Seabird Surveys on NMFS JRS Cruises, 2012

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Introduction

Seabird surveys are an integral part of the NMFS JRS program, providing data that is valuable on several fronts: 1) measurements provide an upper trophic level perspective to complement the lower trophic level plankton data collected by NMFS; 2) estimates of seabird abundance, diversity and distribution may contribute to fisheries management and specifically to ... ; and, 3) by extending our existing time series (now 16 years and counting), measuring annual variation in the seabird community contributes to understanding the effects of climate variability and change on the California Current Ecosystem. This data report summarizes the at-sea survey observations made during the 2012 NMFS JRS cruise, and presents basic distribution and density estimates of seabirds. In 2012 a total of 1724 km (517 km^2) of ocean habitat was surveyed over a period of 22 days.

Methods

At-sea observations are made continuously during daylight ship transits between trawls. The observer is located on the bridge, approximately 15 meters above sea level and uses hand-held binoculars to assist in the identification and enumeration of birds. The observer records all birds (and mammals) seen within a 300 meter strip transect to one side and front of the vessel while the ship is underway at > 5 knots. Observations are entered into a portable computer using the dedicated application “Dlog”; the ship’s position is automatically recorded every 10 seconds from an external GPS. Each observation includes the species, the number of individuals observed, and their behavior (mostly flying or sitting). 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 which includes data from May 1996 to the present. This data is used to derive summary statistics.

This report summarized observations for the survey conducted in 2012 and species data are presented for both the core region and the extended region surveyed since 2004; the relevant seabird species are listed in Table 2. The taxa excluded from this summary are mammals, fish, terrestrial birds and most shorebirds except phalaropes which are largely pelagic. Species density is calculated as the total number of individuals observed per species divided by the area (km^2) surveyed. The overall distribution of seabirds is illustrated by plotting density at each bin’s center position. The density is represented by a circle whose diameter is scaled using the Jenks method in ArcGIS version 9.0.

Results

A summary of survey effort is shown in Table 1. The areas surveyed and the transects are shown in Figure 1 and Figure 2. A summary of species observations is shown in Table 2. Spatial distribution maps for overall seabird density (all species) are shown in Appendix 1. A detailed species list is provided in Appendix 2.

Table 1. Summary of survey effort and seabird community statistics, 2012.

Annual Survey 2012	Core region	Extended region	Total
Survey Vessel	-	-	
Start Date	5/6/2012	5/23/2012	5/6/2012
End Date	6/2/2012	5/27/2012	6/2/2012
Survey Days	17	5	22
Surveyed Distance (km)	1339	385	1724
Surveyed Area (km^2)	402	116	517
Number of Bird Species	34	21	41
Overall Bird Density (per km^2)	31.7	2.8	25.3
Total Individuals Counted	12727	330	13057

