

the model. This also allowed us to avoid potential model convergence difficulties that might result from complex interaction terms, such as a three-way season by sub-area by period interaction. We retained season as a factor in the model and allowed a season and period interaction term whenever sufficient data existed to test it. We estimated the period effect across the entire sub-area by repeating the analysis using data pooled across all at-sea sub-areas. We used contrasts to express the difference in densities between survey periods averaged across seasons and Wald's Z-test to test the significance of this contrast.

DISTRIBUTION MAPS

We averaged seabird densities for 5' grids across years and replicates for each survey month. This resulted in three maps for each species and family representing January, May, and September. To facilitate visual comparisons among maps for individual species or families, map legends were standardized for each species or family based on percentages of maximum densities observed for that species or family. The five categories were: (1) 0 (none observed), (2) >0-50% of densities, (3) >50-75% of densities, (4) >75-90% of densities, and (5) >90% of densities. Standardized density legends highlighted areas of greatest importance to individual species or families.

RESULTS

Between May 1999 and January 2002, we completed nine surveys of the entire area (102 flight days). For all surveys combined, we flew >54,600 km of transects with >20,100 km in the core area and >14,400 km along coastlines. We identified 54 species of seabirds representing 12 families and counted a total of 135,545 seabirds on transect.

Seabirds occurred in all sub-areas and in all seasons (Fig. 5). Densities (all species) averaged 33.7 birds/km² (for at-sea and coastal transects combined) and ranged from 0-12,244 birds/km². Densities for both at-sea and coastal transects were generally greatest in January (Tables 1-4), primarily due to large numbers of California Gulls (*Larus californicus*), Western Grebes (*Aechmophorus occidentalis*), Surf Scoters (*Melanitta perspicillata*) and, to a lesser extent, Black-legged Kittiwakes (*Rissa tridactyla*), Cassin's Auklets, loons, and phalaropes. In May, Western Grebes, Sooty Shearwaters (*Puffinus griseus*), phalaropes, and Western Gulls were the most abundant species in southern California. Sooty Shearwaters were the

most abundant seabird in September, followed by Western Grebes, Western Gulls, and Brown Pelicans. Maximum seabird densities for a single 5' grid occurred in September, involving large flocks of Sooty Shearwaters.

In 1999-2002, mean monthly abundance of seabirds was 981,000 ± 144,000 in January, 862,000 ± 95,000 in May, and 762,000 ± 172,000 in September. Among five at-sea sub-areas, greatest seabird densities occurred in S3 in January and in S1 in May and September. Western Grebes, California and Western gulls, and Cassin's Auklets were the most abundant species in S3 in January. Sooty and Short-tailed shearwaters, phalaropes, and Cassin's Auklets were most abundant in S1 in May, and Sooty and Short-tailed shearwaters, phalaropes, Common or Arctic terns, and Pink-footed Shearwaters were the most abundant species in September.

Among five coastal sub-areas, densities were greater along mainland rather than island coasts because of large numbers of Western Grebes, Sooty and Short-tailed shearwaters, and Surf Scoters, and to a lesser extent, terns. Greatest coastal seabird densities were found in CMC in January and May and in NMC in September (Table 5). Western Grebes, California and Western gulls, and Surf Scoters were the most abundant species in CMC in January. Western Grebes, cormorants, Western Gulls, and Brown Pelicans were the most abundant species in CMC in May. Sooty Shearwaters, Heermann's and Western gulls, Brown Pelicans, and cormorants were the most abundant species in the NMC in September.

All estimates of mean at-sea densities are presented separately by species, season, and geographic sub-area (Tables 1a-e). Mean densities that were greatest along mainland coastlines, island coastlines, and both coastline types are presented separately by species and season (Tables 2a-c). Mean densities for each coastline sub-area are presented for mainland coastlines (Tables 3a-c) and island coastlines (Tables 4a, 4b), and statistical tests of variation are summarized for seasonal (Table 5) and geographic (Table 6) differences. Random effects for year and replicate were not found to be significant ($P > 0.15$ for all species), so we compared at-sea densities between 1975-1983 and 1999-2002 surveys using GLM (Tables 7a, 7b).

Densities for all seabirds combined differed among at-sea and coastal sub-areas. Greatest densities of seabirds occurred in S3 (Table 1c) and in NMC (Tables 2-4), whereas lowest densities occurred in S5 (Table 1e) and in SIC (Tables 2-4). Densities along at-sea transects did not differ consistently among seasons, but greatest seasonal densities for at-sea transects occurred

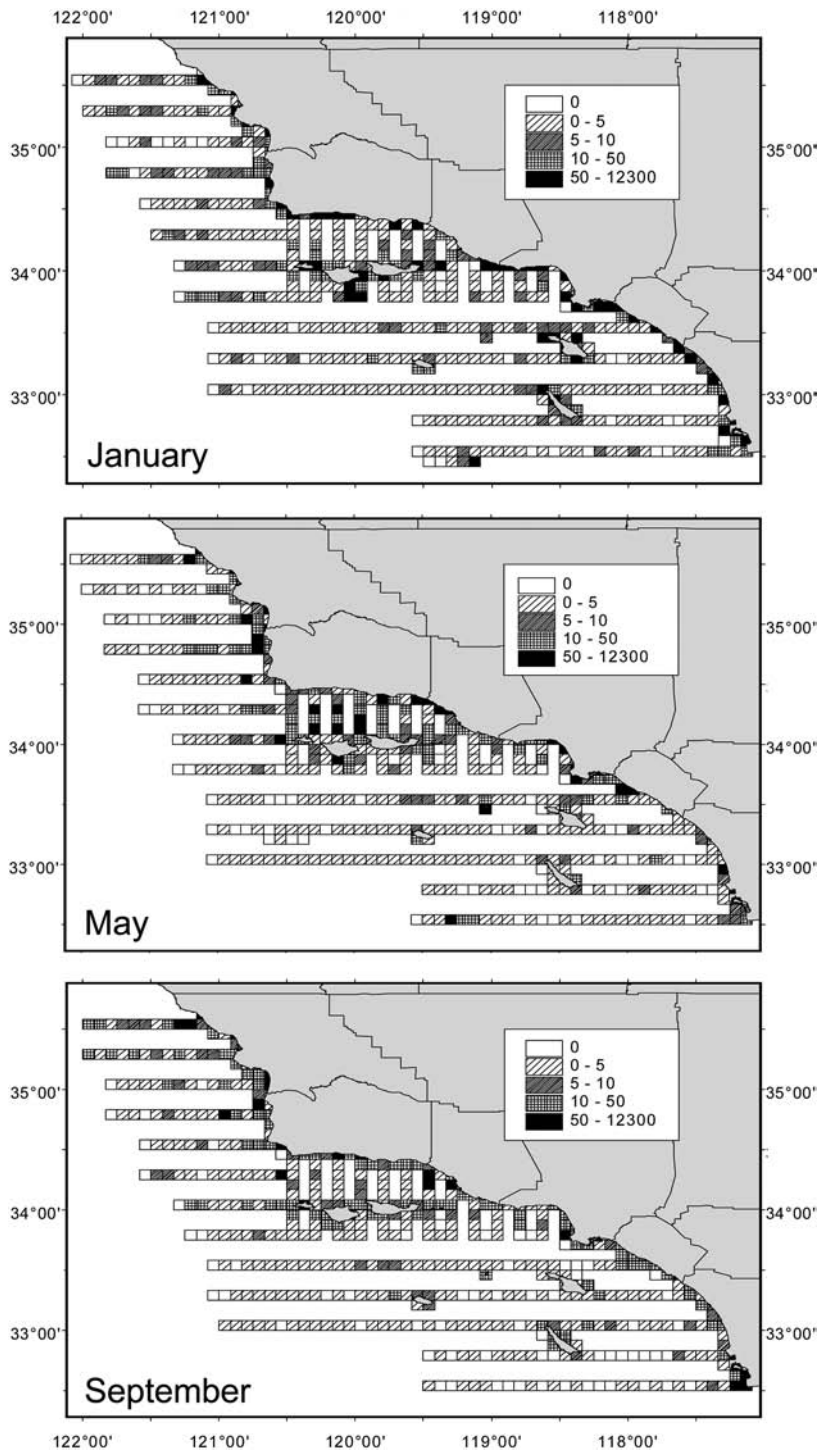


FIGURE 5. All seabird densities (birds/km²) and distribution off southern California from 1999–2002 during January, May, and September.

TABLE 1A. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS WITHIN AT-SEA SUB-AREA S1 (NORTH) DURING JANUARY, MAY, AND SEPTEMBER FROM 1999–2002.

Species	S1 (North)		
	January	May	September
All seabirds	9.57 ± 1.09	22.75 ± 5.76	19.37 ± 3.71
Loons	0.24 ± 0.07	0.38 ± 0.22	0.01 ± 0.01
Common	0.05 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Pacific	0.14 ± 0.06	0.38 ± 0.22	0.00 ± 0.00
Red-throated	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Grebes	0.11 ± 0.06	0.03 ± 0.02	0.08 ± 0.05
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.11 ± 0.06	0.03 ± 0.02	0.08 ± 0.05
Albatrosses	0.02 ± 0.01	0.03 ± 0.02	0.00 ± 0.00
Black-footed	0.02 ± 0.01	0.03 ± 0.02	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.26 ± 0.06	8.56 ± 4.26	11.06 ± 3.49
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.04 ± 0.02
Black-vented Shearwater	0.02 ± 0.01	0.00 ± 0.00	0.14 ± 0.14
Northern Fulmar	0.18 ± 0.05	0.13 ± 0.04	0.01 ± 0.01
Pink-footed Shearwater	0.03 ± 0.01	0.07 ± 0.03	1.06 ± 0.42
Sooty Shearwater	0.03 ± 0.01	8.35 ± 4.26	9.78 ± 3.37
Storm-Petrels	0.05 ± 0.03	0.06 ± 0.02	0.28 ± 0.13
Ashy	0.03 ± 0.02	0.05 ± 0.02	0.20 ± 0.13
Black	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.06 ± 0.02
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	0.33 ± 0.13	0.03 ± 0.03	0.01 ± 0.01
Brown	0.33 ± 0.13	0.03 ± 0.03	0.01 ± 0.01
Cormorants	0.57 ± 0.37	0.04 ± 0.02	0.09 ± 0.04
Brandt's	0.08 ± 0.05	0.01 ± 0.01	0.01 ± 0.01
Double-crested	0.32 ± 0.30	0.00 ± 0.00	0.00 ± 0.00
Pelagic	0.00 ± 0.00	0.01 ± 0.01	0.01 ± 0.01
Sea ducks	0.10 ± 0.06	0.00 ± 0.00	0.00 ± 0.00
Brant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	0.10 ± 0.06	0.00 ± 0.00	0.00 ± 0.00
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 1A. CONTINUED.

