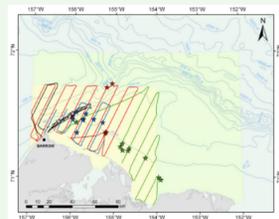


The Bowhead Whale Feeding Ecology Study (BOWFEST)

David Rugh • NMML, AFSC, NOAA Fisheries
Carin Ashjian • Woods Hole Oceanographic Institution
Mark Baumgartner • Woods Hole Oceanographic Institution
Catherine Berchok • NMML, AFSC, NOAA Fisheries
Bob Campbell • University of Rhode Island
Craig George • North Slope Borough Dept. Wildlife Management
Kimberly Goetz • NMML, AFSC, NOAA Fisheries
David Mellinger • Oregon State University
Julie Mocklin • NMML, AFSC, NOAA Fisheries
Steve Okkonen • University of Alaska Fairbanks
Gay Sheffield • ADFG/NSB Dept. Wildlife Management
Mari Smultea • Smultea Environmental Sciences
Kate Stafford • University of Washington/ Applied Physics Lab

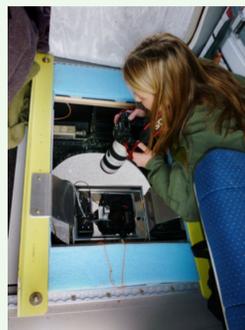


Aerial Surveys



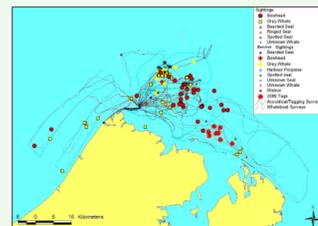
Aerial surveys were conducted on 5 days between 29 Aug and 18 Sept 2009. Totals of aerial sightings of bowheads were 16 in 2007, 56 in 2008, and 25 in 2009.

Photo Analysis



Aerial photography provides images of bowheads used to identify individuals and measure their lengths.

Boat-based Surveys



Boat-based surveys in 2009. Bowhead sightings are indicated with red marks.



Photo of a group of bowhead whales feeding at the sea surface. Photo by Henry Elavgak

The Bowhead Whale Feeding Ecology Study (BOWFEST) was initiated in May 2007 through an Interagency Agreement between the Minerals Management Service (MMS) and the National Marine Mammal Lab (NMML, NOAA Fisheries Service). The study is being conducted through grants and contracts to scientists at eight institutions. Fieldwork is being coordinated with the North Slope Borough, Alaska Eskimo Whaling Commission, Barrow Whaling Captains' Association, Alaska Department of Fish and Game, and Minerals Management Service.

BOWFEST focuses on late summer oceanography and prey densities relative to bowhead whale (*Balaena mysticetus*) distribution north and east of Point Barrow between the Alaska coast and 72°N and between 152° and 157.5° west longitudes. Aerial surveys, boat-based surveys, and acoustic monitoring provide information on the spatial and temporal distribution of bowhead whales in the study area. Oceanographic sampling helps:

1. identify off-shelf sources of zooplankton prey available to whales on the continental shelf
2. describe how oceanographic fronts and currents influence zooplankton aggregation
3. provide a context for interpreting whale feeding behavior.

Results of this research program show that in late summer (mid-August to mid-September), bowheads are generally on a westward feeding migration through the study area predominately along the 20-m isobath, and that most of the whales near Barrow are feeding on krill. Prey densities increase on the shelf after upwelling-favorable east winds are followed by weak and/or southerly winds. This "krill trap" likely contributes to the high proportion of feeding whales seen in this area. A good understanding of bowhead behavior and distribution, as exemplified by this study, is needed to minimize potential impacts from petroleum development activities, possible commercial fishing in the future, and anticipated increased vessel traffic associated with diminishing arctic sea ice.

Passive Acoustics



Locations of passive acoustic recorders deployed in 2009.



EAR



AURAL

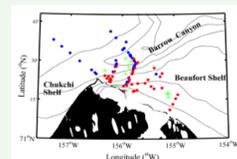
Passive acoustic recorders.

Stomach Content Analyses



This stomach contained fresh undigested euphausiid-like prey with very little fluid.

Mooring and Broadscale Oceanography



The blue symbols are locations of stations with few krill, the red symbols are locations of stations with krill, and the green asterisks are locations of bowhead whales seen from the *Annika Marie*.



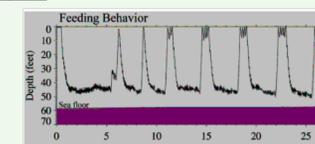
Annika Marie used for oceanography.



Tagging and Fine Scale Oceanography



Launched tag immediately prior to attaching to a bowhead.



Time since tag attachment (minutes).

Acknowledgments

- Funding for this study was provided by the Minerals Management Service, with ongoing support from Chuck Monnett.
- The National Marine Mammal Lab, AFSC, NOAA Fisheries, was the conduit of research funds to eight institutions (see the author list).
- Studies of bowhead whales were conducted under MMPA Research Permits 782-1719 and 369-1757-01.
- Fieldwork has been coordinated with the North Slope Borough, Alaska Eskimo Whaling Commission, Barrow Whaling Captains' Association, and Alaska Department of Fish and Game.

