

**Seabirds and Marine Mammals on the NMFS  
Rockfish Recruitment and Ecosystem Assessment Survey: 2025 Data Report**

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## Introduction

Seabird and marine mammal observations are an integral part of the NMFS Rockfish Recruitment and Ecosystem Assessment Survey (RREAS). These data are valuable for several reasons: (1) measurements provide an upper trophic level perspective to complement the oceanographic and mid-trophic level data collected by NMFS, (2) estimates of seabird and marine mammal abundance, diversity and distribution may contribute to various aspects of ecosystem and fisheries management, and (3) by extending our existing time series, measuring annual variation in the top predator community contributes to understanding the effects of climate variability and change on the California Current Ecosystem (CCE). This data report summarizes the at-sea survey observations made during the 2025 cruise, and presents basic distribution and abundance estimates for seabirds and mammals.

## Methods

*Oceanographic conditions.* We provide sea surface temperature (SST; C°) and wind averages for the periods of 7 May to 26 May 2025 (survey Leg 1) and 1 June to 17 June 2025 (survey Leg 2) along the West Coast, corresponding with the RREAS survey area. SST data and their anomalies (baseline period 1991–2020) were downloaded from the Optimal Interpolated SST (OISST) dataset (<https://psl.noaa.gov/data/gridded/data.noaa.oisst.v2.highres.html>). Additionally, daily SST and wind (speed and direction) data were downloaded from NOAA/NDBC buoys (<https://www.ndbc.noaa.gov/>).

*Seabird observations.* Observations of seabirds and marine mammals are made continuously during daylight ship transits between oceanographic and fish sampling stations. The observer, located on the flying bridge approximately 15 meters above sea level, uses hand-held binoculars to assist in the identification and enumeration of birds and mammals. For seabirds, the observer records all individuals seen within a 300-meter strip transect to one side and in front of the vessel while the ship is underway at speeds greater than 5 knots. For mammals, the observer records all individuals out to the horizon while the ship is underway. Observations are entered into a laptop using the dedicated application “Dlog”; the ship’s position is automatically recorded periodically from an external GPS. Each observation includes the species, the number of individuals observed, and their behavior (mostly “flying”, “sitting on the water”, or “feeding” for birds). At-sea observation data are post-processed using standardized species codes, validation of positioning data, and binning of observations into along-track sections of 3 km in length. The data are then integrated into a survey database that contains data from May 1996 to the present. These data are used to derive summary statistics on density. Species data are presented for both the core region and the full (core + extended) region surveyed since 2004 (see Sakuma et al. 2006 for delineations).

*Calculation of seabird densities.* Taxa excluded from this summary were fish, terrestrial birds, and most shorebirds except phalaropes, which are largely pelagic. For seabirds, density is calculated as the total number of individuals observed per species divided by the area (km<sup>2</sup>) surveyed. For mammals, an “encounter rate” is defined as the total number of individuals observed per species divided by the linear amount of habitat (km) sampled. Density/encounter rate over time is shown for select seabird and mammal species in the core survey area 1996–2025 (Figures 5–8). Seabirds highlighted in this report include: sooty shearwater (*Ardenna griseus*), pink-footed shearwater (*Puffinus creatopus*), northern fulmar (*Fulmarus glacialis*),

black-footed albatross (*Phoebastria nigripes*), Cassin's auklet (*Ptychoramphus aleuticus*), common murre (*Uria aalge*), rhinoceros auklet (*Cerorhinca monocerata*), Brandt's cormorant (*Phalacrocorax penicillatus*), brown pelican (*Pelecanus occidentalis*), western gull (*Larus occidentalis*), Sabine's gull (*Xema sabini*), elegant tern (*Thalasseus elegans*), and grouped phalaropes (red phalarope *Phalaropus fulicarius* and red-necked phalarope *P. lobatus*). Marine mammals included are blue whale (*Balaenoptera musculus*), humpback whale (*Megaptera novaeangliae*), Pacific white-sided dolphin (*Lagenorhynchus obliquidens*), and Risso's dolphin (*Grampus griseus*).

## Results

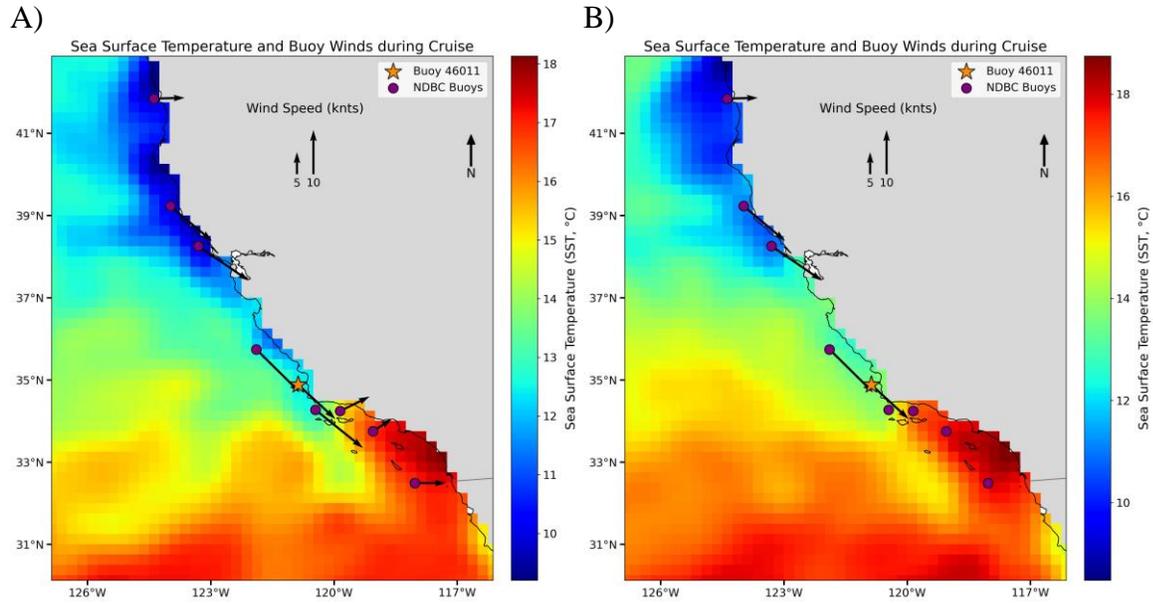
*Oceanographic conditions.* The 2025 RREAS survey transited a wide range of water temperatures, with cool temperatures along the coast in the north, reflective of a typical upwelling signature, and warmer water off Southern California (Figure 1). During the survey, ocean conditions were cooler than average in the nearshore area, except for Southern California, where they were warmer than average (Figure 2). Strong upwelling winds were detected throughout the survey (Figure 3) and are also indicated by the cool waters along the coast (Figures 1, 2).

