Ages of Walrus Taken in Recent Spring Harvests in the Bering Sea Region

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ABSTRACT

One aspect of the monitoring of annual harvests of walruses is the collection of biological samples, primarily for determination of age of the animals in the catch and secondarily to obtain information on their reproductive performance and feeding habits. In this project, we were concerned with age determination of animals in the samples collected since 1979. But because the ages of those samples had been estimated by inexperienced personnel, they were suspected to be not comparable in accuracy with those from samples obtained in previous years. Age of walruses is determined from counts of annual layers of cementum, as seen in thin median sections of the cheekteeth. We re-examined more than 3,200 of those sections to re-determine the ages of the catch samples from Gambell, Savoonga, and Diomede in 1979 to 1984. Most of the sections were of high quality, which is of primary importance for obtaining accurate results, as our test confirmed. Most of the ages estimated for the male walruses by the inexperienced personnel were within ± 2 years of the ages determined by us, but the differences for the females were much greater, especially in the older age classes where their tendency was to greatly underestimate the age. The age-compositions of the samples varied widely from year to year, especially for males, probably due to varying intensity of selection and varying availability of certain age classes. The mean age of both males and females in the samples since the 1950's shows a trend of stability during at least the 50's to early 60's, a gradual increase thereafter, apparently followed by a levelling off since 1979 or 80. Whether this is a reflection of change in the composition of the population or just of the catch is not clear. At Gambell and Savoonga, at least, where females are selectively taken if accompanied by a newborn calf, part of the change apparently is related to an increase in the age of females at first birth.

INTRODUCTION

The Pacific walrus population is a resource of considerable importance to the native inhabitants of both Chukotka and Alaska. Primarily for that reason, it has been under study by the management agencies on both sides of the International Date line for many years. One of the main objectives of that study in Alaska has been to monitor the annual subsistence harvests taken by Alaskan Eskimos. This has been done not only by counting the number taken but by collecting representative biological samples from the catch. Those samples have been collected primarily for determination of the age of the animals in the catch and, secondarily, to obtain information on the reproductive performance and feeding habits. Collection and analysis of those catch samples in Alaska was begun in 1952 by Brooks (1954) and Fay (1955), continued by Fay (1960) up to 1957, then by the U. S. Fish and Wildlife Service in 1958 (Buckley, 1958), and by the Alaska Department of Fish and Game in 1960-79 (Harbo, 1961; Burns, 1965, 1973; Burns and Nelson, 1979). More recently, since 1980, the U. S. Fish and Wildlife Service (FWS) and the Eskimo Walrus Commission (EWC) have conducted the monitoring and sampling.

In this project, we were concerned only with the determination of age of animals in the latest seven samples, 1979 to 1985. The age of walruses is determined by counting annually deposited layers of cementum on the cheek-teeth, as seen in thin, median sections under low magnification. The method was developed and refined over a period of about 20 years by Russian, Canadian, and American biologists K. K. Chapskii (1941), J. W. Brooks (1954), F. H. Fay (1955), A. W. Mansfield (1958), S. J. Harbo (1961), V. I. Krylov (1963, 1965), and J. J. Burns (1965). It has been applied routinely since the 1950's in the USA, USSR, and Canada.

The ages of all of the walruses in the Alaskan catch samples from 1952 to 1975 were determined by Fay, Harbo, and Burns, who frequently compared their results for consistency. Fay also compared results with Canadian and Soviet colleagues and achieved acceptable consistency there, as well. Usually the results were the same or did not often differ by more that $\pm$ 1 year. The ages of walruses in samples from the Alaskan catches of 1979 to 1983, however, were determined by less experienced personnel of the ADFG and FWS, and some of those ages were not consistent with Fay's readings. Unfortunately, the age determination method for walruses is not a simple, straightforward one that can be done precisely by inexperienced people; it requires instruction and extensive practice. Precision and accuracy in determining the ages depend to a considerable degree on the reader's knowledge of the development and structure of walrus teeth and on his or her experience in reading ages from these or other mammalian teeth. Even under the best of conditions, readings of ages from walrus teeth can err, for example, because of poor quality of the sections, natural variation in clarity of annuli, dental pathology, etc. Errors of $\pm$ 1 to 2 years in young animals and $\pm$ 2 to 3 years in adults also can occur because of differences between teeth from the same animal in the way the annuli are formed (Born and Kristensen, in press). Well-trained and experienced readers can at least minimize the errors from those sources by dealing with them in a knowledgeable and consistent manner.

Because the readings of ages from the 1979-83 harvest samples by inexperienced personnel were suspected to be unreliable and not comparable with the samples from previous years, our purpose in this project was to re-examine those samples to obtain readings that were more consistent and comparable. In addition, we proposed to read the 1984 and 1985 samples, as they became available. The information from those seven samples was needed

to trace further the trend in age composition of the catch, which appeared to be rising markedly in the 1960's and early 1970's, possibly reflecting a change in the age composition of the population as a whole (Fay et al., 1984). In addition, the ages from some of those samples were needed to complete the records for specimens from which other data had been obtained, especially regarding reproductive performance. Because the historical record from the catches is longest and fullest from Gambell, Savoonga, and Diomede in the Bering Strait region, only the samples from those localities were examined.

METHODS

The tooth sections, which had been cut earlier and stored in 35% ethanol with glycerine, were made available to us by the ADFG (1979 sample only) and FWS (1980-84 samples). The 1985 sample has not yet been received. Also provided were copies of data sheets giving acquisition numbers, field numbers, sexes, and the ages that had been read earlier by ADFG and FWS personnel. To prevent potential bias in our results, we read the teeth without any reference to those ages. For the 1979 sample, which was packaged in sets of 100 specimens per set, there were one to three sections from each tooth. Rather than take the time to sort and select from those, we read all of the sections from each specimen. In each case where there were two or more sections, the second section was read independently, without reference to the age recorded for the first section. For the 1980-83 samples, in which the sections (often more than one) from each specimen were bottled separately, the most centrally cut section from each tooth was selected for reading, because experience has taught us that the centermost cut provides the clearest view, hence the most precise count. The other sections usually were not examined further.

All tooth sections were read wet, under reflected light, at 10X magnification with a binocular dissecting microscope. For reading, each section was oriented on the microscope stage with the crown at the top of the field and root apex at the bottom. The section was then examined overall (1) to assess the quality of the cut and select the best of the sections available (if there was a choice), (2) to identify the tooth as either an upper incisor, a lower canine, or a postcanine (since the interpretation of the section differs among them), (3) to assess the amount of attrition from the crown (in order to determine whether any of the cementum layers had been worn off), (4) to look for the presence and extent of resorption on the root (to evaluate whether this could have been a cause of loss of cementum layers), and (5) to locate the first six to eight annual increments in the dentin for correlation with the adjacent cementum layers (as an additional check on the first few layers that serve as the starting point for the counts).

The age of each tooth was then read at least twice, usually first on right side of the section, then on the left; it often was read on the root apex and occasionally on the reverse side, as well. Those readings usually were the same; if they differed, the "best" (clearest, most precise) reading was the only one recorded. When they differed by more than 1 year, the section was re-examined thoroughly until a precise reading or best estimate was obtained. Precision frequently was not feasible, because (1) the layering was not clear, (2) the number of layers deleted by attrition and/or resorption could not be estimated precisely, or (3) the section was poorly prepared and difficult to read. For such sections, best estimates of age were derived by the most appropriate of several methods, as follows:

1. The highest and most consistent of the imprecise counts obtained in any location was assumed to be most similar to the actual age.

2. Where the annual layers could be counted in only part of the cementum, for example the outer half, the probable additional number of layers in the inner half was extrapolated by estimating the number of layers that might occur in that thickness of cementum, taking into account the thickness of the layers in the outer part and the usual gradient in relative thickness, from the innermost (maximum) to outermost (minimum) (Fay, 1982).

3. Where the layering in the cementum was completely obscure or resorption was extensive, a conservatively estimated relative age was assigned, taking into account the size of the tooth and the amount of attrition.

These best estimates are identified as such in the tabulated data (Appendices A-F).

RESULTS

The total number of teeth read was 3,203 which included only the 1979-84 sets (Table 1). In most cases, the number of sections read was the total number available in the set for a given locality and year. A complete listing of the ages for each specimen, as determined in this study and in previous efforts, is presented by yearly samples in Appendices A to F.

