

BOEM ENVIRONMENTAL STUDIES PROGRAM: Ongoing Studies

Region: Alaska

Planning Area(s): Bering Sea, Chukchi Sea

Title: Abundance Estimates of Ice-Associated Seals: Bering Sea Populations that Inhabit the Chukchi Sea – Logistics Support (AK-12-x10b)

BOEM Information Need(s) to be Addressed: BOEM needs reliable abundance estimates of ice-associated seal species for NEPA analysis and the future development of sound plans for management, conservation, and mitigation of potential environmental impacts from oil and gas activities and climate change. Improved monitoring of ice-associated seals is also fundamental for ensuring compliance with Federal management and regulatory mandates for stock assessments under the Marine Mammal Protection Act (MMPA) and establishing extinction risk assessments under the Endangered Species Act (ESA). Study findings will be used in pre-lease analyses and documentation for potential future Chukchi Sea lease sales, as well as post-sale NEPA analysis, review of EPs, DPPs and other reviews for post-sale and post-exploration BOEM decision making and mitigation.

Total Cost: \$240,000 plus Joint Funding

Period of Performance: FY 2012-2014

Conducting Organization: NMFS-NMML

BOEM Contact: [Dr. Dan Holiday](#)

Description:

Background: Bearded, spotted, and ribbon seals, collectively referred to as ice seals, are key components of Arctic marine ecosystems and are important subsistence resources for northern coastal Alaska Native communities. These seals are protected under the MMPA and bearded seals are under consideration for listing through the ESA. More comprehensive abundance estimates for these ice-associated seals are needed to establish extinction risk assessments under the ESA and to ensure compliance with Federal management and regulatory mandates for marine mammals under the MMPA. Obtaining reliable abundance estimates for ice seals is also a key requirement for developing sound plans for response to potential environmental impacts of oil and gas activities and the impacts to ice seal populations due to climate change. The seals' geographic distributions are broad and patchy, and the extent, locations, and conditions of their sea ice habitats change rapidly.

Scientists at NOAA's National Marine Mammal Laboratory (NMML) have been collaborating with Russian colleagues to conduct synoptic aerial surveys of ice-associated seals in the Bering and Okhotsk Seas. This procurement provides logistics support for travel of NMFS staff conducting aerial surveys for ice seals (bearded, spotted, and ribbon seals) over the Outer Continental Shelf (OCS) areas of the Bering and southern Chukchi seas. In addition, the project allows for BOEM financial support toward contracting temporary staff to compliment the NMFS-NMML team and facilitate image processing and data analysis of high-resolution digital imagery and thermal output photography. A large volume of images and data are anticipated

from the surveys; annually these data files will be approximately 20 terabytes, including more than 1 million high-resolution photos.

Objectives:

- Conduct aerial surveys to collect high-resolution digital and thermal imagery of ice seals over OCS areas of the Bering and southern Chukchi seas.
- Effectively retrieve, manage, and process sensor imagery for analyses to facilitate calculation of abundance estimates for bearded, spotted, and ribbon seals in the Bering and Chukchi Seas.

Methods: 1) U.S. surveys will begin April 1, 2012, out of Anchorage. A total of 17,000 – 22,000 km of survey transects at an altitude between 800 -1000 ft. will be conducted during an estimated 6 week time period. 2) Surveys will be conducted using two aircraft: a NOAA Twin Otter aircraft and a chartered long range aircraft. The charter aircraft efforts will be focused on the central Bering Sea, an important concentration and breeding area for bearded, spotted, and ribbon seals that is inaccessible to the Twin Otter. 3) New instrument-based methods rather than traditional observer-based methods will be utilized. Multiple high-resolution digital cameras (Canon Mark III 1Ds) will allow surveys to be flown at altitudes too high for on-board observers to identify species. The increase in altitude will reduce disturbance to ice seals being surveyed while providing areal coverage equivalent to surveys flown at lower altitudes during observer-based surveys. 3) Temperature data from a thermal camera (FLIR SC645) paired with each Canon digital camera image will be used to identify when seals are present in the survey area. Utilizing these data will be a thermal automated count and camera-trigger system (Snowflake), a new system that will be tested during this study. This new system allows for images to be collected at regular intervals to monitor sea ice habitat throughout the survey in addition to collecting images when seals are present in the thermal signal. The purpose of this fully automated image collection system is to greatly reduce the number of images collected, thus reducing time for analysis and reducing computer storage space of raw imagery data. 4) After each survey, the digital images, thermal data, and GPS records will be downloaded, duplicated, and stored with appropriate metadata for later analysis. 5) Abundance estimations will be achieved using hierarchical models for seal abundance developed at NMML.

Aircraft support is funded under the companion study titled “Abundance Estimates of Ice-Associated Seals: Bering Sea Populations that Inhabit the Chukchi Sea – Aircraft Support.”

Current Status: Ongoing

Final Report Due: March 2014

Publications Completed: None

Affiliated WWW Sites:

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

ftp://ftp.afsc.noaa.gov/posters/pCameron06_aerial-survey-ice-seals.pdf

Revised Date: October 2012

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