*Surveying effort.* A summary of survey effort is shown in Table 1; transects surveyed are shown in Figure 4. Summarized species observations for all species in the core and total survey area are shown in Tables 2 and 3 (see Appendix 1 for exclusions). A total of 36 days of survey effort covering 3,146 km (944 km<sup>2</sup>) of ocean habitat is summarized; 15 days were spent covering 1,255 km (376 km<sup>2</sup>) in the core survey area between Cypress Point and Bodega Bay. Surveying was done by Brian Hoover on Leg 1 from 7 May to 26 May (20 days) and Jarrod Santora surveyed on Leg 2 from 1 June to 17 June (16 days).

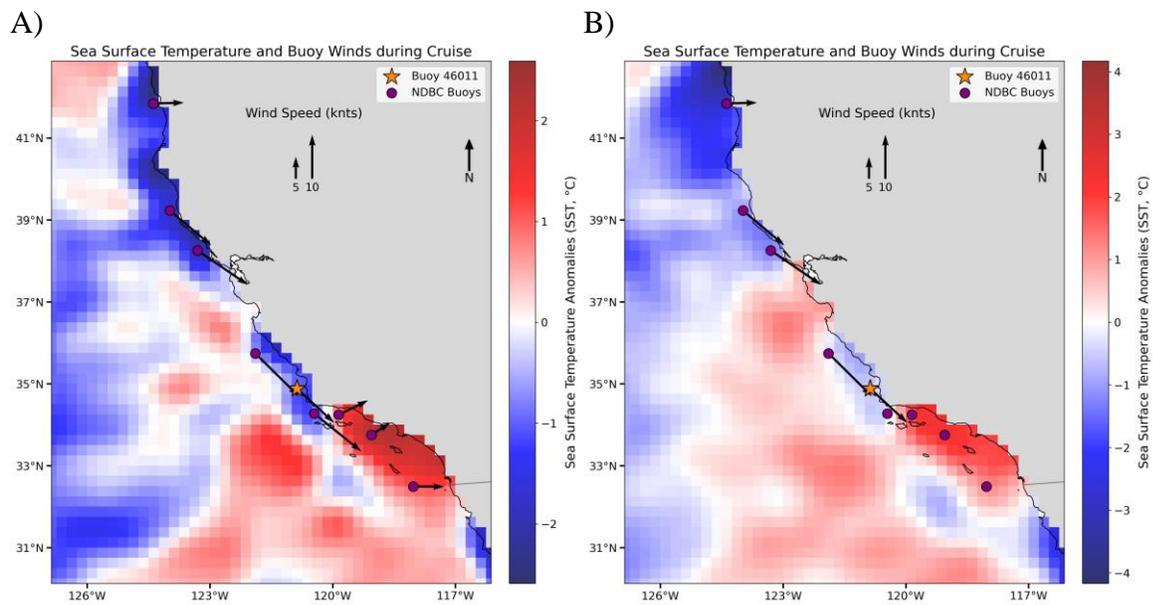
*Seabirds.* Density over time in the core area for the selected seabird species are shown in Figures 5–7. Notable results from the 2025 survey include species with high density (at or above 1 standard deviation (s.d.) from the mean): sooty shearwater, brown pelican, and Sabine's gull. Other species with higher than normal density, but within 1 s.d. of the mean, were common murre and Brandt's cormorant. Brown pelicans, Brandt's cormorants, and common murre are substantial consumers of anchovy. Pink-footed shearwaters, black-footed albatross, rhinoceros auklets, western gulls, and phalaropes were seen at near-average densities. Cassin's auklets were also present at average density following two years of very few observations. Northern fulmars were less abundant than usual, with density below 1 s.d. of the mean. Elegant terns are of particular interest on the California coast due to their recent range expansion north from Mexico (Velarde et al. 2015). None were seen in the core area on this survey, though some birds were observed in other areas (Table 2).

*Marine mammals.* Our focal marine mammals were abundant in 2025 (Figure 8). Humpback whales, Pacific white-sided dolphins, and Risso's dolphins were observed at the highest density of each of their time series. Blue whales were also abundant, with an encounter rate higher than 1 s.d. above the long-term mean. One special observation note from the survey is that three Baird's beaked whales (*Berardius bairdii*) were observed between survey transects on 14 May. Since the observers were off-effort at the time of that observation, it was not included in the database.

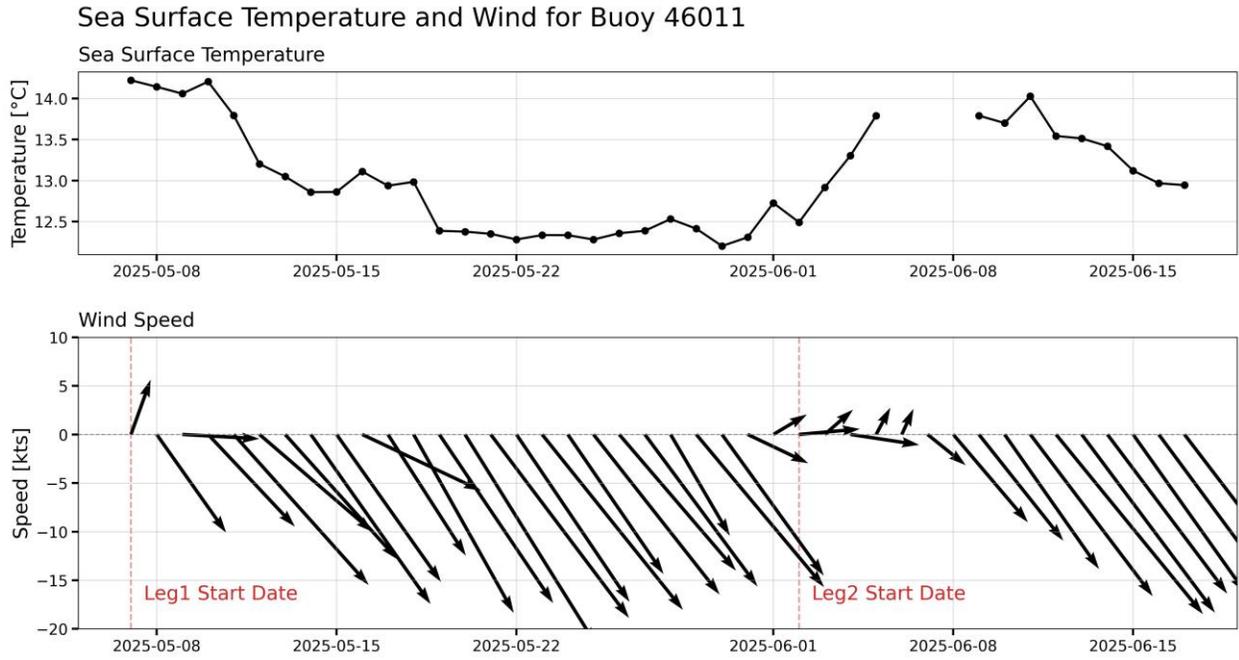
**Figure 1.** Sea surface temperature (SST;  $^{\circ}\text{C}$ ) and wind averages (speed and direction). The direction the wind is blowing is shown at NOAA/NDBC buoys (purple dots and orange star). Data were averaged for A) Leg 1 (7 May to 26 May 2025), and B) Leg 2 of the RREAS survey (1 June to 17 June 2025).