Quality of the Samples

Most of the tooth sections were of high quality. Those from 1979 and 1984 were the best prepared with regard to the mechanical procedures and resultant products; the 1980 sections were by far the worst, with many off-center and oblique cuts, making some of them impossible to read and many of

TABLE 1. Numbers of tooth sections read per location per year.

Sample	Sex	1979[1]	1980	1981	1982	1983	1984	Total
GAMBELL	M	80	74	83	80	66	66	449
GAMBELL	F	71	169	90	144	45	121	640
SAVOONGA	M	236	142	100	55	62	90	685
SAVOONGA	F	57	17	101	43	56	56	330
DIOMEDE	M	133	95	55	58	76	15	432
DIOMEDE	F	111	151	151	173	45	36	667
Total		688	648	580	553	350	384	3,203

[1]One to three sections were read for nearly all of the 1979 samples, hence the number shown is about twice the number of individual walruses represented.

them nearly impossible to interpret. Misidentification of sexes and presence of two teeth with the same number but obviously not from the same specimen were occasionally detected, as well (Table 2). Occurrences of two to four teeth in a sequence that clearly were from the same rather than different specimens were common phenomena in the 1980-83 samples, which were the only ones examined sequentially, hence the only ones for which this kind of error was detectable.

TABLE 2. Frequency of occurrence of some errors detected in the catch samples.

Year	n[1]	Sex misidentified	Mixup of acquisition numbers	Sequences of teeth from same individual		
				No. of teeth in sequence		
				2	3	4
1979	341	2	5	(not examined)[2]		
1980	644	2	0	6	1	0
1981	580	2	0	6	4	2
1982	553	12	0	5	0	0
1983	348	11	0	3	0	0
1984	384	7	13	(not examined)[2]		

[1]Some sample sizes are smaller than those in Table 1, due to elimination of duplicate tooth sections.

[2]In these samples, the teeth were not examined in numerical sequence, hence were not tested for this type of error.

The quality of the sections can have a large influence on the precision of the readings. For example, for the 1979 set, Fay read at least two sections from nearly all of the teeth, but only 45% of those paired readings from males and 29% from females were equal; 87 and 61%, respectively, were within ±1 year of each other; 97 and 77%, respectively, were within ±2 years (Table 3). In all cases where there was a difference, the most centrally cut section consistently provided the most precise reading and usually the highest estimate of age. That is, all or most of the differences between readings appeared to be attributable to the differing quality of the sections. Where the teeth were small, the differences between sections in the age readings were largest, which explains in part why the greatest differences were between sections from animals more than 15 years old and more often from females than from from males.

TABLE 3. Comparative differences in years between ages determined by Fay from two sections of the same tooth. The tabled values under each of the differences in readings are percentages of n.

			Difference (yrs) of first from second reading						
Sample	Age (yrs)[1]	n	0	1	2	3	4	5	>5
1979 Males	1 - 15	50	64	24	8	2	0	0	2
	16 - 36	167	39	47	11	1	0	1	1
1979 Females	1 - 15	53	40	34	9	6	7	0	4
	16 - 39	59	19	31	22	15	3	5	5

[1]Age as determined from the first section that was read.

Comparisons Among Readers

The sections of teeth from females were more difficult for all personnel to read than were those from males, and the repeatability of readings among readers decreased with increasing age of the specimens (Table 4). The majority of ages read for males by the inexperienced personnel were within ± 2 years of ours, but the results for females were much worse, especially in the older age classes. The least differences between our and the other readings were for the 1979 sample; the greatest differences were for the 1981 and 1983 samples. In the latter, for example, only 6 and 5%, respectively, of the ages for the older females (>15 yrs) were within ± 2 years of ours.

The less experienced readers tended to slightly over-estimate the ages of the younger animals (<15 yrs old) and underestimate the ages of the older ones. The underestimations of the latter tended to be greatest in the oldest females.

Age Composition of the Samples

Tabular summaries of the frequency of occurrence of age classes per sex, locality, and year indicate rather wide variation in age composition among annual samples. For males taken at Gambell (Table 5), the age frequencies suggest a slightly bimodal distribution overall, one mode being about 12-15 years and the other about 20-23 years. Although this does not appear to be statistically significant, its occurrence does have some basis in logic, as discussed below. A similarly weak tendency toward bimodality also is suggested by the age frequencies for the Savoonga males (Table 6) but not by the age frequencies for males taken at Diomede (Table 7) or for females at any location (Tables 8,9,10).

TABLE 4. Comparative differences in years between ages determined from the same tooth sections of walruses by different readers. The tabled values under each of the differences in readings are % of n.

Sample	Readers	Age (yrs)[1]	n	Difference (yrs) from Fay's reading						
				0	1	2	3	4	5	>5
1979 Males	Fay-ADFG	1 - 15	51	21	41	18	12	2	2	4
		16 - 36	172	23	38	19	10	4	3	3
1979 Females	Fay-ADFG	1 - 15	55	25	36	20	16	0	2	0
		16 - 39	62	8	11	13	11	6	8	42
1980 Males	Fay-FWS	1 - 15	94	13	31	27	16	5	6	2
		16 - 31	216	14	31	17	16	9	4	9
1980 Females	Fay-FWS	1 - 15	59	14	44	20	8	7	2	5
		16 - 40	97	4	6	5	14	7	10	53
1981 Males	Fay-FWS	1 - 15	99	32	32	20	10	3	1	1
		16 - 30	116	9	17	17	20	8	9	20
1981 Females	Fay-FWS	1 - 15	201	7	23	26	18	12	8	5
		16 - 33	140	1	1	4	3	8	7	76
1982 Males	Fay-FWS	1 - 15	68	10	34	26	15	4	2	9
		16 - 31	118	15	30	31	10	3	3	8
1982 Females	Fay-FWS	1 - 15	164	15	35	26	12	8	4	1
		16 - 40	182	7	7	8	9	7	7	55
1983 Males	Fay-FWS	1 - 15	56	18	32	23	12	7	4	4
		16 - 31	137	26	28	17	10	7	2	10
1983 Females	Fay-FWS	1 - 15	51	10	29	16	16	8	6	16
		16 - 40	93	1	1	3	5	4	4	81

[1]Age as determined by Fay in this study.

TABLE 5. Annual summaries of frequency of occurrence of age classes and mean age of males in the spring harvests of walruses taken at Gambell, St. Lawrence Island, Bering Sea. Age classes 0 to 2 were not represented in any of the samples.

Age	1979	1980	1981	1982	1983	1984
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	1	0	0	0	0
6	0	3	0	1	0	0
7	0	1	1	0	0	0
8	0	6	1	1	0	4
9	0	3	2	1	0	2
10	1	3	0	4	0	3
11	1	2	3	1	1	0
12	3	3	4	2	2	2
13	2	3	3	1	3	5
14	0	2	11	4	2	3
15	2	2	5	3	3	3
16	1	3	2	5	1	3
17	2	2	4	2	4	4
18	2	7	7	3	2	6
19	2	7	3	6	1	1
20	2	3	6	7	8	4
21	2	4	6	5	8	4
22	3	7	5	6	6	0
23	1	3	3	11	6	5
24	1	3	5	3	4	2
25	5	4	3	7	5	5
26	1	1	4	2	6	6
27	1	0	3	1	1	1
28	3	1	2	1	2	0
29	1	0	0	1	1	1
30	0	0	0	1	0	0
31	2	0	0	1	0	0
32	1	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	2
35	0	0	0	0	0	0
36	1	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
Mean Age	21.32	16.54	18.39	19.60	20.80	18.65
Std. Error	1.03	0.70	0.57	0.60	0.54	0.78
N	40	74	83	80	66	66

TABLE 6. Annual summaries of frequency of occurrence of age classes and mean age of males in the spring harvests of walruses taken at Savoonga, St. Lawrence Island, Bering Sea. Age classes 0 to 2 were not represented in any of the samples.