Species	S1 (North)		
	January	May	September
Laridae	2.70 ± 0.37	2.29 ± 0.59	2.82 ± 0.65
Gulls	2.67 ± 0.37	2.10 ± 0.58	1.24 ± 0.23
Black-legged Kittiwake	0.48 ± 0.13	0.04 ± 0.04	0.00 ± 0.00
Bonaparte's	0.01 ± 0.01	0.02 ± 0.01	0.00 ± 0.00
California	1.30 ± 0.26	0.38 ± 0.22	0.01 ± 0.01
Glaucous	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Glaucous-winged	0.02 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Heermann's	0.11 ± 0.05	0.00 ± 0.00	0.09 ± 0.04
Herring	0.02 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Mew	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sabine's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.53 ± 0.13	0.53 ± 0.13	0.54 ± 0.17
Terns	0.53 ± 0.13	0.96 ± 0.51	0.54 ± 0.12
Caspian	0.00 ± 0.00	0.12 ± 0.05	1.44 ± 0.60
Common/ Arctic	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Elegant	0.00 ± 0.00	0.08 ± 0.04	1.34 ± 0.60
Elegant/Royal	0.00 ± 0.00	0.00 ± 0.00	0.07 ± 0.07
Forster's	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.02
Least	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Long-tailed Jaeger	0.03 ± 0.02	0.07 ± 0.03	0.14 ± 0.03
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
South Polar Skua	0.03 ± 0.02	0.02 ± 0.01	0.03 ± 0.01
Alcids	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Cassin's Auklet	3.97 ± 0.62	1.70 ± 0.76	0.94 ± 0.20
Common Murre	1.62 ± 0.30	1.46 ± 0.69	0.23 ± 0.09
Pigeon Guillemots	0.75 ± 0.35	0.01 ± 0.01	0.48 ± 0.16
Rhinoceros Auklet	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Xantus's Murrelet	1.47 ± 0.29	0.06 ± 0.04	0.04 ± 0.03
Phalaropes	0.00 ± 0.00	0.16 ± 0.07	0.04 ± 0.04
Red	1.20 ± 0.25	9.60 ± 2.80	4.03 ± 0.99
Red-necked	0.46 ± 0.11	1.85 ± 1.60	0.41 ± 0.21
	0.01 ± 0.01	3.10 ± 1.19	0.56 ± 0.18

TABLE 1B. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS WITHIN AT-SEA SUB-AREA S2 (WEST-CENTRAL) DURING JANUARY, MAY, AND SEPTEMBER FROM 1999-2002.

Species	S2 (West-central)		
	January	May	September
All seabirds	9.52 ± 2.14	4.37 ± 0.81	7.21 ± 2.04
Loons	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Common	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pacific	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-throated	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Grebes	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Podicipedidae	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Podiceps auritus	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Podilymbus podiceps	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Aechmophorus occidentalis	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Albatrosses	0.04 ± 0.03	0.01 ± 0.01	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Laysan	0.04 ± 0.03	0.00 ± 0.00	0.00 ± 0.00
Phoebastria immutabilis	0.35 ± 0.08	0.56 ± 0.13	0.27 ± 0.11
Shearwaters and fulmars	0.00 ± 0.00	0.00 ± 0.00	0.09 ± 0.05
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.31 ± 0.08	0.10 ± 0.05	0.00 ± 0.00
Northern Fulmar	0.04 ± 0.02	0.09 ± 0.03	0.10 ± 0.07
Pink-footed Shearwater	0.00 ± 0.00	0.37 ± 0.12	0.08 ± 0.04
Sooty Shearwater	0.00 ± 0.00	0.32 ± 0.09	0.24 ± 0.07
Storm-Petrels	0.00 ± 0.00	0.22 ± 0.08	0.12 ± 0.05
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.02
Black	0.00 ± 0.00	0.00 ± 0.00	0.07 ± 0.03
Leach's	0.00 ± 0.00	0.10 ± 0.03	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Brown	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Cormorants	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Brandt's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Double-crested	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelagic	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sea ducks	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Brant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 1B. CONTINUED.

Species	S2 (West-central)		
	January	May	September
Larids			
Gulls			
Black-legged Kittiwake			
Bonaparte's			
California			
Glaucous			
Glaucous-winged			
Heermann's			
Herring			
Mew			
Ring-billed			
Sabine's			
Western			
Terns			
Caspian			
Common/ Arctic			
Elegant			
Elegant/Royal			
Forster's			
Least			
Royal			
Jaegers and skuas			
Long-tailed Jaeger			
Parasitic Jaeger			
Pomarine Jaeger			
South Polar Skua			
Alcids			
Cassin's Auklet			
Common Murre			
Pigeon Guillemots			
Rhinoceros Auklet			
Xantus's Murrelet			
Phalaropes			
Red			
Red-necked			
Laridae	1.00 ± 0.15	0.73 ± 0.22	1.01 ± 0.20
Laraine	0.98 ± 0.15	0.52 ± 0.15	0.24 ± 0.07
<i>Rissa tridactyla</i>	0.58 ± 0.12	0.00 ± 0.00	0.00 ± 0.00
<i>Larus philadelphia</i>	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
<i>Larus californicus</i>	0.16 ± 0.07	0.00 ± 0.00	0.00 ± 0.00
<i>Larus hyperboreus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Larus glaucescens</i>	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
<i>Larus heermanni</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Larus argentatus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Larus canus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Larus delawarensis</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Xema sabini</i>	0.00 ± 0.00	0.30 ± 0.13	0.15 ± 0.06
<i>Larus occidentalis</i>	0.14 ± 0.06	0.20 ± 0.06	0.06 ± 0.03
Sternae			
<i>Sterna caspia</i>	0.00 ± 0.00	0.21 ± 0.12	0.50 ± 0.13
<i>Sterna hirsundo/paradisaea</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Thalasseus elegans</i>	0.00 ± 0.00	0.21 ± 0.12	0.50 ± 0.13
<i>Thalasseus elegans/maaximus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Sterna forsteri</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Sterna antillarum</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Thalasseus maximus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Stercorariinae			
<i>Stercorarius longicaudus</i>	0.01 ± 0.01	0.00 ± 0.00	0.27 ± 0.10
<i>Stercorarius parasiticus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Stercorarius pomarinus</i>	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.02
<i>Stercorarius macconnicki</i>	0.01 ± 0.01	0.00 ± 0.00	0.07 ± 0.03
Alcidae			
<i>Ptychoramphus aleuticus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Uria aalge</i>	6.99 ± 2.15	0.13 ± 0.05	0.11 ± 0.07
<i>Cepphus columba</i>	6.59 ± 2.14	0.10 ± 0.04	0.03 ± 0.03
<i>Cerorhinca monocerata</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Synthliboramphus hypoleucus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropodinae			
<i>Phalaropus fulicarius</i>	0.16 ± 0.05	0.01 ± 0.01	0.00 ± 0.00
<i>Phalaropus lobatus</i>	0.07 ± 0.03	0.03 ± 0.02	0.00 ± 0.00
	1.10 ± 0.22	2.61 ± 0.73	5.57 ± 1.94
	0.72 ± 0.19	0.13 ± 0.07	0.17 ± 0.05
	0.01 ± 0.01	0.91 ± 0.28	0.12 ± 0.07

TABLE 1C. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS WITHIN AT-SEA SUB-AREA S3 (CENTRAL) DURING JANUARY, MAY, AND SEPTEMBER FROM 1999-2002.

Species	S3 (Central)		
	January	May	September
All seabirds	23.69 ± 5.97	20.78 ± 3.56	17.87 ± 7.91
Loons	1.45 ± 0.52	0.14 ± 0.06	0.00 ± 0.00
Common	0.05 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Pacific	0.88 ± 0.37	0.09 ± 0.04	0.00 ± 0.00
Red-throated	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Grebes	8.70 ± 4.91	0.30 ± 0.12	0.06 ± 0.05
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	8.70 ± 4.91	0.30 ± 0.12	0.06 ± 0.05
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.59 ± 0.19	9.99 ± 2.38	6.65 ± 3.00
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.05 ± 0.01
Black-vented Shearwater	0.08 ± 0.04	0.00 ± 0.00	0.14 ± 0.07
Northern Fulmar	0.25 ± 0.07	0.05 ± 0.01	0.02 ± 0.01
Pink-footed Shearwater	0.03 ± 0.02	0.11 ± 0.03	1.11 ± 0.61
Sooty Shearwater	0.05 ± 0.02	9.81 ± 2.37	3.34 ± 1.84
Storm-Petrels	0.00 ± 0.00	0.04 ± 0.01	0.19 ± 0.05
Ashy	0.00 ± 0.00	0.02 ± 0.01	0.09 ± 0.03
Black	0.00 ± 0.00	0.02 ± 0.01	0.03 ± 0.02
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.03 ± 0.02
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	0.24 ± 0.05	0.18 ± 0.04	2.96 ± 2.28
Brown	0.24 ± 0.05	0.18 ± 0.04	2.96 ± 2.28
Cormorants	0.29 ± 0.06	0.30 ± 0.07	0.32 ± 0.11
Brandt's	0.14 ± 0.03	0.21 ± 0.05	0.21 ± 0.10
Double-crested	0.02 ± 0.01	0.03 ± 0.02	0.04 ± 0.01
Pelagic	0.01 ± 0.00	0.02 ± 0.01	0.00 ± 0.00
Sea ducks	0.38 ± 0.14	0.00 ± 0.00	0.00 ± 0.00
Brant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	0.38 ± 0.14	0.00 ± 0.00	0.00 ± 0.00
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 1c. CONTINUED.

Species	S3 (Central)		
	January	May	September
Laridae	9.02 ± 2.26	2.56 ± 0.54	6.83 ± 2.93
Gulls	8.96 ± 2.26	2.42 ± 0.54	6.48 ± 2.92
Black-legged Kittiwake	0.36 ± 0.08	0.00 ± 0.00	0.00 ± 0.00
Bonaparte's	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
California	5.47 ± 2.17	0.09 ± 0.03	0.03 ± 0.01
Glaucous	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Glaucous-winged	0.01 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Heermann's	0.72 ± 0.27	0.00 ± 0.00	0.13 ± 0.04
Herring	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Mew	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sabine's	0.00 ± 0.00	0.05 ± 0.02	0.03 ± 0.02
Western	2.11 ± 0.27	2.20 ± 0.54	5.83 ± 2.68
Terns	0.03 ± 0.01	0.12 ± 0.05	0.23 ± 0.07
Caspian	0.02 ± 0.01	0.00 ± 0.00	0.01 ± 0.01
Common/Arctic	0.00 ± 0.00	0.02 ± 0.01	0.09 ± 0.03
Elegant	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Elegant/Royal	0.01 ± 0.01	0.05 ± 0.04	0.06 ± 0.04
Forster's	0.00 ± 0.00	0.02 ± 0.01	0.03 ± 0.02
Least	0.00 ± 0.00	0.02 ± 0.01	0.00 ± 0.00
Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas	0.03 ± 0.01	0.02 ± 0.01	0.11 ± 0.02
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pomarine Jaeger	0.02 ± 0.01	0.00 ± 0.00	0.04 ± 0.01
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Alcids	2.31 ± 0.31	3.13 ± 1.63	0.20 ± 0.07
Cassin's Auklet	1.66 ± 0.29	2.75 ± 1.62	0.09 ± 0.04
Common Murre	0.08 ± 0.03	0.07 ± 0.04	0.00 ± 0.00
Pigeon Guillemots	0.00 ± 0.00	0.02 ± 0.01	0.00 ± 0.00
Rhinoceros Auklet	0.46 ± 0.07	0.04 ± 0.02	0.01 ± 0.01
Xantus's Murrelet	0.01 ± 0.01	0.22 ± 0.05	0.00 ± 0.00
Phalaropes	0.57 ± 0.16	4.10 ± 1.05	0.65 ± 0.16
Red	0.27 ± 0.10	0.11 ± 0.07	0.03 ± 0.02
Red-necked	0.03 ± 0.02	1.45 ± 0.50	0.08 ± 0.02

TABLE 1D. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS WITHIN AT-SEA SUB-AREA S4 (SOUTH-EAST) DURING JANUARY, MAY, AND SEPTEMBER FROM 1999–2002.

