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HEALTH AND STATUS
OF THE PACIFIC WALRUS
POPULATION

Field Investigation Report
Savoonga, Alaska
1981

On Reserve

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INTRODUCTION

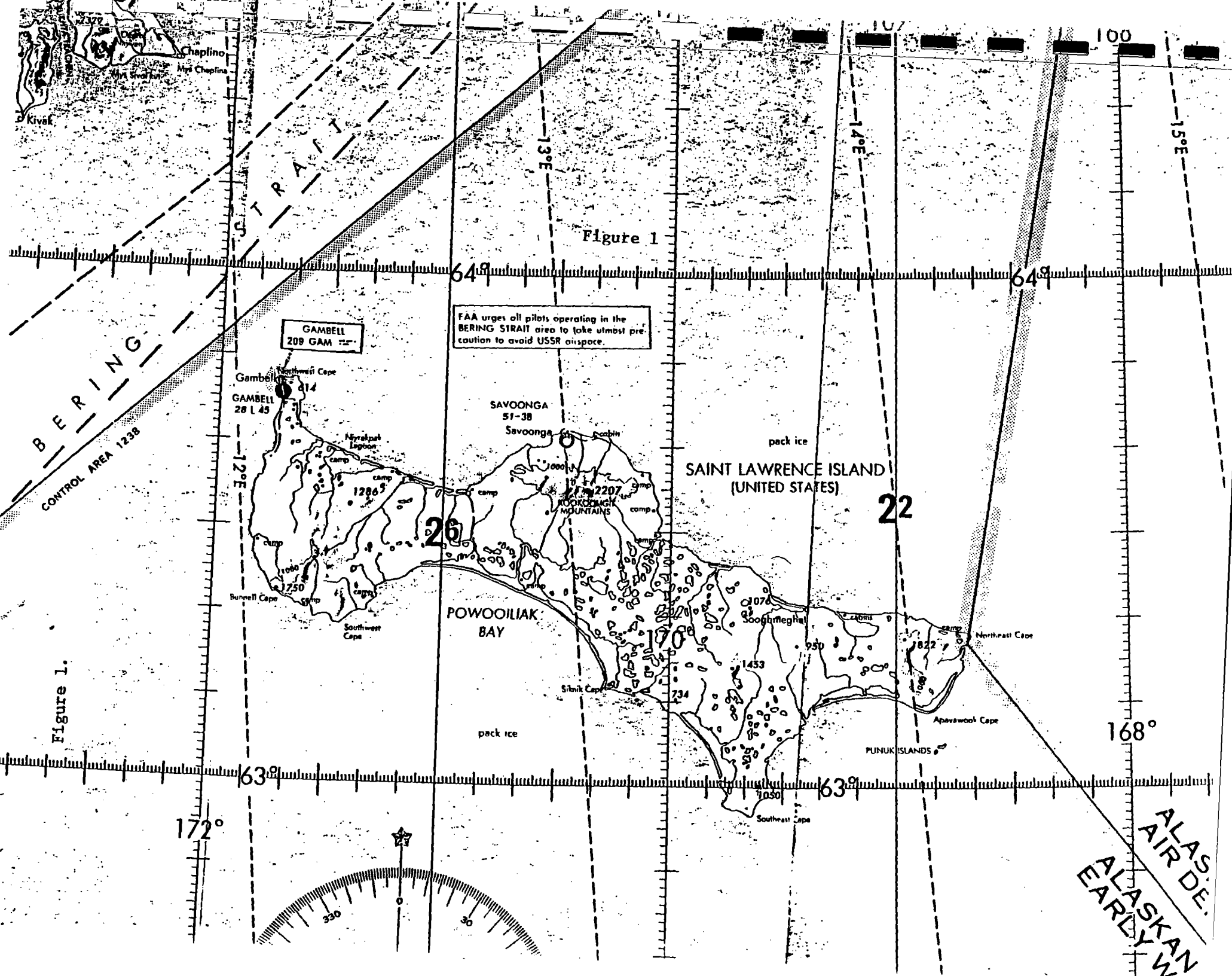
This report provides an account of work undertaken in the spring of 1981 in a continuing study of the health and status of the North Pacific walrus population. This segment involved a monitoring of the harvest of walrus by residents of the village of Savoonga on St. Lawrence Island. A harvest monitoring program has been carried out in Savoonga in most years since 1960 and involved placement of an observer in the village during the height of the spring walrus harvest (mid-May through June) to record conditions of the hunt and collect specimen materials from a sample of the harvested animals.