Age	1979	1980	1981	1982	1983	1984
3	0	1	0	0	0	0
4	0	0	0	0	1	0
5	0	1	0	0	0	1
6	0	0	0	0	1	0
7	0	1	0	0	0	0
8	1	3	1	3	3	0
9	2	0	3	2	0	0
10	0	2	6	3	2	5
11	0	1	4	4	4	1
12	1	5	9	3	3	0
13	3	6	9	2	5	3
14	4	8	5	2	1	4
15	7	12	7	5	5	4
16	4	13	9	1	5	8
17	5	11	5	1	4	6
18	7	19	6	2	2	4
19	9	9	4	5	1	7
20	11	5	6	2	4	4
21	6	11	7	3	1	12
22	7	4	6	3	3	9
23	7	9	3	4	4	7
24	10	3	2	3	2	2
25	8	7	2	1	4	3
26	5	4	4	2	2	2
27	2	3	1	1	2	3
28	7	3	1	0	1	1
29	2	0	0	1	1	0
30	1	0	0	2	0	1
31	2	1	0	0	1	1
32	6	0	0	0	0	1
33	0	0	0	0	0	1
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
Mean Age	21.43	18.18	16.77	17.65	17.61	19.52
Std. Error	0.50	0.42	0.49	0.83	0.80	0.55
N	117	142	100	55	62	90

TABLE 7. Annual summaries of frequency of occurrence of age classes and mean age of males in the spring harvests of walruses taken at Little Diomede Island, Bering Strait. Age classes 0 to 2 were not represented in any of the samples.

Age	1979	1980	1981	1982	1983	1984
3	0	0	0	1	0	0
4	0	0	0	0	0	0
5	0	0	0	2	1	0
6	3	0	2	0	0	0
7	1	1	1	2	2	0
8	2	1	1	4	1	0
9	2	3	5	1	0	0
10	2	2	6	4	3	0
11	3	1	9	5	2	0
12	3	3	3	3	3	0
13	1	6	4	0	3	0
14	4	6	2	3	3	0
15	3	3	3	3	4	0
16	5	7	2	7	3	0
17	7	9	3	0	2	3
18	4	8	4	3	2	0
19	3	7	1	4	7	0
20	6	9	1	5	2	1
21	5	5	1	2	6	1
22	5	5	2	3	7	2
23	1	3	2	4	8	4
24	1	3	1	0	5	2
25	0	4	0	1	2	0
26	0	2	0	0	5	1
27	1	5	0	0	3	0
28	1	1	0	0	0	1
29	0	0	1	1	0	0
30	2	1	1	0	0	0
31	0	0	0	0	0	0
32	2	0	0	0	0	0
33	0	0	0	0	0	0
34	0	0	0	0	0	0
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	0	0
Mean Age	17.18	18.30	14.18	15.21	18.81	22.00
Std. Error	0.75	0.52	0.74	0.76	0.65	0.83
N	67	95	55	58	74	15

TABLE 8. Annual summaries of frequency of occurrence of age classes and mean age of females in the spring harvests of walruses taken at Gambell, St. Lawrence Island, Bering Sea. Age classes 0 to 2 were not represented in any of the samples.

Age	1979	1980	1981	1982	1983	1984
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	2	0	0	0	0
6	0	2	0	0	0	1
7	0	0	1	1	1	0
8	0	4	1	1	0	0
9	1	6	1	2	0	2
10	4	7	7	6	0	4
11	4	5	5	8	3	8
12	3	10	3	7	2	10
13	2	15	7	16	3	8
14	3	16	11	14	4	7
15	0	9	12	14	2	7
16	3	14	12	13	7	8
17	2	10	6	3	3	7
18	0	7	7	8	2	11
19	2	8	3	11	3	14
20	1	10	4	8	3	10
21	2	8	2	6	2	7
22	3	8	2	3	0	4
23	0	5	1	7	6	4
24	1	4	2	6	1	2
25	1	4	1	5	0	4
26	0	3	0	0	0	0
27	0	3	0	2	0	1
28	0	1	1	2	0	0
29	0	1	1	0	0	0
30	1	0	0	0	1	0
31	1	5	0	0	0	0
32	0	0	0	1	0	0
33	0	0	0	0	0	1
34	0	1	0	0	0	0
35	0	1	0	0	1	1
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	0	0	0	1	0
Mean Age	16.32	17.01	15.62	16.77	18.09	17.02
Std. Error	1.00	0.46	0.44	0.40	0.92	0.44
N	34	169	90	144	45	121

TABLE 9. Annual summaries of frequency of occurrence of age classes and mean age of females in the spring harvests of walruses taken at Savoonga, St. Lawrence Island, Bering Sea. Age classes 0 to 2 were not represented in any of the samples.

Age	1979	1980	1981	1982	1983	1984
3	0	0	0	0	0	0
4	0	0	0	0	0	0
5	0	0	0	1	0	0
6	1	0	1	1	0	0
7	1	0	1	0	0	0
8	1	1	2	0	1	0
9	2	0	3	1	1	0
10	2	1	10	1	5	1
11	1	0	11	0	2	4
12	1	1	12	4	3	4
13	2	0	8	1	6	2
14	1	3	5	2	2	4
15	1	0	9	1	1	2
16	0	0	5	5	5	4
17	1	2	7	2	4	8
18	1	1	4	1	5	6
19	0	1	1	3	2	1
20	2	3	5	4	2	4
21	0	1	1	2	1	3
22	1	1	0	1	2	2
23	3	0	8	1	3	2
24	2	1	0	2	2	3
25	1	1	3	2	2	0
26	1	0	1	0	1	0
27	0	0	1	1	1	2
28	0	0	1	1	0	2
29	1	0	0	2	0	0
30	1	0	1	1	1	1
31	0	0	0	0	0	0
32	0	0	1	3	0	0
33	0	0	0	0	3	0
34	0	0	0	0	1	1
35	0	0	0	0	0	0
36	0	0	0	0	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	1	0	0	0	0	0
40	0	0	0	0	0	0
Mean Age	17.86	17.35	15.28	19.23	18.04	18.21
Std. Error	1.54	1.16	0.54	1.06	0.89	0.71
N	28	17	101	43	56	56

TABLE 10. Annual summaries of frequency of occurrence of age classes and mean age of females in the spring harvests of walruses taken at Little Diomede Island, Bering Strait. Age classes 0 to 2 were not represented in any of the samples.

Age	1979	1980	1981	1982	1983	1984
3	0	1	0	0	0	0
4	0	0	0	0	1	0
5	0	1	0	0	0	0
6	1	0	2	1	0	0
7	0	3	0	2	0	1
8	0	2	7	6	1	0
9	3	7	11	4	0	0
10	1	7	9	10	1	4
11	2	5	9	14	3	3
12	3	8	17	10	3	1
13	1	7	11	8	3	2
14	3	8	12	16	2	3
15	9	6	14	16	2	5
16	1	7	8	13	3	4
17	3	10	5	6	2	2
18	2	9	11	4	2	2
19	4	9	2	8	4	0
20	6	9	9	7	4	3
21	3	11	6	6	2	0
22	3	6	2	7	3	1
23	5	7	3	1	1	3
24	2	5	2	4	0	1
25	2	6	1	4	1	0
26	1	1	4	3	1	1
27	0	3	0	4	1	0
28	0	1	2	4	1	0
29	0	2	1	1	1	0
30	0	2	1	2	0	0
31	0	1	0	3	1	0
32	0	1	1	3	1	0
33	0	1	1	1	0	0
34	0	0	0	2	0	0
35	0	0	0	0	0	0
36	0	0	0	2	0	0
37	0	0	0	0	0	0
38	0	0	0	0	0	0
39	0	0	0	0	0	0
40	0	1	0	1	1	0
Mean Age	17.42	17.69	15.27	17.39	18.47	15.83
Std. Error	0.65	0.51	0.44	0.53	1.03	0.77
N	55	147	151	173	45	36

A graphic, sequential comparison of the mean ages of the animals taken at Gambell, Savoonga, and Diomede from the 1950's to 1980's (Fig. 1) indicates that there has been a significant increase in age of the catch. For males, the suggested trend begins with a period of stability near the 13- to 15-year level in the 1950's, then a gradual rise during the late 1960's and 70's to a new level about 18 to 20 years in the 1980's.

The upward trend of mean age for the females at Diomede appears to have been about the same as it was for the males, but at Gambell and Savoonga, the trend appears to have been somewhat different (Fig. 2). In the latter two localities, the mean age of females in the catch seems to have remained at the low level until the early 1970's, then to have risen rapidly to the higher level in the mid- to late 1970's, before stabilizing again. Even though the patterns may have been slightly different, the magnitude of change indicated was about the same in all three localities, from a low level of about 10 to 12 years in the 1950's and early 60's to a high level of about 17 to 18 years in the late 1970's and early 80's.

