1982 Spring Walrus Harvest

Little Diomede, Alaska

Field Report

by

John Merk

U.S. Fish and Wildlife Service

Wildlife Operations

Marine Mammal Project

1011 East Tudor Road

Anchorage Alaska 99503

Table of Contents

Abstract

The U.S. Fish and Wildlife Service and the Eskimo Walrus Commission worked cooperatively in the collection of biological harvest data, teeth, female reproductive tracts, and stomach contents from Eskimo walrus hunters to monitor the health of the walrus population and determine the size, age, sex composition, and distribution of the spring walrus harvest. During spring 1982, Little Diomede hunters expended 10,689 man-hours to harvest 558 walrus during 26 days of hunting between 14 May and 24 June. I purchased 101 reproductive tracts, 59 of which were from females with calves; 27 stomachs; 468 teeth and 8 tissue samples.

Introduction

The following is a field report of my activities, accomplishments, and personal views as a representative of the United States Fish and Wildlife Service (USFWS) during the 1982 walrus biological data collection program conducted at Little Diomede, Alaska. Walrus harvest data was collected from Diomede hunters from 6 May to 2 July. The data presented does not account for the total Pacific walrus harvest, at Diomede since a fall harvest does occur. Information is intended to provide input into the analysis of the walrus herd.

Two final reports will be completed at a later date. One will encompass the 3 spring harvest surveys conducted by the USFWS during '80, '81 and '82. The other will present results from the analysis of specimens collected from western Alaska coastal village hunters.

This is the third consecutive year the USFWS has collected specimens and biological harvest data from Diomede hunters. This year the USFWS worked cooperatively with the Eskimo Walrus Commission (EWC) to monitor the health of the walrus population by collecting teeth, stomach contents, and female reproductive tracts. Dr. Francis H. Fay, Institute of Marine Science, is currently analyzing the stomach content and female reproductive tract samples. The teeth from 1980 and 1981 are being aged by USFWS personnel. Teeth collected in 1982 have been aged by Kae Lourie and Jack Brown of the EWC. The FWS contracted through the EWC for age analysis of the 1982 teeth. In addition, 8 walrus tissue samples were collected for the USFWS. Liver, kidney and subcutaneous fat asmaples will be analyzed for heavy metal concentrations and clorinated hydrocarbons. Results from analysis of tissue samples will be compared with results of samples taken during the 1981 spring harvest.

Socio-economic information definitive of Diomede residents was acquired in part by Kay Lourie (EWC) during a short visit to Diomede and in part by myself through taped interviews with a Diomede resident boat captain and his wife. The tapes and accompaning notes are in possession of the EWC.

Methods

Prior to my arrival on Diomede I participated with biologists assigned to work in other villages (Gambell, Savoonga, Nome) in a two week orientation. One week of training took place in Anchorage for the FWS biologists. This training consisted primarily of reviewing reprints covering walrus biology, the Marine Mammal Protection Act, past jurisdiction of walrus management by the State of Alaska and the FWS, and laws pertaining to marine mammals. Following this period the biologists and village assistants attended a four day walrus workshop conducted in Nome by Kae Lourie of the EWC. The workshop covered walrus biology, data gathering methods, and responsibilities of both the biologist and village assistant while in the village.

A boat captain meeting was held upon my arrival at Diomede. In addition to the boat captains some crew members attended the meeting. Those in attendance were instructed on labeling, packaging and collecting conditions for which specimens were to be brought in (no broken teeth, female reproductive tracts consisting of both ovaries and uterin horns, and stomachs with undisturbed food contents consisting of at least five pounds). A history of the data collection program, FWS and EWC programs and objectives, and prices and methods of payments were also discussed.

A hunter kit was assembled for each boat captain, each containing the following items:

1 instruction card,

1 grease pencil,

5 teeth bags (ziplock sandwich bags),

5 reproductive bags (medium size plastic bags),

1 stomach bag (large heavy weight plastic bag0,

5 plastic tags with string,

5 plastic tags without string,

extra string, and

1 burlap bag.

I delivered one kit to each boat captain at their homes where I was able to personally review the specimen collection procedure with them.

Specimens were inspected at the beach and either accepted or rejected. Teeth were inspected to insure they came from a single identifiable individual and that female reproductive tracts and stomachs matched the teeth of that individual. Stomachs were inspected to determine that a minimum of five pounds of food materials were contained within. Stomachs containing only gravel, seal meat or blood were rejected. Female reproductive tracts were checked to insure proper removal with both ovaries and uterin horns present and whole.

A small laboratory was set up in the BIA school pumphouse where specimens were preserved, processed, and packaged for shipment from Diomede. Three thirty gallon plastic garbage containers were used to contain the preserving solution. Reproductive tracts and stomach contents were preserved in a formaldehyde sea water solution of 24 gallons sea water to three gallons of 37% purified formaldehyde.

All teeth were cleaned by removing attached gum tissue and bone fragments. They were then dried, assigned a specimen number, and packaged in small manila envelopes.

