



Figure 3.31. Caspian and Elegant Terns: maps of seasonal density, high use areas, and breeding colonies.

ABOUT THESE MAPS

Maps a, b and c show the combined at-sea density (birds/km²) of Caspian Tern (*Sterna caspia*) and Elegant Tern (*S. elegans*), in three ocean seasons – Upwelling, Oceanic, and Davidson Current,

displayed in cells of 5' latitude by 5' longitude. Densities are based on the combined data sets of several studies; see the Data and Analyses section of this chapter. The color and mapping

intervals were selected to show the most structure and highlight significant areas, while allowing comparisons among marine bird species. Cells that were surveyed but in which no Caspian or Elegant terns were observed have a density of zero. Areas not surveyed appear white; no information was available for these areas. Blue lines indicate the boundaries of the National Marine Sanctuaries in the study area: Cordell Bank, Gulf of the Farallones and Monterey Bay. Bathymetric contours for the 200 m and 2,000 m isobaths are shown in light blue.

In order to provide an integrated look at the patterns of a species' spatial and temporal occurrence and abundance in the study area, map d shows seasonal high-use areas, displayed in cells of 10' latitude by 10' longitude, and also breeding colonies (when available). The seasonal high use map provides a further synthesis of densities presented in maps a, b and c, and portrays the relative importance of various areas to the species. Areas with consistently high use are highlighted. See the Data and Analyses section of this chapter for further explanation of high-use areas.

DATA SOURCES AND METHODS

The at-sea data set is referred to as the CDAS central California data set (1980-2001) and was developed using software called Marine Mammal and Seabird Computer Data Analysis System (CDAS), by the R.G. Ford Consulting Co. The data set extends from Pt. Arena to Pt. Sal in the study area, and the surveys used were conducted between 1980 and 2001. See the Data and Analyses section of this chapter for more information on the at-sea survey data sets and methods.

RESULTS AND DISCUSSION

Most of the terns in this region (with the exceptions of Arctic and Common terns) frequent shallow, inshore waters. The Elegant and Caspian terns occur regularly within the study area and primarily within the areas encompassed by the north/central California National Marine Sanctuaries, as well as other estuaries and bays, e.g., San Francisco Bay, Bolinas Lagoon. Both species are uncommon in the study area, although Elegant Terns can be locally common during periods of peak abundance. At-sea surveys used in CDAS recorded 98 sightings and 124 individuals of Caspian Tern, and 88 sightings and 186 individuals of Elegant Tern.

Caspian Terns nest in the study area during the Upwelling Season, after which they migrate south to waters off South America and out of the study area. Caspian Terns are present during the Oceanic Season, but almost absent during the Davidson Current Season. This species generally nests inland on artificial structures such as salt-pond levees, with two small populations in San Francisco Bay and another at Elkhorn Slough (see also Appendix 1A, the bird colony data table). Caspian Terns used to nest at the Moss Landing Salt ponds during a portion of this study period (in the early 1980s), but they no longer breed there. Since 1989-1990, several breeding sites have been abandoned and new sites colonized (Strong et al., 2004). No trend in abundance is evident.

The Elegant Tern is a relatively large tern but smaller than the Caspian. Elegant Terns nest outside of the study area on islands and salt pond levees in the northern Gulf of California north to Long Beach, California. The Elegant Tern is present in the study area only during the late Upwelling Season and Oceanic Season, its post-breeding period. Important areas for these Elegant Terns are in the inner portion of Monterey Bay and within the San Francisco Bay tidal plume. Many of these terns roost at such places as Limantour Estero, Bolinas Lagoon and Elkhorn Slough. Like the Caspian Tern, the Elegant Tern is almost absent during the Davidson Current Season.

These two species feed entirely on small fish that they catch by plunging to shallow depths. See Tables 3.5, 3.7, 3.10 and 3.11 for related summary information.



Sophie Webb