Increase in Age at Maturity

Assigning the newly determined ages to the specimens in the 1979, 1980, and 1982 samples from which reproductive data had been obtained earlier, we observed that the age at first birth seemed to be older than in samples that we had dealt with before, from the 1950's to early 70's (Table 11). A comparison of those samples by means of the Kolmogorov-Smirnov 2-Sample Test rejected the null hypothesis and indicated high probability that the change in age at first birth is real (2-tailed $P<0.005$). Whereas the average female gave birth to her first calf previously around 7-8 years of age, the mean age at first birth in recent years has been some two years later, about 9-10 years of age.

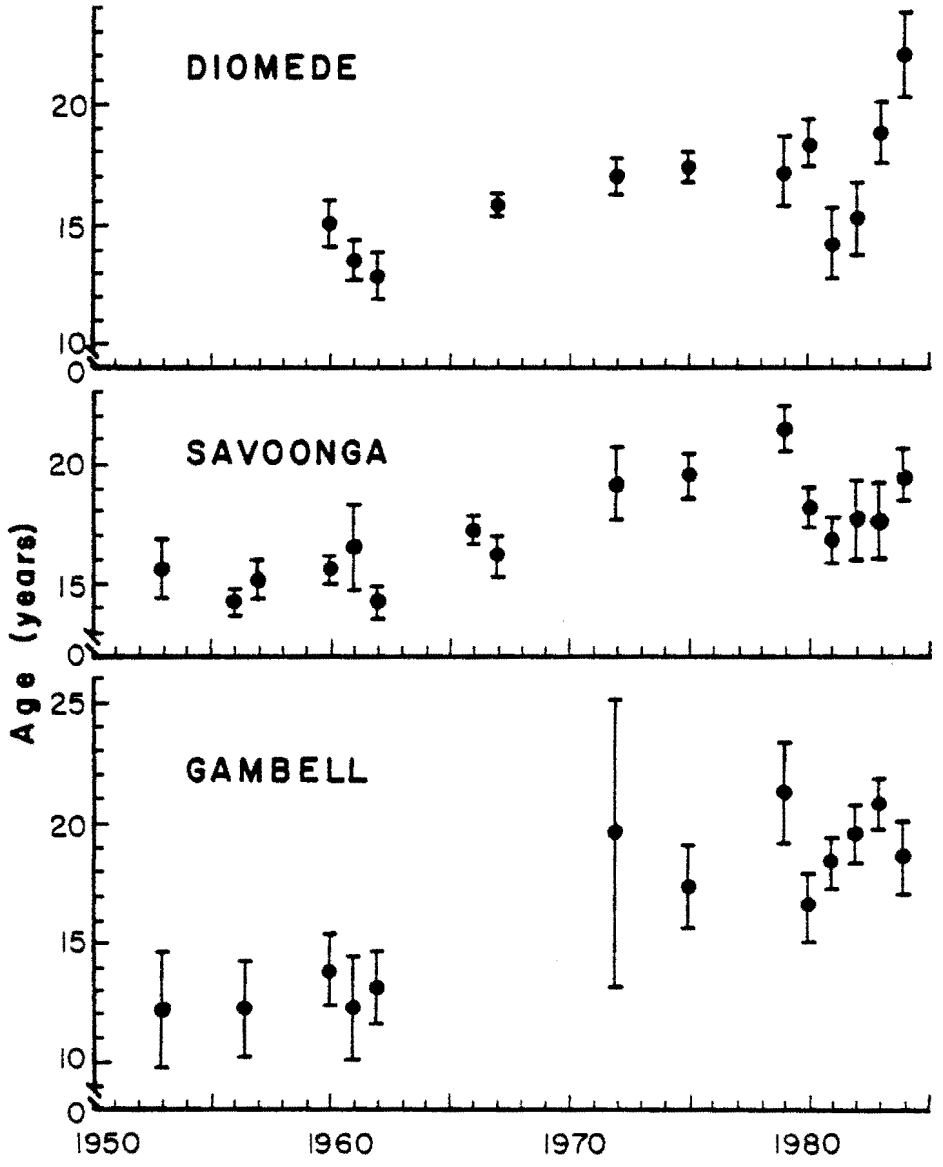

Fig. 1. Mean age of male walruses in the catch samples from Diomede, Savoonga, and Gambell in the 1950's to 1980's. Vertical bars indicate the 95% confidence limits about the means.

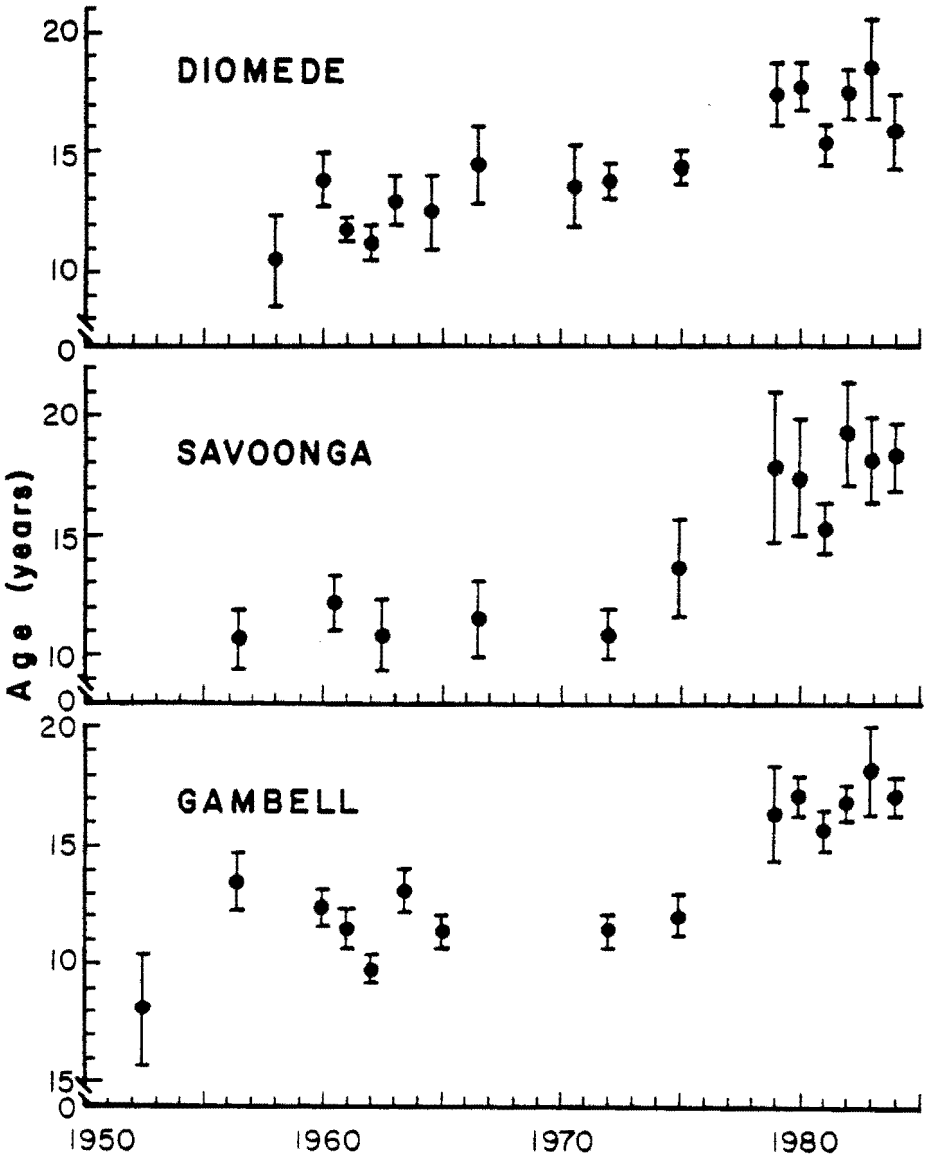

Fig. 2. Mean age of female walruses in the catch samples from Diomede, Savoonga, and Gambell in the 1950's to 1980's. Vertical bars indicate the 95% confidence limits about the means.

Table 11. Comparative age class and cumulative frequencies of ages at first birth for female walruses in the 1952-72 and 1975-82 periods.