Reproductive tracts with an enlarged uterine horn swollen due to the growth of a fetus were treated differently than those from barren females. Reproductive tracts displaying an enlarged uterine horn from parturient or postpartum females were halved between the two uteri. After removing the ovary of the enlarged horn the horn was discarded. The ovary from the

discarded horn was then attached to the remaining horn by string before assigning a specimen number. Reproductive tracts from barren females were left intact and labeled with an assigned specimen number. Excess tissue was trimmed from all reproductive tracts.

Stomach contents were weighed from a 160 pound capacity scale suspended from a large tripod. The tripod was provided by the BIA school maintenance man. Five pounds of stomach contents were removed from each stomach, placed in a paint strainer bag, strained of excess gastric juices and preserved for later analysis. The remaining contents were weighed to obtain a total stomach content weight, then either returned to the boat captain or discarded. Stomachs were either given away or discarded.

Harvest and subsistence information for each hunting trip was recorded on data forms provided by the EWC. In addition to specimen data and hunting success each hunting trip was monitored for departure and arrival times, direction and distance of hunting, boat and motor specifications, observed herds, weather and ice conditions, number of walrus lost and walrus parts kept. Forms were completed either at the beach or later in the lab from notes taken at the beach.

Towards the end of the season I was instructed to collect tissue samples: one sample each of blubber, kidney, and liver from ten walrus. I was able to collect samples from only eight walrus. The samples will be analyzed for various contaminants. In samples collected from Gambell and Savoonga in 1981, liver samples were found to contain significant levels of cadmium (Reichel 1982).

Results

During my observations on Little Diomede 558 walrus were harvested between May 14th and June 24th inclusive. See Table 1 and Figure 1 for display of daily harvest.

Only 25 walrus were reported wounded and sunk. Twenty-two were reported lost in the water. Three were unknown, whether lost on water or ice. Possible bias exists in hunter supplied information.

Females were harvested at nearly a 2-1 ratio over males, 315 (56.5%) to 162 (29.0%). Thirty five calves (6.3%) and 46 adults of unknown sex (8.2%) were also harvested. The preponderance of females is a complete reversal of the 1981 harvest when a preponderance of males were harvested (Halpin, 1981 unpublished report), but proportionally equal to the 1980 harvest of 437 females and 229 males (Smith, 1980 unpublished report) x^2 . 900 p .750, D.F. = 1. See Table 2 for comparison of 1980, 81' and 82' walrus harvest.

Pairs of lower canine teeth were collected from 220 walrus. A single tooth was collected from 22 others. One pair was donated. Reproductive tracts were collected from 101 female walrus (Table 1). Stomach contents were collected from 27 walrus (Table 1). One stomach was purchased without teeth. Another stomach was donated. In addition, eight contamination tissue samples were collected to be analyzed for heavy metals and clorinated hydrocarbon contamination.

Of the 101 female reproductive tracts brought in only one was reported to have contained a fetus. Fifty nine were reported to come from females bearing a calf this year. Forty one were removed from barren females. Hunters reported on 35 other females harvested whose reproductive tracts were not brought to the village; 14 with a calf, 21 without.

Stomach contents from 27 stomachs varied in weight between 2 1/2 to 45 1/2 pounds of food. Eleven samples came from males, 16 from females. The average food content was 15 and 13 pounds per stomach respectively. One walrus was reported to have blood in its stomach accompanied by scratches on its tusks indicating he was possibly a seal eater. Two walrus stomachs were reported to contain only rocks. Two others were reported to contain small amounts of food. Stomachs from 109 other walrus were reported to be empty by hunters.

During the 58 days I was in the village 10,689 man hours were expended to harvest 558 walrus. Each walrus harvested consumed 19.6 Diomede man hours. Skin boat crews harvested 270 walrus durng 5292 man hours while aluminum boat crews harvested 288 walrus during 5398 man hours.

Seven other species of marine mammals were harvested during the spring walrus harvest effort (Table 3).

Discussion

Diomede Harvest

The walrus is a polygynous species, in which each breeding bull services aproximately 3-4 females (Fay, 1982). Harvesting of mostly male on a small scale such as subsistence harvesting may not produce an appreciable change in annual recruitment of the walrus since other natural factors regulate population dynamics more directly.

A few Little Diomede hunters expressed their preference for harvesting mostly males, while stating their concern for maintaining the walrus population, noting that they understand harvesting mostly males will not have a detrimental impact on recruitment of newborns into the population. The harvesting of some females and calves is necessary to fulfill certain specific needs such as hides for skin boats and the desirable meat of calves. Although the Little Diomede hunters first obligation is to provide enough meat for the village they are presently, as stated in the past (Burns, 1965) primarily ivory hunters. They prefer to harvest bulls (Strickland, 1979) which yield greater quantity of ivory then females. In addition to greater quantities of ivory, bulls yield large marketable stomachs and oosiks, each worth a cash value of approximately $100.00.