Species	S4 (South-east)		
	January	May	September
All seabirds	9.81 ± 1.74	5.92 ± 1.20	4.57 ± 0.69
Loons	0.18 ± 0.09	0.00 ± 0.00	0.00 ± 0.00
Common	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pacific	0.17 ± 0.09	0.00 ± 0.00	0.00 ± 0.00
Red-throated	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Grebes	0.13 ± 0.08	0.16 ± 0.12	0.02 ± 0.02
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.13 ± 0.08	0.16 ± 0.12	0.02 ± 0.02
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.81 ± 0.51	2.29 ± 0.33	1.79 ± 0.48
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.07 ± 0.06
Black-vented Shearwater	0.63 ± 0.51	0.00 ± 0.00	0.02 ± 0.01
Northern Fulmar	0.09 ± 0.02	0.00 ± 0.00	0.01 ± 0.01
Pink-footed Shearwater	0.01 ± 0.01	0.12 ± 0.03	1.34 ± 0.44
Sooty Shearwater	0.05 ± 0.02	2.02 ± 0.32	0.36 ± 0.12
Storm-Petrels	0.02 ± 0.01	0.08 ± 0.03	0.18 ± 0.08
Ashy	0.00 ± 0.00	0.01 ± 0.01	0.10 ± 0.05
Black	0.00 ± 0.00	0.07 ± 0.02	0.04 ± 0.02
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.01
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.03 ± 0.01
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Pelicans	0.16 ± 0.06	0.11 ± 0.03	0.08 ± 0.03
Brown	0.16 ± 0.06	0.11 ± 0.03	0.08 ± 0.03
Cormorants	0.05 ± 0.03	0.02 ± 0.01	0.02 ± 0.01
Brandt's	0.03 ± 0.02	0.01 ± 0.01	0.01 ± 0.01
Double-crested	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Pelagic	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sea ducks	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Brant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 1D. CONTINUED.

Species	S4 (South-east)		
	January	May	September
Larids			
Laridae	6.94 ± 1.59	1.61 ± 0.51	1.78 ± 0.35
Gulls	6.87 ± 1.59	1.35 ± 0.51	1.38 ± 0.33
Black-legged Kittiwake			0.00 ± 0.00
Bonaparte's	0.35 ± 0.15	0.00 ± 0.00	0.00 ± 0.00
California	0.23 ± 0.07	0.10 ± 0.06	0.00 ± 0.00
Glaucous-winged	4.66 ± 1.53	0.36 ± 0.35	0.01 ± 0.01
Heermann's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Herring	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Mew	0.06 ± 0.03	0.00 ± 0.00	0.06 ± 0.02
Ring-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sabine's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Terns	0.00 ± 0.00	0.04 ± 0.03	0.01 ± 0.01
Caspian	1.08 ± 0.15	0.82 ± 0.19	1.20 ± 0.32
Common/ Arctic	0.03 ± 0.01	0.25 ± 0.05	0.23 ± 0.05
Elegant	0.00 ± 0.00	0.02 ± 0.01	0.00 ± 0.00
Elegant/Royal	0.00 ± 0.00	0.02 ± 0.01	0.11 ± 0.03
Forster's	0.01 ± 0.01	0.02 ± 0.01	0.01 ± 0.01
Least	0.00 ± 0.00	0.05 ± 0.02	0.07 ± 0.03
Royal	0.00 ± 0.00	0.02 ± 0.01	0.00 ± 0.00
Jaegers and skuas	0.00 ± 0.00	0.06 ± 0.02	0.00 ± 0.00
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.02
Parasitic Jaeger	0.04 ± 0.01	0.02 ± 0.01	0.16 ± 0.03
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
South Polar Skua	0.01 ± 0.01	0.00 ± 0.00	0.01 ± 0.01
Alcids	0.02 ± 0.01	0.02 ± 0.01	0.08 ± 0.03
Cassin's Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Common Murre	1.02 ± 0.15	0.27 ± 0.15	0.02 ± 0.01
Pigeon Guillemots	0.24 ± 0.07	0.05 ± 0.03	0.01 ± 0.01
Rhinoceros Auklet	0.05 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Xantus's Murrelet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red	0.60 ± 0.13	0.00 ± 0.00	0.00 ± 0.00
Red-necked	0.00 ± 0.00	0.22 ± 0.13	0.00 ± 0.00
Phalaropes	0.45 ± 0.10	1.33 ± 1.00	0.65 ± 0.29
Red	0.33 ± 0.09	0.01 ± 0.01	0.02 ± 0.01
Red-necked	0.02 ± 0.01	0.14 ± 0.06	0.12 ± 0.08

TABLE 1E. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS WITHIN AT-SEA SUB-AREA S5 (SOUTH) DURING JANUARY, MAY, AND SEPTEMBER FROM 1999-2002.

Species	S5 (South)		
	January	May	September
All seabirds	5.12 ± 0.38	5.26 ± 1.47	2.53 ± 0.29
Loons			
Common	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Pacific	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Gavia pacifica</i>	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
<i>Gavia stellata</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Grebes			
Podicipedidae	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Podiceps auritus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Podilymbus podiceps</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Aechmophorus occidentalis</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Albatrosses			
Diomedetidae	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Phoebastria immutabilis</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Phoebastria nigripes</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Procellariidae</i>	0.33 ± 0.05	2.96 ± 1.45	0.36 ± 0.10
Shearwaters and fulmars			
<i>Puffinus bulleri</i>	0.00 ± 0.00	0.00 ± 0.00	0.11 ± 0.06
<i>Puffinus opisthomelas</i>	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
<i>Fulmarus glacialis</i>	0.29 ± 0.05	0.05 ± 0.02	0.01 ± 0.01
<i>Puffinus creatopus</i>	0.01 ± 0.01	0.04 ± 0.01	0.10 ± 0.03
<i>Puffinus griseus</i>	0.02 ± 0.01	2.85 ± 1.45	0.13 ± 0.07
Hydrobatidae	0.26 ± 0.06	0.55 ± 0.08	0.29 ± 0.04
Storm-Petrels			
Ashy	0.14 ± 0.04	0.24 ± 0.06	0.09 ± 0.02
Black	0.01 ± 0.01	0.08 ± 0.02	0.02 ± 0.01
Leach's	0.03 ± 0.01	0.15 ± 0.03	0.16 ± 0.03
Tropicbirds			
<i>Phaethontidae</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Phaethon aethereus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans			
Pelicanidae	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
<i>Pelecanus occidentalis</i>	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Cormorants			
Phalacrocoracidae	0.08 ± 0.03	0.21 ± 0.07	0.20 ± 0.10
Brandt's	0.05 ± 0.02	0.19 ± 0.07	0.16 ± 0.10
Double-crested	0.01 ± 0.01	0.01 ± 0.01	0.01 ± 0.01
Pelagic	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Phalacrocorax auritus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Phalacrocorax pelagicus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sea ducks			
Anatidae	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Branta bernicla</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Melanitta perspicillata</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
<i>Melanitta fusca</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 1E. CONTINUED.

Species	S5 (South)		
	January	May	September
Laridae			
Gulls			
Black-legged Kittiwake	1.87 ± 0.23	0.68 ± 0.14	1.13 ± 0.19
Bonaparte's	1.80 ± 0.22	0.58 ± 0.13	0.76 ± 0.18
California	0.59 ± 0.08	0.00 ± 0.00	0.00 ± 0.00
Glaucous	0.19 ± 0.15	0.03 ± 0.01	0.00 ± 0.00
Glaucous-winged	0.30 ± 0.06	0.00 ± 0.00	0.01 ± 0.01
Heermann's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Herring	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Mew	0.01 ± 0.01	0.00 ± 0.00	0.04 ± 0.04
Ring-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sabine's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.00 ± 0.00	0.05 ± 0.02	0.05 ± 0.02
Terns	0.57 ± 0.10	0.48 ± 0.13	0.64 ± 0.17
Caspian	0.01 ± 0.01	0.07 ± 0.03	0.29 ± 0.06
Common/ Arctic	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Elegant	0.01 ± 0.01	0.07 ± 0.03	0.29 ± 0.06
Elegant/Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Forster's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Least	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas	0.05 ± 0.02	0.02 ± 0.01	0.08 ± 0.02
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pomarine Jaeger	0.02 ± 0.01	0.02 ± 0.01	0.05 ± 0.02
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Alcids	1.42 ± 0.16	0.23 ± 0.05	0.03 ± 0.01
Cassin's Auklet	0.84 ± 0.13	0.02 ± 0.01	0.00 ± 0.00
Common Murre	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pigeon Guillemots	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Rhinoceros Auklet	0.43 ± 0.08	0.01 ± 0.01	0.00 ± 0.00
Xantus's Murrelet	0.00 ± 0.00	0.18 ± 0.05	0.00 ± 0.00
Phalaropes	1.13 ± 0.22	0.61 ± 0.11	0.47 ± 0.08
Red	0.66 ± 0.14	0.02 ± 0.01	0.26 ± 0.06
Red-necked	0.02 ± 0.01	0.17 ± 0.04	0.02 ± 0.01

TABLE 2A. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS ALONG ALL COASTLINES WITHIN THE STUDY AREA DURING JANUARY, MAY, AND SEPTEMBER FROM 1999-2002.

Species	All coastlines		
	January	May	September
All seabirds	114.2 ± 8.58	39.77 ± 3.51	58.73 ± 15.63
Loons	5.16 ± 0.71	0.70 ± 0.14	0.03 ± 0.01
Common	0.15 ± 0.03	0.08 ± 0.01	0.00 ± 0.00
Pacific	1.66 ± 0.17	0.56 ± 0.14	0.00 ± 0.00
Red-throated	0.13 ± 0.03	0.00 ± 0.00	0.00 ± 0.00
Grebes	35.20 ± 4.48	20.39 ± 3.02	6.36 ± 1.65
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	34.89 ± 4.48	20.38 ± 3.02	6.34 ± 1.65
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.02 ± 0.01	0.13 ± 0.07	19.70 ± 14.86
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Northern Fulmar	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pink-footed Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Sooty Shearwater	0.01 ± 0.01	0.09 ± 0.07	19.56 ± 14.86
Storm-Petrels	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	1.26 ± 0.12	1.77 ± 0.47	3.80 ± 0.78
Brown	1.26 ± 0.12	1.77 ± 0.47	3.80 ± 0.78
Cormorants	3.66 ± 0.48	3.90 ± 0.63	3.86 ± 0.73
Brandt's	1.62 ± 0.17	1.61 ± 0.16	1.31 ± 0.20
Double-crested	0.46 ± 0.07	0.31 ± 0.04	0.41 ± 0.05
Pelagic	0.16 ± 0.02	0.10 ± 0.02	0.00 ± 0.00
Sea ducks	11.25 ± 1.92	2.36 ± 0.74	0.10 ± 0.05
Brant	0.02 ± 0.02	0.05 ± 0.04	0.00 ± 0.00
Red-breasted Merganser	0.05 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	11.09 ± 1.91	2.31 ± 0.74	0.10 ± 0.05
White-winged Scoter	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00

TABLE 2A. CONTINUED.

