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Progress Report: 1983 Walrus Harvest,
Health, and Welfare Study at Savoonga, Alaska

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Abstract

Walrus harvest data was collected between 14 April and 30 June, 1983, in Savoonga, Alaska. The total documented harvest was 623 animals, comprised of 178 males (28.6%), 204 females (32.7%), 166 calves (17%) and 135 unknown sex and age (21.7%). Twenty days of hunting occurred during which an average of 2.7 walruses per crew were harvested and 11.1 man-hours per walrus were expended. One hundred seventeen pair of lower canines (62 males and 55 females) were collected. Mean age of male and female walruses harvested was 16.2 and 10.1 respectively. Five complete samples of blubber, kidney and liver were collected for analysis of environmental contaminants. The chronology, magnitude and sex ratio of the harvest showed variations compared to the harvests in 1980-82. Boat and motor sizes remained unchanged.

INTRODUCTION

Between 14 April and 5 June, 1983, the U. S. Fish and Wildlife Service (FWS) monitored the spring harvest of walrus taken by Native hunters of Savoonga on St. Lawrence Island, Alaska. The effort was part of an ongoing study conducted by the FWS during the past four years to assess the spring harvest of walrus by five Alaskan coastal villages. The FWS was mandated management responsibilities for walrus by the Marine Mammal Protection Act of 1972.

The objectives of the study were to: 1) determine the number, sex and age of walrus harvested by Savoonga hunters; 2) document hunting effort and methods; 3) determine bioaccumulation levels of heavy metal contaminants and chlorinated hydrocarbons in liver, kidney and blubber tissues; and 4) document the harvest of other marine mammals and birds.

Between 1980 and 1982, in addition to the objectives listed above, the FWS and the Institute of Marine Science collected food habit and reproductive data. Findings in the reproductive tracts indicated that both conception rates and the success rate of carrying a fetus to term had declined (Fay 1982). Furthermore, findings from the stomach contents indicated a dietary shift by the walrus in the St. Lawrence Island region. In the past, walrus primarily selected for bivalve mollusks. However, since 1975 it appears that a higher proportion of invertebrate prey and fishes are being included in the walrus diet. Also, the unit weights of prey items have declined by approximately 50%, suggesting a decline in the age structure of the prey probably due to walrus predation levels (Fay 1982).

The changes in productivity and food habits suggests a change in the walrus population status. With apparent decreased productivity and a depressed food supply it becomes very important to enumerate the harvest by man, the most important single mortality factor over the past 120 years (Fay 1982; 213). More efficient hunting procedures employed by Alaska Natives and the demand for ivory may place greater demands on the walrus population.

The project was funded by the FWS through the University of Alaska, Fairbanks. I gratefully acknowledge the cooperation and friendliness of the residents of Savoonga.

METHODS

A boat captain's meeting was held just prior to the spring walrus hunt. Study objectives were handed out to each boat captain. Also, findings from past years studies were summarized. Captains that were not present at the meeting were visited individually at home.

During the days suitable for hunting I would go to the launch site on the shorefast ice and note departure times and boat, motor and crew size of the different hunting crews. Once the last boat departed, I would rely on Lydia

Akeya, the village harvest monitor, to inform me when the boats were returning as she monitored the radio transmissions between the hunting crews and Savoonga.

Once the boats began returning, I would return to the ice to interview the boat captains concerning the day's hunt. The total number and sex and age (adult or calf) of the harvested animals, distance and direction the hunters had to go to locate the animals and the general weather and ice conditions were recorded. In addition, the number and types of other marine mammals and birds harvested during the hunt were recorded.

The lower pair of canine teeth of adult walruses were purchased to determine the age structure of the harvested walruses. The number of teeth purchased was restricted to 100 pairs (50 male and 50 female). Hunters were paid \$8.00 per pair of teeth. Teeth were not purchased if root tips were broken or if they were not identifiable to an individual animal of a known sex. The individual pairs were accessioned and placed in paper envelopes. Information recorded on the envelopes included date of capture, sex and the name of the captain which harvested the animal. Teeth were sent to the FWS lab in Anchorage for sectioning and ageing.

