

ABOUT THESE MAPS

Maps a, b and c show the combined at-sea densities (birds/km²) of Xantus's Murrelet (*Synthliboramphus hypoleucus*) and Craveri's Murrelet (*Synthliboramphus craveri*) 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 murrelets 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

Xantus's Murrelet, a California state-listed threatened species, frequents waters in the study area, mostly over the continental slope and deeper depths. Craveri's Murrelet, although not rarely

sighted, appears to occur in the same general habitat but perhaps further offshore. The two species are impossible to tell apart in aerial surveys; thus they are treated together here. Xantus's Murrelet nests on islands off northwest Baja California, Mexico and the California Channel Islands during the late Davidson Current Season and Upwelling Season. Craveri's Murrelet breeds entirely in Mexico on islands in the Gulf of California and southwestern Baja California. The two species are seen most frequently in the study area during the Upwelling (post-breeding) season and to a lesser degree, during the early Davidson Current (pre-breeding) seasons. This occurrence pattern represents post-breeding and pre-breeding movements of this species.

These seabirds do not appear to be well detected by aerial surveys, which would explain their concentration off the Gulf of the Farallones where shipboard surveys have been more frequent. Even unidentified murrelets appear to be sparse in suitable habitat lying to the north and south (where aerial surveys have been conducted). Xantus Murrelet is considered to be uncommon in the study area and Craveri's Murrelet is rare. Together, the species occur (sparsely) in the study area during all three ocean seasons.

Xantus Murrelets are generalist feeders; their diet includes euphausiids and small fish, such as anchovies. Craveri's Murrelets have a similar diet. See Tables 3.5, 3.10 and 3.11 for related summary information.