An extensive general description of the village and village life is found in the report of the 1980 walrus study on Savoonga (West 1980). Savoonga is one of two villages occupied year round on St. Lawrence Island. A map of the island is shown in Figure I. Because of its position with respect to ocean currents and ice movements Savoonga is much less favorably located from the standpoint of spring boat hunting than is Gambell on the northwest tip of the island. Gambell hunters use beaches with either a west or northeast aspect and are often able to launch boats and travel at times when Savoonga is completely blocked by moving ice.

Ice movements greatly restricted the activities of Savoonga hunters this spring and played a critical role in determining the total walrus harvest. Shorefast ice from 3/4 to 1 mile persisted until 2 June which added to the difficulty of pursuing marine mammals. Because ice moves predominately from west to east along the north coast of St. Lawrence Island, Savoonga hunters often have access to walrus later in the season than do those in Gambell; however, this situation is strongly influenced by the force and direction of the wind. These factors tended to work to the detriment of Savoonga hunters during the spring of 1981. Moving drift ice beyond the shorefast ice and strong onshore winds limited hunting efforts early in the season. When the shorefast ice finally broke-up, strong winds from the southeast moved the ice pack and walrus associated with it rapidly away from the island and out of the range of boats operating from Savoonga. Consequently, most of the harvest occurred during the brief periods when weather and ice conditions allowed travel and walrus herds were within a 75 mile radius.

In past years some hunters based their hunting camps out of Northeast Cape during the latter part of the season in order to follow the walrus herds as they moved eastward. This year only one boat and crew stayed there. It was not possible to determine the number of animals taken by this party.

While shorefast ice was present, hunters left their boats near the ice edge and travelled back and forth from the village by snowmachine. Activities between hunting parties were closely coordinated throughout the study. Even when boats became widely separated, captains maintained communications with each other and with the village by citizen band



radios. The majority of crews departed and returned at approximately the same time.

The objectives of the field study were to record the magnitude and composition of the spring walrus harvest and to collect specimen material from a representative sample of those animals to provide additional information on the characteristics of the harvest population. Along with the more quantitative aspects of the field investigation, a major benefit was derived from continued contact and communications between biologists and village hunters.

METHODS

Previous experience has shown that reliable harvest information could only be obtained by meeting the boats as they returned. Lydia Akeya who was hired to assist in Savoonga, monitored radio transmissions and notified me when the boats were returning from the hunt. This significantly reduced the amount of time spent waiting on the ice and also reduced the chances of missing some of the crews. Since radio traffic was mainly in Siberian Yupik, a village resident assistant was a great asset.

Along with recording harvest data and collecting and labelling specimens I usually helped with the difficult task of pulling the heavily loaded boats across the loose drift ice onto shorefast ice. With more than 30 boats coming in a short time this generally meant a period of lively activity.

The typical equipment for spring hunting in Savoonga was a 15' to 18' semi-V hulled boat constructed either of aluminum or plywood and powered by an outboard motor from 25 to 70 horsepower. Skin boats, which were used in the past, rapidly became obsolete for walrus hunting with the introduction of the smaller power boats due to their superiority in speed and fuel efficiency. A maximum of 33 boats were used for walrus hunting during the study period (Appendix I). Crew size varied from 3 to 6.

Specimen acquisition during this season was limited to 200 sets of lower canine teeth. The hunter received ten dollars per set, payment was made through the Savoonga Native Store, with the store receiving a two dollar commission for each payment. The goal was to collect teeth from 100 males and 100 females. A plan to distribute the sampling effort over the season was abandoned as unworkable and teeth were purchased as they came in. Due to the nature of the harvest, the desired number of male teeth were obtained during the first three weeks and only female teeth were taken during the remainder of the harvest period. It was specified that the tusks must be made available for measurements when teeth were submitted for payment. I made all tusk measurements myself. Length and circumference at the gum line was recorded from the longest tusk. Hunters were requested to measure the thickness of blubber and skin over the sternum by inserting a plastic tag into a small incision and marking the appropriate points with a grease pencil. I personally performed a limited number of blubber measurements and these are listed separately.

Samples of tissue from harvested walruses were collected for determination of levels of organic chemicals and heavy metal contaminants. A five centimeter cube of organ or blubber tissue was wrapped in aluminum foil and frozen. Because of the need for careful handling to avoid external contamination, I collected all of these specimens myself.