Captains voluntarily brought in blubber, kidney and liver tissue samples for contaminant analysis. Samples were trimmed using a stainless steel knife to remove any contaminants acquired during butchering or while being transported back to Savoonga. Trimmed samples were wrapped in aluminum foil and stored in zip lock bags, then frozen. The sex and the date of capture was recorded. Teeth were collected for ageing from each of the animals for which tissue samples were taken.

RESULTS

The total documented harvest was 623 animals which included 178 males (28.6%), 204 females (32.7%), 166 calves (17%) and 135 unknown sex and age (21.7%). The majority of the unknown harvest category occurred after I left Savoonga, probably from outlying camps located at Northeast Cape and Punuk Islands through the remainder of June. Hunting occurred on 20 of 55 days from 16 April to 11 June. However, 85% of the harvest occurred between 15 May and 11 June (27 days) during 10 days of hunting. The timing and the composition of the harvest appears in Appendix A.

Comparing total number and sex and age class data with previous years findings revealed, of the 382 adults (older than a calf), males comprised 46.6% and females 53.4% of the harvest. The sex distribution of the 1983 harvest was significantly different from 1980 (χ^2 , 0.025 p 0.05) and 1982 (χ^2 , 0.025 p 0.05). The proportion of females and calves was higher and the proportion of males was lower in 1983 than between 1980-82 (Table 1). The 134 animals harvested after 11 June 1983, will not be included so that the study periods between years will basically be the same.

The magnitude of the 1983 walrus harvest was about three times greater than in 1982. The main factor responsible for the difference was better hunting conditions in 1983. Hunters hunted from Savoonga on 16 days in 1983 compared to 8 days in 1982 (Stengle, 1982; 3).

Table 1. Comparison of the spring walrus harvest at Savoonga, 1980-83. Data from West (1980), Smith (1981) and Stengle (1982).

<u>Year</u>	<u>Male</u>	<u>Female</u>	<u>Calf</u>	<u>Unknown</u>	<u>Total</u>
1980					
Number	417	34	5	-	456
% of Total	91.4	7.5	1.1	-	
% of Adults	92.5	7.5	-	-	
1981					
Number	302	258	81	21	662
% of Total	45.6	39.0	12.2	3.2	
% of Adults	53.9	46.1	-	-	
1982					
Number	79	63	19	6	167
% of Total	47.3	37.7	11.4	3.6	
% of Adults	55.6	44.4	-	-	
1983					
Number	178	204	106	136	624
% of Total	28.6	32.7	17.0	21.7	
% of Adults	46.6	53.4	-	-	

Hunt duration was obtained for 141 trips, during which 379 walrus were killed. An average of 2.7 walrus per trip were killed and 11.1 man-hours per walrus were expended.

Average crew size was four and boat size was predominantly between 15-17 feet. The most popular motor size throughout the season was a 40 horsepower, however, as the distance traveled increased, use of motors 50 horsepower and greater became more apparent (Appendix B).

The distance and direction traveled by the hunters were an indication of the distribution of walrus in relation to Savoonga. During April, distances traveled to find walrus were short (3 to 20 miles). At mid-May, the distance traveled began to exceed 40 miles. During this time the hunters were predominantly (ice permitting) hunting north or northwest of the village. By late May, the distance traveled exceeded 70 miles and the direction of travel became mostly northwest.

One hundred and seventeen pairs of lower canines (62 male and 55 female) were collected. The majority (93%) were collected during the first half of the season (17 April - 15 May). All the teeth were sectioned and read at the FWS in Anchorage mean age of males and females was 16.2 and 10.1 years. Total cost of the specimen collection was \$1190.00.

Five complete samples of blubber, liver and kidney were collected. The specimens await analysis for environmental contaminants and will be covered in a future report.

