA[1]	Low	1
Dana Point SMCA[1]	Low	1
Doheny Beach SMCA[1]	Medium	1
San Elijo Lagoon SMR	Low	1
La Jolla SMR	High	1
Sunset Cliffs SMR	Medium	1
Cabrillo SMR	Medium	1

MPA Name	Roost Category	Number of Roosts	MPA Name	Roost Category	Number of Roosts
Doheny SMCA[1]	Medium	1	Oneonta Slough SMR	Medium	1
San Elijo Lagoon SMR	Low	1	*External B*		
La Jolla SMR 1	High	1	Portuguese Bend SMCA[1]	Medium	1
La Jolla SMR 2	Medium	2	Portuguese Bend SMCA[1]	Low	1
Point Loma SMCA[1]	Medium	1	Bolsa Chica SMP[1]	Low	1
Point Loma SMCA[1]	Low	1	Laguna SMR	Medium	1
Ha Sil (South San Deigo Bay) SMP[1]	Low	1	San Elijo Lagoon SMP[1]	Low	1
Tijuana Estuary SMR	Medium	1	La Jolla SMCA[1]	High	1
			Sunset Cliffs SMR	Medium	1
			Mia J Tegner SMCA[1]	Medium	1
			South San Diego Bay SMP[1]	Low	1

[1]Not included in Table 11 because benefits to seabirds are reduced by allowed take activities.

Table 11. Comparison between proposals of size and number of brown pelican roosts within proposed MPAs in each bioregion

	High	Medium	Low
North Mainland			
Proposal 0	0	0	0
Lapis 1	1	3	1
Lapis 2	1	2	1
Opal	0	2	1
Topaz	1	3	3
External A	1	1	1
External B	0	1	0
South Mainland			
Proposal 0	0	1	0
Lapis 1	1	4	5
Lapis 2	1	2	3
Opal	1	6	1
Topaz	1	5	5
External A	1	4	1
External B	0	2	0

Table 12. Proposal 0 weighted contributions to foraging areas for five species of breeding seabirds within proposed MPAs

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
South Mainland					
Point Fermin SMP[1]	0.00	0.00	0.00	0.00	0.01
Batiquitos Lagoon SMP[1]	0.00	0.00	0.00	0.00	0.17
Bolsa Chica SMP[1]	0.00	0.00	0.00	0.00	0.02
Encinitas SMCA[1]	0.00	0.00	0.00	0.00	0.01
La Jolla SMCA[1]	0.77	0.00	0.00	0.00	0.00
San Diego-Scripps SMCA[1]	0.11	0.00	0.00	0.00	0.00
East Channel Islands					
Catalina Marine Science Center SMR	0.00	0.00	0.00	0.06	0.00
Lover's Cove SMCA[1]	0.00	0.00	0.00	0.02	0.00
Mid Channel Islands					
Anacapa Island SMCA	0.05	0.40	0.44	0.00	0.00
Anacapa Island SMR	0.08	0.63	0.70	0.00	0.00
Footprint SMR	0.01	0.09	0.00	0.00	0.00
Gull Island SMR	7.37	12.98	0.11	11.21	0.00
Santa Barbara Island SMR	2.79	0.67	4.48	0.00	0.00
Scorpion SMR	0.00	0.00	0.48	0.00	0.00
West Channel Islands					
Carrington Point SMR	0.13	0.83	0.00	0.00	0.00
Harris Point SMR	11.41	12.38	12.68	0.00	0.00
Judith Rock SMR	0.48	0.20	0.28	0.00	0.00
Richardson Rock SMR	1.17	0.48	0.69	0.00	0.00

MPAs not shown did not contribute to foraging area for any of these species.

[1]Not included in Table 19 because benefits to seabirds are reduced by allowed take activities.