Despite Diomede hunters expressed interest to harvest a preponderance of males, this years harvest, like that of 1980, consisted of a preponderance of females. This suggests that hunters harvest walrus on the basis of availability rather then selection. The 1981 harvest was 250 walrus greater than the 1982 harvest, the difference being almost entirely males (Table 2). The preponderance of females in 1982 thus may not be due to a greater

availability of females to hunters this year, but to a scarcity of males, which may be attributable to male migration patterns coinciding with this years poor wind and ice conditions.

Diomede hunters did not discuss the sex ratio harvested but instead expressed reasons for this years low harvest. Too many days of north or northeast winds which pushed much of the ice flow to the west side (Soveit side) of Bering Strait were thought to be the reason for this years low harvest of bulls. The wind was from the north or northeast 24 of 47 of the days when wind direction and speed were recorded. Sixteen of these days occured between May 8th and June 1st (Table 4). Additionally, hunters stated that the ice passing through the strait composed of large undesirable closely packed ice flows, versus smaller scattered flows with numerous open leads. On large compacted flows the walrus occur inside the ice where they are inaccessible to hunting by boat. Smaller scattered flows with numerous open leads allows access to more ice edge, thus access to more walrus. When a south wind shifts to a north wind it tends to slow the movement of ice drifting with northern ocean currents through the Bering Strait. Scattereed ice then closes together in effect becoming one large compacted flow. Leads which would normally be open during a south wind may close up during a north wind. This creates a dangerous situation for boat crews trying to get inside the ice.

On the 7th, 8th, and 9th of June hunters reported hundreds and up to, thousands of walrus inside vast flows of ice just east of Wales. A total of 319 walrus were harvested during the period, 264 on the first two days. During June 9th the wind shifted to the north. As a result two skin boat crews became trapped within closing leads. Each had to haul their boat onto the ice and drag it to open water. Both crews reportedly faced loosing their

heavily laden boat to the encroaching ice. One crew jetisoned 18 pairs of tusks, meat, and nine stomach specimens to lighten the boat enough to haul out of the water.

Even though walrus hunters express concern for the population, many seem compelled to hunt beyond subsistence means, almost to the point of a commercial venture. For some hunters, hunting for tusks only, especially after sufficient meat is acquired, seems to be a way of subsisting within an increasingly cash oriented economy. The cash is required to subsist in a world of technological convieniences and any threat to this income is met very defensively. Diomede hunters do not feel they should be required to live with any fewer amenities than the average American is accustomed to. Hunters feel the main threat to their income derived from the walrus harvest is a quota or sealing requirement on the numbers they can harvest.

In view of current walrus population estimates I do not believe a restriction of the subsistence harvest is currently necessary. Since native hunters are equipped to harvest large numbers of animals and the population is vulnerable to overharvest (Fay, 1982), the harvest should be closely monitored annually. If restrictions on subsistence hunting are necessary in the near future an alternative income may be necessary to maintain current economic levels. This is especially true for hunters accustomed to harvesting large numbers of walrus. Guide services by natives may provide an acceptable alternative. By requiring guide services be provided only by (native) residents of coastal villages, the cash income derived from uncontrolled subsistence (ivory) hunting may be alleviated by guided controlled trophy hunting. The State of Alaska is currently involved with a program to license walrus hunters as guides as a prerequisite to State management as stated in the amendments of the Act. A further provision could require the ownership of meat from trophy hunted walrus be given to the guide.

Other problems to be considered are the large number of walrus lost due to sinking and the large quantities of waste (Is it really wasted?). Do sunk walrus remain sunk or do most bloat and wash up on shore? Even with an enforced quota much meat will be left behind. Should some means of retrieving walrus meat discarded by natives be devised or should the meat be returned to the sea? Can retrieval be profitable? When headless bodies are discarded should hunters be required to open body cavities and cast the body into the sea?

Hunting Effort

Hunting effort is defined here as the number of man hours expended to capture one walrus. The hours were determined from records of departure and arrival times to the nearest half hour at the village beach. Other activities included with the effort are resting, preparation of meals, and the take of other marine mammals. During nearly every hunt lasting more than 5-6 hours, time would be taken to brew coffee and/or fix meals. On long hunts of 16+ hours, crews will occasionally haul out on ice or shore to rest for a few hours. Even though walruses are the target animals, seals, whales, polar bears, and sometimes birds are taken when the opportunity arises. The amount of time consumed by non-walrus hunting activities is difficult to determine accurately without personal observation, therefore the instances I did observe were always included as part of the hunting effort.

Specimen Collection

After walrus hunting was underway I found that I underestimated collection supplies each boat captain would need. Diomede hunting crews commonly harvest many walrus during a particular hunting trip. During several hunts this year, individual crews harvested in excess of 40 walrus each. Bountiful hunting trips are to be expected. Boat captains should be amply supplied with specimen bags and tags. I would suggest keeping each captain supplied with at least 20 teeth bags, 15 repro bags, 10 stomach bags, plus tags and string for each. These supplies may be sufficient for one captain through the season, while another may exhaust his supply in one day. Be generous with supplies.