Other animals which were harvested were seals and birds. Seventy-eight bearded seals (Erignathus barbatus), 10 ringed seals (Pusa hispida), and numerous thick-billed murres (Uria lomvia), common murres (Uria aalge), crested auklets (Aethia cristatella), parakeet auklets (Cyclorhynchus psittacula), least auklets (Aethia pusilla) and king eiders (Somateria spectabilis) were harvested. No attempt was made to enumerate the numbers of birds killed.

DISCUSSION

In order to more accurately compare 1980-83 walrus harvest success, the 134 unknown sex and age walrus harvested after the 11th of June were dropped from the 1983 sample. This time frame was not included for the years 1980-82. The corrected spring (17 April - 11 June) harvest total for Savoonga in 1983 was 490. This compares closely with 1980, 456, but was markedly different from 1981, 662, and 1982, 167. The greater success during 1983 compared to 1982 can be attributed to the poor weather and ice conditions in 1982 (Stengle, 1982: 8). The effects of weather and ice conditions and in some extent the amount of effort expended in bowhead whale (Balena mysticetus) hunting were probably the main cause of the differences between yearly spring harvests. Strong north or northeast winds kept the ice packed solidly along the north shore of St. Lawrence Island prohibiting boat launching. Also,

strong winds made the sea too rough to hunt safely or efficiently. During the spring the pack ice retreats taking the migrating walrus herds north away from St. Lawrence. There was a point in the season when the cost to harvest walrus outweighed potential benefits.

Bowhead whale hunting was also very important to the Savoonga people. Bowhead hunting normally occurs during April just prior to walrus hunting. Savoonga whaling camps were located on the south side of the island in Poowooliak Bay approximately 90 miles (144 km) from the village. This year's poor weather and ice conditions caused hunters to extend whaling activity until 12 May. Several days suitable for walrus hunting from Savoonga were lost because the hunters were at Poowooliak Bay or in transect between camp and village. Whaling probably had an effect on the number of walrus harvested during 1983.

The harvest of 134 walrus after 11 June was interesting since harvests of this magnitude have not been documented before. Stengle (1982; 2) reported about 20 walrus were taken after his departure in mid-June. I suspect the 134 walrus killed were distributed between Savoonga, NE Cape and Punuk Islands and that the take was predominantly male. Lourie (1982) reports that during June the last of the migrating herds pass St. Lawrence Island and that males pass east and north of the island therefore rendering them more susceptible to Savoonga hunters. I do not know if the magnitude of the June harvest was normal and has gone undocumented by FWS in the past or whether larger numbers of late migrating animals were available to the Savoonga hunters. The timing of the spring harvest was comparable to the spring harvest of 1980-82 in other respects indicating the migration rate was normal.

The composition of the 1983 spring harvest (excluding the 134 animals harvested after 11 June) differed from past years. More females than males (204 vs 178) were taken and calves were harvested at a greater rate than previously recorded. Savoonga has generally been known for predominantly harvesting males (Mottett and Galducci, undated), however, the proportion of females in the Savoonga harvest has been greater than normal since 1981. Hunters prefer female hides for covering umiaks and according to H. Miklahook (pers. comm.), female ivory provides better carving material since it is less prone to cracking.

The increased harvest of calves was most likely associated with the apparent increased availability of females to Savoonga hunters. Cows with calves were selected by Native hunters since calves were a preferred food item. The increased take may reflect increased availability of calves due to a higher production rate this year, to a change in the female walrus migration lending them more accessible to Savoonga hunters or to unknown factors.

The average man-hours expended per walrus retrieved in 1983 (11.1) were less than in 1982 (21.6). The number of walrus killed and the number of high success days (greater than 70 walrus harvested) were greater than experienced in 1982.

No changes in the boat size or outboard motor horsepower were noted this spring. Motors of 50 hp and larger were more popular as the season progressed

and the walruses were located farther from Savoonga. Boat and motor sizes were limited to those which could safely handle treacherous seas yet were light enough to be dragged across pack ice if the crew was trapped.