Table 13. Lapis 1 weighted contributions to foraging areas for five species of breeding seabirds within proposed MPAs

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
North Mainland					
Mugu Lagoon SMRMA[1]	0.00	0.00	0.00	0.00	2.71
Point Conception/Humqaq SMR	0.00	14.24	14.24	0.00	0.00
Coal Oil Point SMR	0.00	0.00	0.00	0.00	0.09
South Mainland					

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
Point Fermin SMP[1]	0.00	0.00	0.00	0.00	0.01
Batiquitos Lagoon SMR	0.00	0.00	0.00	0.00	0.17
Bolsa Chica SMP[1]	0.00	0.00	0.00	0.00	0.02
Ha Sil (South San Deigo Bay) SMP[1]	0.00	0.00	0.00	0.00	6.50
La Jolla SMR 1	0.95	0.00	0.00	0.00	0.00
La Jolla SMR 2	5.16	0.00	0.00	0.00	0.00
Point Loma SMCA[1]	0.00	0.00	0.00	0.00	0.50
San Diego River SMCA[1]	0.00	0.00	0.00	0.00	0.13
San Diego-Scripps SMCA[1]	0.11	0.00	0.00	0.00	0.00
Swami's-San Elijo SMCA[1]	0.00	0.00	0.00	0.00	0.56
Tijuana Estuary SMR	0.00	0.00	0.00	0.00	0.09
Tijuana River Mouth SMCA[1]	0.00	0.00	0.00	0.00	0.23
East Channel Islands					
Arrow Point SMCA[1]	0.00	0.00	0.00	0.95	0.00
Blue Cavern SMCA[1]	0.00	0.00	0.00	0.30	0.00
Blue Cavern SMR	0.00	0.00	0.00	0.55	0.00
Lover's Cove SMR	0.00	0.00	0.00	0.02	0.00
San Clemente Pending Military Closure 1	1.45	0.00	0.00	0.00	0.00
San Clemente Pending Military Closure 2[1]	0.64	0.40	0.44	0.00	0.00
Mid Channel Islands					
Anacapa Island SMCA	0.05	0.40	0.44	0.00	0.00
Anacapa Island SMR	0.08	0.63	0.70	0.00	0.00
Footprint SMR	0.01	0.09	0.00	0.00	0.00
Gull Island SMR	7.37	12.98	0.11	11.21	0.00
Santa Barbara Island SMR	2.79	0.67	4.48	0.00	0.00
Scorpion SMR	0.00	0.00	0.48	0.00	0.00
West Channel Islands					
Carrington Point SMR	0.13	0.83	0.00	0.00	0.00
Harris Point SMR	11.41	12.38	12.68	0.00	0.00
Judith Rock SMR	0.48	0.20	0.28	0.00	0.00
Richardson Rock SMR	1.17	0.48	0.69	0.00	0.00

[1]Not included in Table 19 because benefits to seabirds are reduced by allowed take activities.
MPAs not shown did not contribute to foraging area for any of these species

Table 14. Lapis 2 weighted contributions to foraging areas for five species of breeding seabirds within proposed MPAs

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
North Mainland					
Big Sycamore Canyon SMR	0.00	0.00	0.00	0.00	0.01
Mugu Lagoon SMRMA[1]	0.00	0.00	0.00	0.00	2.71
Point Conception/Humqaq SMR	0.00	14.24	14.24	0.00	0.00
Coal Oil Point SMR	0.00	0.00	0.00	0.00	0.09
South Mainland					
Point Fermin SMP[1]	0.00	0.00	0.00	0.00	0.01
Batiquitos Lagoon SMR	0.00	0.00	0.00	0.00	0.17
Bolsa Chica SMP[1]	0.00	0.00	0.00	0.00	0.02
Ha Sil (South San Deigo Bay) SMP[1]	0.00	0.00	0.00	0.00	6.50
La Jolla SMR	0.95	0.00	0.00	0.00	0.00
Point Loma SMCA[1]	0.00	0.00	0.00	0.00	0.50
San Diego River SMCA[1]	0.00	0.00	0.00	0.00	0.13
San Diego-Scripps SMCA[1]	0.11	0.00	0.00	0.00	0.00
Tijuana Estuary SMR	0.00	0.00	0.00	0.00	0.09
Tijuana River Mouth SMCA[1]	0.00	0.00	0.00	0.00	0.23
East Channel Islands					
Arrow Point SMCA[1]	0.00	0.00	0.00	0.95	0.00
Blue Cavern SMCA[1]	0.00	0.00	0.00	0.30	0.00
Blue Cavern SMR	0.00	0.00	0.00	0.55	0.00
Lover's Cove SMR	0.00	0.00	0.00	0.02	0.00
San Clemente Pending Military Closure 1	1.45	0.00	0.00	0.00	0.00
San Clemente Pending Military Closure 2[1]	0.64	0.00	0.00	0.00	0.00
Mid Channel Islands					
Anacapa Island SMCA	0.05	0.40	0.44	0.00	0.00
Anacapa Island SMR	0.08	0.63	0.70	0.00	0.00
Footprint SMR	0.01	0.09	0.00	0.00	0.00
Gull Island SMR	7.37	12.98	0.11	11.21	0.00
Santa Barbara Island SMR	2.79	0.67	4.48	0.00	0.00
Scorpion SMR	0.00	0.00	0.48	0.00	0.00
West Channel Islands					
Carrington Point SMR	0.13	0.83	0.00	0.00	0.00
Harris Point SMR	11.41	12.38	12.68	0.00	0.00