Species	All coastlines		
	January	May	September
Laridae	57.06 ± 6.86	10.11 ± 0.86	24.67 ± 3.78
Larinae	56.22 ± 6.85	8.99 ± 0.85	21.61 ± 3.69
Black-legged Kittiwake			
<i>Rissa tridactyla</i>	0.03 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Bonaparte's	0.21 ± 0.12	0.16 ± 0.15	0.00 ± 0.00
California	37.45 ± 5.92	0.30 ± 0.06	0.81 ± 0.23
<i>Larus hyperboreus</i>	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Glaucous	0.05 ± 0.01	0.00 ± 0.00	0.01 ± 0.01
Glaucous-winged	1.75 ± 0.39	0.05 ± 0.01	3.59 ± 0.64
Heermann's	0.02 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Herring	0.04 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Mew	0.15 ± 0.05	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sabine's	14.43 ± 3.12	8.04 ± 0.80	16.25 ± 3.46
Western	0.84 ± 0.35	1.11 ± 0.16	3.04 ± 0.54
Terns	0.03 ± 0.01	0.19 ± 0.03	0.48 ± 0.09
Caspian	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Common/Arctic	0.01 ± 0.01	0.23 ± 0.05	0.54 ± 0.12
Elegant	0.61 ± 0.34	0.26 ± 0.06	1.88 ± 0.46
Elegant/Royal	0.10 ± 0.03	0.17 ± 0.04	0.06 ± 0.02
Forster's	0.00 ± 0.00	0.16 ± 0.07	0.00 ± 0.00
Least	0.07 ± 0.02	0.00 ± 0.00	0.04 ± 0.02
Royal	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Jaegers and skuas	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.00
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Alcids	0.14 ± 0.05	0.27 ± 0.06	0.03 ± 0.01
Cassin's Auklet	0.08 ± 0.04	0.01 ± 0.01	0.00 ± 0.00
Common Murre	0.02 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Pigeon Guillemots	0.00 ± 0.00	0.26 ± 0.06	0.02 ± 0.01
Rhinoceros Auklet	0.02 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Xantus's Murrelet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropes	0.02 ± 0.01	0.04 ± 0.03	0.06 ± 0.02
Red	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-necked	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01

TABLE 2B. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS ALONG MAINLAND COASTLINES WITHIN THE STUDY AREA DURING JANUARY, MAY, AND SEPTEMBER FROM 1999-2002.

Species	Mainland coastline		
	January	May	September
All seabirds	141.6 ± 13.99	56.23 ± 6.08	95.41 ± 31.71
Loons	7.27 ± 1.26	0.84 ± 0.23	0.06 ± 0.02
Common	0.16 ± 0.04	0.10 ± 0.02	0.00 ± 0.00
Pacific	1.58 ± 0.22	0.67 ± 0.23	0.00 ± 0.00
Red-throated	0.23 ± 0.05	0.00 ± 0.00	0.00 ± 0.00
Grebes	65.94 ± 7.96	37.42 ± 5.34	12.97 ± 3.33
Horned	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	65.70 ± 7.96	37.40 ± 5.34	12.94 ± 3.33
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.00 ± 0.00	0.00 ± 0.00	39.87 ± 30.40
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Northern Fulmar	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pink-footed Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sooty Shearwater	0.00 ± 0.00	0.00 ± 0.00	39.86 ± 30.40
Storm-Petrels	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	1.49 ± 0.20	2.58 ± 0.86	4.51 ± 0.85
Brown	1.49 ± 0.20	2.58 ± 0.86	4.51 ± 0.85
Cormorants	2.54 ± 0.27	3.68 ± 0.97	2.60 ± 0.45
Brandt's	1.04 ± 0.17	0.89 ± 0.18	0.61 ± 0.09
Double-crested	0.73 ± 0.12	0.39 ± 0.06	0.70 ± 0.10
Pelagic	0.07 ± 0.02	0.05 ± 0.02	0.00 ± 0.00
Sea ducks	12.48 ± 3.30	3.85 ± 1.32	0.20 ± 0.10
Brant	0.04 ± 0.04	0.09 ± 0.07	0.00 ± 0.00
Red-breasted Merganser	0.09 ± 0.03	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	12.18 ± 3.28	3.75 ± 1.32	0.20 ± 0.10
White-winged Scoter	0.02 ± 0.02	0.00 ± 0.00	0.00 ± 0.00

TABLE 2b. CONTINUED.

Species	Mainland coastline		
	January	May	September
Laridae	51.40 ± 10.47	7.56 ± 0.83	34.98 ± 7.51
Gulls	50.84 ± 10.46	5.53 ± 0.76	29.85 ± 7.34
Black-legged Kittiwake		0.00 ± 0.00	0.00 ± 0.00
Bonaparte's	0.39 ± 0.23	0.30 ± 0.28	0.00 ± 0.00
California	31.45 ± 8.62	0.36 ± 0.10	1.52 ± 0.46
Glaucous	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Glaucous-winged	0.07 ± 0.02	0.00 ± 0.00	0.02 ± 0.02
Heermann's	1.09 ± 0.17	0.07 ± 0.02	5.65 ± 1.25
Herring	0.02 ± 0.01	0.00 ± 0.00	0.01 ± 0.01
Mew	0.06 ± 0.04	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	0.27 ± 0.09	0.00 ± 0.00	0.00 ± 0.00
Sabine's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	14.41 ± 5.43	4.15 ± 0.57	20.98 ± 6.91
Terns	0.56 ± 0.09	2.03 ± 0.28	5.11 ± 1.00
Caspian	0.05 ± 0.02	0.34 ± 0.06	0.90 ± 0.17
Common/ Arctic	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Elegant	0.01 ± 0.01	0.42 ± 0.09	1.09 ± 0.23
Elegant/Royal	0.27 ± 0.06	0.48 ± 0.10	2.90 ± 0.82
Forster's	0.18 ± 0.06	0.31 ± 0.07	0.12 ± 0.04
Least	0.00 ± 0.00	0.30 ± 0.12	0.01 ± 0.01
Royal	0.02 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.01
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.01
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Alcids	0.05 ± 0.02	0.15 ± 0.09	0.00 ± 0.00
Cassin's Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Common Murre	0.04 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Pigeon Guillemots	0.00 ± 0.00	0.15 ± 0.09	0.00 ± 0.00
Rhinoceros Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Xantus's Murrelet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropes	0.03 ± 0.02	0.00 ± 0.00	0.05 ± 0.04
Red	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-necked	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 2c. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS ALONG ISLAND COASTLINES WITHIN THE STUDY AREA DURING JANUARY, MAY, AND SEPTEMBER FROM 1999–2002.

Species	Island coastlines		
	January	May	September
All seabirds	83.32 ± 8.69	20.18 ± 1.90	23.58 ± 3.26
Loons	2.79 ± 0.45	0.53 ± 0.15	0.00 ± 0.00
Common	0.14 ± 0.04	0.04 ± 0.02	0.00 ± 0.00
Pacific	1.74 ± 0.27	0.43 ± 0.14	0.00 ± 0.00
Red-throated	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Grebes	0.56 ± 0.36	0.12 ± 0.06	0.02 ± 0.02
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.17 ± 0.08	0.12 ± 0.06	0.02 ± 0.02
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.03 ± 0.03	0.29 ± 0.16	0.37 ± 0.32
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Northern Fulmar	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Pink-footed Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.01
Sooty Shearwater	0.03 ± 0.03	0.19 ± 0.14	0.10 ± 0.07
Storm-Petrels	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	1.00 ± 0.14	0.81 ± 0.11	3.12 ± 1.30
Brown	1.00 ± 0.14	0.81 ± 0.11	3.12 ± 1.30
Cormorants	4.92 ± 0.97	4.17 ± 0.77	5.08 ± 1.36
Brandt's	2.28 ± 0.31	2.46 ± 0.26	1.98 ± 0.38
Double-crested	0.15 ± 0.03	0.22 ± 0.05	0.14 ± 0.03
Pelagic	0.27 ± 0.05	0.16 ± 0.03	0.00 ± 0.00
Sea Ducks	9.87 ± 1.68	0.59 ± 0.33	0.00 ± 0.00
Brant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	9.87 ± 1.68	0.59 ± 0.33	0.00 ± 0.00
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 2C. CONTINUED.

Species	Island coastlines		
	January	May	September
Laridae	63.45 ± 8.61	13.13 ± 1.58	14.78 ± 1.48
Gulls	62.30 ± 8.59	13.11 ± 1.58	13.72 ± 1.44
Black-legged Kittiwake	0.07 ± 0.03	0.00 ± 0.00	0.00 ± 0.00
Bonaparte's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
California	44.21 ± 8.03	0.23 ± 0.07	0.13 ± 0.03
Glaucous	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Glaucous-winged	0.03 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Heermann's	2.49 ± 0.81	0.01 ± 0.01	1.61 ± 0.30
Herring	0.02 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Mew	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sabine's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Terns	14.46 ± 2.57	12.67 ± 1.54	11.73 ± 1.38
Caspian	1.15 ± 0.73	0.01 ± 0.01	1.05 ± 0.43
Common/ Arctic	0.01 ± 0.01	0.01 ± 0.01	0.07 ± 0.03
Elegant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Elegant/Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Forster's	0.99 ± 0.73	0.00 ± 0.00	0.90 ± 0.43
Least	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas	0.13 ± 0.03	0.00 ± 0.00	0.08 ± 0.03
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Alcids	0.24 ± 0.10	0.42 ± 0.07	0.05 ± 0.02
Cassin's Auklet	0.16 ± 0.09	0.02 ± 0.02	0.00 ± 0.00
Common Murre	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pigeon Guillemots	0.01 ± 0.01	0.39 ± 0.07	0.04 ± 0.02
Rhinoceros Auklet	0.04 ± 0.03	0.00 ± 0.00	0.00 ± 0.00
Xantus's Murrelet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropes	0.00 ± 0.00	0.08 ± 0.07	0.07 ± 0.03
Red	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-necked	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01

TABLE 3A. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS ALONG THE NORTHERN MAINLAND COASTLINE DURING JANUARY, MAY, AND SEPTEMBER FROM 1999–2002.

Species	Northern mainland coastline		
	January	May	September
All seabirds	72.12 ± 11.15	43.74 ± 12.48	253.8 ± 156.7
Loons	7.05 ± 1.40	1.98 ± 1.14	0.05 ± 0.03
Common	0.34 ± 0.14	0.11 ± 0.05	0.00 ± 0.00
Pacific	2.83 ± 0.58	1.69 ± 1.14	0.00 ± 0.00
Red-throated	0.16 ± 0.08	0.00 ± 0.00	0.00 ± 0.00
Grebes	17.95 ± 4.82	18.88 ± 10.18	12.84 ± 5.06
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	17.47 ± 4.82	18.88 ± 10.18	12.72 ± 5.07
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.00 ± 0.00	0.00 ± 0.00	201.5 ± 155.4
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Northern Fulmar	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pink-footed Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.02
Sooty Shearwater	0.00 ± 0.00	0.00 ± 0.00	201.4 ± 155.4
Storm-Petrels	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	1.36 ± 0.38	1.23 ± 0.45	5.09 ± 2.62
Brown	1.36 ± 0.38	1.23 ± 0.45	5.09 ± 2.62
Cormorants	2.20 ± 0.51	3.31 ± 0.69	4.15 ± 0.51
Brandt's	1.36 ± 0.41	1.55 ± 0.46	1.68 ± 0.34
Double-crested	0.27 ± 0.09	0.43 ± 0.16	0.57 ± 0.18
Pelagic	0.18 ± 0.07	0.25 ± 0.08	0.02 ± 0.02
Sea ducks	20.49 ± 7.43	12.98 ± 6.87	0.67 ± 0.45
Brant	0.00 ± 0.00	0.27 ± 0.27	0.00 ± 0.00
Red-breasted Merganser	0.02 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	19.61 ± 7.14	12.70 ± 6.87	0.67 ± 0.45
White-winged Scoter	0.09 ± 0.09	0.00 ± 0.00	0.00 ± 0.00

TABLE 3A. CONTINUED.

