Bowhead Whale Diet: Bering Sea to Beaufort Sea (2007-2012)

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INTRODUCTION

Bowhead whales migrate from the Bering Sea to the Chukchi and Beaufort Seas, presumably to feed. This study examined the diet of bowhead whales harvested during 2007-2012. We noted the percentage of whales feeding and identified prey from bowhead stomachs and/or fecal samples from whales harvested by the communities on Saint Lawrence Island (Gambell and Savoonga), Barrow, and Kaktovik.

Proportion of Bowhead Whales Feeding

- More whales were feeding near Barrow (92%) than at Kaktovik (54%).
- More whales were feeding near Barrow during the fall (92%) than the spring (10%).
- During spring, more whales were feeding near Saint Lawrence Island (73%) than at Barrow (10%).
- There was no seasonal difference in the proportion of whales feeding near Saint Lawrence Island (spring 73% vs. fall 75%) .

Bowhead Whale Diet

Chukchi/Beaufort Sea – Barrow

- During the spring, euphausiids, or krill, were the dominant prey.
- During the fall 2007-2009, stomach contents were dominated by euphausiids and frequently included mysids and fish. During fall 2010, the dominant prey switched to copepods. A diversity of prey types dominated the fall 2011-2012 samples and included copepods, amphipods, mysids, fish, isopods.

Beaufort Sea - Kaktovik

- During the fall, copepods were the dominant prey; however, amphipods also occurred in every sample.

Bering Sea – Saint Lawrence Island (SLI)

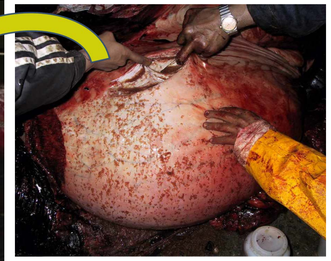
- Copepods occurred most frequently, spring and fall. Euphausiids were identified in fall but not in spring.

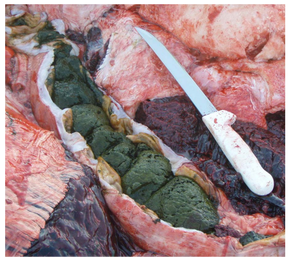
Location / Season	% Feeding
Kaktovik - Fall (n=13)	54%
Barrow - Fall (n=60)	92%
Barrow - Spring (n=50)	10%
St. Lawrence I. - Spring (n=22)	73%
St. Lawrence I. - Fall (n=4)	75%

Above: Percent feeding, by location and season for 149 harvested bowhead whales examined during 2007-2012.

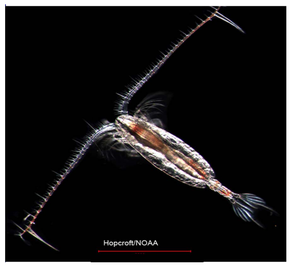
Right: Frequency of occurrence for prey items identified from stomach samples collected from bowhead whales harvested near Barrow, Kaktovik, and Saint Lawrence Island during 2007-2012.

	BEAUFORT Barrow (fall)	BEAUFORT Barrow (spring)	BEAUFORT Kaktovik (fall)	BERING SLI (fall)	BERING SLI (spring)
n=# whales sampled	n=55	n=5	n=7	n=3	n=16
Copepod	60%	60%	100%	100%	81%
Amphipod	91%	60%	100%	33%	6%
Mysid	60%	-	43%	-	19%
Euphausiid	58%	60%	14%	67%	-
Fish	56%	-	14%	-	13%
Cumacea	27%	-	14%	-	-
Shrimp	24%	-	14%	67%	19%
Isopod	15%	-	14%	-	-
Crab	15%	-	-	-	-
Annelid worm	4%	-	14%	-	-
Echinoderm	4%	-	-	-	-
Barnacle	2%	-	-	-	-
Ostrocod	2%	-	-	-	-
Unid. Decapod	2%	-	-	-	6%
Snail	2%	-	8%	-	6%
Clam	2%	-	8%	-	19%
Jellyfish	2%	-	-	-	-

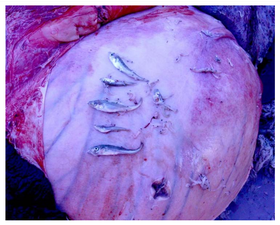





L to R: Sample jar with copepods; stomach with copepods; stomach with euphausiids, or krill; fecal sample with copepods.




Above L to R: Copepods are smaller than euphausiids (or krill), or about as large as a grain of rice; Krill are almost an inch in length; Amphipods about 1-2 inches in length; **Right**: Fish found in stomach harvested near Barrow.



DISCUSSION

Chukchi/Beaufort Sea

- More bowhead whales fed regularly in the Beaufort Sea during the fall migration than in the Chukchi Sea during the spring. Near Barrow, whales with full stomachs were observed far more often in fall.
- During spring, most whales harvested near Barrow were not feeding or had little food in their stomachs.
- There appears to be annual variation in the types and volume of prey consumed.
- Ecological shifts in secondary prey types may be occurring and deserve further study. For example, small fish occurred in over half of whales near Barrow during fall.

Bering Sea

- The waters near Saint Lawrence Island appear to be important areas of bowhead whale feeding during spring and fall.

Beaufort Sea vs. Bering Sea

- There are strong seasonal differences in the prey types and feeding behavior of harvested whales between the Bering and Beaufort Seas.
- We recommend using caution when interpreting these results due to small sample size and state of digestion in samples.

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