**Figure 2.** Sea surface temperature anomalies (SSTa;  $^{\circ}\text{C}$ ) averages for both legs of the RREAS survey. Baseline period: 1991–2020. NOAA/NDBC buoys shown in Figure 1 are shown again here. Data were averaged for A) Leg 1 (7 May to 26 May 2025) and B) Leg 2 of the RREAS survey (1 June to 17 June 2025).



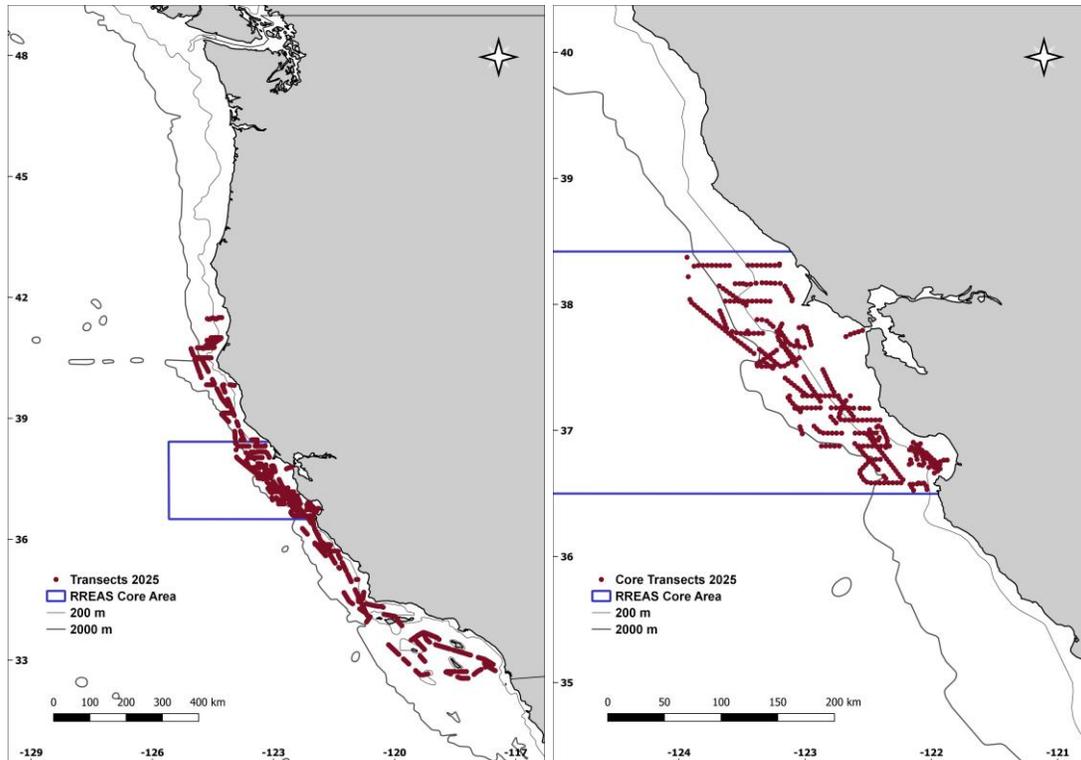
**Figure 3.** Daily SST (C°) and wind averages for the period of 7 May to 17 June 2025 at NOAA/NDBC buoy 46011; location is marked in Figures 1 and 2 with an orange star. The beginning of each cruise leg is shown with a dashed vertical line. Bottom panel: arrow direction indicates the direction the wind is blowing (up = north) and the y-axis indicates wind speed scale in knots. Upwelling-favorable winds are strong winds to the southeast.



**Table 1.** Summary of survey effort and seabird and mammal community statistics.

2025	Core Area	Full Area
Survey vessel		<i>R/V Reuben Lasker</i>
Start date		5/7/2025
End date		6/17/2025
Number of survey days	15	36
Distance surveyed (km)	1,255	3,146
Area surveyed (km <sup>2</sup> )	376	944
Number of bird species	34	52
Overall bird density (per km <sup>2</sup> )	66.153	44.236
Total birds observed	24,905	41,750
Number of mammal species	12	19
Overall mammal encounter rate (per 100 km)	181	323.5
Total mammals observed	2,272	10,179

**Figure 4.** 2025 survey transects for the full (left) and core (right) regions. Gaps usually reflect nighttime.



**Table 2.** Bird survey observations, stratified by area and species. Cell values represent: total number of individuals seen / number of species sightings / average density (birds/km<sup>2</sup>).