Species	Northern mainland coastline			
	January	May	September	September
Laridae	22.42 ± 4.88	4.29 ± 0.76	29.14 ± 10.09	29.14 ± 10.09
Gulls	22.17 ± 4.89	4.20 ± 0.75	28.06 ± 9.95	28.06 ± 9.95
Black-legged Kittiwake	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Rissa tridactyla	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Bonaparte's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Larus philadelphia	13.60 ± 4.77	0.39 ± 0.20	3.51 ± 1.44	3.51 ± 1.44
California	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Glaucous	0.11 ± 0.05	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Larus hyperboreus	0.50 ± 0.29	0.02 ± 0.02	11.34 ± 5.44	11.34 ± 5.44
Glaucous-winged	0.05 ± 0.03	0.00 ± 0.00	0.02 ± 0.02	0.02 ± 0.02
Heermann's	0.05 ± 0.03	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Herring	0.23 ± 0.15	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Mew	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	5.80 ± 0.89	3.49 ± 0.68	11.39 ± 3.21	11.39 ± 3.21
Sabine's	0.25 ± 0.13	0.09 ± 0.06	1.09 ± 0.34	1.09 ± 0.34
Western	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Larus occidentalis	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Terns	0.00 ± 0.00	0.00 ± 0.00	0.22 ± 0.09	0.22 ± 0.09
Caspian	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Hydroprogne caspia	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Common/ Arctic	0.00 ± 0.00	0.05 ± 0.05	0.10 ± 0.05	0.10 ± 0.05
Elegant	0.07 ± 0.04	0.00 ± 0.00	0.62 ± 0.25	0.62 ± 0.25
Elegant/Royal	0.14 ± 0.10	0.00 ± 0.00	0.02 ± 0.02	0.02 ± 0.02
Forster's	0.00 ± 0.00	0.05 ± 0.05	0.05 ± 0.05	0.05 ± 0.05
Least	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Thalasseus maximus	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Alcids	0.16 ± 0.08	0.84 ± 0.46	0.00 ± 0.00	0.00 ± 0.00
Cassin's Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ptychoramphus aleuticus	0.11 ± 0.07	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Common Murre	0.00 ± 0.00	0.84 ± 0.46	0.00 ± 0.00	0.00 ± 0.00
Uria aalge	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pigeon Guillemots	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Rhinoceros Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Synthliboramphus hypoleucus	0.11 ± 0.11	0.02 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Xantus's Murrelet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropes	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropus fulicarius	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-necked	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropus lobatus	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 3B. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS ALONG THE CENTRAL MAINLAND COASTLINE DURING JANUARY, MAY, AND SEPTEMBER FROM 1999–2002.

Species	Central mainland coastline		
	January	May	September
All seabirds	158.7 ± 22.24	59.62 ± 9.56	66.26 ± 16.79
Loons	5.31 ± 1.40	0.71 ± 0.16	0.08 ± 0.04
Common	0.14 ± 0.04	0.12 ± 0.03	0.01 ± 0.01
Pacific	1.65 ± 0.33	0.55 ± 0.14	0.00 ± 0.00
Red-throated	0.28 ± 0.07	0.00 ± 0.00	0.00 ± 0.00
Grebes	69.12 ± 10.84	39.40 ± 7.93	18.75 ± 6.75
Horned	0.02 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Western	68.82 ± 10.84	39.37 ± 7.93	18.74 ± 6.75
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.01 ± 0.01	0.01 ± 0.01	0.00 ± 0.00
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Northern Fulmar	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Pink-footed Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sooty Shearwater	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Storm-Petrels	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	1.40 ± 0.24	4.04 ± 1.80	3.73 ± 0.66
Brown	1.40 ± 0.24	4.04 ± 1.80	3.73 ± 0.66
Cormorants	3.78 ± 0.47	4.96 ± 1.91	1.97 ± 0.32
Brandt's	1.41 ± 0.29	1.01 ± 0.30	0.35 ± 0.09
Double-crested	1.24 ± 0.23	0.49 ± 0.10	1.08 ± 0.18
Pelagic	0.06 ± 0.02	0.01 ± 0.01	0.00 ± 0.00
Sea ducks	5.33 ± 0.89	2.03 ± 0.54	0.01 ± 0.01
Brant	0.00 ± 0.00	0.09 ± 0.09	0.00 ± 0.00
Red-breasted Merganser	0.17 ± 0.07	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	5.15 ± 0.89	1.94 ± 0.52	0.01 ± 0.01
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 3b. CONTINUED.

Species	Central mainland coastline		
	January	May	September
Laridae	73.03 ± 19.78	8.35 ± 1.55	41.51 ± 15.54
Gulls	72.39 ± 19.77	7.05 ± 1.49	36.22 ± 15.23
Black-legged Kittiwake		0.00 ± 0.00	0.00 ± 0.00
Bonaparte's	0.80 ± 0.46	0.62 ± 0.58	0.00 ± 0.00
California	45.55 ± 15.93	0.46 ± 0.19	1.62 ± 0.78
Glaucoous	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Glaucoous-winged	0.08 ± 0.03	0.01 ± 0.01	0.03 ± 0.03
Heermann's	1.44 ± 0.31	0.04 ± 0.02	4.61 ± 1.18
Herring	0.01 ± 0.01	0.00 ± 0.00	0.01 ± 0.01
Mew	0.03 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	0.13 ± 0.06	0.00 ± 0.00	0.01 ± 0.01
Sabine's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	21.24 ± 10.86	4.93 ± 1.08	28.92 ± 14.85
Terns	0.64 ± 0.15	1.30 ± 0.34	5.27 ± 1.96
Caspian	0.06 ± 0.02	0.24 ± 0.06	0.79 ± 0.24
Common/ Arctic	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00
Elegant	0.00 ± 0.00	0.19 ± 0.07	0.72 ± 0.30
Elegant/Royal	0.28 ± 0.11	0.11 ± 0.04	3.62 ± 1.70
Forster's	0.25 ± 0.10	0.31 ± 0.10	0.10 ± 0.04
Least	0.00 ± 0.00	0.29 ± 0.25	0.00 ± 0.00
Royal	0.04 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.02
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.02 ± 0.02
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Alcids	0.04 ± 0.03	0.00 ± 0.00	0.00 ± 0.00
Cassin's Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Common Murre	0.04 ± 0.03	0.00 ± 0.00	0.00 ± 0.00
Pigeon Guillemots	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Rhinoceros Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Xantus's Murrelet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropes	0.02 ± 0.02	0.00 ± 0.00	0.12 ± 0.08
Red	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Red-necked	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 3C. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS ALONG THE SOUTHERN MAINLAND COASTLINE DURING JANUARY, MAY, AND SEPTEMBER FROM 1999–2002.

Species	Southern mainland coastline		
	January	May	September
All seabirds	155.0 ± 25.55	58.22 ± 9.81	43.26 ± 6.90
Loons	10.33 ± 3.13	0.42 ± 0.19	0.04 ± 0.02
Common	0.08 ± 0.05	0.07 ± 0.03	0.00 ± 0.00
Pacific	0.78 ± 0.34	0.30 ± 0.19	0.01 ± 0.01
Red-throated	0.20 ± 0.09	0.01 ± 0.01	0.00 ± 0.00
Grebes	88.10 ± 17.47	44.55 ± 9.50	5.42 ± 2.18
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	88.07 ± 17.47	44.55 ± 9.50	5.42 ± 2.18
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Northern Fulmar	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pink-footed Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sooty Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Storm-Petrels	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	1.71 ± 0.43	1.32 ± 0.24	5.19 ± 1.77
Brown	1.71 ± 0.43	1.32 ± 0.24	5.19 ± 1.77
Cormorants	0.87 ± 0.18	2.14 ± 0.98	2.54 ± 1.20
Brandt's	0.29 ± 0.07	0.38 ± 0.18	0.34 ± 0.12
Double-crested	0.23 ± 0.07	0.24 ± 0.08	0.27 ± 0.09
Pelagic	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Sea ducks	18.76 ± 9.09	1.48 ± 0.73	0.18 ± 0.15
Brant	0.13 ± 0.13	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	18.62 ± 9.09	1.48 ± 0.73	0.18 ± 0.15
White-winged Scoter	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Gaviidae			
<i>Gavia immer</i>			
<i>Gavia pacifica</i>			
<i>Gavia stellata</i>			
Podicipedidae			
<i>Podiceps auritus</i>			
<i>Podilymbus podiceps</i>			
<i>Aechmophorus occidentalis</i>			
Diomedetidae			
<i>Phoebastria nigripes</i>			
<i>Phoebastria immutabilis</i>			
Procellariidae			
<i>Puffinus bulleri</i>			
<i>Puffinus opisthomelas</i>			
<i>Fulmarus glacialis</i>			
<i>Puffinus creatopus</i>			
<i>Puffinus griseus</i>			
Hydrobatidae			
<i>Oceanodroma homochroa</i>			
<i>Oceanodroma melania</i>			
<i>Oceanodroma leucorhoa</i>			
Phaethontidae			
<i>Phaethon aethereus</i>			
Pelecanidae			
<i>Pelecanus occidentalis</i>			
Phalacrocoracidae			
<i>Phalacrocorax penicillatus</i>			
<i>Phalacrocorax auritus</i>			
<i>Phalacrocorax pelagicus</i>			
Anatidae			
<i>Branta bernicla</i>			
<i>Mergus serrator</i>			
<i>Melanitta perspicillata</i>			
<i>Melanitta fusca</i>			

TABLE 3C. CONTINUED.

Species	Southern mainland coastline			
	January	May	September	
Laridae	35.05 ± 11.01	8.23 ± 1.04	29.72 ± 4.37	
Gulls	34.42 ± 11.01	4.16 ± 0.69	22.48 ± 3.99	
Black-legged Kittiwake		0.00 ± 0.00	0.00 ± 0.00	
Bonaparte's	0.00 ± 0.00	0.01 ± 0.01	0.00 ± 0.00	
California	20.22 ± 10.50	0.21 ± 0.07	0.27 ± 0.11	
Glaucous	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Glaucous-winged	0.03 ± 0.02	0.00 ± 0.00	0.01 ± 0.01	
Heermann's	0.89 ± 0.19	0.13 ± 0.05	3.78 ± 0.83	
Herring	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00	
Mew	0.13 ± 0.13	0.00 ± 0.00	0.00 ± 0.00	
Ring-billed	0.51 ± 0.24	0.00 ± 0.00	0.00 ± 0.00	
Sabine's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Western	8.93 ± 2.87	3.44 ± 0.64	16.00 ± 3.52	
Terns	0.62 ± 0.12	4.07 ± 0.62	7.21 ± 1.21	
Caspian	0.06 ± 0.03	0.67 ± 0.16	1.44 ± 0.39	
Common/Arctic	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Elegant	0.04 ± 0.04	0.93 ± 0.23	2.16 ± 0.51	
Elegant/Royal	0.37 ± 0.09	1.25 ± 0.28	3.25 ± 0.75	
Forster's	0.10 ± 0.06	0.48 ± 0.14	0.21 ± 0.11	
Least	0.00 ± 0.00	0.44 ± 0.12	0.00 ± 0.00	
Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Jaegers and skuas	0.00 ± 0.00	0.00 ± 0.00	0.03 ± 0.02	
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.03 ± 0.02	
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Alcids	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Cassin's Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Common Murre	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Pigeon Guillemots	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Rhinoceros Auklet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Xantus's Murrelet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Phalaropes	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Red	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	
Red-necked	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00	

TABLE 4A. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS FROM COASTAL TRANSECTS AROUND THE NORTHERN CHANNEL ISLANDS' COASTLINES IN THE SOUTHERN CALIFORNIA BIGHT DURING JANUARY, MAY, AND SEPTEMBER FROM 1999-2002. NORTHERN CHANNEL ISLANDS INCLUDE SAN MIGUEL, SANTA ROSA, SANTA CRUZ, AND ANACAPA ISLANDS.

