BOWHEAD WHALE FEEDING IN THE NORTHERN BERING SEA NEAR SAINT LAWRENCE ISLAND, ALASKA

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Introduction

- Bowhead whales seasonally occupy the Bering, Chukchi, and Beaufort seas. Most information on bowhead diet has come from examinations of harvested animals in the Beaufort Sea. Prior to this project, results from only one examination of bowhead stomach contents in the northern Bering Sea had been published (Hazard and Lowry 1984).
- We studied feeding of bowhead whales harvested by Alaska Natives at St. Lawrence Island in the northern Bering Sea during spring (April-May) and fall (November) migrations.

Objectives

- Identify the proportion of harvested whales that had been feeding during spring and fall based on all available harvest records.
- Describe the prey identified from the stomach and/or intestinal contents of whales harvested during fall 2005 - spring 2009.

Methods

- Harvest records were compiled and reviewed for information on feeding status. Proportions of whales feeding in the Bering Sea were compared with those from the Beaufort Sea using a 2x2 Chi-square test.
- Stomach and/or intestinal samples were collected from subsistence-harvested bowhead whales during fall 2005 to spring 2009 and prey were identified to the lowest taxonomic level possible.

Results

- Records from 133 bowhead harvests during 1972-2009 were reviewed. Thirty records contained information on feeding status. Eleven bowhead whales were classified as feeding (3 fall, 8 spring), 14 were classified as not feeding (spring). For five whales, the status of feeding was uncertain (spring).
- During spring, eight whales (36%; n=22) were classified as feeding. There was no difference in the proportion of bowhead whales feeding in the Bering Sea and the Beaufort Sea (34%; n=91 Lowry et al. 2004) during the spring migration.
- All three whales (100%) examined during the fall harvest were feeding.
- During the study period (2005-2009), stomachs and/or intestines of 14 whales harvested near SLI were examined and sampled (Table 1). Of these, copepods were identified in 88% of the diet samples (Table 2). Several epibenthic items were identified including polychaete, clam, and shrimp. Euphausiids dominated the diet samples of whales harvested during late November.

Table 1. Summary information for bowhead whales harvested near St. Lawrence I. and sampled during fall 2005 to spring 2009.

ID #	Village	Date	Sex	Total length (meters)
05S5	Savoonga	29-Nov-05	Female	16.5 m
05S6	Savoonga	29-Nov-05	Female	17.1 m
05S7	Savoonga	29-Nov-05	Female	18.3 m
07S1	Savoonga	13-Apr-07	Male	10.0 m
07S2	Savoonga	15-Apr-07	Female	8.3 m
07S3	Savoonga	16-Apr-07	Male	10.7 m
07S4	Savoonga	27-Apr-07	Female	15.2 m
07G2	Gambell	1-May-07	Female	16.3 m
07G3	Gambell	1-May-07	Female	15.3 m
07G4	Gambell	1-May-07	Female	15.2 m
08S1	Savoonga	7-Apr-08	Female	7.6 m
08S2	Savoonga	27-Apr-08	Male	13.7 m
09S1	Savoonga	15-Apr-09	Female	13.5 m
09S3	Savoonga	18-Apr-09	Male	13.3 m

Figure 1. Euphausiids (upper) dominated the fall samples. Copepods (lower) were the most frequently identified prey in spring.

Table 2. Prey items identified from 10 bowhead whales during fall 2005 - spring 2009.

	05S5	05S6	05S7	07S2	07G3	07G4	08S1	08S2	09S1	09S3
	Fall	Fall	Fall	Spring	Spring	Spring	Spring	Spring	Spring	Spring
Crustaceans	-	-	-	-	X	-	-	-	-	-
Euphausiids	X	X	X	-	-	-	-	-	-	-
Thysanoessa raschii	x	-	x	-	-	-	-	-	-	-
Mysids	-	-	-	X	-	-	-	-	-	-
Mysis oculata	-	-	-	x	-	-	-	-	-	-
Amphipods	-	-	-	X	-	-	-	-	-	-
Copepods	X	X	X	-	X	X	X	X	X	X
c.f. Calanus marshallae	x	x	x	-	-	-	-	-	-	-
Calanus glacialis	-	-	-	-	-	-	-	-	x	x
Shrimp	-	X	X	X	X	-	-	-	X	-
Pandalidae	-	-	x	-	-	-	-	-	-	-
Crangonidae	-	-	x	-	-	-	-	-	-	-
Fish (vertebra)	-	-	X	-	-	-	-	-	-	-
Bivalve (shell)	-	-	-	X	-	-	-	-	X	-
Nuculana sp.	-	-	-	-	-	-	-	-	x	-
Gastropod (operculum)	-	-	-	-	-	-	-	-	X	X
Polychaete	X	X	X	-	-	-	-	-	-	-

Conclusions

- Bowhead whales feed in the northern Bering Sea during April-May and late November.
- Copepods were the most frequently identified prey item. Epibenthic prey were identified and suggests some bowhead whales are feeding near the seafloor. Euphausiids dominated the fall samples and did not occur in the spring 2005-2009 samples.
- There are indications of seasonal differences in the diet and feeding status of whales. However, we recommend caution when interpreting these results due to the small sample size.
- Data are consistent with bowhead feeding behavior observed by Alaska Native whalers from St. Lawrence Island.

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