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
Judith Rock SMR	0.48	0.20	0.28	0.00	0.00
Richardson Rock SMR	1.17	0.48	0.69	0.00	0.00

MPAs not shown did not contribute to foraging area for any of these species

[1]Not included in Table 19 because benefits to seabirds are reduced by allowed take activities.

Table 15. Opal weighted contributions to foraging areas for five species of breeding seabirds within proposed MPAs

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
North Mainland					
Point Conception SMR	0.00	7.30	7.30	0.00	0.00
Point Mugu Estuary SMRMA[1]	0.00	0.00	0.00	0.00	0.13
Coal Oil Point SMR	0.00	0.00	0.00	0.00	0.09
South Mainland					
Point Fermin SMP[1]	0.00	0.00	0.00	0.00	0.01
Batiquitos Lagoon SMR	0.00	0.00	0.00	0.00	0.34
Bolsa Chica SMP[1]	0.00	0.00	0.00	0.00	0.02
Encinitas SMCA[1]	0.00	0.00	0.00	0.00	0.01
La Jolla SMR	0.77	0.00	0.00	0.00	0.00
Little Bird Rock SMR	0.45	0.00	0.00	0.00	0.00
Ocean Beach SMCA[1]	0.00	0.00	0.00	0.00	0.08
San Diego-Scripps SMCA[1]	0.11	0.00	0.00	0.00	0.00
South San Diego Bay SMCA[1]	0.00	0.00	0.00	0.00	0.75
Sunset Cliffs SMR	0.00	0.00	0.00	0.00	0.38
Sweetwater Marsh SMR	0.00	0.00	0.00	0.00	0.40
Tijuana Reef SMCA[1]	0.00	0.00	0.00	0.00	0.16
Tijuana River Estuary SMR	0.00	0.00	0.00	0.00	0.09
Tijuana River Mouth SMR	0.00	0.00	0.00	0.00	0.23
East Channel Islands					
Arrow Point-Lion's Head SMCA[1]	0.00	0.00	0.00	0.30	0.00
Catalina Harbor SMCA[1]	0.00	0.00	0.00	0.32	0.00
San Clemente Pending Military Closure 1	1.45	0.00	0.00	0.00	0.00
San Clemente Pending Military Closure 2[1]	0.64	0.00	0.00	0.00	0.00
Santa Catalina Marine Science Center SMR	0.00	0.00	0.00	0.36	0.00
Long Point SMCA[1]	0.00	0.00	0.00	8.98	0.00

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
Long Point SMR	0.00	0.00	0.00	2.68	0.00
Lovers Cove SMCA[1]	0.00	0.00	0.00	0.05	0.00
Mid Channel Islands					
Anacapa Island SMCA	0.05	0.40	0.44	0.00	0.00
Anacapa Island SMR	0.08	0.63	0.70	0.00	0.00
Footprint SMR	0.01	0.09	0.00	0.00	0.00
Gull Island SMR	7.37	12.98	0.11	11.21	0.00
Santa Barbara Island SMR	2.79	0.67	4.48	0.00	0.00
Scorpion SMR	0.00	0.00	0.48	0.00	0.00
West Channel Islands					
Carrington Point SMR	0.13	0.83	0.00	0.00	0.00
Harris Point SMR	11.41	12.38	12.68	0.00	0.00
Judith Rock SMR	0.48	0.20	0.28	0.00	0.00
Richardson Rock SMR	1.17	0.48	0.69	0.00	0.00

MPAs not shown did not contribute to foraging area for any of these species

[1]Not included in Table 19 because benefits to seabirds are reduced by allowed take activities.

