

Environmental Studies Program: Ongoing Study

Field	Study Information
Title	Winter Ringed Seal Density within Beaufort Sea Oil and Gas Project Areas (AK-21-01)
Administered by	Alaska Regional Office
BOEM Contact(s)	Dr. Christina Bonsell (christina.bonsell@boem.gov)
Procurement Type(s)	Cooperative Agreement
Conducting Organization(s)	Alaska Department of Fish and Game
Total BOEM Cost	\$500,000
Performance Period	FY 2021–2025
Final Report Due	January 2025
Date Revised	February 16, 2023
Problem	Oil and gas exploration and development activities occur on landfast sea ice in winter, including ice road and gravel island development. An estimate of the number of ringed seal structures such as lairs and breathing holes that could be disturbed within oil and gas project areas is needed to assess potential impacts to local ring seal population.
Intervention	This study will enhance assessment of impacts on ringed seals by establishing viable ways to locate ringed seals and their under-snow structures using satellite-telemetry tags that sense and record whether a seal is inside a lair, and a sensor web to monitor under-snow structures for ringed seal activity.
Comparison	This study will consider various approaches to develop capabilities for sensing ringed seal lairs and monitoring their use.
Outcome	This study will produce new technological and logistical solutions for quantifying impacts of oil and gas activities on ringed seals and refining guidance for future permitting and mitigation decisions for BOEM. The new technology will also expand capabilities for population assessments of ringed seals, facilitate research on their habitat requirements, and improve understanding about their vulnerability in a warming Arctic.
Context	Beaufort Sea

BOEM Information Need(s): Ringed seals are the most numerous marine mammal present during winter in the coastal areas of the Alaskan Arctic. BOEM needs better information about the number of ringed seals that may be affected by actions that could cause disturbance or injury from ice road, gravel island construction and seismic and drilling operations. The permitting process requires an estimate of the number of ringed seals that may be affected by oil and gas activities. Therefore, ringed seal densities within Beaufort Sea oil and gas project areas in winter are needed for use in ESA Section 7 consultations and NEPA documents for permitting exploration and development projects in the Beaufort Sea.

Background: This study will re-survey a previous study area in Prudhoe Bay in the vicinity of Reindeer Island, near Northstar Island, to compare the number and type of ringed seal structures found (breathing holes, basking holes, resting lairs, and pupping lairs) to what was found there in 1982 and 1983 (Kelly et al. 1988, Kelly and Quakenbush 1990). The study will contribute substantially to improving our understanding of the winter density, ecology, and habitat use of ringed seals in the Beaufort Sea oil and gas project areas to evaluate the effects of disturbance on ringed seals and identify effective mitigation measures. A comparison of the same study area across 40 years will provide substantial insight into the responses of ringed seals in a breeding area to changes in sea ice and snow depth due to climate warming.

Objectives: This study will enhance capacity for assessment of impacts on ringed seals by establishing a viable solution for maintaining the capability to find ringed seals and their under-snow structures.

Methods: Trained wildlife-detecting dogs will be used to find ring seal structures by scent. These dogs are known to be 85–96% effective at finding seal holes (Hammill 1987, Kelly et al. 2005) and the latitude and longitude of structures will be recorded using GPS and mapped using GIS software. Mesa units (Juniper Systems Inc., Logan, UT, USA), or a similar field tablet will be used to record data in the field, including structure type (breathing hole, basking hole, resting lair, or pupping lair), status (open/active or frozen/abandoned), and snow depth. A field tablet will automatically record latitude and longitude to each data record using a highly accurate GPS. Field tablets significantly reduce data entry and translocation errors often associated with latitudes and longitudes that are obtained from hand-held GPS units, written in field notebooks or on datasheets, and later manually entered into a database. Data, including latitude and longitude, can be downloaded directly from the field tablet to field laptops without concern for transcription errors.

Specific Research Question(s): How can new technology expand capabilities and facilitate research on the habitat of ringed seals and improve understanding about potential impacts from oil and gas activities?

Current Status: Ongoing, fieldwork underway

Publications Completed: None

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

References:

- Hammill, M.O. 1987. Ecology of the ringed seal (*Phoca hispida* Schreber) in the fast-ice of Barrow Strait, Northwest Territories. Ph.D. Dissertation. McGill University, Montreal, Quebec, Canada. 108 pp.
- Kelly, B.P., J.J. Burns, and L.T. Quakenbush. 1988. Responses of ringed seals (*Phoca hispida*) to noise disturbance. Pages 27–39 in: W.M. Sackinger and M.O. Jefferies, eds. Port and Ocean Engineering Under Arctic Conditions Vol. II Symposium on Noise and Marine Mammals. Geophysical Institute University of Alaska, Fairbanks, Alaska.
- Kelly, B.P. and L.T. Quakenbush. Spatiotemporal use of lairs by ringed seals (*Phoca hispida*) 1990. Canadian Journal of Zoology 68(12):2503–2512.
- Kelly B.P., O.P. Harding, M. Kunasranta, L.T. Quakenbush, and B.D. Taras. 2005. Correction Factor for ringed seal surveys in northern Alaska. Final Report to the Coastal Marine Institute, OCS Study MMS 2005-006 32 pp.