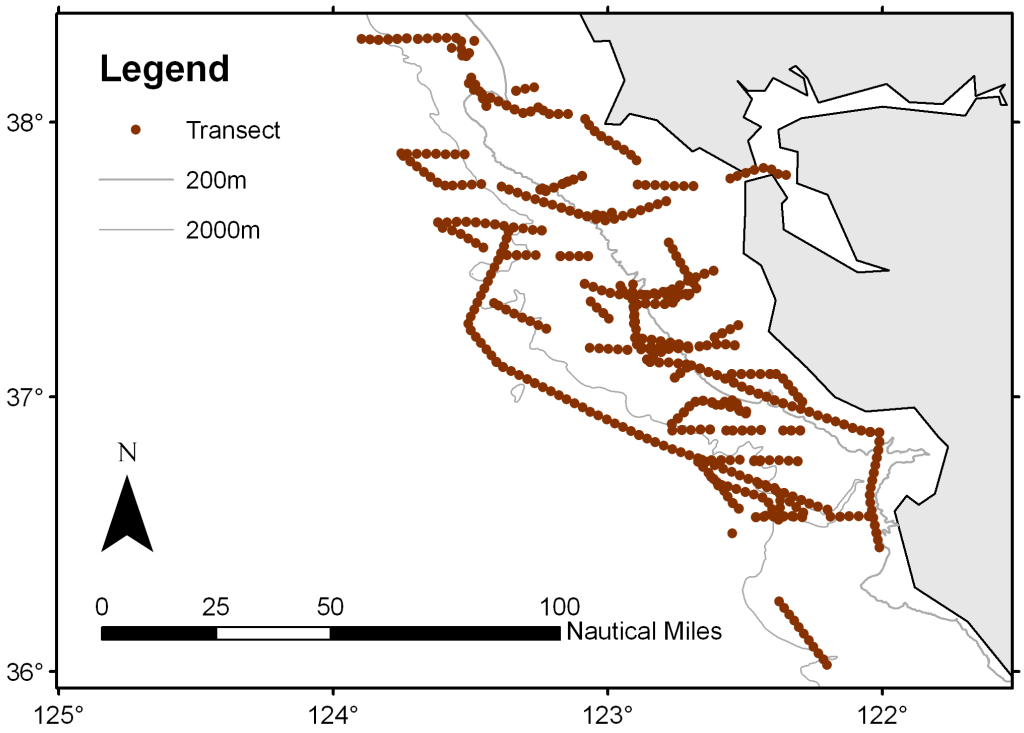

Figure 1. Survey transects for the northern core region.

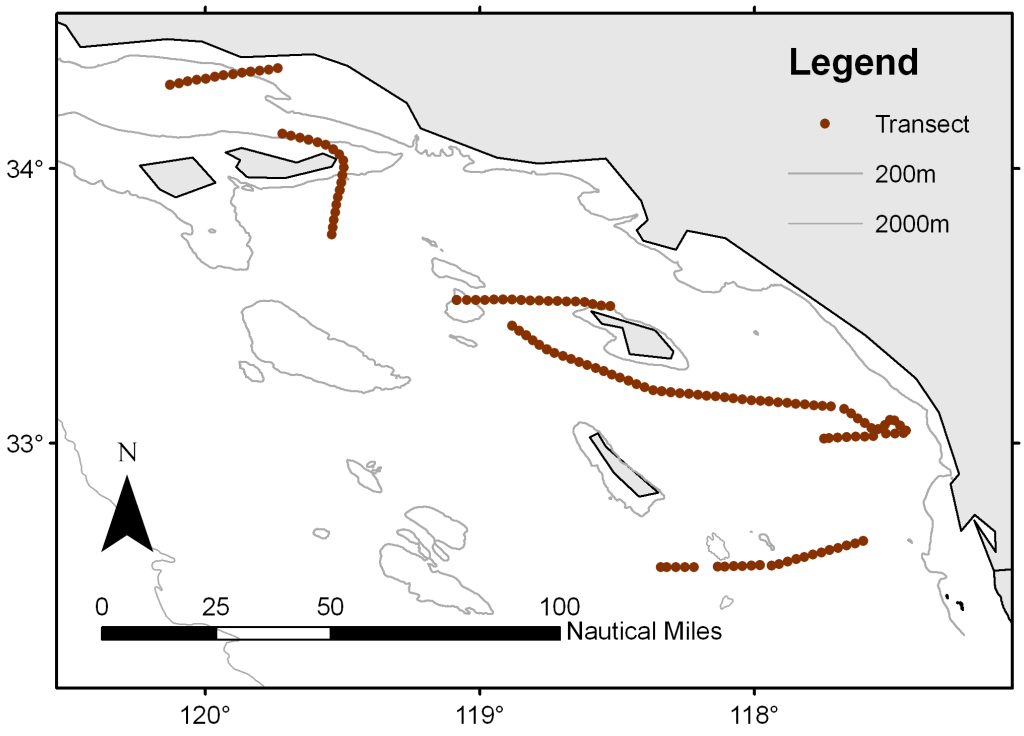

Figure 2. Survey transects for the southern extended region