Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Marine Bird Distribution and Abundance in Offshore Waters (AK-17-03)
Administered by	Alaska Regional Office
BOEM Contact(s)	Heather Crowley (heather.crowley@boem.gov)
Procurement Type(s)	Interagency Agreement
Conducting Organization(s)	USFWS
Total BOEM Cost	$510,000
Performance Period	FY 2017-2022
Final Report Due	December 2022
Date Revised	February 22, 2023
Problem	Seabirds are wide-ranging apex predators and good indicators of changes in marine ecosystems. Therefore, information on distribution, abundance, and habitat requirements of marine birds is needed to assess effects of oil and gas exploration, development and production in the Chukchi Sea, Beaufort Sea, and Cook Inlet Planning Areas.
Intervention	Information obtained from marine bird surveys would assist in development of mitigation measures and strategies to reduce potential impacts on all seabirds and listed species under the ESA.
Comparison	The results will document changes in marine bird populations over time and support ESA Section 7 consultations and NEPA analyses.
Outcome	The analysis will estimate the spatial distribution, species composition and seasonal changes in populations and estimate abundances for marine birds in designated Alaska OCS planning areas.
Context	Chukchi Sea, Beaufort Sea, and Cook Inlet Planning Areas

BOEM Information Need(s): This project will provide basic information on distribution, abundance, and habitat requirements of marine birds, necessary to assess potential effects of oil and gas exploration, development and production in the Chukchi Sea, Beaufort Sea, and Cook Inlet Planning Areas. Results from the project will support ESA Section 7 consultations and NEPA analyses for potential future lease sales and DPPs. The information obtained from these surveys may assist in development of mitigation measures and strategies to reduce potential impacts on listed and candidate species under the ESA (Spectacled Eider, Steller's Eider, Short-Tailed Albatross, Yellow-billed Loon) as well as Priority Species identified by the USFWS (11 Tier-1 species and 14 Tier-2 species). By collaborating with multi-disciplinary vessel-based projects, it will be possible to make linkages between physical and biological factors that influence the distribution of marine birds.

Background: Seabirds are wide-ranging apex predators and good indicators of changes in marine ecosystems. Seabirds spend most of the year offshore, yet our information needs are greatest for the pelagic aspect of their lives. To address these needs, an At-sea Seabird Observer Program was initiated

by the U.S. Fish and Wildlife Service with a grant from the North Pacific Research Board (Project 637; 2006-2008) and continued as part of the Bering Sea Study (B64; 2008-2010) and by an inter-agency agreement with BOEM (AK-10-10; 2010-2015) to provide marine bird data for areas of oil and gas activity. In total, these surveys provided > 200,000 km of survey effort to the North Pacific Pelagic Seabird Database and resulted in marine bird distribution files and multiple publications relevant to BOEM requirements for NEPA and other Environmental Assessments in offshore waters. Among the published findings: seabird and marine mammal 'hotspots' in the Chukchi Sea; evidence of shifts in distribution and species composition in the Bering and Chukchi Seas; new information was also obtained on seasonal changes in seabird distribution and on locations of molt areas for several alcid species. Additionally, BOEM has collaborated with USFWS in Cook Inlet as part of the GulfWatch Alaska program in 2014-2015. Because of observed and on-going climate change, it will be important to document shifts in species distribution, particularly following the exceptionally warm 2014 and 2015 years, with predicted warm conditions in 2016-2017.

Basic information on timing and duration of use within designated Alaska OCS planning areas is necessary to better define the impacts of perturbations and ultimately population effects. Breeding seabirds are generally monitored at colonies, yet they spend most of the year dispersed offshore. Additionally, one half or more of all seabirds do not breed in a given year, thus management of marine birds requires knowledge of spatial and temporal patterns of seabird distribution at sea.

Objectives:

- Estimate the spatial distribution, species composition and seasonal changes in species and estimate abundances for marine birds in designated Alaska OCS planning areas.
- Process the data for entry into the North Pacific Pelagic Seabird Database for future accessibility and facilitate management decisions for marine bird use of planning areas.
- Examine trends in abundance of key species by comparison to 1993 and 1995-99 for Cook Inlet, and for Kachemak Bay, relative to 2005-2007 and 2011. These historic data and the newly collected observations will be used to determine if there have been changes in marine bird distribution.
- Examine the effects of environmental drivers (climate and oceanographic conditions) as well as biological drivers (prey availability) on seabird distribution by collaborating with researchers who collected oceanographic and biological data during the same research cruises.

Methods: This project will build off established methods for an at-sea survey program, to opportunistically collect distribution data on seabirds via partnership and collaboration among the USFWS, NOAA-Fisheries and other vessel-based monitoring or research programs. Observers will conduct visual surveys using established protocol (strip transect or modified distance sampling) to identify all marine birds and mammals while a vessel is in transit. Data is entered directly into a computer with location data (latitude and longitude) along with associated environmental conditions. Data is processed and submitted to the North Pacific Pelagic Seabird Database by converting counts into densities (birds/km2). Five data sets (time series) will be compared for abundance trends and analyzed for changes. The report will discuss how environmental drivers relate to spatial distribution and abundance of key species and discuss whether climate change is affecting listed species or document other potential causes (reduced breeding habitat, etc.).

Specific Research Question(s): Is the environmental change occurring in the Arctic affecting seabird distribution and abundance?

Current Status: Completed

Publications Completed:

Labunski EA, Kuletz KJ, Lanctot S, Saalfeld S, Morgan TC, McGuire RL, Gall AE (USFWS, Migratory Bird Management, Anchorage, AK and ABR, Inc.–Environmental Research & Services, Fairbanks, AK). 2022. Marine bird distribution and abundance in the northern Bering and Chukchi seas. Anchorage (AK): U.S. Department of the Interior, Bureau of Ocean Energy Management, Alaska OCS Region. 174 p. Report No.: OCS Study BOEM 2022-067. Contract No.: M17PG00039.

Affiliated WWW Sites:

http://www.boem.gov/akstudies/