			Age (yrs) at first birth											
Sample	n		4	5	6	7	8	9	10	11	12	13	14	15
1952-72	61	f	0	1	6	19	14	9	3	3	2	2	2	0
		cum.f	0	1	7	26	40	49	52	55	57	59	61	61
		cum.%	0	2	12	43	66	80	85	90	93	97	100	100
1975-82	37	f	0	0	3	3	5	7	4	5	4	1	0	5
		cum.f	0	0	3	6	11	18	22	27	31	32	32	37
		cum.%	0	0	8	16	30	49	60	73	84	86	86	100

DISCUSSION

The determination of age of walruses from the cementum annuli in their teeth is not entirely precise. Even experienced people can read some tooth sections several times and derive estimates that differ by as much as a year or two, disappointingly often. The inexperienced reader usually will find that the differences between successive readings are even larger than ± 2 years, sometimes leading to discouragement and disbelief in the accuracy of the method. Nonetheless, the method can yield valid results, judging from the cases in which the teeth of known-aged animals have been read accurately (Fay, 1982).

The problems of inaccurate and inconsist readings are attributable to many factors, some of which can be controlled and overcome, and some cannot. Misidentification of sexes, errors in numbering, and inclusions of more than one tooth per specimen are problems that arise from insufficient instruction of field personnel who collect the teeth and inadequate attention to detail in labelling by the people who process them. That there is value in separate, sequential packaging of the sections (at least initially) to overcome human error in the numbering is evident from the fact that the 1980-83 samples apparently were free of such errors, whereas the mass-packaged 1979 and 1984 samples had many mixups in numbering. Although the errors introduced by these sources usually are not large enough to have a significant effect on sample means, they can be large enough to be very troublesome in the records of individual specimens, hence they should be eliminated if possible.

Small differences of a year or two between ages, whether by the same or by different readers, can be attributed to whether (1) the outermost, incomplete layer is counted, (2) the number of layers lost through attrition is estimated accurately, and (3) the very thin, outer layers are counted

precisely. Larger differences between ages can be attributed to (4) indistinct annuli, (5) the presence of intermediate, false annuli within annual layers (especially common in males), and (6) some annuli being more prominent than others. The effects of all of these can be minimized by experience. Errors from causes (1) and (2) can be overcome by instruction and experience, and those from miscount of the outer layers are soluble by strict attention to detail. One learns to overcome cause (4) by readjusting the lighting, the magnification, the position of the tooth section itself, and regulating the amount of moisture on it as means to enhance indistinct annuli and to get a reading where none seemed possible at first. For cause (5), one also learns to recognize the "false" annuli within the "true" annuli of males and to ignore them when counting. The problem (cause 6) of some annuli being more prominent than others is particularly troublesome in the teeth of old females. Those more prominent annuli tend to occur at 2- to 3-year intervals (which implies that they are related to pregnancies), and the inexperienced reader tends to read only them and to pass over the less prominent ones, with the result that the "age" read by the inexperienced can be nearly 50% lower than those read by experienced personnel.

Some sources of error in the readings are uncontrollable, even with thorough instruction and long experience. Pathologic resorption of cementum can remove many of the layers from the root surface, sometimes without leaving a trace. Often there is no possible way of extrapolating precisely for such losses. Even the experienced reader can make only a rough estimate, based on the general appearance of the tooth and on his or her recollection of ages of others that had teeth that were similar in appearance. Obviously, an animal that has, for example, a lower premolar that is worn very short from attrition must be comparatively old, even

though the number of cementum layers remaining on the root of the tooth is low and suggests that the animal was very young. This is not uncommon in old females. Unless a different tooth from the same animal can be obtained, and unless that different tooth was unaffected by the resorptive process, the age of that animal can only be approximated in relative terms.

Another problem that cannot be overcome without reading several of the teeth from each animal is the matter of variation in number of annuli among teeth of the same individual. Hypothetically, every tooth in the mouth of an individual animal should have the same number of cementum layers on it, and one can verify that hypothesis readily, as Fay (1982) did. According to Born and Kristensen (in press), however, the hypothesis is not always valid; there are some individuals in which the number of readable annuli varies among teeth. In those findings, such differences averaged from ± 1 year in the young animals up to ± 2 or 3 years in the adults. These are small errors, but they could be troublesome if there are many in a sample.

Those problems are not unique to walruses. Age determination of mammals by counting layers of cementum is widely practiced, but the imprecision of the method seldom is mentioned and perhaps seldom tested. Further experimentation to gain better understanding of the causes and magnitudes of errors in the results from the method in walruses would be useful. At least for consistency of results, the readings should always be done be well-trained, experienced personnel. The variations among samples in age structure and mean age could be important indicators of the nature of the harvest and may be useful as indices of the status of the population, as well. The risk of producing misinformation by employing inexperienced personnel in the reading of the teeth is untenable.

The very wide variation in mean age among samples, especially of males, does not appear to be attributable to error in the age readings, for the

males are by far the easiest to read precisely. And the significant differences from one year to the next in samples from a given locality also could not possibly be reflections of change in the composition of the population. Furthermore, this kind of variation does not appear to be attributable to changes in selection on the part of the hunters from year to year, for there is neither evidence of change nor any basis for it. The economic foundation for the selection of animals with large tusks has not wavered and is not likely to waver in the foreseeable future. Only the intensity of the selection is likely to have varied from year to year, mainly with the size of the catch, for the hunters are understandably less selective when the catch is small than when it is large. Random variation in availability of certain age classes, partly due to varying weather and ice conditions each year, also may play a part in making the annual samples non-uniform. To a certain degree, that irregularity in composition of the catch also can be attributed to age- and sex-segregation. During the time of the spring hunt, for example, the younger males tend to migrate with the females, whereas the older males take up residence in their summering areas, separate from the females. At St. Lawrence Island, this means that young males are more available to the east and west of island, where the herds of females and young males are migrating by; conversely, the older males are mostly available in the ice remnant to the north of the island, where they apparently congregate before taking up summer residence at such places as Arakamchechen, Nunyangan, and Big Diomede Islands.

At Gambell, most of the males taken early in the spring are the subadults and young adults from the herds that are migrating northward through Anadyr Strait, off the western end of the island. Later in the spring, however, the Gambell hunters often travel eastward into a large

remnant of the pack ice, which often remains to the north of St. Lawrence Island until early June (Fay, 1958, 1982; Burns et al., 1980). There, in that ice remnant, they take mainly very large, old males. And for that reason, in years when the ice allows hunting in both areas, the harvests of males by Gambell hunters tend to be somewhat bimodal in age composition, with young animals taken early in the season and older animals toward the end.

At Savoonga also, the older males are taken from that same remnant of the pack ice, north of the island, but they usually are taken early, rather than late in the spring. The reason for this is that the Savoonga hunters often cannot range outside the ice remnant until it opens up, late in the season. They therefore hunt within it at first, finding mainly large, adult males. In years when that ice does not open up enough to allow access to its eastern edge, the catch at Savoonga may be made up mainly of adult males. Younger males are taken by the Savoonga hunters mostly late in the spring, far out on the eastern border of the ice remnant, where the herds of females and young males are migrating northward. In years when the ice opens early, and the Savoonga hunters can go far eastward early in the season, their catch tends to be mainly of females and young males.

We would expect that the catches at Diomede would be the least variable in age composition from year to year of any locality, simply because the location "in the neck of the hourglass" is optimal for access to most of the population. But even there, ice conditions and accessibility vary widely from year to year, and there is no distinct, repetitive pattern in the composition of the catches (Sease, in prep.).

For both sexes of walruses taken in all three localities, the trend in average age was generally upward during the 1960's and 70's, but it appears to have levelled off in recent years. This suggests, as do several other

biological parameters of the population, that the composition of the population as a whole also may have changed in some related way. Because we know, however, that the catches are taken selectively when opportunity permits, and because we do not know how much effect that selection has on the composition of the catch samples, we must assume conservatively that the change in age composition of the catches is just as much (or more) a reflection of change in availability of certain age classes as it is of change in composition of the population. That is, as the population increased in size from 1960 to 1980, the larger, older animals that the hunters selected would have been increasingly available because they were becoming ever more numerous. If the change in mean age of the catch has been primarily a function of availability, then the population must have reached its maximum in size and begun to level off about 1979, for the mean age seems to have remained more or less constant since that time.

