BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Alaska

Planning Area(s): Chukchi Sea

Title: Estimation of Abundance and Demographic Rates of Pacific Walruses Using a Genetics-based Mark-Recapture Approach (AK-16-06)

BOEM Information Need(s) to be Addressed: Large numbers of Pacific walruses (*Odobenus rosmarus divergens)* utilize areas of high oil and gas resource potential in OCS waters of the northeast Chukchi Sea. BOEM needs reliable estimates of abundance and demographic rates of Pacific walruses for use in sound planning, management, and mitigation of potential environmental impacts from oil and gas activities and climate change. Abundance and demographic rates of walruses are also important for NEPA analyses, stock assessments under the Marine Mammal Protection Act (MMPA) and for extinction risk assessment under the Endangered Species Act (ESA). Results from this study may be used for future Chukchi Sea lease sales, as well as in BOEM decision-making and mitigation.

Total Cost: 150,000 (+ joint funding) **Period of Performance:** FY 2016-2019

Conducting Organization: USFWS

BOEM Contact: Carol Fairfield

Description:

Background: Walruses are a protected species under the MMPA and are listed as warranted but precluded under the ESA. As part of a 2011 Multi-District Settlement Agreement (United States District Court Docket No. 2165), the U.S. Fish and Wildlife Service must make a decision by September 2017 on whether to propose the walrus for listing under the Endangered Species Act or remove it as a candidate species. Information on abundance and demographic rates will be an important contribution to the relisting decision, which will impact how BOEM manages overlap between oil and gas exploration and development and walrus activity.

Furthermore, decision-making regarding oil and gas-related activities in the OCS areas of the Chukchi Sea relies on a small numbers determination and combining estimates of regional abundance. Current BOEM-funded walrus studies examine distribution and habitat patterns in the Chukchi Sea, as outlined in the studies *Walrus Seasonal Distribution and Habitat Use in the Eastern Chukchi Sea* (AK-13-06), and *Walrus Habitat Use in Drilling Area* (AK-09-01). The results from these studies, combined with a better population estimate of Pacific walrus, would allow managers at BOEM and U.S. Fish and Wildlife Service (USFWS) to determine the proportion of the population that could potentially interact with these activities. Therefore, comprehensive estimates of global abundance and demographic rates for walruses are important for regulatory

and mitigation activities associated with oil and gas development in the northeast Chukchi Sea.

Past efforts to estimate abundance of walruses were based on aerial surveys. The study *Development of Airborne Remote Sensing Methods for Surveys of Pacific Walrus* (OCS Study MMS 2006-003) identified a number of drawbacks to the use of this technique for measuring abundance with sufficient precision to monitor population trends. Therefore, the USFWS, in collaboration with the Alaska Department of Fish and Game, ChukotTINRO, the Association of Traditional Marine Mammal Hunters of Chukotka, and the Eskimo Walrus Commission, secured funds to initiate a genetics-based mark-recapture project for estimation of abundance and demographic rates of walruses in FY 2013.

Objectives: The objective of this study is to partner with USFWS to support the laboratory testing component of a project that uses a genetics-based mark-recapture approach to achieve the following goals:

- Estimate annual abundance of walruses for evaluation of population status and trends by applying mark-recapture analytical techniques to biopsy samples.
- Assess demographic rates of walruses including age and sex specific survival and fecundity for validation and parameterization of population models.
- Compare the estimates of abundance produced from this study with those produced from the BOEM study *Walrus Seasonal Distribution and Habitat Use in the Eastern Chukchi Sea* (AK-13-06) that estimates the abundance of walruses in the OCS areas of the northeast Chukchi Sea for assessment of the proportion of the population potentially exposed to oil and gas activities in the region.

Methods: Genetics testing will be conducted on up to 2000 walrus biopsy samples per year (different age/sex classes). In addition to existing samples, skin biopsy samples will be collected from live walruses hauled out on sea ice during their northward migration from 2016 through 2018. Researchers will utilize the expertise of subsistence hunting communities in both the U.S. and Russia for sample collection. Individual walruses will be identified using single-nucleotide polymorphism markers which are currently being developed by the USFWS. Mark-recapture models will use the resultant genetic information to estimate abundance. Interim results will be made available to the USFWS to help inform decisions regarding listing of walrus. Results of mark-recapture analyses will be used to estimate population size, population growth rate, age and sex specific survival rates, and recruitment of walruses starting in 2016 and continuing through 2018.

Current Status: Planned new start

Final Report Due: TBD

Publications Completed: None

Affiliated WWW Sites: http://www.boem.gov/akstudies/

Revised Date: August 2015

ESPIS: Environmental Studies Program Information System
All *completed* ESP studies can be found
here: http://www.data.boem.gov/homepg/data_center/other/espis/espisfront.asp