The light weight reproductive tract bags used his year proved inadequate often splitting from the weight of the reproductive tract. I suggest distributing heavyweight bags to captains for packaging both stomachs and reproductive tracts.

Aluminum Boats vs. Skin Boats

Four skin boats and eight aluminum boats were used this spring by Diomede hunters. Eleven boat captains commanded crews (Table 5) during the spring season, though no more than nine boat crews actively hunted during a particular day (Table 2).

Aluminum boats have become quite popular over the last few years. Their numbers have grown from one used in 1980 (Smith 1980, unpublished report) to five in 1981 (Halpin 1981, unpublished report) to eight in 1982. All eight aluminum boats were used early in the season. Two crews switched to skin boats part way through the season. Another crew dispersed and the captain began hunting with a skin boat crew. By June 4th five aluminum boats were still used for hunting.

The main attraction of aluminum boats versus skin boats is their greater speed. Crews with faster boats spend less time traveling. In addition the smaller size and ease of hauling in and out of water mean a smaller crew may be utilized. This way an individual family, one with several sons, may hunt alone. Despite the attraction of aluminum boats, their disadvantages in relation to skin boats out weigh the advantages. Aluminum boats cannot carry as much weight, are more difficult to repair, and are not as safe. The weight of all meat and the hide from one adult walrus will exceed the capacity of aluminum boats used on Diomede versus skin boats which can carry meat and hides from 2-3 walrus. If damaged, aluminum boats require specialized tools for repair work. Skin boats are easily repaired with a sewing kit of hide and thread. If punctured by ice or slashing walrus tusks the crew will haul out on the nearest ice, repair the boat, and be hunting again within a couple of hours. I personally witnessed an incident were a skin boat hide suffered a 6-8 inch cut on sharp ice. Within one and a half hours the boat was repaired

and again put to sea. The smaller aluminum boats are more suseptible to being swamped by a retaliating walrus (particularly young males). Hunters have related rare instances where a walrus hooked its tusks over the boot edge and capsizes the boat. When swamped or capsized skin boats will float. Purchased aluminum boats come equiped with styrofoam flotation built into the bench seats, but the styrofoam is nearly always removed to allow for more storage of gear.

During my stay on Diomede two boat captains expressed their desire to build new skin boats. The aluminum boats, although, seem to have found a place with some Diomede hunters.

Village Assistants

A village resident was hired by Kawerak to assist with this springs work. The assistant was a housewife with a large family to care for. Her availability to work was drastically reduced due to her household obligations. In addition the CB in her house was non-functional.

I recommend that in the future two main qualifications be required of an assistant before he-she is hired. First that the assistant be available and willing to work any time of the day or night. By the second week in May true darkness no longer occurs so hunters will depart or arrive at any hour of the day. Secondly the assistant would be of greater value if he-she had a working CB with which to monitor the boat crews. Most crews are equiped with one and usually call into the village before arriving. CB communication is usually in native language so the assistant would be of great value in this respect. The assistant could either meet the hunters at the beach or inform the biologist of their impending arrival.

I handled the situation by borrowing a CB base station from Walter Duncan the BIA school teacher. By listening to call numbers I was often able to judge when hunters were returning, then met them on the beach.

On Diomede the biologist could handle the work alone if tissue specimens are not purchased and preserved or just teeth are purchased. In this case the biologist should be furnished with a CB, either from the village or one which is included with the field gear.

Living Quarters

Three options are available to choose from when selecting living quarters in the village. I am familiar with two. The third I have only heard of.

Two rooms are available through the village corporation. These are small rooms about 12' x 14' in size, and equiped with stove, refrigerator, and sink. Bathroom facilities consist of a chemical toilet. Sponge baths are the most common method of bathing. If the corporation room is chosen to live in, showers can be taken at the BIA school, if sufficient water is available at the school. This year the schools water supply was very low.

Option two is to rent the BIA school apartment, a one room studio type about 20' x 20' square shaped room. Depending on date of arrival the school apartment may have to be shared with one of the school teachers for a short time. The teacher leaves when school ends in mid May. The apartment is equipped with a stove, refrigerator, sink with cold and hot running water, and furniture. Cooking and eating utensils, and washer and dryer are also available. An adjoining full bathroom goes with the apartment. If the schools water supply runs low which happened this spring, conservation of water becomes the rule.

A third option which may be looked into, one which I only heard of, but did not investigate, is an apartment in the village church. I was told by the village major, Pat Omiak, the option was used by ADF&G biologists during the late 70's.

FWS personnel have stayed in the BIA school apartment each spring since 1980. This apartment is desirable for two reasons. All the conveniences of the school are available. Second, if a work area is needed in which to set up a specimen preservation laboratory, the schools water pumphouse is available during the spring and conveniently located to the school.