Seals and alcids were secondary in importance to walrus and were harvested when walruses were not available, or when bad weather prevented walrus hunting. Additional subsistence prey items were used in handicrafts and clothing, and food for the Eskimos and their dogs.

Specimen Collection

Levels of heavy metal contaminants in walrus tissues (kidney, liver and blubber) have been investigated since 1980. Preliminary findings indicate that mercury was present in the liver of all the animals harvested from St. Lawrence Island (Metzger, 1983). Walrus liver continues to be a preferred food of the Savoonga residents, however, effects or dangers of eating liver to Eskimos has not been determined.

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Appendix A. Data of capture and composition of walruses harvested during the spring hunt, 1983, in Savoonga, Alaska.

<u>Date</u>	<u>Adult Male</u>	<u>Adult Female</u>	<u>Calves</u>	<u>Unknown</u>	<u>Total</u>
April					
17	2	0	0	0	2
18	7	0	0	0	7
25 ¹	2	0	0	0	2
29	1	0	0	0	1
May					
1	5	1	0	0	6
7 ²	3	0	0	0	3
10 ³	3	3	0	0	6
11 ³	8	6	0	0	14
13	1	1	1	0	3
14	11	7	3	0	21
15	27	35	30	0	92
16	3	0	1	0	4
19	0	0	1	0	1
21	2	3	3	0	8
28	42	62	50	1	155
29	31	27	14	0	72
June					
2	4	2	0	1	7
3	0	0	1	0	1
7	3	0	0	0	3
11	23	57	2	0	82
Remainder of June	-	-	-	134	134
Totals	<u>178</u>	<u>204</u>	<u>106</u>	<u>136</u>	<u>624</u>

- ¹ Killed at SW Cape
² Killed at Camp Collier
³ Killed at Poowooliak Bay

Appendix B. List of walrus boat captains, and the sizes of their boats, motors and crews from Savoonga, Alaska, 1983.

<u>Boat Captain</u>	<u>Boat Size</u>	<u>Motor Horsepower</u>	<u>Crew Size</u>
Alex Akeya	15-17	50	4-5
Calvin Akeya ¹	18	25, 40	3-4
Tom Akeya	15-17	40	4
Roland Alowa	15-17	35	4-5
Jonathan Annogiyak	15-17	55	4
Merrill Annogiyak	15-17	40, 55	4-5
Ray Gologeran	15-17	70	4-5
Hans Gologeran	15-17	40	4
Gordon Iya	15-17	35, 40	4
Larry Kava	15-17	40, 55	4
Truman Kava	15-17	40	4
Kermit Kingeekuk	15-17	50	5
Franklin Kiyuklook	18	55	3-4
Mike Kiyuklook	18	55	3-4
Martin Kogassagoon	15-17	50	3-4
John Kulowiyi	15-17	35	3-4
Marvin Kulowiyi, Sr.	15-17	35, 40	2-4
Floyd Martin	15-17	40	3-4
Mark Miklahook	18	50	4-5
Jackson Mikiyuk	15-17	35	4
Davis Mikiyuk	15-17	35	4
Chester Noongwook	15-17	40, 48	3-4
Dwight Noongwook	15-17	50	3
Elvin Noongwook	15-17	40	3-4
Henry Noongwook	15-17	48	3-4
Joe Noongwook	15-17	48	4-5
Nathan Noongwook	15-17	50	4
Wilson Okoomealingok	15-17	35, 50	3-5
Tony Pelowook	15-17	35, 40	4-5
Wayne Penayah	15-17	55	3-4
Ivan Pungowiyi	15-17	50	4
Bryan Rookok	15-17	40	4
Clyde Rookok	15-17	40	4-6
Cecil Seppilu	15-17	48	4-5
Melvin Seppilu	15-17	50	4-5
Raymond Toolie	15-17	55	3-5
Walter Toolie	15-17	35	3
Clarence Waghiyi	15-17	15, 35, 55	3-4
Elmer Wongittilin	15-17	35	3-4

¹ Deceased

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