Although a study of food habits was not undertaken this year, incidental observations were recorded particularly when unusual objects were found among stomach contents.

RESULTS

Lower canine teeth were collected from 202 individual walruses, 100 males and 102 females. Tusk measurements were taken in every case where teeth were purchased (Appendix II). Savoonga hunters, with a few exceptions, were quick to grasp the objectives of the collection program and were good at keeping the teeth and tusks from the same animal together. When there was any doubt as to the validity of the specimen sets, they were rejected. The specimen material which was collected is thought to be accurately represented and correctly grouped with tusk measurements.

Weather and ice conditions were particularly unfavorable for walrus hunting out of Savoonga in the spring of 1981. Hunters were able to pursue walruses by boat on only 10 of 34 days during the study period.

A minimum of 581 adult walruses were taken during and immediately prior to the study period. Table 1 shows the composition of the harvest. A determination of the age of harvested animals will be obtained by cementum layer analysis and will be published at a later date.

More than 100 newborn walruses were estimated to have been taken by hunters during the study period. Walrus calves were tabulated separately because it was assumed that they were taken incidental to the taking of females. It is unlikely that they would have survived on their own if they had not been killed by hunters. Occasional observations of dead or moribund walrus calves in hunted areas during the spring lend support to this assumption.

The thickness of blubber and skin over the sternum was obtained for 74 animals (Table 2 & 3). Mean values and the range of measurements are shown in Table 4. The data in Table 2 & 3 were primarily provided by hunters. Questionable data were discarded and repeated attempts were made to insure that the hunters clearly understood the desired measurement technique.

A total of twenty samples of blubber, heart, liver, kidney, brain, lung and spleen tissue were collected and frozen. These specimens will be analyzed later to determine levels of environmental contaminants.

Three walruses, one female and two males, with seal remains in their stomachs were among the harvested animals. These animals could be identified by their yellow stained tusks and deep scratches on the inner

Table 1. Walrus harvest summary Savoonga, Spring 1981

DATE OF KILL	MALE	FEMALE	SEX UNKNOWN	CALVES	TOTAL ADULT
Prior to 5-7	6	9	10	0	25
5-7	32	9		3	41
5-11	56	32		25	88
5-12	7	13		0	20
5-22	13	1		0	14
5-23	28	43		20	71
5-24	0	21		0	21
5-27	47+	43+	11	5+	101
6-5	71	56		13	127
6-6	42	31		15	73
TOTALS	302	258	21	61	581

Table 2. Thickness of skin and blubber over the sternum obtained from male walrus taken by hunters on Savoonga, May-June, 1981..

NUMBER	SKIN	BLUBBER	TOTAL
SW-26-81	16	42	58
SW-27-81	17	36	53
SW-29-81	26	51	77
SW-38-81	35	46	81
SW-42-81	21	45	66
SW-43-81	30	52	82
SW-44-81	20	46	66
SW-45-81	19	38	57
SW-46-81	27	47	74
SW-47-81	19	47	66
SW-48-81	20	38	58
SW-71-81	25	31	56
SW-72-81	34	32	66
SW-105-81	-	76	-
SW-106-81	-	25	-
SW-107-81	-	19	-
SW-108-81	-	38	-
SW-109-81	-	51	-
SW-111-81	-	51	-
SW-130-81	14	29	43
SW-138-81	23	31	54
SW-140-81*	11	24	35
SW-141-81*	15	22	37
SW-143-81*	16	28	44
SW-144-81	-	20	-
SW-145-81	24	10	34
SW-146-81	23	22	55
SW-147-81	26	13	39
SW- -81	24	49	73
SW- -81	24	51	75

Table 3. Thickness of skin and blubber over the sternum obtained from female walrus taken by hunters on Savoonga, May-June, 1981.