Table 16. Topaz weighted contributions to foraging areas for five species of breeding seabirds within proposed MPAs

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
North Mainland					
Magu/ Muwu Lagoon SMRMA[1]	0.00	0.00	0.00	0.00	2.71
Point Conception SMR	0.00	14.24	14.24	0.00	0.00
Santa Clara Rivermouth SMCA	0.00	0.00	0.00	0.00	0.03
Helo SMR	0.00	0.00	0.00	0.00	0.10
South Mainland					
Point Fermin SMP[1]	0.00	0.00	0.00	0.00	0.02
Batiquitos Lagoon SMR	0.00	0.00	0.00	0.00	0.34
Bolsa Chica SMP[1]	0.00	0.00	0.00	0.00	0.02
Imperial Beach SMCA[1]	0.00	0.00	0.00	0.00	0.05
Kendal Frost SMCA	0.00	0.00	0.00	0.00	0.03
La Jolla North SMR	0.90	0.00	0.00	0.00	0.00
La Jolla South SMCA	0.45	0.00	0.00	0.00	0.02
La Jolla South SMR	0.72	0.00	0.00	0.00	0.00
Ocean Beach SMCA[1]	0.00	0.00	0.00	0.00	0.17
Ocean Beach SMR	0.00	0.00	0.00	0.00	0.33

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
San Diego River/Famosa Slough SMCA	0.00	0.00	0.00	0.00	0.13
South San Diego Bay SMCA[1]	0.00	0.00	0.00	0.00	7.30
Swamis SMCA[1]	0.00	0.00	0.00	0.00	0.30
Tijuana Estuary SMR	0.00	0.00	0.00	0.00	0.09
East Channel Islands					
Blue Cavern SMR	0.00	0.00	0.00	0.85	0.00
Cat Harbor SMCA[1]	0.00	0.00	0.00	0.33	0.00
Emerald Bay SMCA[1]	0.00	0.00	0.00	0.39	0.00
San Clemente Pending Military Closure 1	1.45	0.00	0.00	0.00	0.00
San Clemente Pending Military Closure 2[1]	0.64	0.00	0.00	0.00	0.00
Lover's Cove SMCA[1]	0.00	0.00	0.00	0.06	0.00
Long Point SMR	0.00	0.00	0.00	3.54	0.00
Mid Channel Islands					
Anacapa Island SMCA	0.05	0.40	0.44	0.00	0.00
Anacapa Island SMR	0.08	0.63	0.70	0.00	0.00
Footprint SMR	0.01	0.09	0.00	0.00	0.00
Gull Island SMR	7.37	12.98	0.11	11.21	0.00
Santa Barbara Island SMR	2.79	0.67	4.48	0.00	0.00
Scorpion SMR	0.00	0.00	0.48	0.00	0.00
West Channel Islands					
Carrington Point SMR	0.13	0.83	0.00	0.00	0.00
Harris Point SMR	11.41	12.38	12.68	0.00	0.00
Judith Rock SMR	0.48	0.20	0.28	0.00	0.00
Richardson Rock SMR	1.17	0.48	0.69	0.00	0.00

MPAs not shown did not contribute to foraging area for any of these species

[1]Not included in Table 19 because benefits to seabirds are reduced by allowed take activities.

Table 17. External A weighted contributions to foraging areas for five species of breeding seabirds within proposed MPAs

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
North Mainland					
Point Conception SMR	0.00	14.24	14.24	0.00	0.00
Campus Point SMR	0.00	0.00	0.00	0.00	0.09
South Mainland					
Ocean Beach SMCA[1]	0.00	0.00	0.00	0.00	0.06

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
Point Fermin SMP[1]	0.00	0.00	0.00	0.00	0.01
Batiquitos Lagoon SMR	0.00	0.00	0.00	0.00	0.34
Bolsa Chica SMP[1]	0.00	0.00	0.00	0.00	0.02
La Jolla SMR	0.77	0.00	0.00	0.00	0.00
Oneonta Slough SMR	0.00	0.00	0.00	0.00	0.09
Sunset Cliffs SMR	0.00	0.00	0.00	0.00	0.34
East Channel Islands					
Bird Rock SMCA[1]	0.00	0.00	0.00	0.45	0.00
Blue Cavern SMR	0.00	0.00	0.00	0.40	0.00
Cat Harbor SMCA[1]	0.00	0.00	0.00	0.33	0.00
San Clemente Pending Military Closure 1	1.45	0.00	0.00	0.00	0.00
San Clemente Pending Military Closure 2[1]	0.64	0.00	0.00	0.00	0.00
Lover's Cove SMCA[1]	0.00	0.00	0.00	0.06	0.00
Mid Channel Islands					
Anacapa Island SMCA	0.05	0.40	0.44	0.00	0.00
Anacapa Island SMR	0.08	0.63	0.70	0.00	0.00
Footprint SMR	0.01	0.09	0.00	0.00	0.00
Gull Island SMR	7.37	12.98	0.11	11.21	0.00
Santa Barbara Island SMR	2.79	0.67	4.48	0.00	0.00
Scorpion SMR	0.00	0.00	0.48	0.00	0.00
West Channel Islands					
Carrington Point SMR	0.13	0.83	0.00	0.00	0.00
Harris Point SMR	11.41	12.38	12.68	0.00	0.00
Judith Rock SMR	0.48	0.20	0.28	0.00	0.00
Richardson Rock SMR	1.17	0.48	0.69	0.00	0.00