Common Name	Scientific Name	Core Area	Full Area
American White Pelican	<i>Pelecanus erythrorhynchos</i>		
Ancient Murrelet	<i>Synthliboramphus antiquus</i>	2 / 1 / 0.01	3 / 2 / 0
Arctic Loon	<i>Gavia arctica</i>		
Arctic Tern	<i>Sterna paradisaea</i>		
Ashy Storm-Petrel	<i>Oceanodroma homochroa</i>	5 / 3 / 0.01	12 / 4 / 0.01
Black guillemot	<i>Cephus grylle</i>		
Black Scoter	<i>Melanitta nigra</i>		
Black Storm-Petrel	<i>Oceanodroma melania</i>		11 / 7 / 0.01
Black-Footed Albatross	<i>Phoebastria nigripes</i>	142 / 130 / 0.38	309 / 275 / 0.33
Black-Legged Kittiwake	<i>Rissa tridactyla</i>		
Black-Vented Shearwater	<i>Puffinus opisthomelas</i>		
Bonaparte's Gull	<i>Larus philadelphia</i>	47 / 3 / 0.12	75 / 6 / 0.08
Brandt's Cormorant	<i>Phalacrocorax penicillatus</i>	340 / 108 / 0.9	1018 / 201 / 1.08
Brant	<i>Branta bernicla</i>		
Brown Booby	<i>Sula leucogaster</i>		1 / 1 / 0
Brown Noddy	<i>Anous stolidus</i>		
Brown Pelican	<i>Pelecanus occidentalis</i>	46 / 30 / 0.12	218 / 92 / 0.23
Buller's Shearwater	<i>Puffinus bulleri</i>		
California Gull	<i>Larus californicus</i>	38 / 26 / 0.1	67 / 46 / 0.07
Caspian Tern	<i>Sterna caspia</i>	4 / 3 / 0.01	5 / 4 / 0.01
Cassin's Auklet	<i>Ptychoramphus aleuticus</i>	265 / 79 / 0.7	310 / 95 / 0.33
Clark's Grebe	<i>Aechmophorus clarkii</i>		
Common Loon	<i>Gavia immer</i>	1 / 1 / 0	3 / 2 / 0
Common Murre	<i>Uria aalge</i>	4067 / 1003 / 10.8	4400 / 1205 / 4.66
Common Tern	<i>Sterna hirundo</i>		
Cook's Petrel	<i>Pterodroma cookii</i>		2 / 2 / 0
Craveri's Murrelet	<i>Synthliboramphus craveri</i>		
Dark Shearwater	(species group)		
Dark-Rumped Petrel	<i>Pterodroma phaeopygia sandwichensis</i>		
Double-Crested Cormorant	<i>Phalacrocorax auritus</i>		
Eared Grebe	<i>Podiceps nigricollis</i>		
Elegant Tern	<i>Sterna elegans</i>		87 / 31 / 0.09
Flesh-Footed Shearwater	<i>Puffinus carneipes</i>		1 / 1 / 0
Fork-Tailed Storm-Petrel	<i>Oceanodroma furcata</i>		
Forster's Tern	<i>Sterna forsteri</i>	1 / 1 / 0	1 / 1 / 0
Franklin's Gull	<i>Larus pipixcan</i>		
Glaucous Gull	<i>Larus hyperboreus</i>		
Glaucous-Winged Gull	<i>Larus glaucescens</i>	5 / 5 / 0.01	8 / 8 / 0.01
Glaucous-winged / Western Hybrid Gull			9 / 8 / 0.01
Guadalupe Murrelet	<i>Synthliboramphus hypoleucus</i>		
Hawaiian Petrel	<i>Pterodroma sandwichensis</i>		3 / 3 / 0