NUMBER	SKIN	BLUBBER	TOTAL
SW-23-81	22	72	94
SW-24-81	23	54	77
SW-25-81	14	48	62
SW-28-81	25	74	99
SW-70-81	21	57	78
SW-73-81	18	64	82
SW-77-81	15	44	59
SW-78-81	-	56	-
SW-79-81	-	48	-
SW-80-81	-	57	-
SW-81-81	-	63	-
SW-82-81	-	52	-
SW-83-81	-	62	-
SW-85-81	15	51	66
SW-86-81	15	67	82
SW-87-81	18	66	84
SW-104-81	-	40	-
SW-131-81	14	47	61
SW-150-81	16	34	50
SW-158-81	-	65	-
SW-159-81	25	34	59
SW-160-81	19	33	52
SW-161-81	20	39	59
SW-162-81	19	36	55
SW-163-81	19	37	56
SW-164-81	20	35	55
SW-165-81	18	69	87
SW-167-81	11	43	54
SW-168-81	16	38	54
SW-169-81	13	28	41
SW-172-81	18	12	30
SW-173-81	18	12	30
SW-179-81	17	40	57
SW-187-81	17	49	66
SW-188-81	14	43	57
SW-189-81	16	44	60
SW-190-81	22	41	63
SW-191-81	16	34	50
SW-192-81	17	45	62
SW-193-81	16	43	59
SW-194-81	17	50	67
SW-197-81	18	41	59
SW-198-81	18	38	56

Table 3 con't

NUMBER	SKIN	BLUBBER	TOTAL
SW-199-81	18	39	57
SW-200-81	17	30	47
SW-201-81	19	36	55

Table 4. Comparison of skin and blubber thickness values over the sternum, obtained from walruses taken by hunters on Diomedé 1980 and Savoonga 1981.

DIOMEDE, 1980						
	MALES SKIN	N=22 BLUBBER	TOTAL	FEMALES SKIN	N=122 BLUBBER	TOTAL
\bar{X}	20	27	47	19	39	57
range	11-31	4-60	31-81	9-28	12-75	28-83

SAVOONGA, 1981						
	MALES SKIN	N=30 BLUBBER	TOTAL	FEMALES SKIN	N=44 BLUBBER	TOTAL
\bar{X}	25.5	37	58.7	17.7	45.9	61.6
range	11-35	10-76	34-82	11-25	12-74	30-99

surfaces of the tusks presumably made by the seal in its efforts to escape. The seal eating walrus appeared to be in excellent physical condition. An explanation of the origin of the seal eating habit given by Savoonga hunters is that those walrus which lose their mothers at an early age survive by scavenging and eventually learn to kill and devour seals.

The bulk of stomach contents which were examined consisted of three species of commonly occurring clams. Substantial proportions of oopahs, Tethyum aurantium, (rock attached bottom dwelling marine tunicates) appeared in the stomachs of some walrus. This was said to be an increasing trend in recent years by local people. The significance of this shift in prey selection is not readily apparent. The palatability of this animal is demonstrated by the large quantities of oopahs which were gathered for human consumption. Approximately (30 kg) of blue cods Boreogadus saida were found in the stomach of one walrus. Although fish are occasionally found among walrus stomach contents this large quantity, was considered quite unusual.

DISCUSSION

Savoonga hunters normally have access to walrus over a longer period of time than those in other walrus hunting areas. Although most of the hunting is concentrated in the spring period, walrus may be taken at any time of the year. When the ice opens up, the hunter population disperses to camps around the island making harvest monitoring difficult. Fall harvests are often significant and animals are usually killed throughout the winter. In former times hunting of walrus at winter breathing holes was an important source of food. Although the harvest estimates obtained during the study period were thought to accurately reflect the actual retrieved kill of walrus during the study period, a number of animals were killed during the preceeding winter and there may have been continued hunting activity at other areas of the island after hunting was finished in the vicinity of Savoonga. Walrus distribution and availability is so sporadic at seasons other than the spring it is impossible to generalize about the magnitude of the unrecorded harvest in a particular year.

Blubber thickness measurements (Table 2 & 3), indicated generally good fat deposition levels among the sample population. However, because of the lack of control over measurement technique; these values can only be used in a very general manner. Too few measurements were taken by the investigator for these alone to be significant. Blubber thickness is a difficult measurement to duplicate even by experienced workers. Position of the animal, condition of the surface under the animal and the length of the knife cut may all cause enough variation in apparent thickness to negate the value of the measurement. The most common tendency among persons unfamiliar with the proper method is to make too long a cut. The skin and blubber pulls back from the cut and yields a diagonal measure which may be as much as 30% greater than the actual thickness. Although it was possible to eliminate some of these where the error was obvious, there is only limited confidence in the quality of the remainder presented in Table 2 & 3. Under the present data

gathering scheme only a major difference in mean blubber thickness values obtained in future years can be considered significant.