Species	Northern Channel Islands' coastlines		
	January	May	September
All seabirds	82.01 ± 10.58	22.32 ± 2.41	26.77 ± 4.88
Loons	3.96 ± 0.64	0.74 ± 0.21	0.00 ± 0.00
Common	0.17 ± 0.05	0.07 ± 0.03	0.00 ± 0.00
Pacific	2.46 ± 0.38	0.59 ± 0.20	0.00 ± 0.00
Red-throated	0.02 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
Grebes	0.81 ± 0.53	0.17 ± 0.08	0.03 ± 0.02
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.24 ± 0.12	0.17 ± 0.08	0.03 ± 0.02
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.05 ± 0.04	0.42 ± 0.23	0.55 ± 0.49
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Northern Fulmar	0.01 ± 0.01	0.01 ± 0.01	0.00 ± 0.00
Pink-footed Shearwater	0.00 ± 0.00	0.01 ± 0.01	0.04 ± 0.02
Sooty Shearwater	0.04 ± 0.04	0.28 ± 0.21	0.14 ± 0.11
Storm-Petrels	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	0.94 ± 0.15	0.91 ± 0.14	3.75 ± 1.98
Brown	0.94 ± 0.15	0.91 ± 0.14	3.75 ± 1.98
Cormorants	6.08 ± 1.41	5.15 ± 1.11	7.02 ± 2.08
Brandt's	2.52 ± 0.45	2.83 ± 0.34	2.55 ± 0.58
Double-crested	0.14 ± 0.03	0.22 ± 0.06	0.18 ± 0.05
Pelagic	0.39 ± 0.06	0.24 ± 0.04	0.00 ± 0.00
Sea ducks	14.28 ± 2.39	0.86 ± 0.49	0.00 ± 0.00
Brant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	14.28 ± 2.39	0.86 ± 0.49	0.00 ± 0.00
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 4A. CONTINUED.

Species	Northern Channel Islands' coastlines		
	January	May	September
Laridae	54.90 ± 10.33	13.34 ± 1.92	15.09 ± 2.08
Larinae	54.64 ± 10.34	13.33 ± 1.92	13.60 ± 2.02
Gulls			
Black-legged Kittiwake	0.09 ± 0.04	0.00 ± 0.00	0.00 ± 0.00
Bonaparte's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
California	36.92 ± 9.58	0.31 ± 0.11	0.12 ± 0.04
Glaucous-winged	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Heermann's	0.04 ± 0.03	0.00 ± 0.00	0.01 ± 0.01
Herring	1.30 ± 0.28	0.01 ± 0.01	1.23 ± 0.27
Mew	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Sabine's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Terns	15.32 ± 3.37	12.75 ± 1.86	12.08 ± 1.96
Caspian	0.26 ± 0.07	0.01 ± 0.01	1.48 ± 0.66
Common/Arctic	0.02 ± 0.02	0.01 ± 0.01	0.08 ± 0.04
Elegant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Elegant/Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Forster's	0.07 ± 0.04	0.00 ± 0.00	0.00 ± 0.00
Least	0.00 ± 0.00	0.00 ± 0.00	1.29 ± 0.66
Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas	0.15 ± 0.05	0.00 ± 0.00	0.10 ± 0.04
Long-tailed Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Parasitic Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pomarine Jaeger	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.01 ± 0.01
Alcids	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Cassin's Auklet	0.35 ± 0.15	0.57 ± 0.10	0.06 ± 0.03
Common Murre	0.24 ± 0.13	0.04 ± 0.02	0.00 ± 0.00
Pigeon Guillemots	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Rhinoceros Auklet	0.01 ± 0.01	0.53 ± 0.10	0.04 ± 0.02
Xantus's Murrelet	0.06 ± 0.04	0.01 ± 0.01	0.00 ± 0.00
Phalaropes	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red	0.00 ± 0.00	0.12 ± 0.11	0.10 ± 0.04
Red-necked	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
		0.01 ± 0.01	0.02 ± 0.02

TABLE 4B. DENSITIES (BIRDS/KM² ± SE) OF SEABIRDS FROM COASTAL TRANSECTS AROUND THE SOUTHERN CHANNEL ISLANDS' COASTLINES IN THE SOUTHERN CALIFORNIA BIGHT DURING JANUARY, MAY, AND SEPTEMBER FROM 1999-2002. SOUTHERN CHANNEL ISLANDS INCLUDE SANTA BARBARA, SAN NICOLAS, SANTA CATALINA, AND SAN CLEMENTE ISLANDS.

Species	Southern Channel Islands' coastlines		
	January	May	September
All seabirds	86.05 ± 15.29	15.52 ± 2.90	17.67 ± 1.98
Loons	0.35 ± 0.08	0.08 ± 0.08	0.00 ± 0.00
Common	0.06 ± 0.04	0.00 ± 0.00	0.00 ± 0.00
Pacific	0.25 ± 0.07	0.08 ± 0.08	0.00 ± 0.00
Red-throated	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Grebes	0.03 ± 0.02	0.02 ± 0.02	0.01 ± 0.01
Horned	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pied-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Western	0.01 ± 0.01	0.02 ± 0.02	0.01 ± 0.01
Albatrosses	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-footed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Laysan	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Shearwaters and fulmars	0.00 ± 0.00	0.00 ± 0.00	0.03 ± 0.03
Buller's Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black-vented Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Northern Fulmar	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pink-footed Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sooty Shearwater	0.00 ± 0.00	0.00 ± 0.00	0.03 ± 0.03
Storm-Petrels	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Ashy	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Black	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Leach's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Tropicbirds	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Pelicans	1.14 ± 0.29	0.59 ± 0.17	1.94 ± 0.49
Brown	1.14 ± 0.29	0.59 ± 0.17	1.94 ± 0.49
Cormorants	2.48 ± 0.30	2.02 ± 0.41	1.46 ± 0.23
Brandt's	1.75 ± 0.24	1.65 ± 0.39	0.91 ± 0.16
Double-crested	0.16 ± 0.06	0.22 ± 0.07	0.07 ± 0.03
Pelagic	0.03 ± 0.02	0.00 ± 0.00	0.01 ± 0.01
Sea ducks	0.62 ± 0.21	0.00 ± 0.00	0.00 ± 0.00
Brant	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Red-breasted Merganser	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Surf Scoter	0.62 ± 0.21	0.00 ± 0.00	0.00 ± 0.00
White-winged Scoter	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 4B. CONTINUED.

Species	Southern Channel Islands' coastlines		
	January	May	September
Laridae			
Laridae	81.40 ± 15.25	12.69 ± 2.77	14.20 ± 1.73
Gulls			
Black-legged Kittiwake	78.39 ± 15.18	12.65 ± 2.78	13.94 ± 1.72
Bonaparte's	0.03 ± 0.02	0.00 ± 0.00	0.00 ± 0.00
California	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Glaucous	59.51 ± 14.43	0.05 ± 0.04	0.15 ± 0.06
Glaucous-winged	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Heermann's	0.00 ± 0.00	0.02 ± 0.02	0.00 ± 0.00
Herring	5.01 ± 2.43	0.03 ± 0.02	2.33 ± 0.68
Mew	0.06 ± 0.03	0.00 ± 0.00	0.00 ± 0.00
Ring-billed	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Sabine's	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Western	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Terns			
Caspian	12.67 ± 3.64	12.50 ± 2.77	11.07 ± 1.48
Common/Arctic	3.01 ± 2.26	0.02 ± 0.02	0.27 ± 0.11
Elegant	0.00 ± 0.00	0.00 ± 0.00	0.04 ± 0.03
Elegant/Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Forster's	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Least	2.93 ± 2.26	0.02 ± 0.02	0.17 ± 0.10
Royal	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Jaegers and skuas			
Long-tailed Jaeger	0.07 ± 0.04	0.00 ± 0.00	0.04 ± 0.03
Parasitic Jaeger	0.00 ± 0.00	0.02 ± 0.02	0.00 ± 0.00
Pomarine Jaeger	0.00 ± 0.00	0.02 ± 0.02	0.00 ± 0.00
South Polar Skua	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Alcids			
Cassin's Auklet	0.00 ± 0.00	0.08 ± 0.05	0.03 ± 0.03
Common Murre	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
Pigeon Guillemots	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Rhinoceros Auklet	0.00 ± 0.00	0.08 ± 0.05	0.03 ± 0.03
Xantus's Murrelet	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00
Phalaropes			
Red	0.01 ± 0.01	0.02 ± 0.02	0.00 ± 0.00
Red-necked	0.01 ± 0.01	0.00 ± 0.00	0.00 ± 0.00
	0.00 ± 0.00	0.00 ± 0.00	0.00 ± 0.00

TABLE 5. SIGNIFICANCE TESTS BASED ON F-STATISTICS FROM THE GLMM MODEL FOR ANALYZING SEASON, SUB-AREA, AND SEASON-BY-SUB-AREA INTERACTION EFFECTS ON AT-SEA DENSITIES OF SEABIRDS BY SPECIES. ALL TESTS WERE CONDUCTED FOR THE RANGE OF MONTHS AND SUB-AREAS HAVING A POSITIVE DENSITY ESTIMATE. DIFFERENCES AMONG ALL MONTHS (JANUARY, MAY, AND SEPTEMBER) AND ALL SUB-AREAS (S1 THROUGH S5) WERE TESTED, UNLESS OTHERWISE NOTED. SPECIES TYPES WITH NO TEST FOR A SEASON, SUB-AREA, OR INTERACTION EFFECT DID NOT HAVE SUFFICIENT DENSITY INFORMATION TO TEST THAT EFFECT. ANY EFFECT WITH F-STATISTIC LEADING TO A $P < 0.05$ IS CONSIDERED TO BE STATISTICALLY SIGNIFICANT.