Acknowledgement

I would like to thank the Diomede hunters for their cooperation in supplying specimens and harvest data during this springs harvest. I feel Tommy Menadelook, the BIA school maintenance man and Walter Duncan the school principle deserve special mention for their cooperation in providing laboratory space and school equipment I made use of. In addition, Sam and Annie Mogg were very generous in supplying socio-economic and subsistence information of Diomede, Alaska.

Literature Cited

Burns, J.J. 1965. The walrus in Alaska, its ecology and management. Federal aid in wildlife restoration project report. Vol. V. Project W-6-R-5. 48 pp.

Fay, F.H. 1982. Ecology and biology of the Pacific Walrus, Odobenus rosmarus divergens Illiger. North American Fauna 74. U.S. Government Printing Office. 279 pp.

Halpin, L. 1981. Walrus harvest, health/welfare study. Little Diomede, Alaska. USFWS unpublished report, Anchorage, Alaska. 21 pp.

Reichel, W.L. 1982. Walrus tissue analyses report PF-2327. Patuxent wildlife research center. 3 pp.

Smith, T.E. 1980. Walrus study project, 1980 field collection report Diomede, Alaska. USFWS unpublished report, Anchorage, Alaska. 15 pp.

Strickland, D. 1979. Diomede field report, ADF&G, Juneau, Alaska. Unpublished report. 5 pp.

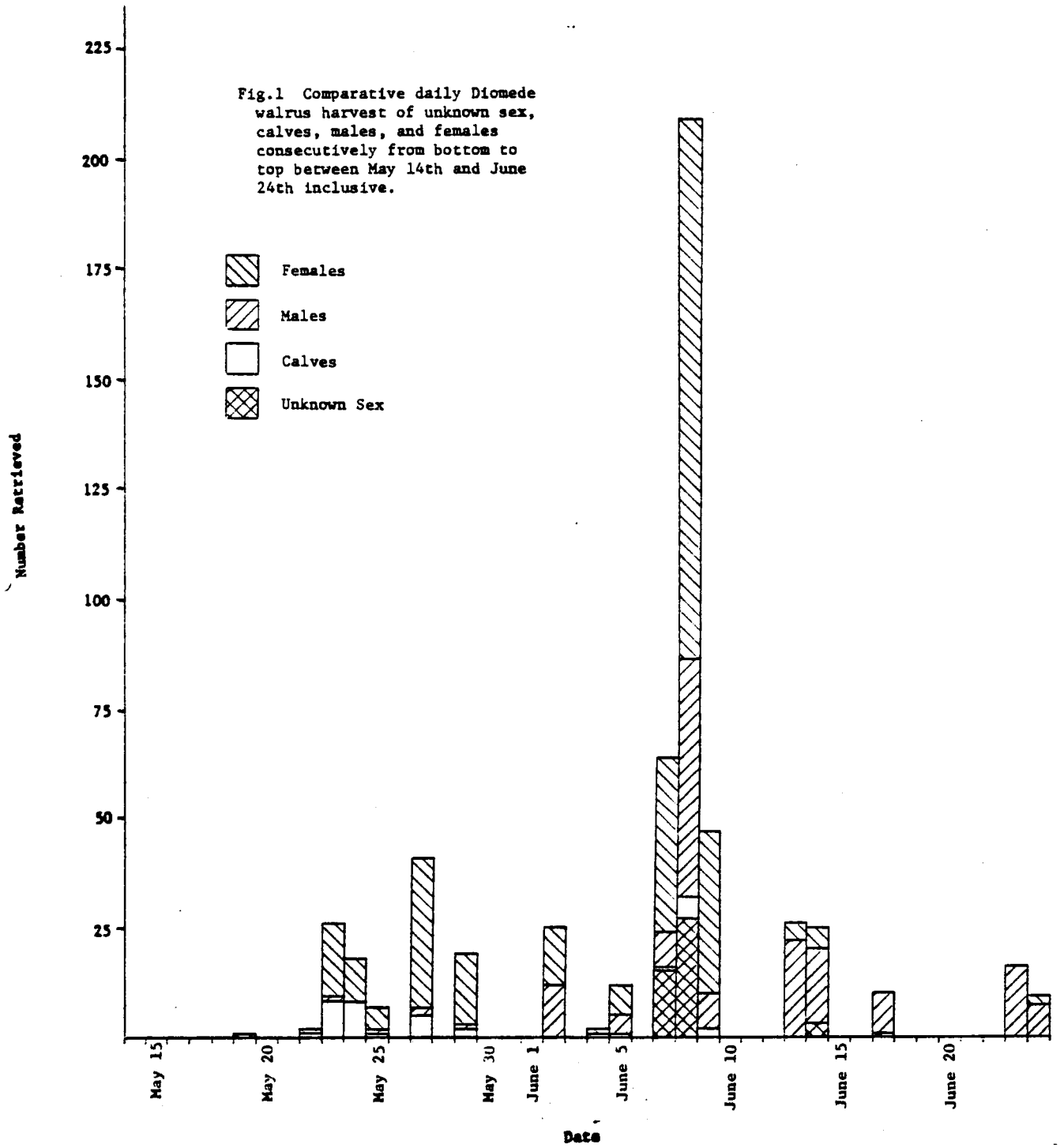


Fig.1 Comparative daily Diomede walrus harvest of unknown sex, calves, males, and females consecutively from bottom to top between May 14th and June 24th inclusive.

