# BOWHEAD WHALE FEEDING IN THE ALASKAN BEAUFORT SEA


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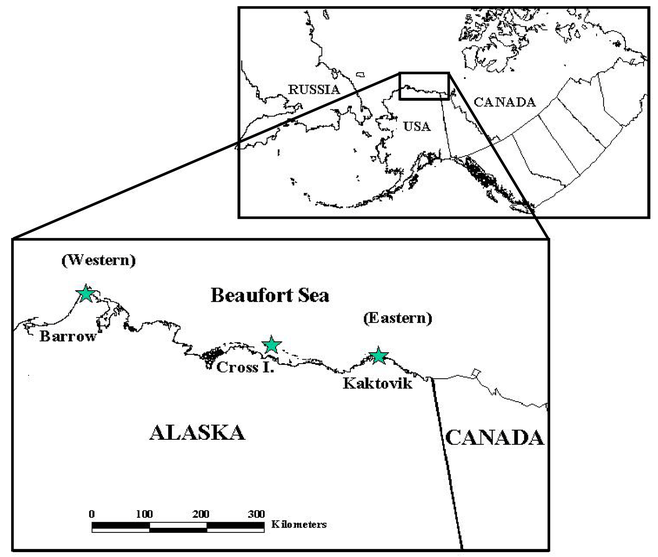
We studied feeding of bowhead whales (*Balaena mysticetus*) taken by Alaska Natives in the Beaufort Sea.




### OBJECTIVES

1) Identify the proportion of harvested whales that had been feeding from 1969-2000.
2) Describe diet based on stomach contents of whales harvested during 1986-2000.

### METHODS

Stomach content data acquired from 1969-2000 from subsistence-harvested bowheads were compiled and separated by region. The frequencies and volumes with which different prey types were represented were calculated. The frequencies of prey types were compared with 2x2 contingency tests (using Bonferroni's procedure) by sex, length, harvest season, and region.

### RESULTS

There was no significant difference in the proportion of animals that had been feeding during the fall at Kaktovik (75%) and Barrow (73%) ($\chi 2 = 0.69$; df=1; P>0.1). During fall, copepods occurred more frequently in animals from Kaktovik ($\chi 2 = 43.04$; df=1; P<0.001), while euphausiids ($\chi 2 = 10.61$; df=1; P<0.01) and hyperiid amphipods ($\chi 2 = 12.39$; df=1; P <0.001) occurred more frequently at Barrow (Table 1). Additionally, the percent copepods by volume was greater in animals taken at Kaktovik than at Barrow (mean = 60.7% vs. 4.5%; t=5.45; df=23; P< 0.001) (Figure 1), while the percent euphausiids by volume was greater in whales from Barrow (mean = 84.2% vs. 21.9%; t=6.88; df=29; P<0.001) (Figure 2). At Barrow, a larger proportion of animals was feeding in the fall (73%) than in the spring (31%) ($\chi 2 = 35.77$; df=1; P<0.001), and copepods occurred more often in the spring ($\chi 2 = 31.52$; df=1; P<0.001). There were no major differences in the diets of males vs. females, or in small (<13 m) vs. larger (>13 m) whales (Table 2).

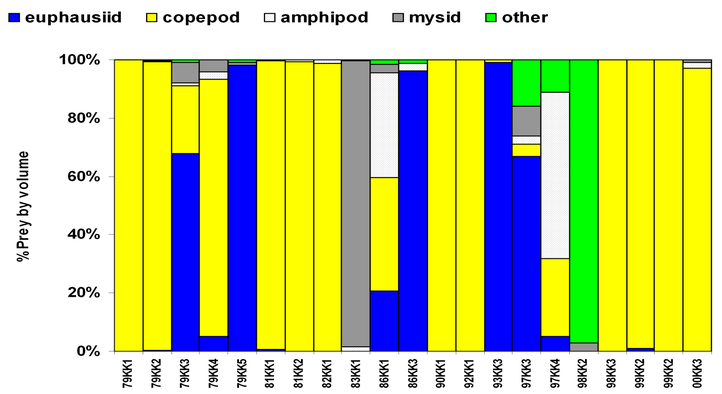



Figure 1. Percent prey by volume for 21 whales harvested near Kaktovik during the fall, 1979-2000.

