Subsistence harvest of bowhead whales (*Balaena mysticetus*) by Alaskan Eskimos during 2003

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ABSTRACT

In 2003, 41 bowhead whales (*Balaena mysticetus*) were struck during the Alaskan subsistence hunt resulting in 35 animals landed. The efficiency (# landed / # struck) of the hunt was 85%, which is higher than the average efficiency over the past 10 years (mean =77%, standard deviation =0.07%). Seventeen of the landed whales were males, 17 were females and the sex of one animal was not determined. Of the females, five were presumably mature (>13.4m in length); however, only three were examined closely. Two had recently given birth and the other was not pregnant.

KEYWORDS: ARCTIC; *BALAENA MYSTICETUS*; BOWHEAD WHALE; STATISTICS; WHALING-ABORIGINAL

INTRODUCTION

Harvesting of bowhead whales (*Balaena mysticetus*) provides for important subsistence needs of several northern and western Alaskan Eskimo communities. The Alaska Eskimo Whaling Commission (AEWC) locally manages the harvest through an agreement with the National Oceanic and Atmospheric Administration (NOAA). The level of allowable harvest is determined under a quota system in compliance with the International Whaling Commission (IWC 1980; Gambell 1982). The quota is based on the nutritional and cultural needs of Alaskan Eskimos as well as on estimates of the size and growth of the Bering-Chukchi-Beaufort seas stock of bowhead whales (Donovan, 1982; Braund, 1992).

The subsistence hunt typically takes place in spring and autumn as whales migrate between the Bering and Beaufort seas. Hunters on St. Lawrence Island may take whales during the winter. These hunts are subjected to considerable environmental interference from weather (wind speed and direction, fog, and temperature), stability of landfast ice and sea ice concentration. The success of the hunt is greatly affected by these factors and shows considerable variation by year and location.

Since 1981, the North Slope Borough Department of Wildlife Management has gathered basic data on landed whales in several communities, especially Barrow, and assisted the AEWC in compiling statistics on landed whales from outlying villages (Albert, 1988). The purposes of this paper are to document: (1) the number, location (village), and dates of landed and struck-and-lost bowhead whales in 2003 in Alaska, (2) the estimated fate of struck and lost bowhead whales, (3) basic morphometric data and the sex composition of the harvest, and (4) the hunting efficiency of the harvest.

METHODS

Harvest data such as sex, length, dates, and fate of struck and lost whales for all whaling villages were obtained from the AEWC. Biologists recorded similar information for most whales taken at Barrow and Kaktovik, and also collected specimens and detailed morphometric data.

RESULTS AND DISCUSSION

In 2003, 41 whales were struck during the Alaskan subsistence hunt resulting in 35 animals landed. The total number of whales landed (n=35) in 2003 was approximately the same as the average number of whales landed (per year) over the last 10 years (mean = 41.0 whales, standard deviation = 4.9).

Hunters from four villages (Barrow, Gambell, Point Hope, and Wainwright) landed 20 whales during the spring migration (Table 1). The earliest whale was taken at St. Lawrence Island (Gambell), which is fairly typical, although Gambell and Savoonga faced high winds and poor spring whale conditions. No whales were taken at Savoonga during the spring. Point Hope landed four whales in four days in late April but then poor weather prevented further success. At Barrow, ten whales were taken between 19 April and 1 June. The whale landed on 19 April, was the earliest landing at Barrow in the last 30 years. After this first whale was landed at Barrow, poor weather set in for two weeks preventing further hunting. Periodic poor weather and unsafe ice conditions through May restricted hunting. As in other seasons, whales taken late in spring at Barrow tended to be larger (Suydam et al., 2004b). Three communities, Kivalina, Wales, and Little Diomede, which usually hunt in the spring, did not take any whales. As in the previous year, all three hunts failed due to poor weather and hazardous or difficult sea ice conditions (Suydam et al., 2003). Raymond Hollie (pers. comm. 28 May, 2004) of Kivalina noted:

> "There's been lots of young ice in the lead in recent years, and we can't get to the whales. Winds are coming from the west and east more and the leads are not clear. We need a north wind to clear leads, but recently when it does blow from the north, it blows too hard and lasts 4-5 days; sometimes it's close to 100 mph. We've had no shorefast ice (tuvuk) all year at Kivalina and in the recent past. The young ice piles up and then goes away again with a strong wind. It doesn't form solid ice like in the old days. It's changed a lot in recent years. "

Fifteen whales were landed during fall migration or in winter by five villages (Barrow, Kaktovik, Nuiqsut and Savoonga; Table 1). Nuiqsut hunters used a period of good weather during one week in early September to fill their quota of four whales. Kaktovik took two whales during early September, the time they typically hunt. Poor weather, especially windy conditions, prevented hunting for two weeks. Kaktovik's third whale was taken on 25 September. At Barrow, the hunt began on 6 October and continued into November. Six whales were taken between 8 and 14 October. The hunters stated that they had to travel a considerable distance offshore (~36 km), farther than usual, to find whales. Some hunters felt whales were farther offshore because of barge and tug operations that occurred later in the autumn than usual. This shipping activity occurred in the nearshore waters of the Beaufort Sea. Two whales were caught at Savoonga in December, which has become more common recently (Suydam and George, 2004). George Noongwook (pers. comm. 19 June 2002) of Savoonga noted:

> "We never used to see this many whales [in winter] 20 years ago, this started about 10 years ago when we began seeing them in winter. We are starting to hunt again here at the village for the first time since the 1878 starvation of the Kukuliq people [at the old village site]."

Savoonga usually travels to Southwest Cape, approximately 60 km away to hunt bowheads.

Of those whales that were struck but lost in 2003, one had an excellent chance of survival, two had a fair chance of survival, two had a poor chance of survival, and the fate was unknown for the other (based on the hunting Captain's assessment of survival; Table 2). The efficiency of the hunt (# landed / # struck) in 2003 was 85%, which is a bit higher than the average efficiency over the past 10 years (mean = 77%, standard deviation = 0.07%).

Seventeen (49%) of the 35 landed whales of known sex were males. The longest male was 14.9 m and the shortest was 7.6 m. Based on length, four males were presumably mature (>13 m; O'Hara et al. 2002). Confirmation of reproductive status is pending results of histological and hormonal analyses.

Seventeen of the landed whales were females (49% of 34 whales of known sex). The longest female was approximately 16.5 m in length. This large whale was measured in the water because it was too large to be pulled onto the ice. The shortest female was 8.5 m. Five (29%) of the 17 females landed in 2003 were sexually mature. These five females were > 13.4 m in length, the average length at sexual maturity

(George et al. 2004). Previously, we assumed sexual maturity at a length of 14.2 m for females based on examinations of 54 females harvested from 1978-1993 (Tarpley and Hillmann 1999). Additional data and analysis has refined this length to 13.4, although females smaller than this can be pregnant and females larger can be immature (George et al. 2004). Only three of the sexually mature females (length >13.4 m) landed in 2003 were examined closely. One was not pregnant but the other two had recently given birth. Both were lactating and had a large corpus luteum present on an ovary.

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REFERENCES

Albert, T.F. 1988. The role of the North Slope Borough in arctic environmental research. Arctic Res. of the U.S. (2): 17-23.

Braund, S.R. 1992. Traditional Alaska Eskimo whaling and the bowhead quota. Arctic Research 6(Fall):37-42.

Donovan, G.P. (ed.). 1982. Report of the International Whaling Commission (Special Issue 4). Aboriginal Subsistence Whaling (with special reference to the Alaska and Greenland fisheries). International Whaling Commission, Cambridge. 86pp.

Gambell, R. 1982. The bowhead whale problem and the International Whaling Commission. Rep. int. Whal. Commn. (Special Issue 4):1-6.

George, J.C., Follmann, E., Zeh, J., Suydam, R., Sousa, M., Tarpley, R, and Koski, B. 2004. Inferences from bowhead whale corpora data, age estimates, length at sexual maturity and ovulation rates Paper SC/56/BRG8 presented to the Scientific Committee of the International Whaling Commission.