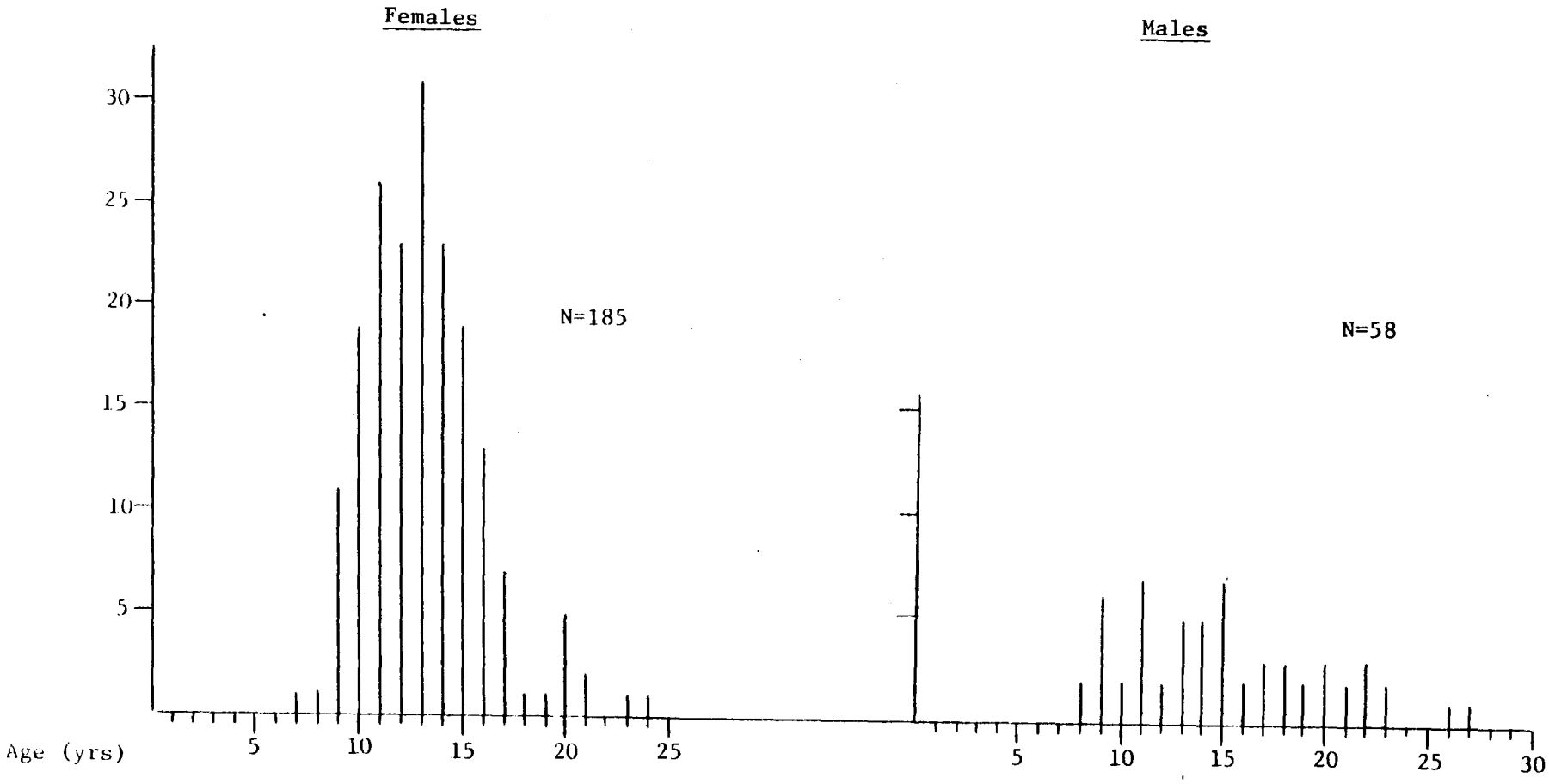


Fig. 2 Age composition of walrus from which lower canine teeth were collected at Little Diomede during the 1982 spring harvest.

Table 1. 1982 spring walrus harvest chart comparing number of walrus harvested, number of specimens collected, and presentation of wind speed and direction during each day hunting occured.