MPAs not shown did not contribute to foraging area for any of these species

[1]Not included in Table 19 because benefits to seabirds are reduced by allowed take activities.

Table 18. External B weighted contributions to foraging areas for five species of breeding seabirds within proposed MPAs

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
North Mainland					
Big Sycamore SMR	0.00	0.00	0.00	0.00	0.97
Mugu Lagoon SMRMA[1]	0.00	0.00	0.00	0.00	0.29
South Mainland					

MPA Name	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagles	California Least Tern
Ocean Beach SMCA[1]	0.00	0.00	0.00	0.00	0.06
Point Fermin SMP[1]	0.00	0.00	0.00	0.00	0.02
Batiquitos Lagoon SMP[1]	0.00	0.00	0.00	0.00	0.34
Bolsa Chica SMP[1]	0.00	0.00	0.00	0.00	0.02
La Jolla SMCA[1]	0.77	0.00	0.00	0.00	0.00
San Diego-Scripps SMCA[1]	0.11	0.00	0.00	0.00	0.00
South San Diego Bay SMP[1]	0.00	0.00	0.00	0.00	1.47
Sunset Cliffs SMR	0.00	0.00	0.00	0.00	0.34
Sweetwater Marsh SMR	0.00	0.00	0.00	0.00	0.61
East Channel Islands					
Arrow Pt to Lionhead SMCA[1]	0.00	0.00	0.00	0.44	0.00
Bird Rock SMCA[1]	0.00	0.00	0.00	0.45	0.00
Catalina Marine Science Center SMR	0.00	0.00	0.00	0.40	0.00
Charles F Holder Catalina SMCA[1]	0.00	0.00	0.00	84.87	0.00
Lover's Cove SMCA[1]		0.00	0.00	0.02	0.00
San Clemente Pending Military Closure 1	1.45	0.00	0.00	0.00	0.00
San Clemente Pending Military Closure 2[1]	0.64	0.00	0.00	0.00	0.00
Mid Channel Islands					
Anacapa Island SMCA	0.05	0.40	0.44	0.00	0.00
Anacapa Island SMR	0.08	0.63	0.70	0.00	0.00
Footprint SMR	0.01	0.09	0.00	0.00	0.00
Gull Island SMR	7.37	12.98	0.11	11.21	0.00
Santa Barbara Island SMR	2.79	0.67	4.48	0.00	0.00
Scorpion SMR	0.00	0.00	0.48	0.00	0.00
West Channel Islands					
Carrington Point SMR	0.13	0.83	0.00	0.00	0.00
Harris Point SMR	11.41	12.38	12.68	0.00	0.00
Judith Rock SMR	0.48	0.20	0.28	0.00	0.00
Richardson Rock SMR	1.17	0.48	0.69	0.00	0.00

MPAs not shown did not contribute to foraging area for any of these species

[1]Not included in Table 19 because benefits to seabirds are reduced by allowed take activities.

