

TECHNICAL SUMMARY

Study Title: Shorebird Abundance and Distribution on Beaches of Ventura County, California 2007-2010

Report Title: Shorebird Abundance and Distribution on Beaches of Ventura County, California 2007-2010. BOEMRE OCS Study 2010-24

Contract Number: MO7AC12460

Sponsoring OCS Region: Pacific

Applicable Planning Area: Central and Southern California

Fiscal Years of Project Funding: 2007-2010

Completion Date of the Report: December 2011

Costs: \$68,680.30

Cumulative Project Cost: \$68,680.30

Principal Investigator: Donald Rodriguez

Key Words: Shorebirds, Ventura County beaches, seasonal distribution, temporal distribution, human disturbance

Background and Objectives:

The coastline and Central Valley of California are the main areas where shorebirds concentrate in the southern Pacific region of the United States. Tidal wetlands, sand beaches, and rocky shoreline are the principal shorebird habitats on the coast (Hickey et al. 2003). From June 1994 to May 1997 the Minerals Management Service conducted a study to determine shorebird distribution, abundance, and beach use patterns on 14 sandy beaches in Ventura County. Each of the 14 beaches were 1 kilometer (km) in length, and counts were conducted once per month for 3 years. A total of 23 shorebird species were recorded during the three-year period with six species representing 97% of the total number of shorebirds recorded. The six most abundant species were Sanderlings (46%), Willets (32%), Marbled Godwits (7%), Black-bellied Plovers (5%), Snowy Plovers (4%), and Whimbrels (3%). While the overall mean shorebird count was 44.1 birds/kilometer (n=504), there was a great deal of variation in shorebird numbers from month to month and beach to beach (McCrary and Pierson 2002).

The Southern Pacific Region is extremely important to 20 shorebird species relative to the majority of other regions (Hickey et al. 2003). Four of those species were among the six most prevalent species observed during the original survey: Black-bellied Plover (*Pluvialis squatarola*), Snowy Plover (*Charadrius nivosus*), Marbled Godwit (*Limosa fedoa*), and Willet (*Tringa semipalmata*) (McCrary and Pierson 2002).

Most shorebird research has been conducted in wetland habitats, therefore relatively little information exists on shorebird use of exposed sandy and rocky shoreline habitat (McCrary & Pierson 2002). This presents a problem because beaches are becoming increasingly necessary for shorebirds. In southern California the loss of protected habitats, such as wetlands, may be increasing the importance of exposed coastal habitats, such as sandy beaches, for shorebirds (Hubbard and Dugan 2003).

Shorebirds use beaches as a supplement to their wetland diet. Many shorebirds feed on mudflats that become covered during high tides, therefore habitat use between high and low tides is frequently different. Many studies from around the world have noted the same pattern: mudflats are used on low tides; pastures, marshes, mangrove, sand beaches, etc. are used on high tides (Warnock et al. 2002).

The Ventura County coastline is about 62 km in length and consists of 93% wave-swept sandy intertidal beaches (McCrary and Pierson 2002). As part of the original research McCrary and Pierson randomly selected 14, 1-km beach segments (about 20% of the county shoreline) for study. Monthly surveys were conducted from June 1994 through May 1997 to determine spatial and temporal species composition for each site.

Most (12 of 14 or 86%) of the beaches consist of sandy intertidal habitat, reflecting the predominance of this habitat in the county. One segment (Pt. Mugu) is almost entirely (about 95%) rocky intertidal habitat, while another (Deer Creek) is equal parts rocky and sandy intertidal. McCrary and Pierson originally chose the sites based on the number they could survey during the same tidal sequence each month (about a three-day period), which was estimated at about four to five beaches per day, and on the length of the Ventura County shoreline.