			# of Specimens Collected				1) Wind	
Date of Hunt	# of Crews	# Walrus Harvested	Teeth	Repros	Stomachs	Tissue Samples	Dir	Speed
May 14	2	0	0	0	0	0	N	5G8
19	1	1	2	1	0	0	N	30G38
21	4	0	0	0	0	0	N	13G20
22	8	2	2	1	0	0	N	7G10
23	8	26	31	9	0	0	N	8G9
24	9	18	15	5	1	0	N	6G9
25	2	7	11	4	0	0	SE	11G20
27	9	41	60	28	0	0	SE	6G10
29	4	19	20	0	0	0	SE	19G27
June 2	5	25	29	1	1	0	SE	16G30
3	1	0	0	0	0	0	S	17G28
4	2	2	2	1	1	0	S	10G19
5	9	12	22	5	0	0	S	11G19
7	9	64	92	11	2	0	S	9G12
8	8	208	122	32	4	0	S	7G9
9	9	47	24	3	11	0	N	
13	3	26	14	0	7	0	N	21G28
14	7	25	4	0	0	2	S	11G14
17	8	0	0	0	0	0	S	11G15
2) 18-22	6	10	8	0	0	4	N	
23	2	16	4	0	0	2	N	11G18
24	7	9	0	0	0	0	S	6G7
Harvest totals		558	462	101	27	8		

1) Wind direction and speed was recorded at the Diomede village beach.
2) Weather bound on mainland for five days.

Table 2. Comparative summary of the walrus harvest by Diomede hunters during 1980, '81, and '82.

Year	Males	Females	Calves	Unk. Sex	Totals
1980	229	437	16	27	709
1981	458	304	36	10	808
1982	162	315	35	46	558

Table 3. Seals, whales, and polar bears retrieved during the 1982 spring walrus harvest.

Specie	# Harvested	Date(s) of Harvest
*Gray Whale	1 (male)	6-24-82
Belukha	1	5-23-82
Polar Bear	1 (male)	5-21-82
Bearded Seal	37	5-14 to 6-5
Spotted Seal	12	5-21 to 6-17
Ringed Seal	8	5-24 to 6-24
Ribbon Seal	4	5-25 to 6-9

* One other gray whale was sunk.

Date		Wind		Date		Wind	
May	# of Crews	Dir	Speed	June	# of Crews	Dir	Speed
8	0	N	14	1	0	S	14G29
9	0	NE	15	2	5	SE	16G30
10	0	NE	15	3	1	S	17G28
11	0	NE	25	4	2	S	10G19
12	0	N	17	5	9	S	11G19
13	0	N	18	6	0	S	19G30
14	2	N	5G8	7	9	S	9G12
15	0	S	5G7	8	8	S	7G9
16	0	E	7G12	9	9	N	
17	0	NE	22G34	10	0	NE	15G20
18	0	N	34G45	11	0	N	22G29
19	1	N	30G38	12	0	N	29G37
20	0	N	30G40	13	3	N	21G28
21	4	N	13G20	14	7	S	11G14
22	8	N	7G10	15	0	S	20G24
23	8	N	8G9	16	0	S	16G21
24	9	N	6G9	17	8	S	11G15
25	2	SE	11G20	18	*6		
26	0	NE	19G30	19	6		
27	9	SE	6G10	20	6		
28	0	SE	19G28	21	6		
29	4	SE	19G27	22	6		
30	0	SE	22G33	23	2	N	11G18
31	0	SE	18G40	24	7	S	6G7

Table 4. Wind direction and speed (average/high gust) related to days hunted and number of crews hunting. Recordings were taken between 8 and 10 A.M. each morning at the village beach.

*Weatherbound on mainland to morning of 22nd of June.