The slightly different shape of the trend in mean age of females taken at Gambell and Savoonga than of females at Diomede appears to have been caused by differences between villages in hunter selection. Whereas, the selection is primarily for large tusks in males at all three locations and in females as well at Diomede, the primary selection of females at Gambell and Savoonga is for those with calves; selection for tusk size is secondary (Fay, 1958). Apparently, for that reason, the mean age of females taken at Gambell and Savoonga remained low for a longer time than at Diomede, centered near the age of maximal fecundity. The fact that it did rise at all suggests that the age of maximal fecundity changed upward during the 1970's. Unfortunately we have no measure of that in the catch samples, but using age at first birth as an index of the age/fecundity relationship, we now find that there has been a significant change in this character. The

average maturing female in the period from 1975 to 1982 was about 2 years older when she bore her first calf than she would have been two decades ago.

LITERATURE CITED

Born, E. W., and T. Kristensen. In press. Biology and exploitation of the Atlantic walrus, Odobenus rosmarus rosmarus L., in the Thule District, North Greenland. Meddlelser om Grønland.

Brooks, J. W. 1954. A contribution to the life history and ecology of the Pacific walrus. Unpubl. M.S. thesis, Univ. Alaska, Fairbanks, 103 pp.

Buckley, J. L. 1958. The Pacific walrus, a review of current knowledge and suggested management needs. Spec. Sci. Rep. Wildlife 41. U. S. Fish and Wildlife Service, Washington, DC, 29 pp.

Burns, J. J. 1965. The walrus in Alaska, its ecology and management. Alaska Department of Fish and Game, Juneau, AK, 48 pp.

Burns, J. J. 1973. Report of survey and inventory activities: walrus studies. Federal Aid in Wildlife Restoration, vol. 1. Alaska Department of Fish and Game, Juneau, AK, 12 pp.

Burns, J. J., and R. R. Nelson. 1979. Walrus: Survey - Inventory Progress Report - 1979. Alaska Department of Fish and Game, Juneau, AK, 25 pp.

Burns, J. J., L. H. Shapiro, and F. H. Fay. 1980. The relationships of marine mammal distributions, densities, and activities to sea ice conditions. Final rep. R.U.248/249. NOAA, Outer Continental Shelf Program, Boulder, CO, 172 pp.

Chapskii, K. K. 1941. Marine mammals of the Soviet Arctic. Biblioteka Arktika. Glavsevmorput', Leningrad, 186 pp.

Fay, F. H. 1955. The Pacific walrus: spatial ecology, life history, and population. Ph.D. dissertation. Univ. British Columbia, Vancouver, BC, 171 pp.

Fay, F. H. 1958. Pacific walrus investigations on St. Lawrence Island, Alaska. Unpubl. rept. Arctic Health Research Center, Anchorage, AK, 54 pp.

Fay, F. H. 1960. Investigations of the Pacific walrus. Terminal Rep. Project No. 26. Arctic Institute of North America, Montreal, Canada, 72 pp.

Fay, F. H. 1982. Ecology and biology of the Pacific walrus, Odobenus rosmarus divergens Illiger. N. Amer. Fauna, 74:1-279.

Fay, F. H., B. P. Kelly, P. H. Gehnrich, J. L. Sease, and A. A. Hoover. 1984. Modern populations, migrations, demography, trophics, and historical status of the Pacific walrus. Final Rep. Res. Unit No. 611. NOAA, Outer Continental Shelf Environmental Assessment Program, Anchorage, AK, 142 pp.

Harbo, S. J., Jr. 1961. Marine mammal investigations: work plan J. 1960-61 Pittman Robertson Project Report, vol. II, no. 9. Alaska Department of Fish and Game, Juneau, AK, 54 pp.

Krylov, V. I. 1963. Determination of age, rate of development, and age structure of the population of Pacific walruses. Pp. 25-26 in K. K. Chapskii (ed.), Second All-Union Conference on Studies of Marine Mammals, Abstracts of Reports. Acad. Sci. USSR, Moscow-Leningrad.

Krylov, V. I. 1965. Determination of age, rate of growth and analysis of the age structure of the harvest of Pacific walruses. Pp. 201-211 in E. N. Pavlovskii, B. A. Zenkovich, S. E. Kleinenberg, and K. K. Chapskii (eds.), Marine Mammals. Nauka, Moscow.

Mansfield, A. W. 1958. The biology of the Atlantic walrus, Odobenus rosmarus rosmarus (Linnaeus) in the eastern Canadian Arctic. Fish. Res. Board Canada, Manuscript Rept. Ser. (Biol.), 653:1-146.

Sease, J. L. In Prep. Historical status and population dynamics of the Pacific walrus. M.S. thesis. University of Alaska, Fairbanks, AK.

APPENDIX A

Ages of walruses in the catch samples from Gambell, Savoonga, and Diomede, spring 1979. Ages preceded by the symbol ~ are "best estimates" as described in the text. Those preceded by the symbol > are conservative estimates in instances where the tooth appeared to be from an animal much older than the reading indicated. In the center are Fay's (this project) readings from the first (left) and second (right) sections, followed by the difference (Dif.) between them. At right is the age estimated by a less experienced reader from the Alaska Department of Fish and Game (ADFG) and the difference (Diff.) between it and Fay's first reading.

1979 WALRUS CATCH SAMPLE (AGES FROM TEETH) -- GAMBELL

Acqu. No.	Field No.	Sex	Age per Fay		Dif.	ADFG	Diff.
4852	(GW-001-79)	M	21	22	1	23	2
4853	(GW-002-79)	M	20	21	1	20	0
4854	(GW-003-79)	M	25	26	1	22	-3
4855	(GW-004-79)	M	11	11	0	12	1
4856	(GW-006-79)	M	27	26	-1	26	-1
4857	(GW-007-79)	F	19	20	1	20	1
4858	(GW-008-79)	M	26	27	1	24	-2
4859	(GW-009-79)	M	22	23	1	24	2
4860	(GW-013-79)	M	22	22	0	22	0
4861	(GW-014-79)	F	~30	~30	0	19	-11
4862	(GW-015-79)	F	31	~28	-3	20	-11
4863	(GW-021-79)	M	28	28	0	32	4
4864	(GW-022-79)	F	11	11	0	11	0
4865	(GW-024-79)	F	~24	~21	-3	11	-13
4866	(GW-027-79)	M	13	15	2	17	4
4867	(GW-028-79)	M	12	12	0	13	1
4868	(GW-032-79)	F	22	22	0	22	0
4869	(GW-033-79)	F	21	22	1	23	2
4870	(GW-034-79)	F	16	16	0	13	-3
4871	(GW-035-79)	F	>14	15	<1	15	<1
4872	(GW-036-79)	F	13	13	0	14	1
4873	(GW-037-79)	F	9	10	1	10	1
4874	(GW-038-79)	F	16	18	2	16	0
4875	(GW-039-79)	F	17	17	0	21	4
4876	(GW-040-79)	F	21	22	1	13	-8
4877	(GW-042-79)	M	18	19	1	23	5
4878	(GW-043-79)	F	17	19	2	17	0
4879	(GW-044-79)	M	12	12	0	17	5
4880	(GW-045-79)	M	12	12	0	13	1
4881	(GW-046-79)	F	22	22	0	21	-1
4882	(GW-047-79)	F	13	13	0	12	-1
4883	(GW-048-79)	F	12	12	0	12	0
4884	(GW-049-79)	F	22	22	0	23	1
4885	(GW-050-79)	F	14	>17	>3	13	-1
4886	(GW-052-79)	M	25	27	2	28	3
4887	(GW-053-79)	M	15	15	0	15	0
4888	(GW-054-79)	M	15	15	0	16	1
4889	(GW-055-79)	F	10	10	0	7	-3
4890	(GW-056-79)	M	24	24	0	26	2
4891	(GW-057-79)	M	28	28	0	26	-2
4892	(GW-058-79)	M	~28	27	-1	29	1
4893	(GW-059-79)	M	25	25	0	23	-2
4894	(GW-060-79)	M	10	10	0	12	2