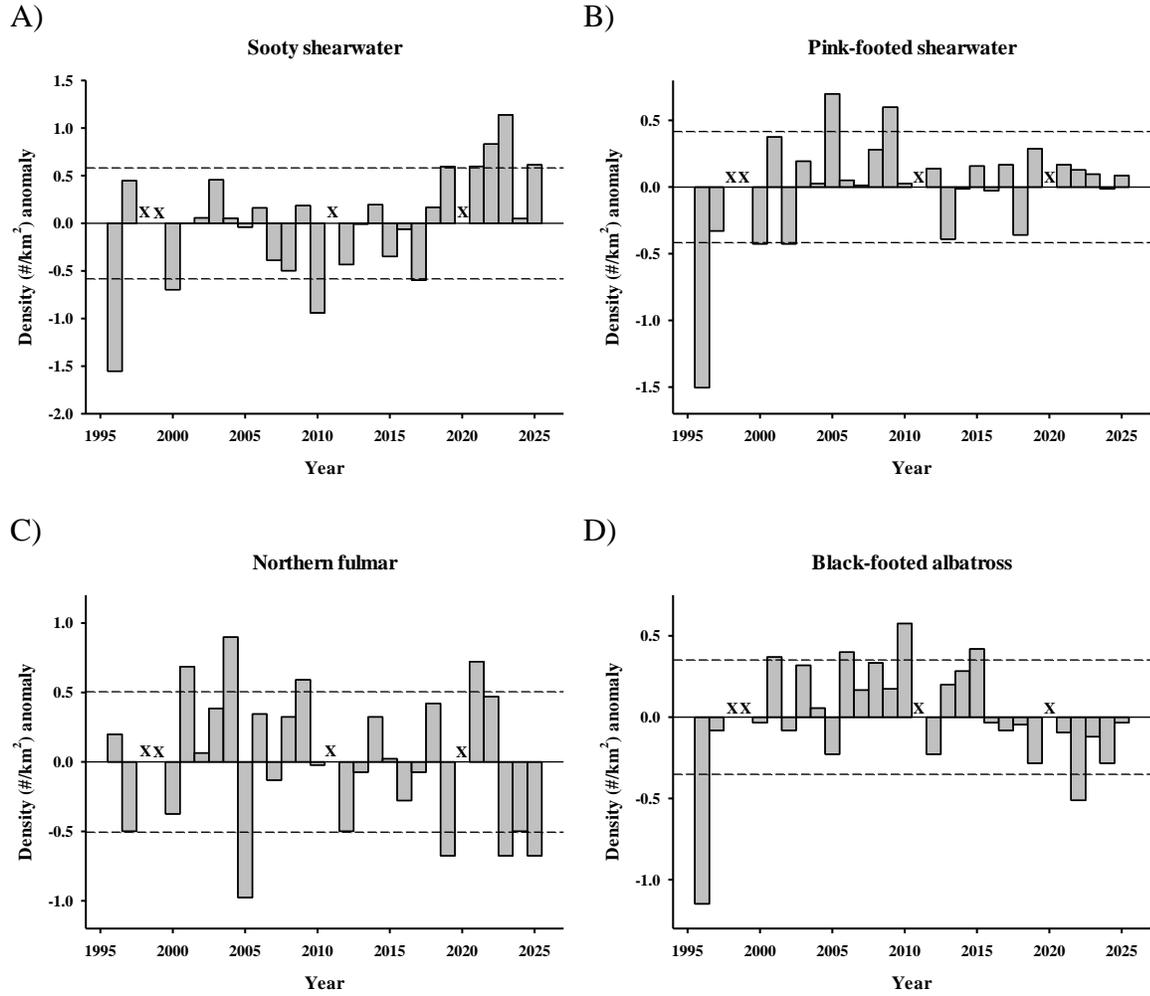
Heermann's Gull	<i>Larus heermanni</i>	2 / 2 / 0.01	2 / 2 / 0
Herring Gull	<i>Larus argentatus</i>		2 / 2 / 0
Horned Puffin	<i>Fratercula corniculata</i>		
Hybrid Gull	(species group)		
Juan Fernandez Petrel	<i>Pterodroma externa</i>		
Kelp Gull	<i>Larus dominicanus</i>		
Kermadec Petrel	<i>Pterodroma neglecta</i>		
Laughing Gull	<i>Larus atricilla</i>		
Laysan Albatross	<i>Phoebastria immutabilis</i>	2 / 2 / 0.01	2 / 2 / 0
Leach's Storm-Petrel	<i>Oceanodroma leucorhoa</i>		27 / 7 / 0.03
Least Storm-Petrel	<i>Oceanodroma microsoma</i>		
Least Tern	<i>Sterna antillarum</i>		2 / 1 / 0
Long-Tailed Jaeger	<i>Stercorarius longicaudus</i>		
Manx Shearwater	<i>Puffinus puffinus</i>		
Marbled Murrelet	<i>Brachyramphus marmoratus</i>		
Masked Booby	<i>Sula dactylatra</i>		1 / 1 / 0
Mew Gull	<i>Larus canus</i>		
Mottled Petrel	<i>Pterodroma inexpectata</i>		5 / 5 / 0.01
Murphy's Petrel	<i>Pterodroma ultima</i>	2 / 2 / 0.01	58 / 46 / 0.06
Nazca Booby	<i>Sula granti</i>		
Northern Fulmar	<i>Fulmarus glacialis</i>	2 / 2 / 0.01	12 / 11 / 0.01
Osprey	<i>Pandion haliaetus</i>		
Pacific Loon	<i>Gavia pacifica</i>	33 / 12 / 0.09	41 / 18 / 0.04
Parakeet Auklet	<i>Aethia psittacula</i>		
Parasitic Jaeger	<i>Stercorarius parasiticus</i>	5 / 5 / 0.01	9 / 9 / 0.01
Pelagic Cormorant	<i>Phalacrocorax pelagicus</i>		1 / 1 / 0
Peregrine Falcon	<i>Falco peregrinus</i>		
Pigeon Guillemot	<i>Cephus columba</i>	16 / 11 / 0.04	18 / 13 / 0.02
Pink-Footed Shearwater	<i>Puffinus creatopus</i>	142 / 82 / 0.38	639 / 310 / 0.68
Pomarine Jaeger	<i>Stercorarius pomarinus</i>	3 / 3 / 0.01	3 / 3 / 0
Providence/Solander's Petrel	<i>Pterodroma solandri</i>		
Red Phalarope	<i>Phalaropus fulicaria</i>	9 / 2 / 0.02	12 / 3 / 0.01
Red-Billed Tropicbird	<i>Phaethon aethereus</i>		1 / 1 / 0
Red-Footed Booby	<i>Sula sula</i>		
Red-Necked Grebe	<i>Podiceps grisegena</i>		
Red-Necked Phalarope	<i>Phalaropus lobatus</i>	688 / 137 / 1.83	1718 / 274 / 1.82
Red-Tailed Tropicbird	<i>Pheathon rubricauda</i>		
Red-Throated Loon	<i>Gavia stellata</i>		
Rhinoceros Auklet	<i>Cerorhinca monocerata</i>	81 / 38 / 0.22	100 / 52 / 0.11
Ring-Billed Gull	<i>Larus delawarensis</i>		
Royal Tern	<i>Sterna maxima</i>	2 / 1 / 0.01	2 / 1 / 0
Ruddy Turnstone	<i>Arenaria interpres</i>		
Sabine's Gull	<i>Larus sabini</i>	140 / 24 / 0.37	230 / 36 / 0.24
Scripps's murrelet	<i>Synthliboramphus scrippsi</i>	2 / 1 / 0.01	11 / 5 / 0.01
Short-billed gull	<i>Larus brachyrhynchus</i>		3 / 2 / 0
Short-Tailed / Slender-Billed Shearwater	<i>Puffinus tenuirostris</i>		
Short-Tailed Albatross	<i>Phoebastria albatrus</i>		

Sooty Shearwater	<i>Puffinus griseus</i>	18254 / 1089 / 48.49	31287 / 2238 / 33.15
South Polar Skua	<i>Stercorarius maccormicki</i>		3 / 3 / 0
Stejneger's Petrel	<i>Pterodroma longirostris</i>		
Surf Scoter	<i>Melanitta perspicillata</i>		
Thayer's Gull	<i>Larus thayeri</i>		
Townsend's Storm-Petrel	<i>Oceanodroma socorroensis</i>		
Tufted Puffin	<i>Fratercula cirrhata</i>	10 / 9 / 0.03	11 / 10 / 0.01
Unidentified Albatross	(species group)		
Unidentified Auklet	(species group)		
Unidentified Booby	(species group)		
Unidentified Cormorant	(species group)		
Unidentified Gull	(species group)	47 / 34 / 0.12	130 / 90 / 0.14
Unidentified Jaeger	(species group)	1 / 1 / 0	1 / 1 / 0
Unidentified Large Alcid	(species group)		
Unidentified Leach's Storm-Petrel	(species group)		
Unidentified Loon	(species group)		
Unidentified Murre	(species group)		
Unidentified Murrelet	(species group)		
Unidentified Petrel	(species group)		
Unidentified Phalarope	(species group)	8 / 3 / 0.02	8 / 3 / 0.01
Unidentified Procellarid	(species group)		
Unidentified Shearwater	(species group)		
Unidentified Small Alcid	(species group)		
Unidentified Storm-Petrel	(species group)		1 / 1 / 0
Unidentified Tern	(species group)		8 / 2 / 0.01
Wedge-Rumped Storm-Petrel	<i>Oceanodroma tethys</i>		
Wedge-Tailed Shearwater	<i>Puffinus pacificus</i>		
Western Grebe	<i>Aechmophorus occidentalis</i>		
Western Gull	<i>Larus occidentalis</i>	493 / 304 / 1.31	859 / 546 / 0.91
Wilson's Storm-Petrel	<i>Oceanites oceanicus</i>		
Xantus's / Craveri's Murrelet	(species group)		
Xantus's Murrelet	<i>Synthliboramphus hypoleucus</i>		

