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History of Bowhead Surveys in the U.S. Beaufort and Chukchi Seas ~ 1975-2009

Mari A. Smultea^{1,2}, Dagmar Ferti^{2,3}, David J. Rugh⁴, and Cathy Bacon¹

¹Smultea Environmental Sciences, LLC, 29333 SE 64th St., Issaquah, WA 98027 (msmultea@msn.com); ²HDR Alaska Inc., 2525 C St., Suite 305, Anchorage, AK 99503; ³Ziphius EcoServices, 8112 Springmoss Dr., Plano, TX 75025; ⁴National Marine Mammal Laboratory, Alaska Fisheries Science Center, National Marine Fisheries Service, NOAA, 7600 Sand Point Way NE, Seattle, Washington, 98115



RESULTS

Studies involving bowheads in the U.S. Beaufort and Chukchi seas are numerous; they include many obscure and/or unpublished reports/datasets that are difficult to locate. In just 2008 and 2009, there were nearly 45 studies involving bowheads in this region. Compilation of such information is directly relevant to fulfilling goals of current inter-disciplinary efforts to study bowhead ecology vis-à-vis ongoing, proposed and anticipated offshore oil and gas activities in the Beaufort and Chukchi seas.



Map of selected historical, current and proposed oil and gas production activities in the U.S. Beaufort Sea. Associated marine mammal monitoring programs have contributed to systematic studies of bowheads along with projects funded by many other entities.

Examples of major entities funding bowhead whale systematic surveys and monitoring efforts

- Minerals Management Service
- Bureau of Land Management
- U.S. and Canadian Oil/Gas Industry
- National Marine Mammal Laboratory (NMFS)
- North Slope Borough
- Alaska Eskimo Whaling Commission
- Fisheries and Oceans Canada
- Indian and Northern Affairs, Canada
- Alaska Department of Fish and Game
- National Science Foundation

INTRODUCTION

As part of the Bowhead Whale Feeding Ecology Study (BOWFEST) being coordinated by NMFS' National Marine Mammal Laboratory for the Minerals Management Service (MMS), we conducted a comprehensive review of all prominent scientific surveys that systematically recorded bowhead whales (*Balaena mysticetus*) in the U.S. Beaufort and Chukchi seas. This review represents the "best available information" on bowheads needed to support environmental risk assessments, environmental impact assessments, and other pre-and post-leasing decision documents for potential gas and oil leasing by the MMS in the Beaufort and Chukchi Sea Planning Areas.

Given the cumulative number of such studies and the predicted continued growth of industrial activities in this region, our goals were to provide:

- (1) a summary for historical comparisons;
- (2) a format to integrate and track the studies; and
- (3) a publicly available starting point to identify data of relevance to ongoing work.

Example of the table format used for the database on systematic surveys of bowhead whales

First Yr of Study	Study Years	Method	Funding Source	PI / POC	Research Team	Project Title	Description	General Location	Timeframe	Preliminary List of Reports and Publications	General Notes
1975	1975-1981, 1984-1989, 1990-1992	aerial survey	NMML	D. Rugh, H. Braham, T. Albert	NMML, NSB	bowhead & beluga migration, distribution, abundance in the Bering, Chukchi, and Beaufort seas	develop reliable technique for counting bowhead whales to determine population size; supported ice-based census during same years	vicinity of Pt Barrow, Bering, Chukchi, Beaufort	spring	Braham et al. 1977, 1979, 1980a,b, 1984; Krogman et al. 1989	
1976	annually 1976 - 1988; 1992, 1993, 1999, 2000, 2001	ice-based visual survey	NSB-DWM, NOAA-AEWC, BP Exploration AK, IITSAI, College, NSF	C. George	NSB DWM		ice-based censuses of W Arctic stock of bowhead; first 2 yrs examined logistics of counting from ice as the whales passed near Pt Barrow during spring migration	vicinity of Pt Barrow	mid-April to mid-June	Braham et al. 1979a,b; Braham et al. 1980a,b, 1984; Braham and Krogman 1977; Carroll and Smith-Hillier 1980; Johnson et al. 1981; Ljungblad 1981; Marquette et al. 1982; Dronenburg et al. 1984, 1986; Krogman et al. 1982, 1985, 1986, 1989; Zeh et al. 1983; Ljungblad et al. 1986a, 1987; George et al. 1995, 2004	of surveys in 1999-2001, only 2001 data were useful (pers. Comm., J.C. George, Dec 2008); acoustic censuses conducted simultaneously during some years beginning in 1984 (see First Year 1984, PI Chris Clark)

METHODS

To address our goals, we compiled and synthesized a list of past and current visual/acoustic detection studies that systematically recorded bowhead whales in the U.S. Beaufort and Chukchi seas. This compilation included data derived from:

- aerial surveys for whale distribution,
- aerial photography,
- ice and shore-based census/tracking efforts,
- vessel-based and tagging efforts, and
- monitoring associated with offshore oil and gas exploration, development and operations.

IN SUMMARY

Our intent is to *provide a comprehensive resource* to serve as a foundation for the integration of past and ongoing bowhead studies relative to industrial activities, mitigation, and management. It is meant to assist and improve the flow of scientific information between interested entities and the public, leading eventually to an integration of research on bowhead whales.

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