Species	Seasons and subareas used (all months and subareas unless noted)	Season	Subarea	Interaction
All seabirds		$F_{2,4932} = 0.8$; $P = 0.451$	$F_{8,4932} = 22.1$; $P < 0.001$	$F_{8,4932} = 1.4$; $P = 0.176$
Loons		$F_{2,4487} = 6.2$; $P = 0.002$	$F_{3,4487} = 4.5$; $P = 0.004$	
Common Pacific	S1, S3, S4, and S5	$F_{1,1335} = 3.1$; $P = 0.077$	$F_{1,1335} = 0.0$; $P = 0.950$	
Western Grebe	Jan and May; S1, S3, S4, and S5	$F_{1,13038} = 3.7$; $P = 0.055$	$F_{3,3038} = 1.7$; $P = 0.160$	
Shearwaters and fulmars	S1, S3, and S4	$F_{2,3266} = 0.8$; $P = 0.431$	$F_{2,3266} = 1.1$; $P = 0.322$	$F_{8,4932} = 0.9$; $P = 0.442$
Black-vented Shearwater	S1, S3, S4, and S5	$F_{2,4932} = 5.9$; $P = 0.003$	$F_{4,932} = 3.7$; $P = 0.005$	$F_{8,4932} = 1.4$; $P = 0.191$
Northern Fulmar		$F_{2,4487} = 3.1$; $P = 0.046$	$F_{3,4487} = 2.9$; $P = 0.032$	
Pink-footed Shearwater		$F_{2,4940} = 49.1$; $P < 0.001$	$F_{4,940} = 5.1$; $P < 0.001$	
Sooty Shearwater		$F_{2,4932} = 12.3$; $P < 0.001$	$F_{4,932} = 0.8$; $P = 0.495$	
Ashy Storm-Petrel		$F_{2,4940} = 14.4$; $P < 0.001$	$F_{4,940} = 16.5$; $P < 0.001$	
Leach's Storm-Petrel		$F_{2,4940} = 4.3$; $P = 0.013$	$F_{4,940} = 5.2$; $P < 0.001$	
Brown Pelican		$F_{2,4940} = 5.6$; $P = 0.004$	$F_{4,940} = 2.5$; $P = 0.040$	
Cormorants		$F_{2,4940} = 17.1$; $P < 0.001$	$F_{4,940} = 25.4$; $P < 0.001$	
Brandt's Double-crested Surf Scoter	S1, S3, S4, and S5	$F_{2,4481} = 0.9$; $P = 0.409$	$F_{4,481} = 7.0$; $P < 0.001$	$F_{6,4481} = 2.0$; $P = 0.060$
Larids	S1, S3, S4, and S5	$F_{2,4481} = 0.3$; $P = 0.734$	$F_{3,4481} = 5.6$; $P < 0.001$	$F_{6,4481} = 1.0$; $P = 0.427$
Black-legged Kittiwake	Jan and May	$F_{1,1335} = 4.5$; $P = 0.012$	$F_{3,4487} = 7.3$; $P < 0.001$	
Bonaparte's Gull	Jan and May	$F_{1,1335} = 2.1$; $P = 0.146$	$F_{1,1335} = 2.1$; $P = 0.145$	
California Gull	Jan and May	$F_{2,4932} = 4.1$; $P = 0.017$	$F_{4,932} = 12.7$; $P < 0.001$	$F_{8,4932} = 1.2$; $P = 0.295$
Heermann's Gull	Jan and May	$F_{1,3363} = 29.8$; $P < 0.001$	$F_{4,3363} = 2.1$; $P = 0.082$	
Sabine's Gull	Jan and Sep; S1, S3, S4, and S5	$F_{1,3362} = 7.8$; $P = 0.005$	$F_{4,3362} = 3.6$; $P = 0.006$	
Western Gull	May and Sep	$F_{2,4940} = 22.2$; $P < 0.001$	$F_{4,940} = 6.3$; $P < 0.001$	
Alcids		$F_{1,2950} = 0.1$; $P = 0.721$	$F_{3,2950} = 6.5$; $P < 0.001$	$F_{6,2950} = 1.8$; $P = 0.149$
Cassin's Auklet		$F_{1,3262} = 1.3$; $P = 0.259$	$F_{4,3262} = 17.3$; $P < 0.001$	$F_{8,3262} = 0.9$; $P = 0.467$
Common Murre		$F_{2,4932} = 0.0$; $P = 0.968$	$F_{4,932} = 21.9$; $P < 0.001$	$F_{8,4932} = 1.2$; $P = 0.284$
Rhinoceros Auklet		$F_{2,4932} = 26.3$; $P < 0.001$	$F_{4,932} = 6.7$; $P < 0.001$	$F_{8,4932} = 4.9$; $P < 0.001$
Xantus's Murrelet		$F_{2,4940} = 13.3$; $P < 0.001$	$F_{4,940} = 10.7$; $P < 0.001$	
Phalaropes	S1, S3, and S4	$F_{2,3270} = 8.0$; $P < 0.001$	$F_{3,3270} = 22.7$; $P < 0.001$	
Red-necked		$F_{2,4940} = 15.4$; $P < 0.001$	$F_{4,940} = 0.5$; $P = 0.700$	$F_{8,4932} = 3.0$; $P = 0.002$
		$F_{2,4932} = 6.3$; $P = 0.002$	$F_{4,932} = 8.1$; $P < 0.001$	$F_{8,4932} = 3.3$; $P < 0.001$
		$F_{2,4932} = 10.6$; $P < 0.001$	$F_{4,932} = 8.5$; $P < 0.001$	$F_{8,4932} = 1.8$; $P = 0.080$
		$F_{2,4932} = 17.8$; $P < 0.001$	$F_{4,932} = 1.2$; $P = 0.295$	

TABLE 6. SIGNIFICANCE TESTS BASED ON F-STATISTICS FROM THE GLMM MODEL FOR ANALYZING SEASON, SUB-AREA, AND SEASON-BY-SUB-AREA INTERACTION EFFECTS ON COASTAL DENSITIES OF SEABIRDS BY SPECIES. ALL TESTS WERE CONDUCTED FOR THE RANGE OF MONTHS AND SUB-AREAS HAVING A POSITIVE DENSITY ESTIMATE. DIFFERENCES AMONG ALL MONTHS (JANUARY, MAY, AND SEPTEMBER) AND ALL SUB-AREAS (NIC = NORTHERN ISLAND COASTLINE, SIC = SOUTHERN ISLAND COASTLINE, NMC = NORTHERN MAINLAND COASTLINE, CMC = CENTRAL MAINLAND COASTLINE, AND SMC = SOUTHERN MAINLAND COASTLINE) WERE TESTED, UNLESS OTHERWISE NOTED. SPECIES TYPES WITH NO TEST FOR A SEASON, SUB-AREA, OR INTERACTION EFFECT DID NOT HAVE SUFFICIENT DENSITY INFORMATION TO TEST THAT EFFECT. ANY EFFECT WITH F-STATISTIC LEADING TO A $P < 0.05$ IS CONSIDERED TO BE STATISTICALLY SIGNIFICANT.

Species	Season	Subarea	Interaction
All seabirds	$F_{1,1781} = 13.5$; $P < 0.001$	$F_{1,1781} = 5.4$; $P < 0.001$	$F_{8,1781} = 3.9$; $P < 0.001$
Loots	$F_{2,1789} = 57.6$; $P < 0.001$	$F_{4,1789} = 8.5$; $P < 0.001$	
Common	$F_{2,1789} = 9.9$; $P < 0.001$	$F_{4,1789} = 3.8$; $P = 0.005$	
Pacific	$F_{2,1789} = 22.9$; $P < 0.001$	$F_{4,1789} = 10.5$; $P < 0.001$	
Western Grebe	$F_{2,1789} = 0.1$; $P = 0.896$	$F_{4,1781} = 6.1$; $P < 0.001$	$F_{8,1781} = 1.5$; $P = 0.156$
Shearwaters and fulmars	$F_{2,1436} = 1.0$; $P = 0.380$	$F_{3,1436} = 1.2$; $P = 0.306$	
Sooty Shearwater	$F_{2,1436} = 1.5$; $P = 0.222$	$F_{3,1436} = 1.5$; $P = 0.219$	
Brown Pelican	$F_{2,1781} = 12.3$; $P < 0.001$	$F_{4,1781} = 2.0$; $P = 0.091$	$F_{8,1781} = 1.6$; $P = 0.135$
Cormorants	$F_{2,1781} = 0.6$; $P = 0.549$	$F_{4,1781} = 10.1$; $P < 0.001$	$F_{8,1781} = 1.4$; $P = 0.184$
Brandt's	$F_{2,1781} = 2.2$; $P = 0.107$	$F_{4,1781} = 23.7$; $P < 0.001$	$F_{8,1781} = 1.5$; $P = 0.162$
Double-crested	$F_{2,1781} = 0.0$; $P = 0.953$	$F_{4,1781} = 25.3$; $P < 0.001$	$F_{8,1781} = 2.1$; $P = 0.035$
Pelagic	$F_{2,1789} = 14.6$; $P < 0.001$	$F_{4,1789} = 14.9$; $P < 0.001$	
Surf Scoter	$F_{2,1789} = 36.9$; $P < 0.001$	$F_{4,1789} = 10.5$; $P < 0.001$	
Larids	$F_{2,1781} = 23.2$; $P < 0.001$	$F_{4,1781} = 1.3$; $P = 0.281$	$F_{8,1781} = 2.5$; $P = 0.011$
Bonaparte's Gull	$F_{1,589} = 0.2$; $P = 0.664$	$F_{1,589} = 2.0$; $P = 0.161$	
California Gull	$F_{2,1781} = 12.3$; $P < 0.001$	$F_{4,1781} = 0.4$; $P = 0.840$	$F_{8,1781} = 0.7$; $P = 0.692$
Heermann's Gull	$F_{2,1781} = 16.1$; $P < 0.001$	$F_{4,1781} = 0.2$; $P = 0.921$	$F_{8,1781} = 4.3$; $P < 0.001$
Western Gull	$F_{2,1781} = 4.1$; $P = 0.016$	$F_{4,1781} = 1.6$; $P = 0.163$	$F_{8,1781} = 1.6$; $P = 0.117$
Caspian Tern	$F_{2,1789} = 33.0$; $P < 0.001$	$F_{4,1789} = 24.0$; $P < 0.001$	
Alcids	$F_{2,1436} = 12.3$; $P < 0.001$	$F_{3,1436} = 10.0$; $P < 0.001$	
Cassin's Auklet	$F_{1,1310} = 4.9$; $P = 0.027$		
Common Murre	$F_{2,927} = 20.5$; $P < 0.001$	$F_{2,333} = 1.9$; $P = 0.154$	
Pigeon Guillemot	$F_{2,927} = 20.5$; $P < 0.001$	$F_{2,927} = 6.1$; $P = 0.002$	

Seasons and subareas used
(all months and subareas
unless noted)

NIC, SIC, CMC, and NMC
NIC, SIC, CMC, and NMC
Jan and May; CMC and SMC
NIC, SIC, CMC, and NMC
Jan and May; NIC
Jan; SIC, CMC, and NMC
NIC, SIC, and NMC

TABLE 7A. SIGNIFICANCE TESTS BASED ON WALD'S Z-STATISTICS FROM THE GLM MODEL FOR ANALYZING DIFFERENCES IN AT-SEA DENSITIES OF SEABIRDS BETWEEN 1975-1983 AND 1999-2002, BY SPECIES AND SUB-AREA (S1, S2, AND ALL FIVE SUB-AREAS COMBINED). SPECIES WITH NO TEST FOR A SUB-AREA DID NOT HAVE SUFFICIENT DENSITY INFORMATION TO TEST PERIOD DIFFERENCES IN THAT SUB-AREA. A NEGATIVE Z-STATISTIC INDICATES DENSITIES WERE GREATER FROM 1975-1983. A POSITIVE Z-STATISTIC INDICATES DENSITIES WERE GREATER FROM 1999-2002. ANY EFFECT WITH A $P < 0.05$ IS CONSIDERED TO BE STATISTICALLY SIGNIFICANT.