Acqu. no.	Field no.	Sex	Age per Fay	Dif.	ADFG	Diff.
4895	(GW-061-79)	M	18		20	2
4896	(GW-062-79)	M	19	~30 11	14	-5
4897	(GW-063-79)	M	16	15 -1	17	1
4898	(GW-064-79)	M	25	35 10	30	5
4899	(GW-065-79)	M	31		31	0
4900	(GW-066-79)	M	23	23 0	24	1
4901	(GW-067-79)	M	22	24 2	22	0
4902	(GW-068-79)	F	10	10 0	10	0
4903	(GW-069-79)	F	12	14 2	11	-1
4904	(GW-070-79)	F	>20	~33 13	19	-1
4905	(GW-071-79)	F	10	9 -1	8	-2
4906	(GW-072-79)	F	12	14 2	12	0
4907	(GW-073-79)	F	19		16	-3
4908	(GW-074-79)	F	10	10 0	12	2
4909	(GW-075-79)	F	14	14 0	12	-2
4910	(GW-076-79)	M	31	32 1	>28	-3
4911	(GW-077-79)	M	17	18 1	20	3
4912	(GW-078-79)	M	36	36 0	30	-6
4913	(GW-079-79)	F	11	15 4	11	0
4914	(GW-080-79)	F	11	9 -2	8	-3
4915	(GW-081-79)	F	>16	>19 3	11	-5
4916	(GW-082-79)	F	25	20 -5	13	-12
4917	(GW-083-79)	M	25	25 0	26	1
4918	(GW-085-79)	M	~21	~21 0	18	-3
4919	(GW-086-79)	M	32	32 0	33	1
4920	(GW-087-79)	M	19	20 1	21	2
4921	(GW-088-79)	M	29	29 0	25	-4
4922	(GW-089-79)	F	11	11 0	10	-1
4923	(GW-091-79)	M	13	14 1	13	0
4924	(GW-092-79)	M	20	20 0	19	-1
4925	(GW-093-79)	M	17	17 0	16	-1

1979 WALRUS CATCH SAMPLE (AGES FROM TEETH) -- SAVOONGA

Acqu. No.	Field No.	Sex	Age per Fay	Dif.	ADFG	Diff.
5028	(SW-001-79)	M	22	21	-1	24	2
5029	(SW-002-79)	M	12	12	0	12	0
5030	(SW-003-79)	M	24	26	2	27	3
5031	(SW-004-79)	M	~26	26	0	25	-1
5032	(SW-005-79)	M	8	9	1	14	6
5033	(SW-006-79)	M	20	21	1	20	0
5034	(SW-007-79)	F	23	20	-3	16	-7
5035	(SW-008-79)	F	~29	29	0	21	-8
5036	(SW-009-79)	F	~18	17	-1	21	3
5037	(SW-011-79)	F	~20	21	1	15	-5
5038	(SW-013-79)	F	~13	~13	0	11	-2
5039	(SW-014-79)	M	28	29	1	29	1
5040	(SW-015-79)	M	22	24	2	20	-2
5041	(SW-016-79)	F	11	10	-1	11	0
5042	(SW-017-79)	M	25	26	1	26	1
5043	(SW-018-79)	M	~20	18	-2	19	-1
5044	(SW-019-79)	M	26	27	1	27	1
5045	(SW-020-79)	M	26	~28	2	24	-2
5046	(SW-021-79)	M	24	25	1	24	0
5047	(SW-024-79)	M	20	21	1	21	1
5048	(SW-025-79)	F	~15	15	0	16	1
5049	(SW-026-79)	F	39	40	1	20	-19
5050	(SW-027-79)	F	~30	39	9	30	0
5051	(SW-028-79)	F	17	16	-1	14	-3
5052	(SW-029-79)	M	~27	27	0	24	-3
5053	(SW-030-79)	M	31	33	2	31	0
5054	(SW-031-79)	F	12	13	1	13	1
5055	(SW-032-79)	F	14	14	0	14	0
5056	(SW-033-79)	F	6	5	-1	6	0
5057	(SW-034-79)	M	24	23	-1	21	-3
5058	(SW-035-79)	M	20	21	1	21	1
5059	(SW-036-79)	M	28	28	0	24	-4
5060	(SW-037-79)	M	~32	32	0	30	-2
5061	(SW-038-79)	M	32	32	0	27	-5
5062	(SW-039-79)	M	32	31	-1	30	-2
5063	(SW-040-79)	M	28	27	-1	26	-2
5064	(SW-041-79)	M	19	18	-1	16	-3
5065	(SW-042-79)	M	19	19	0	21	2
5066	(SW-043-79)	M	30	31	1	27	-3
5067	(SW-044-79)	F	23	28	5	15	-8
5068	(SW-045-79)	M	~28	29	1	24	-4
5069	(SW-046-79)	M	25	24	-1	25	0
5070	(SW-047-79)	F	7	7	0	>8	>1

Acqu. no.	Field no.	Sex	Age per Fay		Dif.	ADFG	Diff.
5071	(SW-048-79)	M	~15	17	2	18	3
5072	(SW-049-79)	M	18	18	0	19	1
5073	(SW-050-79)	M	18	17	-1	17	-1
5074	(SW-051-79)	M	13	13	0	14	1
5075	(SW-052-79)	F	13	12	-1	10	-3
5076	(SW-053-79)	F	10	9	-1	10	0
5077	(SW-054-79)	M	32	31	-1	30	-2
5078	(SW-055-79)	F	23	21	-2	18	-5
5079	(SW-056-79)	M	9			9	0
5080	(SW-057-79)	M	14	16	2	17	3
5081	(SW-058-79)	M	~17	15	-2	16	-1
5082	(SW-059-79)	M	16	16	0	18	2
5083	(SW-060-79)	M	19	19	0	19	0
5084	(SW-061-79)	M	15	15	0	15	0
5085	(SW-062-79)	M	25	25	0	26	1
5086	(SW-067-79)	F	8	8	0	9	1
5087	(SW-069-79)	F	9	8	-1	11	2
5088	(SW-071-79)	M	32	32	0	32	0
5089	(SW-072-79)	M	24	25	1	23	-1
5090	(SW-073-79)	M	21	22	1	20	-1
5091	(SW-074-79)	M	20	20	0	20	0
5092	(SW-075-79)	M	28	29	1	29	1
5093	(SW-076-79)	M	20	20	0	19	-1
5094	(SW-082-79)	M	21	22	1	24	3
5095	(SW-083-79)	M	21	21	0	23	2
5096	(SW-084-79)	M	21	21	0	22	1
5097	(SW-197-79)	M	16	15	-1	15	-1
5098	(SW-198-79)	M	19	19	0	17	-2
5099	(SW-199-79)	M	17	16	-1	15	-2
5100	(SW-225-79)	M	22	22	0	22	0
5101	(SW-226-79)	M	25	23	-2	25	0
5102	(SW-227-79)	M	18	18	0	19	1
5103	(SW-230-79)	M	15	15	0	16	1
5104	(SW-231-79)	M	16	16	0	17	1
5105	(SW-232-79)	M	17	17	0	18	1
5106	(SW-233-79)	M	23	25	2	22	-1
5107	(SW-234-79)	M	20	20	0	21	1
5108	(SW-235-79)	M	18	19	1	21	3
5109	(SW-236-79)	M	21	20	-1	20	-1
5110	(SW-237-79)	F	26	25	-1	28	2
5111	(SW-238-79)	F	10	11	1	11	1
5112	(SW-239-79)	F	9	12	3	10	1
5113	(SW-240-79)	M	9	~15	6	12	3
5114	(SW-241-79)	M	28	29	1	28	0
5115	(SW-242-79)	M	25	27	2	28	3