Table 1. Percent frequency of occurrence of major prey types identified from whales harvested near Kaktovik, Cross Island, and Barrow.

| Prey type | Kaktovik fall (n = 21) | Cross I. fall (n = 3) | Barrow fall (n = 69) | Barrow spring (n = 30) |
|---|---|---|---|---|
| Copepod | 100 | 100 | 20 | 80 |
| Euphausiid | 62 | 33 | 94 | 93 |
| Gammarid amphipod | 81 | 67 | 55 | 23 |
| Hyperiid amphipod | 67 | 67 | 28 | 33 |
| Mysid | 57 | 0 | 49 | 20 |
| Fish | 48 | 0 | 26 | 3 |
| Decapod | 52 | 67 | 29 | 7 |
| Isopod | 24 | 0 | 19 | 0 |
| Cumacean | 24 | 33 | 13 | 3 |

Table 2. Percent frequency of occurrence of major prey types identified from whales harvested in the Beaufort Sea, separated by sex and size.

| Prey type | Males (n = 61) | Females (n = 58) | Length <13 m (n = 77) | Length >13 m (n = 42) |
|---|---|---|---|---|
| Copepod | 49 | 50 | 57 | 36 |
| Euphausiid | 87 | 88 | 88 | 86 |
| Gammarid amphipod | 49 | 55 | 53 | 50 |
| Hyperiid amphipod | 39 | 33 | 35 | 38 |
| Mysid | 43 | 45 | 51 | 31 |
| Fish | 23 | 26 | 31 | 12 |
| Decapod | 28 | 28 | 25 | 33 |
| Isopod | 15 | 16 | 19 | 7 |
| Cumacean | 10 | 16 | 13 | 12 |

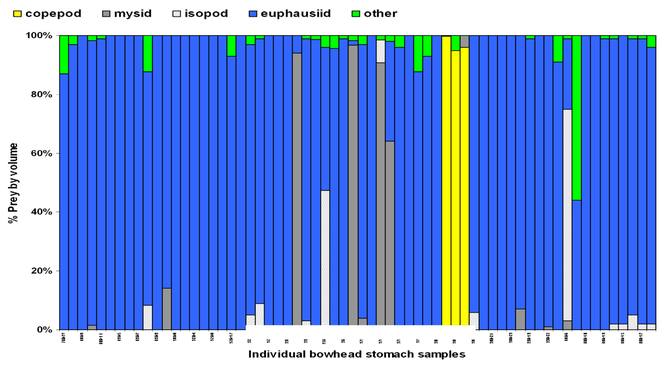



Figure 2. Percent prey by volume for 64 whales harvested near Barrow during the fall, 1976-2000.

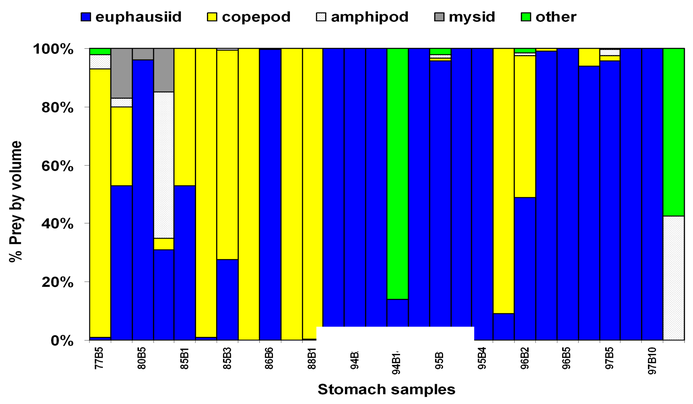



Figure 3. Percent prey by volume for 28 whales harvested near Barrow during the spring, 1977-1998.

### CONCLUSIONS

- Coastal waters of the entire Alaskan Beaufort Sea are commonly used for feeding by bowhead whales during September-October.
- This entire coastal region should be considered part of their normal summer-fall feeding range.
- In the Alaskan Beaufort Sea there are regional and seasonal differences in bowhead whale diet.
- During spring, feeding by bowheads near Barrow is more common than previously thought.


### ACKNOWLEDGEMENTS

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