International Whaling Commission. 1980. Report of the Special Meeting on North Pacific Sperm Whale Assessments, Cronulla, November 1977. Rep. int. Whal. Commn. (Special Issue 2):1-10.

Koski, W.R, Davis, R.A., Miller, G.W., and Withrow, D.E. 1993. Reproduction. *In*: The Bowhead Whale. Edited by J.J. Burns, J. J. Montague, and C.J. Cowles. Allen Press, Lawrence, Kansas. pp. 239-269.

O'Hara, T.M., George, J.C., Tarpley, R. J., Burek, K, and Suydam, R.S. 2002. Sexual maturation in male bowhead whales (*Balaena mysticetus*) of the Bering Sea stock. Journal of Cetacean Research and Management 4(2):143-148.

Tarpley, R.J. and Hillmann, D.J. 1999. Observations on ovary morphology, fetal size and functional correlates in the bowhead whale *Balaena mysticetus*. Report to the Department of Wildlife Management, North Slope Borough, Box 69, Barrow, AK from Department of Veterinary Anatomy, College of Veterinary Medicine, Texas A&M University, College Station, TX. 276 pages.

Table 1. Village, whale identification number, date landed, length (meters) and sex of bowhead whales landed by Alaskan Eskimos during the 2003 subsistence hunt. Note: The Alaska Eskimo Whaling Commission reports to the U.S. National Marine Fisheries Service the date a whale is struck and not the date the whale is landed, as we do here.

Village	Whale ID#	Date Landed	Length (m)	Sex
Barrow[1]	03B1	4/19/03	9.1	F
	03B2	5/3/03	13.8	M
	03B3	5/7/03	9.0	F
	03B4	5/8/03	13.4	M
	03B5	5/8/03	7.7	M
	03B6	5/9/03	13.9	F
	03B7	5/12/03	12.8	M
	03B8	5/24/03	14.9	M
	03B9	5/25/03	16.4[1]	F
	03B10	6/1/03	16.5[2]	F
	03B11	10/8/03	8.7	F
	03B12	10/9/03	11.2	F
	03B13	10/9/03	11.9	M
	03B14	10/9/03	11.1	M
	03B15	10/14/03	12.5	F
	03B16	10/14/03	10.1	F
Gambell	03G1	4/5/03	10.8	M
Kaktovik	03KK1	9/3/03	13.2	M
	03KK2	9/07/03	12.0	M
	03KK3	9/25/03	7.6	M
Nuiqsut	03N1	9/1/03	8.0	M
	03N2	9/5/03	8.5	F
	03N3	9/5/03	11.9	F
	03N4	9/6/03	12.5	M
Point Hope	03H1	4/20/03	8.8	F
	03H2	4/22/03	8.5	M
	03H3	4/22/03	9.0	F
	03H4	4/23/03	9.2	F
Savoonga	03S1	12/6/03	15.2	U
	03S2	12/11/03	16.2	F
Wainwright	03WW1	4/18/03	9.1	F
	03WW2	4/25/03	8.3	M
	03WW3	4/27/03	12.4	M
	03WW4	4/28/03	12.8	M
	03WW5	5/12/03	15.5	F

[1] Had recently given birth: lactating and corpus luteum present. Calf nearby when harvested.
[2] Approximate measurement, whales measured by Captain with a rope. Had recently given birth: lactating and corpus luteum present.
[3] The fall/winter hunting season at St. Lawrence Is. has developed because of decreasing sea ice and increasing whale numbers. The season now overlaps the New Year.

Table 2. Number of landed bowhead whales and estimated fates of struck and lost whales during the 2003 subsistence harvest by Alaska Eskimos[1].

Village	Landed	Struck & Lost	Total Struck	Estimated Fate[2]
Barrow	16	3	19	2p, 1f
Gambell	1	1	2	1e
Kaktovik	3		3	
Nuiqsut	4		4	
Point Hope	4	2	6	1f, 1e
Savoonga	2		2	
Wainwright	5		5	
Totals	35	6	41	2p, 1u, 2f, 1e

[1] Data provided by the Alaska Eskimo Whaling Commission
[2] Whaling captain's estimate on bowheads chance of survival: p=poor, u=unknown, f=fair, e=excellent.