Table 19. Comparison of proposals to total contributions of weighted foraging areas for five species of breeding seabirds in the study region by bioregion

	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagle	California Least Tern
North Mainland					
Proposal 0	0.00	0.00	0.00	0.00	0.00
Lapis 1	0.00	14.24	14.24	0.00	0.09
Lapis 2	0.00	14.24	14.24	0.00	0.09
Opal	0.00	7.30	7.30	0.00	0.09
Topaz	0.00	14.24	14.24	0.00	0.13
External A	0.00	14.24	14.24	0.00	0.09
External B	0.00	0.00	0.00	0.00	0.97
South Mainland					
Proposal 0	0.00	0.00	0.00	0.00	0.00
Lapis 1	6.12	0.00	0.00	0.00	0.26
Lapis 2	0.95	0.00	0.00	0.00	0.26
Opal	1.22	0.00	0.00	0.00	1.45
Topaz	1.62	0.00	0.00	0.00	0.93
External A	0.77	0.00	0.00	0.00	0.78
External B	0.00	0.00	0.00	0.00	0.96
East Channel Islands					
Proposal 0	0.00	0.00	0.00	0.00	0.00
Lapis 1	1.45	0.00	0.00	0.58	0.00
Lapis 2	1.45	0.00	0.00	0.58	0.00
Opal	1.45	0.00	0.00	3.04	0.00
Topaz	1.45	0.00	0.00	4.39	0.00
External A	1.45	0.00	0.00	0.40	0.00
External B	1.45	0.00	0.00	0.40	0.00
Mid Channel Islands					
Proposal 0	10.26	14.38	5.77	11.21	0.00
Lapis 1	10.26	14.38	5.77	11.21	0.00
Lapis 2	10.26	14.38	5.77	11.21	0.00
Opal	10.26	14.38	5.77	11.21	0.00
Topaz	10.26	14.38	5.77	11.21	0.00
External A	10.26	14.38	5.77	11.21	0.00
External B	10.26	14.38	5.77	11.21	0.00
West Channel Islands					
Proposal 0	13.19	13.89	13.65	0.00	0.00
Lapis 1	13.19	13.89	13.65	0.00	0.00
Lapis 2	13.19	13.89	13.65	0.00	0.00

	Brandt's Cormorant	Pelagic Cormorant	Pigeon Guillemot	Bald Eagle	California Least Tern
Opal	13.19	13.89	13.65	0.00	0.00
Topaz	13.19	13.89	13.65	0.00	0.00
External A	13.19	13.89	13.65	0.00	0.00
External B	13.19	13.89	13.65	0.00	0.00

Table 20. Proposal 0 contributions to neritic foraging area 'hot spots' based on 11 species of seabirds and 2 marine mammals within proposed MPAs

MPA Name	Area of Overlap (sq mi)
North Mainland	
Goleta Slough SMP[1]	0.19
Refugio SMCA[1]	1.03
Big Sycamore Canyon SMR	0.01
South Mainland	
Abalone Cove SMP[1]	0.10
Point Fermin SMP[1]	0.07
Niguel SMCA[1]	0.48
Dana Point SMCA[1]	0.20
Doheny SMCA[1]	0.19
Doheny Beach SMCA[1]	0.14
San Diego-Scripps SMCA[1]	0.11
La Jolla SMCA[1]	0.77
Mid Channel Islands	
Anacapa Island SMCA	5.80
West Channel Islands	
Richardson Rock SMR	15.65

MPAs not shown did not contribute to neritic foraging area 'hot spots'.

[1]Not included in Table 27 because benefits to seabirds are reduced by allowed take activities.

Table 21. Lapis 1 contributions to neritic foraging area 'hot spots' based on 11 species of seabirds and 2 marine mammals within proposed MPAs

MPA Name	Area of Overlap (sq mi)
North Mainland	
Point Conception/Humqaq SMR[1]	13.91
Coal Oil Point SMR	10.10

Goleta Slough SMR	0.19
Mugu Lagoon SMRMA[1]	1.67
Point Dume SMR	5.43
South Mainland	
Palos Verdes SMR	10.33
Point Fermin SMP[1]	0.07
SoLag Dana SMCA[1]	3.69
Dana Point SMR	0.53
Doheny SMCA[1]	0.34
La Jolla SMR 1	0.95
La Jolla SMR 2	6.46
Point Loma SMCA[1]	2.21
San Diego-Scripps SMCA[1]	0.11
Mid Channel Islands	
Anacapa Island SMCA	5.80
West Channel Islands	
Richardson Rock SMR	15.65

MPAs not shown did not contribute to neritic foraging area 'hot spots'.

[1]Not included in Table 27 because benefits to seabirds are reduced by allowed take activities.