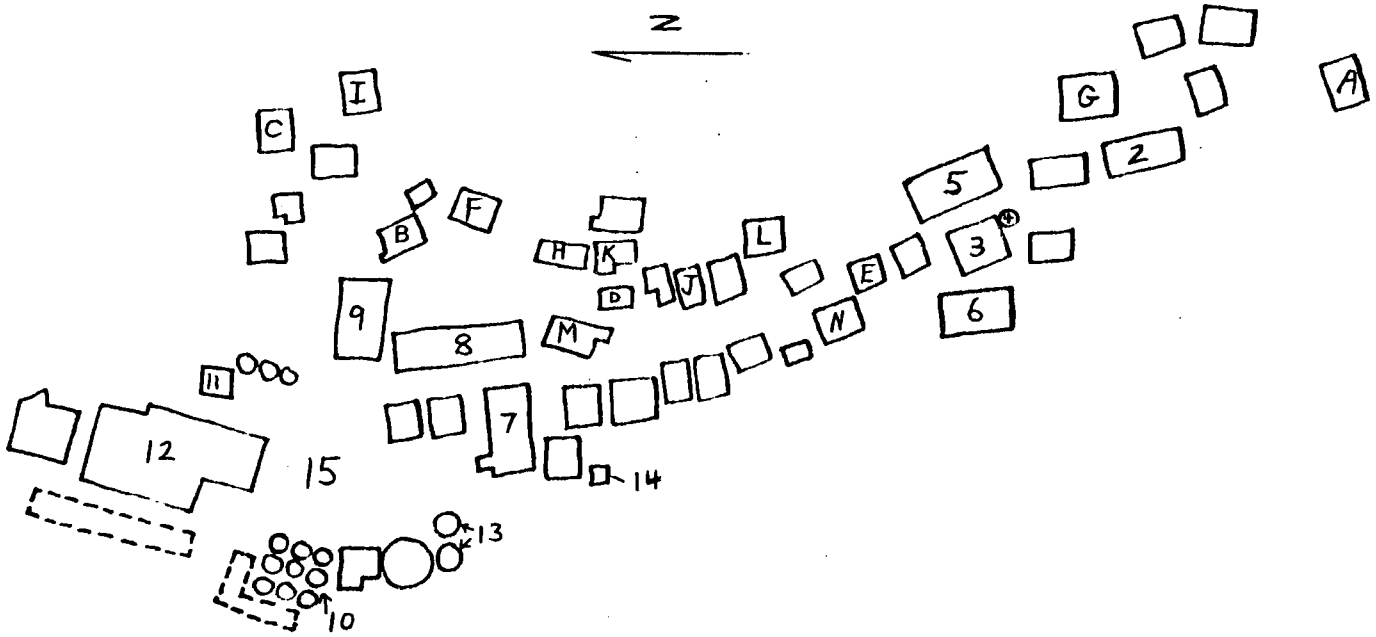
Boat Captains	Type of Boat
Orville Ahkinga	Skin
Phillip Ahkinga	Aluminum
Peter Ahkvaluk	Aluminum
Glenn Iyahuk	Skin
Edgar Iyapana	Aluminum
Andrew Kunayak	Aluminum
Tommy Menadelook	Skin
Moses Milligrock	Aluminum
Sam Mogg	Aluminum
Louis Ozenna	Skin and Aluminum
Dennis Soolook	Aluminum

Table 5. List of active boat captains and type of boat used during 1982.

Appenixes 1. Expenditures by the FWS and EWC paid into the Diomede economy during 1982. Female reproductive tracts and stomachs were paid for by the EWC. All other expenses were paid by the FWS.

Payment For	Amount
Female reproductive tracts @ $15.00 each	$1515.00
Stomachs @ $50.00 each	$1300.00
Teeth @ $8.00/pair of lower canines	$1792.00
Diomede Student Council Apartment Rental: 58 days @ $20/day	$1160.00
Payment to village assistant @ $5.00/hr	$ 145.00
Boat trip to Wales, Alaska	$ 70.00
Total	$5982.00

Appenixes II. Map of Diomede with boat captains houses and community buildings marked and listed.



Boat Captains

A) Orvill Ahkinga
B) Phillip Ahkinga
C) Peter Ahkvaluk
D) Glenn Iyahuk
E) Edgar Iyapana
F) Andrew Kunayak
G) Tommy Menadelook
H) Mosses Milligrock
I) Sam Mogg
J) Louis Ozenna
K) Dennis Soolook

L) Pat Omiak Diomede Mayor
M) Albert Iyahuk Retired Boat Captain
N) John Iyapana Retired Boat Captain

Community Buildings

1) Village Water Reservoir
2) Freezer Warehouse
3) Health Clinic
4) Clinic Bulk Tank
5) Old Catholic Church
6) Inalik Native Corp. (Office & Apartment)
7) New Native Store
8) National Guard Armory
9) Community Hall
10) BIA Bulk Tanks
11) BIA Warehouse
12) BIA School
13) Native Store Bulk Oil Tanks
14) Storage Shed
15) Community Play Yard

Boat Captains		Type of Boat
A)	Orvill Ahkinga	Skin
B)	Phillip Ahkinga	Aluminum
C)	Peter Ahkvaluk	Aluminum
D)	Glenn Iyahuk	Skin
E)	Edgar Iyapana	Aluminum
F)	Andrew Kunayak	Aluminum
G)	Tommy Menadelook	Skin
H)	Moses Milligrock	Aluminum
I)	Sam Mogg	Aluminum
J)	Louis Ozenna	Skin and Aluminum
K)	Dennis Soolook	Aluminum
L)	Pat Omiak	Diomede Mayor
M)	Albert Iyahuk	Village Elder
N)	John Iyapana	Village Elder

Community Buildings

1) Village Water Reservoir
2) Freezer Warehouse
3) Health Clinic
4) Clinic Bulk Tank
5) Old Catholic Church
6) Inalik Native Corp. (Office & Apartment
7) New Native Store
8) National Guard Armory
9) Community Hall
10) BIA Bulk Tanks
11) BIA Warehouse
12) BIA School
13) Native Store Bulk Oil Tanks
14) Storage Shed
15) Community Play Yard

Appendixes 2. Map of Diomede showing all buildings. All boat captains, the village mayor, and two village elders homes are marked as well as most community buildings. Boat captains boat types used during 1982 are listed along with the boat captains.