This report includes:

- A description of the study area and methods used, including any modifications and improvements made to the survey protocol described in the MMS shorebird study conducted from 1994-19997.
- Results of the surveys conducted including maps, data tables, and graphic representations.
- Discussion of the results and comparison with data collected during previous surveys.
- A description of any data collected incidental to the shorebird surveys (e.g., stranded birds and marine mammals).

All analyses resulting in a database(s) will be submitted to BOEMRE in Microsoft Access and/or Microsoft Excel.

Description:

The goal of this study is to continue the development of a long term data set of coastal bird observations in an effort to quantitatively investigate and characterize shorebird species and their seasonal populations along the Ventura County coastline. Fourteen 1-km transects, covering 20% of the Ventura shoreline adjacent to offshore oil and gas operations, were monitored monthly for a three-year period starting in July 2007. Results of the three-year study are compared to a similar three-year study completed from 1994-1997 to improve our understanding of the effects of human activities on the coastal environment. Current data analysis suggests that over the last decade there has been a significant decline in total numbers of shorebirds using Ventura County beaches. The results for the four most

prevalent species observed during the original study all show distribution changes. The numbers of Snowy Plovers, however, are generally consistent with the data from 10 years ago. This species is listed as threatened under the Endangered Species Act and efforts are underway to ensure its protection.

Significant Results:

From July 2007 through June 2010, we conducted monthly counts of shorebirds on 14 beaches in Ventura County, California to determine shorebird distribution, abundance, and amount of human disturbance on local populations. High energy, ocean fronting beaches are dynamic ecosystems with the potential to be important foraging habitats for shorebirds (Hubbard and Dugan 2003). Shorebird densities and distribution serve as an important barometer of ecosystem condition along the Pacific Coast. This study was a replication of a similar study completed by the Minerals Management Service from June 1994-May 1997. A total of 504 surveys were completed during each project period (1994-1997, 2007-2010), for a total of 1,008 surveys analyzed in this report.

Each of the surveys was completed by walking a 1 km transect on each of the 14 study sites. This was a methodology following the protocols established by McCrary and Pierson (2002). Surveys were done at low tide and timed to coincide with incoming tides and avoiding weekends to minimize human disturbance.

During the survey period (2007-2010) a total of 39,072 birds were counted. Of these, 17,575 were of the six focal species. Six exemplar bird species were counted on each survey and additional field notes include other bird species sighted, notes and counts of disturbances, and basic weather descriptions. Total bird counts are reported for each survey. As each survey was 1 km long, these numbers represent sightings/ linear km of beach.

For each species we then compared the recent survey data with the historical data and used generalized linear models (GLM's) to identify key deterministic factors and interactions between factors.

2007-2010 surveys: Total number of birds counted was 39,072 in the 2007-2010 surveys; of the total count, 17,575 were of the 6 focal species. Mean number of birds sighted per transect (1km) was 77.5 (s.d. 155.3) per transect for all bird species, and 34.8 (s.d. 75.4) birds per transect, when considering only the focal 6 species. Sanderlings were the most commonly sighted of the focal species, accounting for 7,353 of these sightings. Notably large flocks were seen on infrequent occasions (see individual species accounts below).

1994-1997 surveys: Total number of birds counted was 21,623 in the 1994-1997 surveys, however this included only the 6 focal species; non focal species bird counts were not reported. Mean number of focal birds sighted per transect (1km) was 42 (s.d. 72.8) birds per transect. Sanderlings were the most commonly sighted of the focal species, accounting for 10,373 of these sightings, including a number of large flocks. A broad based analysis of sighting rates for all surveys, all beaches indicates significant differences in the numbers of Sanderlings, Willets, and Black-bellied Plovers. See Table 1.

STUDY PRODUCTS:

Presentations:

Kahler, Christopher. (2007). Shoreline Survey of Coastal Birds in Ventura County. Poster presented at the Southern California Conference for Undergraduate Research. California State University Los Angeles. November 17.