Table 22. Lapis 2 contributions to neritic foraging area 'hot spots' based on 11 species of seabirds and 2 marine mammals within proposed MPAs

MPA Name	Area of Overlap (sq mi)
North Mainland	
Point Conception/Humqaq SMR	13.91
Coal Oil Point SMR	10.10
Goleta Slough SMR	0.19
Mugu Lagoon SMRMA[1]	1.67
Big Sycamore Canyon SMR	0.03
Malibu SMR	10.30
South Mainland	
Point Vicente SMR	1.11
Abalone Cove SMCA[1]	13.45
Point Fermin SMP	0.07
SoLag Dana SMCA[1]	3.69
Dana Point SMR	0.53
Doheny SMCA[1]	0.34
Del Mar SMR	9.25

MPA Name	Area of Overlap (sq mi)
La Jolla SMR	0.95
Point Loma SMCA[1]	2.21
San Diego-Scripps SMCA[1]	0.11
Mid Channel Islands	
Anacapa Island SMCA	5.80
West Channel Islands	
Richardson Rock SMR	15.65

MPAs not shown did not contribute to neritic foraging area 'hot spots'.

[1]Not included in Table 27 because benefits to seabirds are reduced by allowed take activities.

Table 23. Opal contributions to neritic foraging area 'hot spots' based on 11 species of seabirds and 2 marine mammals within proposed MPAs

MPA Name	Area of Overlap (sq mi)
North Mainland	
Point Conception SMR	12.65
Devereux Lagoon SMR	0.10
Goleta Slough SMR	0.19
Coal Oil Point SMR	10.11
Point Mugu Estuary SMRMA[1]	0.32
Point Dume SMCA[1]	1.30
South Mainland	
Point Vicente SMR	4.66
Point Fermin SMP[1]	0.07
Laguna SMR	0.18
Laguna South SMCA[1]	1.13
Del Mar SMR	9.25
San Diego-Scripps SMCA[1]	0.11
La Jolla SMR	0.77
Little Bird Rock SMR	0.44
Ocean Beach SMCA[1]	1.50
Sunset Cliffs SMR	0.93
Mid Channel Islands	
Anacapa Island SMCA	5.80
West Channel Islands	
Richardson Rock SMR	15.65

MPAs not shown did not contribute to neritic foraging area 'hot spots'.

[1]Not included in Table 27 because benefits to seabirds are reduced by allowed take activities.

Table 24. Topaz contributions to neritic foraging area 'hot spots' based on 11 species of seabirds and 2 marine mammals within proposed MPAs

MPA Name	Area of Overlap (sq mi)
North Mainland	
Point Conception SMR	13.91
Refugio SMCA[1]	0.85
Naples SMCA[1]	2.56
Helo SMR	12.60
Devereux Lagoon SMR	0.09
Goleta Slough SMR	0.19
Ventura River Mouth SMCA	0.02
Santa Clara Rivermouth SMCA	0.07
Magu/Muwu Lagoon SMRMA[1]	1.28
Deer Creek SMCA[1]	9.27
Sequit SMCA[1]	0.76
Point Dume SMR	4.10
South Mainland	
Palos Verdes SMR	6.73
Point Fermin SMP	0.12
Doheny Beach SMCA[1]	0.28
La Jolla North SMR	0.90
La Jolla South SMCA	0.72
La Jolla South SMR	0.80
Three Arch Bay SMCA[1]	0.04
Dana Point SMCA[1]	1.08
Del Mar SMR	9.78
San Diego River/Famosa Slough SMCA	<0.01
Ocean Beach SMCA[1]	3.06
Ocean Beach SMR	0.93
Mid Channel Islands	
Anacapa Island SMCA	5.80
West Channel Islands	
Richardson Rock SMR	15.65

MPAs not shown did not contribute to neritic foraging area 'hot spots'.

[1]Not included in Table 27 because benefits to seabirds are reduced by allowed take activities.

Table 25. External A contributions to neritic foraging area 'hot spots' based on 11 species of seabirds and 2 marine mammals within proposed MPAs

MPA Name	Area of Overlap (sq mi)
North Mainland	
Point Conception SMR	11.31
Campus Point SMR	10.13
Goleta Slough SMR	0.19
Big Sycamore Canyon SMR	0.03
Deer Creek SMCA[1]	5.82
Malibu SMR	10.30
South Mainland	
Point Vicente SMR	1.12
Portuguese Bend SMCA[1]	13.81
Point Fermin SMP[1]	0.07
Laguna SMR	0.31
Dana Point SMCA[1]	1.04
Doheny Beach SMCA[1]	0.19
Del Mar SMR	9.26
La Jolla SMR	0.77
Ocean Beach SMCA[1]	3.58
Sunset Cliffs SMR	0.63
Mid Channel Islands	
Anacapa Island SMCA	5.80
West Channel Islands	
Richardson Rock SMR	15.65

MPAs not shown did not contribute to neritic foraging area 'hot spots'.