The meat of harvested walrus was salvaged in various proportions by different hunting parties. Most of the Savoonga families moved to camps distant from the village during the summer making it impractical to store large quantities of meat taken in the spring. Although meat was salvaged by every hunting party, the quantity ranged from 100% of a few walrus taken by hunters with a more traditional lifestyle to less than 10% of larger numbers of animals taken by hunters whose families ate a greater proportion of imported foods. Walrus calves were very much sought after by Savoonga hunters in the spring. These were most commonly brought back to town whole and preserved by drying.

The large number of small boats used by Savoonga hunters required many crew members to man them. Sometimes there were only 2 or 3 men in a boat and often times young men who would not have been allowed to hunt in former times because of their inexperience and lack of interest were pressed into service strictly as a result of the shortage of crewmen. I felt that this situation was not conducive to good hunting practices. Skin boats used in the past, were generally manned by crews large enough to pull adult walrus onto the ice when they were killed in the water. Smaller crews were unable to do this, and the meat of animals shot in the water often could not be recovered. Typically, in large skin boats, one or two of the best hunters sat in the bow and did most of the shooting. This resulted in lower crippling loss because they knew the vital spots, used more control in shooting, and could handle heavier weapons competently. Also skin boats were capable of hauling larger loads than could be safely carried by aluminum boats. The limited load capacity of aluminum boats often necessitated abandonment of meat, particularly in bad weather.

RECOMMENDATIONS

A major goal of this program is to establish and maintain working relations with the people in the village. In fact this may be the critical objective since little or no work can be accomplished without the cooperation of the hunters. During the period when specimens were purchased, it was easy to record harvest data; however, when the specimen purchase was suspended this task became more difficult. Inquiries made to determine precisely the number, sex, and age of harvested walrus were regarded with suspicion without the mechanical activities associated with parts collection. The imposition of quotas during the years when the waiver of the Marine Mammals Protection Act was in effect has left a lasting fear of regulation which was particularly apparent in Savoonga. At times it may be preferable to make subjective estimates by casual observation rather than to doggedly pursue exact documentation of the numbers taken. Such information is more readily obtainable without alienating the hunters and is at least as useful as detailed information collected over a relatively brief portion of the hunting season. Although a precise accounting of all walrus removed from the population by hunters is a desirable goal, the cost of achieving this goal is high in terms of funds and the disruption of village life.

Lack of continuity in the personnel involved in the walrus study program has been a serious weak point. Hunters are much more reluctant to volunteer information to someone who is unknown. There is a direct relationship between the amount of time an individual spends in the village and the ease with which he can obtain harvest data. Although there are many reasons for the rapid turnover in personnel, the program would be greatly improved if this were not the case.

This year the price paid for a set of lower canine teeth was increased from six dollars to ten dollars. Prices at this level were thought to be high enough to influence the harvest. A noticeable increase in the proportion of females in the harvest occurred after collection of male teeth was suspended. There were few sources of cash during the most active hunting season, at a time when expenses for the purchase of gas, oil and ammunition were high. When both sexes were available, it appeared the ten dollar payment was sufficient to induce some hunters to take more females. From my experience last year on Diomedes (Smith 1980), I felt that the lower payment schedule was adequate to obtain the specimens and did not affect the harvest significantly.

Appendix I

SAVOONGA BOAT CAPTAINS - SPRING 1981

- | | |
|------------------------|------------------------|
| 1. Alex Akeya | 18. Mark Miklahook |
| 2. Calvin Akeya | 19. Jackson Mokiuk |
| 3. Tim Alowa | 20. Elvin Noongwook |
| 4. Abner Gologergen | 21. Joe Noongwook |
| 5. Patrick Gologergen | 22. Carl Pelowook |
| 6. Ray Gologergen | 23. Ivan Pungowiyi |
| 7. Gordon Iya | 24. Wayne Penayah |
| 8. Larry Kava | 25. Lane Rookok |
| 9. Truman Kava | 26. Cecil Seppilu |
| 10. Kermit Kingeekuk | 27. David Seppilu |
| 11. Lawrence Kingeekuk | 28. Herman Toolie |
| 12. Kent Kiyuklook | 29. Raymond Toolie |
| 13. Michael Kiyuklook | 30. Walter Toolie |
| 14. Kieth Koontz | 31. Clarence Waghiyi |
| 15. Dean Kulowiyi | 32. Elmer Wongittilin |
| 16. Ike Kulowiyi | 33. Jerry Wongittilin |
| 17. Marvin Kulowiyi | 34. Reggie Wongittilin |

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