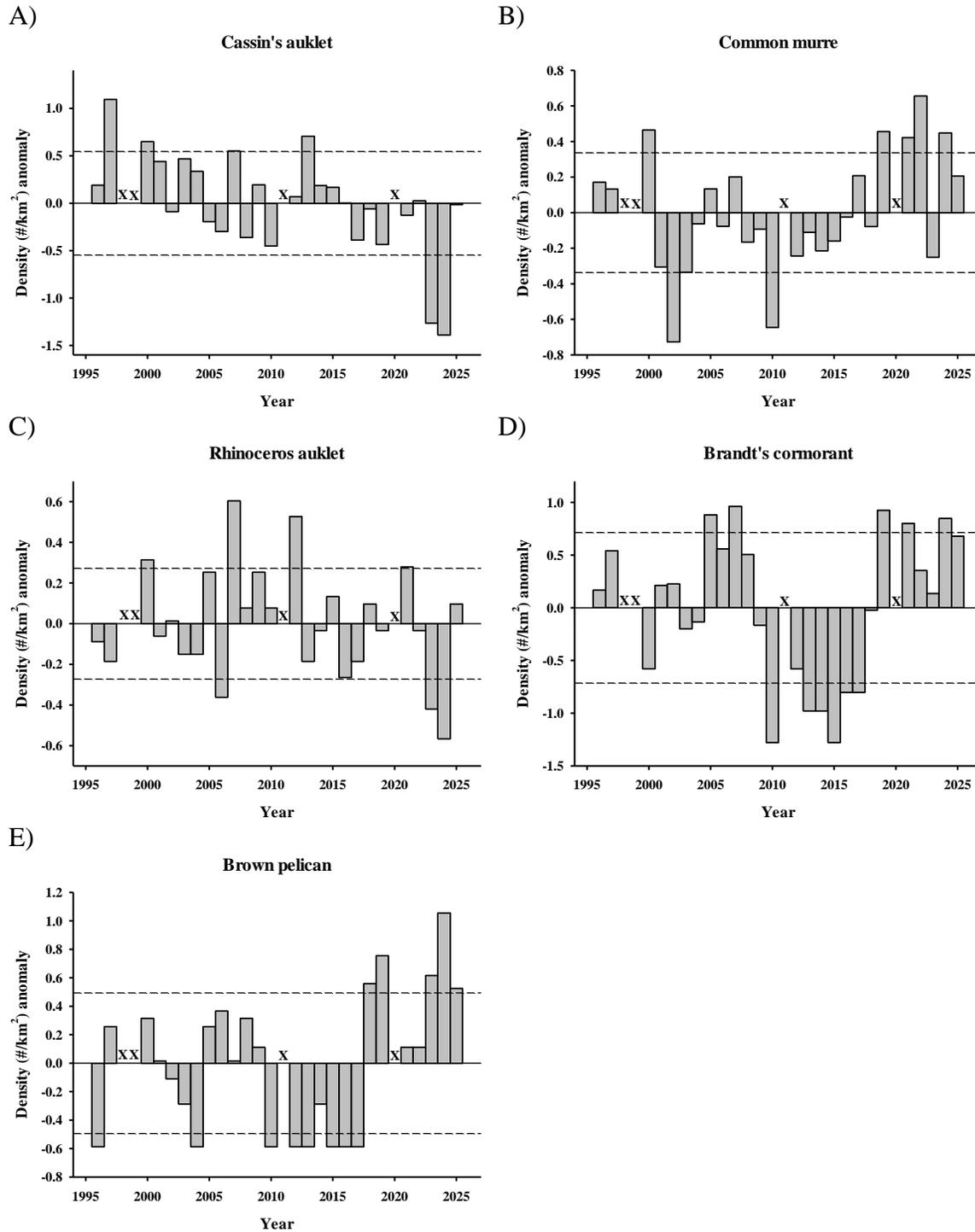
**Table 3.** Mammal survey observation summary, broken down by survey area and species. Cell values represent: total number of species individuals / number of species sightings / average species encounter rate (individuals per 100 km).

Common Name	Scientific Name	Core Area	Full Area
Baird's beaked whale	<i>Berardius bairdii</i>		2 / 1 / 0.1
Blue whale	<i>Balaenoptera musculus</i>	22 / 12 / 1.8	32 / 21 / 1
Bottlenose dolphin	<i>Tursiops truncatus</i>		9 / 1 / 0.3
California sea lion	<i>Zalophus californianus</i>	37 / 12 / 2.9	1130 / 84 / 35.9
Common dolphin	<i>Delphinus delphis</i>		6 / 1 / 0.2
Cuvier's beaked whale	<i>Ziphius cavirostris</i>		
Dall's porpoise	<i>Phocoenoides dalli</i>	4 / 1 / 0.3	13 / 2 / 0.4
False killer whale	<i>Pseudorca crassidens</i>		
Fin whale	<i>Balaenoptera physalus</i>	32 / 20 / 2.5	84 / 47 / 2.7
Gray whale	<i>Eschrichtius robustus</i>		
Green sea turtle	<i>Chelonia mydas</i>		
Guadalupe fur seal	<i>Arctocephalus townsendi</i>		
Harbor porpoise	<i>Phocoena phocoena</i>		
Harbor seal	<i>Phoca vitulina</i>		
Humpback whale	<i>Megaptera novaeangliae</i>	311 / 184 / 24.8	498 / 293 / 15.8
Killer whale	<i>Orcinus orca</i>	6 / 2 / 0.5	21 / 6 / 0.7
Long-beaked common dolphin	<i>Delphinus capensis</i>		
Minke whale	<i>Balaenoptera acutorostrata</i>	3 / 3 / 0.2	14 / 11 / 0.4
Northern elephant seal	<i>Mirounga angustirostris</i>		2 / 2 / 0.1
Northern fur seal	<i>Callorhinus ursinus</i>	2 / 2 / 0.2	2 / 2 / 0.1
Northern right whale dolphin	<i>Lissodelphis borealis</i>	493 / 7 / 39.3	4003 / 9 / 127.2
Pacific white-sided dolphin	<i>Lagenorhynchus obliquidens</i>	1114 / 29 / 88.8	1885 / 48 / 59.9
Pilot whale	<i>Globicephala spp.</i>		
Pygmy sperm whale	<i>Kogia breviceps</i>		
Ridley sea turtle	<i>Lepidochelys olivacea</i>		
Right whale dolphin	<i>Lissodelphis spp</i>		
Risso's dolphin	<i>Grampus griseus</i>	230 / 35 / 18.3	294 / 41 / 9.3
Sea otter	<i>Enhydra lutris</i>		
Sei whale	<i>Balaenoptera borealis</i>		
Short-beaked common dolphin	<i>Delphinus delphis</i>		1770 / 28 / 56.3
Short-finned pilot whale	<i>Globicephala macrorhynchus</i>		
Sperm whale	<i>Physeter macrocephalus</i>		
Spinner dolphin	<i>Stenella longirostris</i>		200 / 2 / 6.4
Steller sea lion	<i>Eumetopias jubatus</i>		
Striped dolphin	<i>Stenella coeruleoalba</i>		
Unidentified Balaenoptera	(species group)		
Unidentified beaked whale	(species group)		
Unidentified Cetacean	(species group)		
Unidentified dolphin	(species group)		160 / 3 / 5.1
Unidentified large whale	(species group)		
Unidentified Pinniped	(species group)		
Unidentified sea lion	(species group)		
Unidentified seal	(species group)		
Unidentified whale	(species group)	18 / 12 / 1.4	54 / 39 / 1.7