Species	Sub-area		
	All combined	S1	S2
All seabirds	Z = -12.5; P < 0.001	Z = -1.3; P = 0.182	Z = -2.3; P = 0.024
Loons	Z = -5.0; P < 0.001	Z = 0.4; P = 0.690	
Common Pacific	Z = -11.5; P < 0.001		
Shearwaters and fulmars	Z = -8.8; P < 0.001	Z = 1.6; P = 0.110	Z = -5.4; P < 0.001
Northern Fulmar	Z = -3.3; P = 0.001	Z = -0.1; P = 0.886	Z = -0.7; P = 0.489
Pink-footed Shearwater	Z = -6.1; P < 0.001	Z = -0.0; P = 0.976	Z = -8.2; P < 0.001
Sooty Shearwater	Z = -0.4; P = 0.703	Z = 1.3; P = 0.186	Z = -7.4; P < 0.001
Ashy Storm-Petrel	Z = 0.3; P = 0.740	Z = 0.6; P = 0.560	Z = 4.1; P < 0.001
Black Storm-Petrel	Z = 16.8; P < 0.001	Z = 7.6; P < 0.001	Z = -6.3; P < 0.001
Leach's Storm-Petrel	Z = 9.1; P < 0.001	Z = -4.6; P < 0.001	Z = -9.9; P < 0.001
Brown Pelican	Z = -10.0; P < 0.001	Z = -5.2; P < 0.001	
Cormorants	Z = 4.4; P < 0.001	Z = -1.0; P = 0.330	
Brandt's Double-crested	Z = 4.1; P < 0.001	Z = 3.5; P < 0.001	
Larids	Z = 13.0; P < 0.001	Z = 4.4; P < 0.001	
Black-legged Kittiwake	Z = 16.4; P < 0.001		
Bonaparte's Gull	Z = -9.7; P < 0.001	Z = -2.3; P = 0.019	Z = -0.9; P = 0.373
California Gull	Z = -8.0; P < 0.001	Z = -2.1; P = 0.037	Z = 3.9; P < 0.001
Heermann's Gull	Z = -20.2; P < 0.001	Z = -7.6; P < 0.001	Z = -4.8; P < 0.001
Sabine's Gull	Z = -2.4; P = 0.015	Z = -1.3; P = 0.182	Z = -6.0; P < 0.001
Western Gull	Z = -73.4; P < 0.001	Z = -6.6; P < 0.001	
Alcids	Z = 14.8; P < 0.001	Z = 16.6; P < 0.001	Z = 3.8; P < 0.001
Cassin's Auklet	Z = 3.4; P < 0.001	Z = -0.7; P = 0.486	Z = -2.8; P = 0.005
Common Murre	Z = -11.2; P < 0.001	Z = -2.0; P = 0.050	Z = -3.1; P = 0.002
Rhinoceros Auklet	Z = 4.8; P < 0.001	Z = -3.0; P = 0.003	Z = -1.9; P = 0.062
Xantus's Murrelet	Z = -17.0; P < 0.001	Z = -2.3; P = 0.023	Z = -6.6; P < 0.001
Phalaropes	Z = -3.1; P = 0.002	Z = 2.8; P = 0.005	
Red Phalarope	Z = 13.2; P < 0.001	Z = 13.2; P < 0.001	Z = 0.1; P = 0.957
Red-necked Phalarope	Z = -10.2; P < 0.001	Z = -0.9; P = 0.385	Z = 5.2; P < 0.001
	Z = 5.1; P < 0.001	Z = 11.6; P < 0.001	
	Z = 17.6; P < 0.001	Z = 19.2; P < 0.001	

TABLE 7b. SIGNIFICANCE TESTS BASED ON WALD'S Z-STATISTICS FROM THE GLM MODEL FOR ANALYZING DIFFERENCES IN AT-SEA DENSITIES OF SEABIRDS BETWEEN 1975–1983, AND 1999–2002, BY SPECIES AND SUB-AREA (S3, S4, AND S5). SPECIES WITH NO TEST FOR A SUB-AREA DID NOT HAVE SUFFICIENT DENSITY INFORMATION TO TEST PERIOD DIFFERENCES IN THAT SUB-AREA. A NEGATIVE Z-STATISTIC INDICATES DENSITIES WERE GREATER FROM 1975–1983. A POSITIVE Z-STATISTIC INDICATES DENSITIES WERE GREATER FROM 1999–2002. ANY EFFECT WITH A $P < 0.05$ IS CONSIDERED TO BE STATISTICALLY SIGNIFICANT.

Species	Sub-area		
	S3	S4	S5
All seabirds	Z = -0.1; P = 0.942	Z = -8.7; P < 0.001	Z = -12.7; P < 0.001
Loons	Z = -10.6; P < 0.001	Z = -11.8; P < 0.001	Z = -13.9; P < 0.001
Common	Z = -9.0; P < 0.001		
Pacific	Z = -7.0; P < 0.001		
Shearwaters and fulmars	Z = 2.9; P = 0.004	Z = -2.9; P = 0.004	Z = -14.3; P < 0.001
Northern Fulmar	Z = -2.8; P = 0.005	Z = -8.6; P < 0.001	Z = -2.9; P = 0.004
Pink-footed Shearwater	Z = -1.1; P = 0.284	Z = 3.2; P = 0.001	Z = 4.2; P < 0.001
Sooty Shearwater	Z = 5.7; P < 0.001	Z = -13.9; P < 0.001	Z = -16.2; P < 0.001
Ashy Storm-Petrel	Z = 5.7; P < 0.001	Z = 6.4; P < 0.001	Z = -4.9; P < 0.001
Black Storm-Petrel	Z = 4.5; P < 0.001	Z = 6.7; P < 0.001	Z = 4.5; P < 0.001
Leach's Storm-Petrel	Z = -10.8; P < 0.001	Z = -11.3; P < 0.001	Z = 4.5; P < 0.001
Brown Pelican	Z = 1.9; P = 0.059	Z = -2.1; P = 0.039	Z = -13.0; P < 0.001
Cormorants	Z = -11.0; P < 0.001	Z = -4.7; P < 0.001	Z = 4.1; P < 0.001
Brandt's	Z = 6.1; P < 0.001	Z = 2.0; P = 0.047	Z = 6.0; P < 0.001
Double-crested	Z = 5.9; P < 0.001	Z = -2.6; P = 0.011	
Larids	Z = -3.5; P < 0.001	Z = -4.0; P < 0.001	Z = -14.8; P < 0.001
Black-legged Kittiwake	Z = -7.5; P < 0.001	Z = -5.7; P < 0.001	Z = -1.9; P = 0.052
Bonaparte's Gull	Z = -3.4; P < 0.001	Z = -3.8; P < 0.001	Z = -16.0; P < 0.001
California Gull	Z = -1.9; P = 0.057	Z = 0.6; P = 0.546	Z = -4.4; P < 0.001
Heermann's Gull	Z = 3.8; P < 0.001	Z = -10.4; P < 0.001	Z = -8.6; P < 0.001
Sabine's Gull	Z = 3.2; P = 0.001	Z = 5.2; P < 0.001	
Western Gull	Z = 2.0; P = 0.042	Z = -2.5; P = 0.014	Z = -3.1; P = 0.002
Alcids	Z = -1.3; P = 0.187	Z = -4.1; P < 0.001	Z = -5.1; P < 0.001
Cassin's Auklet	Z = 3.0; P = 0.003	Z = 3.0; P = 0.003	Z = 8.0; P < 0.001
Common Murre	Z = -14.6; P < 0.001	Z = -10.5; P < 0.001	
Rhinceros Auklet	Z = -10.7; P < 0.001	Z = 0.4; P = 0.653	Z = -1.1; P = 0.290
Xantus's Murrelet	Z = -0.0; P = 0.993	Z = -1.0; P = 0.316	Z = 4.5; P < 0.001
Phalaropes	Z = -4.1; P < 0.001	Z = -2.1; P = 0.039	Z = -4.2; P < 0.001
Red	Z = -8.2; P < 0.001	Z = -2.8; P = 0.005	Z = 7.7; P < 0.001
Red-necked	Z = 4.3; P < 0.001		

in S3 in January and in S1 in May (Tables 1, 5). Densities along coastal transects differed among seasons with greatest densities in January and lowest densities in May (Tables 2-4, 6). At-sea densities for all seabirds combined were greater in 1975-1983 than in 1999-2002 for the entire study area, S2, S4, and S5, but did not differ significantly in S1 and S3 (Tables 7a, 7b).

SPECIES ACCOUNTS

GAVIIDAE

Loons occurred commonly in southern California and were observed primarily along mainland and island coastlines (Fig. 6). Because it was difficult to distinguish between Common and Pacific loons (*Gavia immer* and *G. pacifica*), and also some Red-throated Loons (*G. stellata*) when in winter plumage, 52% of loons counted were recorded as unidentified (Fig. 7). At-sea densities differed among seasons and the four sub-areas in which loons occurred (S1, S3, S4, and S5; Table 5). Greatest densities occurred in S3 in January and in S1 in May (Tables 1a, 1c). Coastal densities differed among seasons and sub-areas (Table 6). Greatest coastal densities occurred in January along mainland coasts (Tables 2-4). At-sea densities of loons were greater in 1975-1983 than in 1999-2002 for the entire study area, S2, S3, S4, and S5 (Tables 7a, 7b).

Common Loon

Common Loons winter inshore from the western Aleutian Islands, Alaska, to the southwest coast of Mexico (McIntyre and Barr 1997). In 1975-1983, Common Loons occurred in California waters from late March to late May and from late October to December (Briggs et al. 1987). Briggs et al. (1987) estimated several thousand Common Loons off California in April with hundreds occurring <0.5 km from shore. Most large loon concentrations in 1975-1983 were north of our study area (Briggs et al. 1987). In 1999-2002, we observed loons along the coast near Morro Bay, from Point Arguello to Point Dume, near San Diego, and near San Miguel and Santa Rosa islands in January and May (Fig. 8).

At-sea densities of Common Loons did not differ among the two seasons (January and May) or two sub-areas (S1 and S3) in which they were observed (Table 5). Most (82%) Common Loons were observed on coastal transects. Coastal densities differed among seasons and sub-areas and were greatest in January and along the northern portion of the mainland coast (Tables 2-4, 6).

At-sea densities of Common Loons in 1975-1983 were greater than in 1999-2002 for the entire study area and S3 (Tables 7a, 7b); but since Common Loons occurred mainly in coastal transect areas that were not surveyed by Briggs et al. (1987), we cannot determine if reduced densities truly reflect lower population sizes. In other sub-areas, we lacked the data to make statistical comparisons to Briggs et al. (1987).

Pacific Loon

Pacific Loons, the most abundant loons in North America, are strictly marine except when breeding in the Arctic and sub-Arctic (Russell 2002). Pacific Loons winter from Alaska to Mazatlan, Mexico (Russell 2002). Briggs et al. (1987) recorded greatest abundances off southern California in mid-December, especially within the eastern Santa Barbara Channel northeast of Anacapa Island. In our surveys, Pacific Loons were most common within 40 km of the southern California mainland in all seasons. In 1999-2002, we observed loons in January and May near the northern Channel Islands (except Anacapa) from Point Conception to Point Buchon, between Santa Barbara and Point Dume, and on the west side of Santa Catalina Island (Fig. 9). On at-sea transects, 87% of observed Pacific Loons were <5 km from shore.

In 1999-2002, at-sea densities of Pacific Loons did not differ among the two seasons (January and May) or the four sub-areas (S1, S3, S4, and S5) in which they were observed (Table 5). On coastal transects, densities differed among seasons and sub-areas (Table 6). Coastal densities were greatest in January and along the northern mainland and northern Channel Island coastlines (Tables 2-4).

At-sea densities of Pacific Loons were greater in 1975-1983 than in 1999-2002 for the entire study area, S3, S4, and S5 but did not differ significantly in S1 (Tables 7a, 7b). D. Nysewander (unpubl. data) found a 79% decline for loons in Puget Sound over a 20-yr period, indicating that the reduction in loon abundance may extend along the entire Pacific coast.

WESTERN GREBE (*AECHMOPHORUS OCCIDENTALIS*) AND CLARK'S GREBE (*A. CLARKIA*)

We were unable to distinguish between Western and Clark's grebes from the air, but because most observations indicate that the overwhelming majority are Western Grebes, we combined both species for analyses and hereafter refer to them as Western Grebes. Western Grebes breed on lakes from northwestern Canada to northern Baja California, Mexico,