Kahler, Christopher. (2007). Shoreline Survey of Coastal Birds in Ventura County. Poster presented at the Capstone Poster session, Library Collaboratory, California State University Channel Islands. May 3.

Rodriguez, Donald A. (2007). Methodology for monitoring coastal shorebirds. University of Guadalajara Coastal Studies Unit. Melaque, Mexico. March 23

Rodriguez, Donald A., Chapman, Angela, Kahler, Christopher, and Thomsen, Garrick. (2008). Have shorebird populations changed along the Ventura County coastline in the last decade? Paper presented for publication in the Conference Proceedings of the 7th California Islands Symposium. Mandalay Bay Embassy Suites Hotel, Oxnard, California. February 7-9.

Rodriguez, Donald A., Angela Chapman, Greg Sanders, Christopher Kahler, and Garrick Thomsen. (2008). A Comparison of Current and Historical Shorebird Populations in Ventura County: Preliminary Results. Poster presented at the 7th California Islands Symposium. Mandalay Bay Embassy Suites Hotel, Oxnard, California. February 7-9.

Thomsen, Garrick. (2008). Current and Historical Shorebird Populations in Ventura County, California and the Role of Human Disturbance in Limiting Foraging Behavior. Paper presented at the Twenty Second Annual CSU Student Research Competition. California State University, East Bay. May 2-3.

Rodriguez, Donald A. (2009). Ventura County shoreline study. Presented to Kiwanis Club of Oxnard. Marriott Courtyard, Oxnard, California. November 19.

Rodriguez, Donald A. (2009). Monitoring shorebirds in an era of climate change." Presented to Town Meets Gown Lecture Series. Camarillo City Hall, California. November 17.

Chapman, A., Rodriguez, D.A., Fahim, C., Goldstein, A. and Winfry, L. (2009). A comparison of current and historical shorebird populations in Ventura County. Paper presented at the SAGE Faculty Student Research Forum, John Spoor Broome

Library, California State University Channel Islands. May 9.

Chapman, A., Rodriguez, D.A., Fahim, C., Goldstein, A. and Winfry, L. (2009). A comparison of current and historical shorebird populations in Ventura County. Poster presented at the Southern California Academy of Sciences Annual Conference. Loyola Marymount University, Los Angeles, California. May 29.

Rodriguez, Don, Chapman, Angela, Fahim, Goldstein, Amanda, Christina, Kahler, Christopher, Thomsen, Garrick, and Winfrey, Lisa (2010). A comparison of current and historical shorebird populations in Ventura County: Preliminary results. STEM @ CI: 4th Annual Celebration of Excellence. John Spoor Broome Library, California State University Channel Islands. May 5.

Rodriguez, Donald, Chapman, Angela, Cartwright, Rachel, Adolf, Cassidy (2010). A 10 year comparison of shorebird abundance and seasonal distribution in Ventura County. Poster presented at the Ballona Wetland Science and Research Symposium. December 8. Loyola Marymount University, Los Angeles, California.

Media Coverage:

For the Birds: CSUCI faculty work with U.S. Dept. of Interior's Mineral Management Services to inventory birds in Ventura County. Feature article California State University Channel Islands *Current* magazine. Spring 2008, vol. 12 (1) pg. 15

Barlow, Zeke (2007). Team counts shorebirds in case of oil spill off the coast. Ventura County Star. November 22 (front page).

Bond, Andrea (2007). Shorebird counts in Ventura County. New HD News. Direct TV News video. November 18.

Barlow, Zeke producer. (2007). "Counting Shorebirds on County Coast." Ventura County Star video.

Barlow, Zeke (2007). Team counts shorebirds in case of oil spill off the coast. San Jose Mercury News article. November 23.

Barlow, Zeke (2007). Team counts shorebirds in case of oil spill off the coast. Camarillo Acorn. November 22.

Rodriguez, Donald (2007). Radio interview with Jim Bohannon on KVTa 1520 AM Talk radio. November 23.