[1]Not included in Table 27 because benefits to seabirds are reduced by allowed take activities.

Table 26. External B contributions to neritic foraging area 'hot spots' based on 11 species of seabirds and 2 marine mammals within proposed MPAs

MPA Name	Area of Overlap (sq mi)
North Mainland	
Devereux Lagoon SMR	0.09
Goleta Slough SMP[1]	0.19
Mugu Lagoon SMRMA[1]	0.56
Big Sycamore SMP[1]	1.54
Big Sycamore SMR	0.07

Palos Verdes SMCA[1]	8.77
Portuguese Bend SMCA[1]	3.11
Point Fermin SMP[1]	0.16
Del Mar SMCA[1]	5.05
Del Mar SMR	4.22
San Diego-Scripps SMCA[1]	0.11
La Jolla SMCA[1]	0.77
Ocean Beach SMCA[1]	3.58
Sunset Cliffs SMR	0.63
Mid Channel Islands	
Anacapa Island SMCA	5.80
West Channel Islands	
Richardson Rock SMR	15.65

MPAs not shown did not contribute to neritic foraging area 'hot spots'.

[1]Not included in Table 27 because benefits to seabirds are reduced by allowed take activities.

Table 27. Comparison of proposals to total contributions of neritic foraging area 'hot spots' for 11 species of breeding seabirds and 2 marine mammals in the south coast study region

	North Mainland	South Mainland	Mid Channel Islands	West Channel Islands
Proposal 0	0.01	0.00	5.80	15.65
Lapis 1	29.63	18.28	5.80	15.65
Lapis 2	34.54	11.85	5.80	15.65
Opal	23.04	16.24	5.80	15.65
Topaz	30.98	19.85	5.80	15.65
External A	21.67	22.38	5.80	15.65
External B	0.16	4.84	5.80	15.65

Table 28. Comparison of proposals to total contributions of coastal habitats used by shorebirds and waterfowl

	North Mainland	South Mainland	East Channel Islands	Mid Channel Islands	West Channel Islands
Beaches					
Proposal 0	0.00	0.21	0.08	3.90	6.33
Lapis 1	9.91	8.12	9.96	3.90	6.33
Lapis 2	7.88	7.79	9.96	3.90	6.33
Opal	9.52	14.51	13.32	3.90	6.33

	North Mainland	South Mainland	East Channel Islands	Mid Channel Islands	West Channel Islands
Topaz	6.14	16.55	10.66	3.90	6.33
External A	7.61	7.77	7.70	3.90	6.33
External B	5.99	7.79	7.70	3.90	6.33
Coastal Marsh					
Proposal 0	0.00	0.01	N/A	N/A	N/A
Lapis 1	0.44	1.16	N/A	N/A	N/A
Lapis 2	0.45	1.15	N/A	N/A	N/A
Opal	0.21	1.25	N/A	N/A	N/A
Topaz	0.60	1.51	N/A	N/A	N/A
External A	0.19	1.00	N/A	N/A	N/A
External B	0.02	0.32	N/A	N/A	N/A
Tidal Flats					
Proposal 0	0.00	0.00	N/A	N/A	N/A
Lapis 1	0.59	1.51	N/A	N/A	N/A
Lapis 2	0.69	1.51	N/A	N/A	N/A
Opal	0.56	2.36	N/A	N/A	N/A
Topaz	1.55	4.61	N/A	N/A	N/A
External A	0.66	1.91	N/A	N/A	N/A
External B	0.10	1.02	N/A	N/A	N/A
Estuary					
Proposal 0	0.00	0.04	N/A	N/A	N/A
Lapis 1	0.53	2.13	N/A	N/A	N/A
Lapis 2	0.57	2.09	N/A	N/A	N/A
Opal	0.34	2.63	N/A	N/A	N/A
Topaz	0.81	3.51	N/A	N/A	N/A
External A	0.25	2.38	N/A	N/A	N/A
External B	0.09	1.04	N/A	N/A	N/A