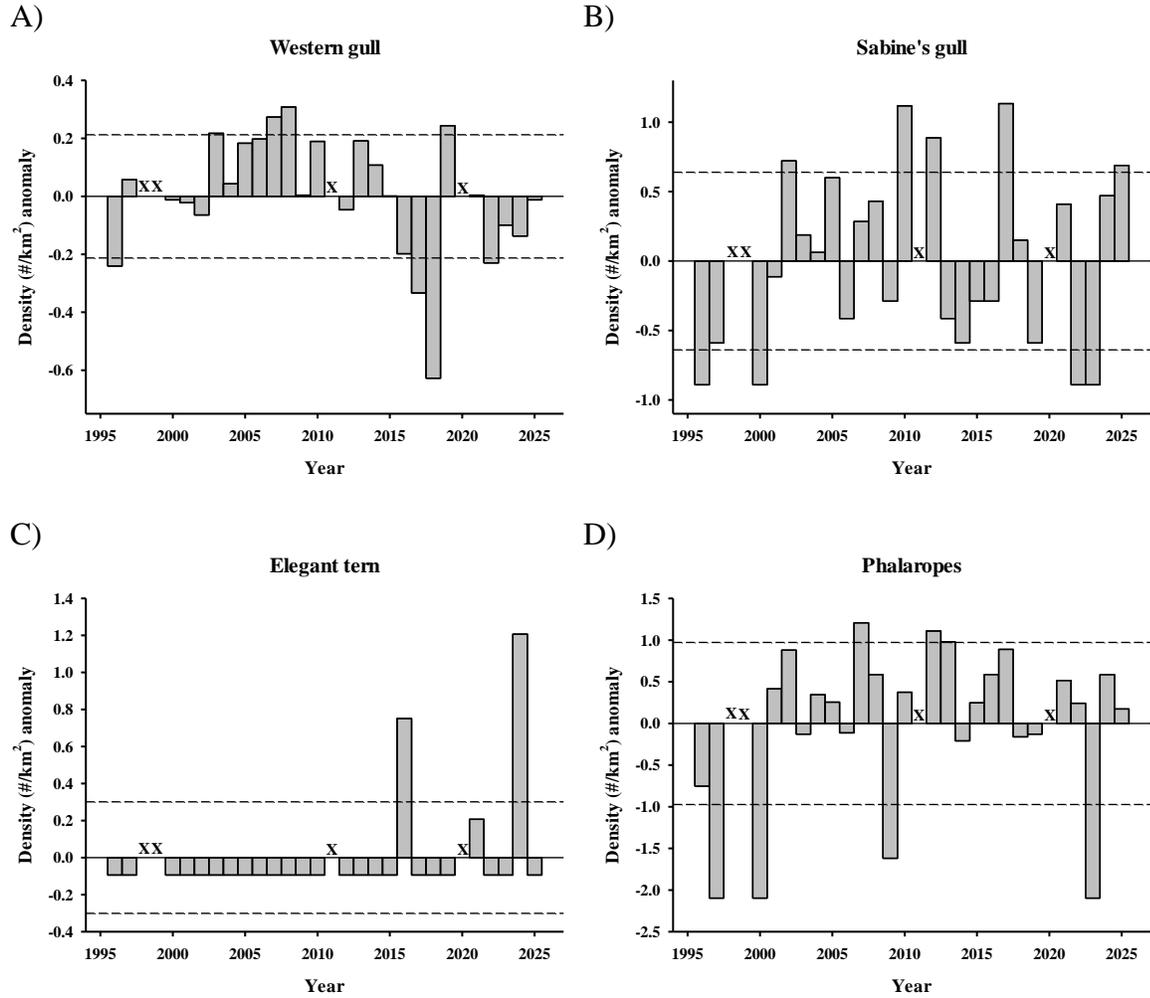
**Figure 5.** Log<sub>10</sub> density anomalies over time for select seabird species, core survey area, 1996–2025. A) sooty shearwater, B) pink-footed shearwater, C) northern fulmar, and D) black-footed albatross. The dashed lines indicate  $\pm 1$  s.d. of the long-term mean, and ‘x’ indicates years when no survey was conducted. A constant of 0.01 was added to each density prior to log<sub>10</sub> transformation and the anomaly calculation.



