

Environmental Studies Program: Planned New Study

Study Area(s): Hawaii

Administered By: Pacific OCS Region

Title: Atlas of Main Hawaiian Island Seabird Colonies
(PC-17-03)

BOEM Information Need(s) to be Addressed: The Hawaii Clean Energy Initiative and renewable energy goals are the most aggressive in the nation, with the Governor setting the goal at 100% clean energy by 2045. In addition to land-based alternative energy, the DOI and the State of Hawaii have received proposals to develop commercial-scale offshore renewable energy capacity within state and federal waters surrounding the Main Hawaiian Islands (MHI). Several Hawaiian seabird species, including Endangered Hawaiian Petrels, are killed by terrestrially sited wind turbines; future turbine infrastructure at sea and marine cable-laying operations pose strike, grounding, and mortality risks to free-ranging seabirds that colonize Hawaii. This risk will vary according to species, time of year, and environmental conditions. Currently, BOEM, federal, state, and local resource managers lack comprehensive, quantitative data to map seabird colony locations, extents, and breeding population sizes throughout the MHI. This basic population information—compiled in previous MMS-supported seabird colony catalogues for California, Oregon, Washington, and Alaska—now is urgently needed in Hawaii to (1) evaluate threats to colonies and adjacent high-use offshore waters, (2) provide a reference to measure population trends, and (3) best inform place-based conservation and restoration actions.

Total BOEM Cost: \$900,000

Period of Performance: FY 2017–2021

Conducting Organization(s): TBD

Principal Investigator(s): TBD

BOEM Contact(s): [David Pereksta](#)

Description:

Background: The MHI (8 main islands, excluding the leeward archipelago) and numerous associated offshore islets provide substantial breeding habitat for approximately 20 seabird species; the Newell's Shearwater, Hawaiian Petrel, and Band-rumped Storm Petrel are considered threatened or endangered by state or federal agencies. Presently, very little is known about seabird breeding population sizes and trends throughout the MHI. More than 30-years ago, the U.S. FWS initiated a synthesis of existing information about the status of seabird populations in Hawaii; a review of reports and literature identified 21 species and 247 colony sites (Fefer n.d.). This effort occurred before GIS mapping and no new colony surveys were conducted in association with the synthesis. To support extensive colony-based tracking of Hawaiian seabirds (BOEM 2015a) and a comprehensive vulnerability assessment for seabirds at sea throughout the MHI (BOEM 2015b), USGS has compiled a digitized geodatabase

version of the preliminary Fefer et al. synthesis and has worked with more recent collaborator data (Hawaii State Department of Land and Natural Resources) to update site-specific species count data. A revised, comprehensive Atlas of Hawaiian Seabird Colonies is needed by BOEM to support environmental risk assessments, environmental impact statements, and pre- and post-lease decisions related to potential renewable energy leasing on the Pacific OCS surrounding Hawaii. This effort will provide mapped breeding distributions and contemporary reference information to increase knowledge, build resource management capacity, and assist targeted conservation actions on land. Furthermore, this atlas will allow USGS to generate quantitative model-based predictions of at-sea distribution based on colony size and location, central-place foraging theory, and new empirical data from at-sea ranging studies throughout Hawaii (BOEM 2015a).

Objectives:

1. Update the known status of seabird colonies on the Main Hawaiian Islands.
2. Assess the effectiveness of survey protocols and other data collection approaches.
3. Determine how information on Hawaiian seabird colonies can be shared with other scientists, agencies, and stakeholders.
4. Determine how colony data can quantify and map foraging seabird distribution at sea.

Methods: This three-phase effort is facilitated by previous seabird colony atlases. In phase one, USGS will continue networking among main-island-based resource stakeholders (federal and state land managers, NGO partners, and private land owners) to involve existing regional expertise in a collaborative effort to concatenate the most recent colony count data into a common database and identify regional data gaps. This is imperative for a regionally comprehensive atlas because of the physical and political separation of the MHI, their resources, and stakeholders. In phase two, quantitative surveys guided by results from regional data gap analysis will be implemented to measure breeding seabird abundance, distribution, and habitat characteristics. Effective survey protocols and standardized approaches (e.g., ground-based sampling for burrowing seabirds, aerial photogrammetry for surface-nesting species, acoustic and remote methods for cryptic and nocturnal species) will be developed to quantify abundance and associated habitat metrics. New aerial photogrammetry methods will be used to document and map remote and inaccessible islet sites to a fine-scale (~5 cm resolution). The resulting SQL database of seabird colonies will host count data, habitat metrics, and associated metadata (e.g., sources, methods, history, introduced species, threats, etc.). A comprehensive and accessible GIS Atlas (geodatabase) of seabird colonies throughout the MHI and associated islets will be created and hosted online via the BOEM Marine Cadastre and USGS. New methods to generate at-sea distributions among breeding seabirds can be used to inform similar efforts to map colony-based distributions in the Pacific. In phase three, USGS will use a modeling-based approach to combine recent BOEM-supported seabird at-sea utilization data with new colony data from this atlas to generate spatially explicit, central-place-foraging-based species probability distributions (Grecian et al. 2012).

Current Status: Not yet awarded. Planning is underway on an interagency agreement that would be awarded to USGS.

Final Report Due: TBD

Publications Completed: None

Affiliated WWW Sites: None

Revised Date: February 3, 2017

References:

BOEM. 2015a. Habitat Affinities and At-sea Ranging Behaviors among Main Hawaiian Island Seabirds (PC-13-03). Last revised December 10, 2015. Bureau of Ocean Energy Management: <http://www.boem.gov/pc-13-03/>.

BOEM. 2015b. Developing and Applying a Vulnerability Index for Scaling the Possible Adverse Effects of Offshore Renewable Energy Projects on Seabirds on the Pacific OCS (PC-12-01). Last revised December 10, 2015. Bureau of Ocean Energy Management: <http://www.boem.gov/pc-12-01/>.

Fefer, S. I. Unpublished data 1983-1989. U.S. Fish and Wildlife Service.

Grecian, W.J., M.J. Witt, M.J. Attrill, M.J., S. Bearhop, B.J. Godley, D. Grémillet, K.C. Hamer, and S.C. Votier. 2012. A novel projection technique to identify important at-sea areas for seabird conservation: An example using Northern Gannets breeding in the North East Atlantic. *Biological Conservation*, 156(2012), p.43-52.