

MMS ENVIRONMENTAL STUDIES PROGRAM: ONGOING STUDIES

Region: Alaska

Planning Areas: Beaufort Sea, Chukchi Sea, Bering Sea

Title: Bowhead Whale Feeding Variability in the Western Alaskan Beaufort Sea (AK-06-01)

MMS Information Needs to be Addressed: With additional information on the importance of the study area to feeding bowhead whales, and a better understanding of potentially predictable factors that correlate with variations in whale behavior, alternative mitigation options for future Beaufort Sea lease sales may be feasible. Also this study addresses a conservation recommendation in NMFS' 2001 Arctic Region Biological Opinion. The recommendation is that MMS study "the use of the Beaufort Sea by feeding bowheads and assess the importance of this feeding to the health and well being of these animals." Information from this study will be used for permit approvals for all Beaufort Sea Lease Sales and NEPA analysis and documentation for Beaufort Sea Lease Sales and DPPs.

Total Cost: \$6,687,300

Period of Performance: FY 2005-2011

Conducting Organization: ADF&G and NMFS NMML

MMS Contact: [Chief, Alaska Environmental Studies Section](#)

Description:

Background A previous MMS study estimated the extent to which the bowhead whale population utilizes OCS areas in the eastern Alaskan Beaufort Sea for feeding, as well as that area's importance to individual whales. Additional research on this subject has been requested particularly at locations other than those included in the previous study. In a 2001 Arctic Region Biological Opinion NMFS made a Conservation Recommendation that MMS continue to study "the use of the Beaufort Sea by feeding bowheads and assess the importance of this feeding to the health and well being of these animals." Other stakeholders have recommended that MMS expand the scope of the research to include the entire Alaskan Beaufort Sea.

In this proposed study, emphasis will be placed on achieving an understanding of the factors enhancing or limiting the expression of feeding behavior in various locations in the western Alaskan Beaufort Sea. Implicit to the proposed study is the assumption that feeding by bowhead whales occurs with some degree of regularity during August-October the western Beaufort Sea study area. It is further assumed that variation in feeding behavior potentially results from any, or all, of a variety of environmental and behavioral variables including, but not limited to: sea ice coverage, oceanographic conditions, prey concentrations, and movements by whales, potentially from summering areas in both the Beaufort Sea and Chukchi Sea. By understanding how such factors are related to bowhead feeding in western Beaufort Sea locations near offshore oil and gas leases, MMS would be in a better position to mitigate potential effects of such actions on bowheads and their populations.

Objectives To better understand the relationship between feeding and environmental and behavioral variables on the timing and spatial extent of bowhead feeding in the western Alaska Beaufort Sea; specifically to:

1. Document the movements of whales of various ages, sexes, and reproductive statuses from the Beaufort Sea and Chukchi Sea within, into and out of the study area.
2. Document feeding behavior and prey utilization by bowheads at locations in the western Alaska Beaufort Sea with emphasis on timing and dynamics/variability.
3. Document variability in locations and densities of potential prey of bowhead whales.
4. Estimate variability of physical oceanographic conditions associated with concentrations of bowheads and their prey.
5. Integrate results from this study with previous results from other sources to develop a dynamic model of bowhead feeding behavior in the western Alaska Beaufort Sea.
6. Synthesize existing results and conclusions in a scientifically reviewed monograph to be published in an appropriate journal or other similar outlet.

Methods This study will have two phases and be conducted over geographic and temporal scales sufficient to include normal variability associated with environmental phenomena including local currents and upwellings, variation in ice conditions, and *el Nino*. The study area will be encompassed by the polygon bounded by the shoreline, 100 m isobath, 152° W and 155° W meridians.

Phase I: A task employing satellite transmitters would be designed and conducted to provide information on topics including, but not limited to: bowhead movements in and out of the study location, migration timing, swim speed, and residence times in functionally important portions of bowhead whale range. Collaborations would be developed between whaling captains, AEWC, NSB, ADF&G, NMFS, MMS and other interested parties to resolve roles in permitting, co-sponsorship and implementation. Satellite transmitters would be deployed on bowhead whales near Native villages in the Beaufort, Chukchi and Bering Seas during spring and fall migrations. Transmissions would be monitored and data analyzed.

Phase II: Based on preliminary observations of locations of bowhead feeding having high potential for more comprehensive study and analysis as determined during Phase I, other project planning and research would be initiated in Phase II using planning and field methods similar to those of the previous eastern Alaskan Beaufort Sea bowhead feeding study. These would include planning meetings and fieldwork such as analyses of stomach contents at Barrow and Cross Island, behavioral observations by aircraft, plankton tows by small vessel, stable isotope ratios in baleen layers, fatty acid comparisons, recording of traditional knowledge, and computer modeling of feeding information. Real-time distribution of whales in the Beaufort Sea, as well as historic information on bowhead whale feeding activity in the study area, would be provided by the ongoing MMS *Bowhead Whale Aerial Survey Project*. The study would be carefully coordinated with the Alaska Eskimo Whaling Commission (AEWC) and Whaling Captains Associations in Barrow, Nuiqsut and Kaktovik to avoid interference with fall subsistence hunts and, where feasible, to involve whaling communities in the conduct of the study. Phase II would also involve the concurrent and coordinated use of a combination of remote sensing and field measurement of oceanographic conditions in the study area. MMS will accomplish Phase II in three components:

1. Satellite tracking of bowhead whales (AK-05-01)
2. Feeding observations (AK-06-01)
3. Oceanographic measurements (AK-06-02)

Current Status:

Bowhead whales were successfully tagged at Barrow and off the McKenzie River Delta this past summer and movements can be viewed at the website below. The feeding behavior tasks were initiated this summer, but were hampered by small numbers of bowheads being present near Barrow when the research team was stationed in Barrow. Oceanography tasks were successfully completed during 2007. Annual reports for Phase I are due in 2006-2009 and a Final Report is due in August 2010. Annual reports for Phase II are due in December 2008, 2009 and 2010. A draft and final report are due in October and December 2011, respectively.

Final Reports Due: Track task: 2010; Behavior and Oceanography tasks: 2012

Publications Completed: None

Affiliated WWW Sites:

<http://www.wildlife.alaska.gov/index.cfm?adfg=marinemammals.bowhead>
<http://www.mms.gov/alaska/>

Revised Date: March 2008