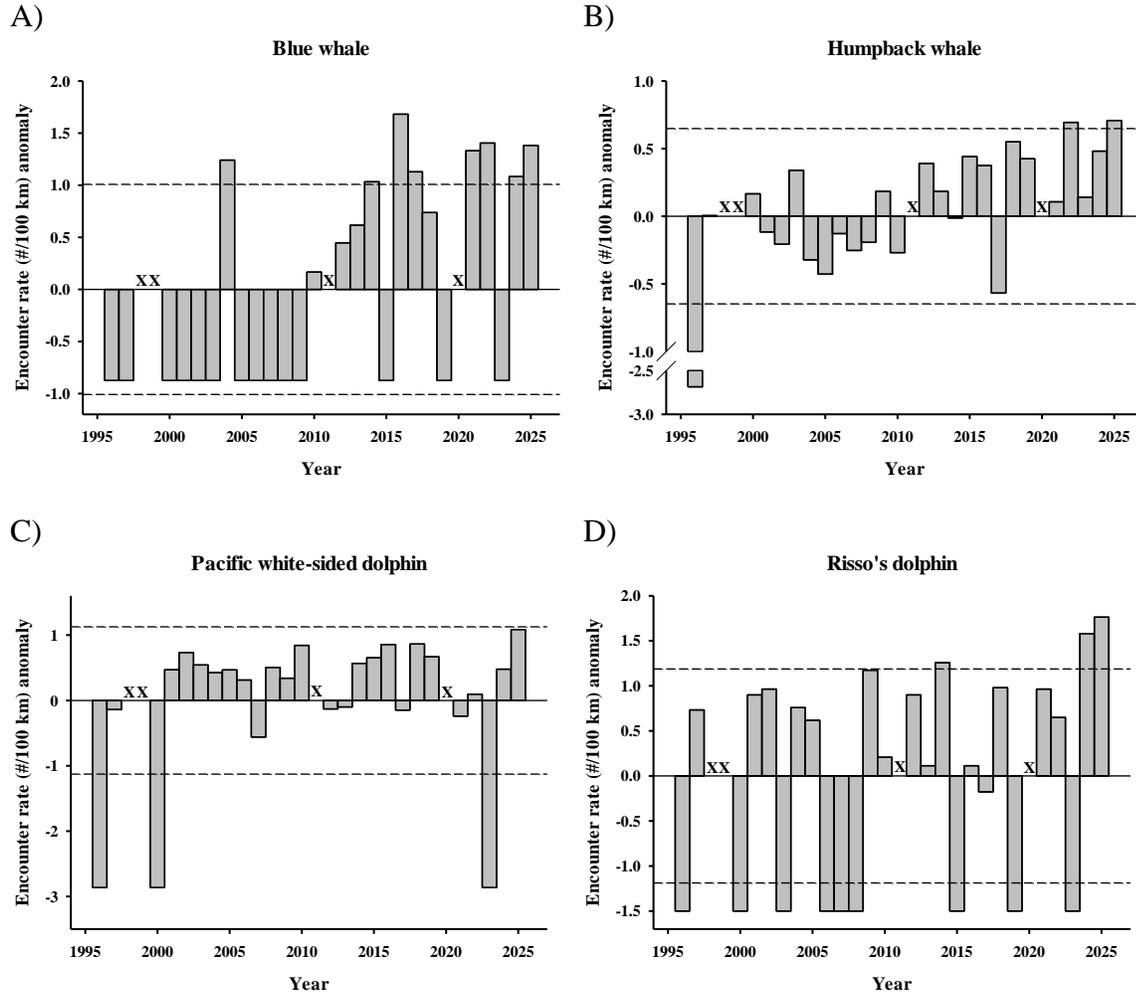
**Figure 6.** Log<sub>10</sub> density anomalies over time for select locally breeding seabird species, core survey area, 1996–2025. A) Cassin’s auklet, B) common murre, C) rhinoceros auklet, D) Brandt’s cormorant, and E) brown pelican. The dashed lines indicate  $\pm 1$  s.d. of the long-term mean, and ‘x’ indicates years when no survey was conducted. A constant of 0.01 was added to each density prior to log<sub>10</sub> transformation and the anomaly calculation.



**Figure 7.** Log<sub>10</sub> density anomalies over time for select seabird species, core survey area, 1996–2025. A) western gull, B) Sabine’s gull, C) elegant tern, and D) grouped phalaropes (red and red-necked phalaropes). The dashed lines indicate  $\pm 1$  s.d. of the long-term mean, and ‘x’ indicates years when no survey was conducted. A constant of 0.01 was added to each density prior to log<sub>10</sub> transformation and the anomaly calculation.



**Figure 8.** Log<sub>10</sub> encounter rate anomalies (#/100 km) over time from core area surveys, 1996–2025. A) blue whale, B) humpback whale, C) Pacific white-sided dolphin, D) and Risso’s dolphin. The dashed lines indicate  $\pm 1$  s.d. of the long-term mean, and ‘x’ indicates years when no survey was conducted. A constant of 0.01 was added to each density prior to log<sub>10</sub> transformation and the anomaly calculation. Note: marine mammals were observed on the 1996 survey, but these particular species were not seen that year.



## **References**

Sakuma, K.M., Ralston, S., and Wespestad, V.G. 2006. Interannual and spatial variation in the distribution of young-of-the-year rockfish (*Sebastes* spp.): Expanding and coordinating a survey sampling frame. California Cooperative Oceanic Fisheries Investigations (CalCOFI) Report 47:127-139.

Velarde, E., E. Ezcurra, M.H. Horn, and R.T. Patton. 2015. Warm oceanographic anomalies and fishing pressure drive seabird nesting north. *Science Advances* 1:e1400210.

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**Appendix.** List of bird species excluded from this summary. These species may or may not have been observed during the survey.

<b>Common Name</b>	<b>Scientific Name</b>
American coot	<i>Fulica americana</i>
Blue-footed booby	<i>Sula nebouxii</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Black oystercatcher	<i>Haematopus bachmani</i>
Black skimmer	<i>Rynchops niger</i>
Black tern	<i>Chlidonias niger</i>
Black turnstone	<i>Arenaria melanocephala</i>
Brewer's sparrow	<i>Spizella breweri</i>
Black-throated gray warbler	<i>Setophaga nigrescens</i>
Bufflehead	<i>Bucephala albeola</i>
Chapman's storm-petrel	<i>Oceanodroma leucorhoa chapmani</i>
Eurasian collared dove	<i>Streptopelia decaocto</i>
European starling	<i>Sturnus vulgaris</i>
Great blue heron	<i>Ardea herodias</i>
Great egret	<i>Ardea alba</i>
Green heron	<i>Butorides virescens</i>
Long-billed curlew	<i>Numenius americanus</i>
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>
Least sandpiper	<i>Calidris minutilla</i>
Marbled godwit	<i>Limosa fedoa</i>
Mallard duck	<i>Anas platyrhynchos</i>
Mourning dove	<i>Zenaida macroura</i>
Parkinson's petrel	<i>Procellaria parkinsoni</i>
Unidentified raptor	(species group)
Red-breasted merganser	<i>Mergus serrator</i>
Ruddy duck	<i>Oxyura jamaicensis</i>
Sanderling	<i>Calidris alba</i>
Savannah sparrow	<i>Passerculus sandwichensis</i>
Snowy egret	<i>Egretta thula</i>
Snow goose	<i>Anser caerulescens</i>
Townsend's warbler	<i>Setophaga townsendi</i>
Unidentified bird	(species group)
Unidentified dowitcher	(species group)
Unidentified duck	(species group)
Unidentified goose	(species group)
Unidentified grebe	(species group)
Unidentified hummingbird	(species group)
Unidentified passerine	(species group)
Unidentified shorebird	(species group)
Unidentified skua	(species group)
Unidentified tropicbird	(species group)
Wandering tattler	<i>Tringa incana</i>
Western sandpiper	<i>Calidris mauri</i>
Whimbrel	<i>Numenius phaeopus</i>
Willet	<i>Tringa semipalmata</i>

Wilson's warbler	<i>Cardellina pusilla</i>
White-winged scoter	<i>Melanitta deglandi</i>
Yellow-rumped warbler	<i>Setophaga coronata</i>