Acqu. No.	Field No.	Sex	Age per Fay		Dif.	ADFG	Diff.
5116	(SW-243-79)	M	26	25	-1	27	1
5117	(SW-244-79)	M	28	27	-1	26	-2
5118	(SW-245-79)	M	15	15	0	15	0
5119	(SW-246-79)	M	24	23	-1	25	1
5120	(SW-247-79)	M	23	23	0	23	0
5121	(SW-248-79)	M	14	14	0	14	0
5122	(SW-249-79)	M	24	25	1	23	-1
5123	(SW-250-79)	M	15	12	-3	14	-1
5124	(SW-251-79)	M	23	23	0	22	-1
5125	(SW-252-79)	M	14	13	-1	14	0
5126	(SW-253-79)	M	27	26	-1	26	-1
5127	(SW-254-79)	M	21	22	1	21	0
5128	(SW-255-79)	M	23	22	-1	23	0
5129	(SW-256-79)	M	25	25	0	24	-1
5130	(SW-258-79)	M	26	28	2	28	2
5131	(SW-268-79)	M	24			13	-11
5132	(SW-269-79)	M	20	19	-1	19	-1
5133	(SW-270-79)	M	22	20	-2	21	-1
5134	(SW-271-79)	M	23			19	-4
5135	(SW-272-79)	M	18	18	0	19	1
5136	(SW-273-79)	M	23			18	-5
5137	(SW-274-79)	M	14	~15	1	11	-3
5138	(SW-293-79)	F	24	22	-2	22	-2
5139	(SW-342-79)	M	18	18	0	18	0
5140	(SW-345-79)	M	20	20	0	17	-3
5141	(SW-346-79)	F	25	26	1	26	1
5142	(SW-347-79)	M	20	19	-1	19	-1
5143	(SW-349-79)	M	29	28	-1	26	-3
5144	(SW-351-79)	M	13	13	0	15	2
5145	(SW-352-79)	M	25	26	1	26	1
5146	(SW-366-79)	M	17	16	-1	>19	2
5147	(SW-367-79)	M	22	23	1	23	1
5148	(SW-368-79)	M	>24	>23	-1	17	-7
5149	(SW-369-79)	M	23	25	2	23	0
5150	(SW-370-79)	M	18	18	0	18	0
5151	(SW-371-79)	M	24	~25	1	22	-2
5152	(SW-372-79)	M	16	15	-1	15	-1
5153	(SW-373-79)	M	17	18	1	19	2
5154	(SW-374-79)	M	20	21	1	21	1
5155	(SW-375-79)	M	13	13	0	13	0
5156	(SW-376-79)	F	22	24	2	23	1
5157	(SW-377-79)	F	24	23	-1	23	-1
5158	(SW-386-79)	M	15	15	0	13	-2
5159	(SW-387-79)	M	31	32	1	26	-5
5160	(SW-388-79)	M	29	30	1	25	-4

Acqu. no.	Field no.	Sex	Age per Fay		Dif.	ADFG	Diff.
5161	(SW-389-79)	M	19	22	3	23	4
5162	(SW-390-79)	M	22	23	1	22	0
5163	(SW-391-79)	M	25	26	1	27	2
5164	(SW-392-79)	F	20	21	1	21	1
5165	(SW-393-79)	M	19	19	0	20	1
5166	(SW-394-79)	M	~32	31	-1	35	3
5167	(SW-395-79)	M	~24	29	5	23	-1
5168	(SW-396-79)	M	19	19	0	19	0
5169	(SW-397-79)	M	19	18	-1	18	-1
5170	(SW-398-79)	M	15	15	0	16	1
5171	(SW-399-79)	M	22	22	0	21	-1
5172	(SW-400-79)	M	19	22	3	>17	-2

1979 WALRUS CATCH SAMPLE (AGES FROM TEETH) -- DIOMEDE

Acqu. No.	Field No.	Sex	Age per Fay		d	ADFG	Diff.
5173	(DW-001-79)	F	15	14	-1	13	-2
5174	(DW-002-79)	F	23			13	-10
5175	(DW-003-79)	M	16	17	1	16	0
5176	(DW-004-79)	F	17	13	-4	17	0
5177	(DW-005-79)	M	30	31	1	32	2
5178	(DW-006-79)	M	17			18	1
5179	(DW-007-79)	F	22	~19	-3	19	-3
5180	(DW-008-79)	F	9	9	0	11	2
5181	(DW-009-79)	F	6	6	0	8	2
5182	(DW-010-79)	F	21	~20	-1	>16	-5
5183	(DW-011-79)	F	~25	~25	0	>15	-10
5184	(DW-012-79)	M	14	14	0	17	3
5185	(DW-013-79)	M	14	14	0	15	1
5186	(DW-014-79)	M	19	19	0	22	3
5187	(DW-015-79)	M	15	15	0	15	0
5188	(DW-016-79)	F	9	9	0	11	2
5189	(DW-017-79)	F	~15	~15	0	>15	0
5190	(DW-018-79)	F	15	13	-2	12	-3
5191	(DW-019-79)	F	17	~15	-2	15	-2
5192	(DW-020-79)	F	15	14	-1	15	0
5193	(DW-021-79)	F	15	11	-4	12	-3
5194	(DW-022-79)	F	20	~20	0	13	-7
5195	(DW-023-79)	M	22	22	0	20	-2
5196	(DW-024-79)	F	~20	21	1	18	-2
5197	(DW-025-79)	F	15			13	-2
5198	(DW-026-79)	F	14	~18	4	17	3
5199	(DW-027-79)	F	15			14	-1
5200	(DW-028-79)	F	>26	~25	-1	>16	-10
5201	(DW-029-79)	F	21	21	0	17	-4
5202	(DW-030-79)	F	23	~20	-3	13	-10
5203	(DW-031-79)	F	19	22	3	14	-5
5204	(DW-032-79)	F	~17	~20	3	15	-2
5205	(DW-033-79)	F	~25	~24	-1	>16	-9
5206	(DW-034-79)	F	11	10	-1	13	2
5207	(DW-035-79)	F	19	18	-1	12	-7
5208	(DW-036-79)	M	11	11	0	13	2
5209	(DW-037-79)	M	23	22	-1	22	-1
5210	(DW-038-79)	M	16	16	0	15	-1
5211	(DW-039-79)	M	9	10	1	11	2
5212	(DW-040-79)	F	~24	26	2	20	-4
5213	(DW-041-79)	F	9	8	-1	10	1
5214	(DW-042-79)	F	11	12	1	11	0
5215	(DW-043-79)	F	~24	31	7	26	2

Acqu. No.	Field No.	Sex	Age per Fay		d	ADFG	Diff.
5216	(DW-044-79)	M	21	20	-1	21	0
5217	(DW-045-79)	M	10	11	1	11	1
5218	(DW-046-79)	M	17	18	1	18	1
5219	(DW-047-79)	M	20	20	0	20	0
5220	(DW-048-79)	F	20	22	2	>13	-7
5221	(DW-059-79)	M	6	6	0	8	2
5222	(DW-060-79)	M	32	31	-1	30	-2
5223	(DW-061-79)	F	14	14	0	15	1
5224	(DW-062-79)	M	11	11	0	11	0
5225	(DW-063-79)	M	15	13	-2	13	-2
5226	(DW-064-79)	M	20	20	0	20	0
5227	(DW-065-79)	F	>14	23	9	>11	-3
5228	(DW-066-79)	F	>18	~14	-4	13	-5
5229	(DW-067-79)	M	12	13	1	13	1
5230	(DW-068-79)	M	22	21	-1	21	-1
5231	(DW-069-79)	F	18	~20	2	14	-4
5232	(DW-070-79)	M	20	21	1	21	1
5233	(DW-071-79)	F	~20	17	-3	14	-6
5234	(DW-072-79)	F	20	14	-6	12	-8
5235	(DW-073-79)	M	17	18	1	17	0
5236	(DW-074-79)	F	16	18	2	13	-3
5237	(DW-078-79)	F	~23	~22	-1	>17	-6
5238	(DW-079-79)	F	12	13	1	13	1
5239	(DW-080-79)	F	15	13	-2	12	-3
5240	(DW-081-79)	F	~23	28	5	15	-8
5241	(DW-082-79)	F	13	14	1	13	0
5242	(DW-083-79)	F	~21	21	0	12	-9
5243	(DW-084-79)	F	~22	~24	2	12	-10
5244	(DW-085-79)	F	19	~20	1	13	-6
5245	(DW-086-79)	F	~15	19	4	15	0
5246	(DW-087-79)	M	18	17	-1	17	-1
5247	(DW-088-79)	M	6	6	0	7	1
5248	(DW-089-79)	M	24	24	0	24	0
5249	(DW-090-79)	M	11	11	0	14	3
5250	(DW-091-79)	M	13	13	0	15	2
5251	(DW-092-79)	M	14	13	-1	13	-1
5252	(DW-093-79)	M	14	14	0	15	1
5253	(DW-094-79)	M	18	19	1	18	0
5254	(DW-095-79)	M	12	12	0	13	1
5255	(DW-096-79)	M	15	15	0	16	1
5256	(DW-097-79)	M	22	22	0	21	-1
5257	(DW-098-79)	M	21	21	0	22	1
5258	(DW-099-79)	M	32	32	0	32	0
5259	(DW-100-79)	F	22	25	3	>13	-9
5260	(DW-101-79)	F	10	10	0	11	1

Acqu. No.	Field No.	Sex	Age per Fay		d	ADFG	Diff.
5261	(DW-107-79)	M	7	8	1	9	2
5262	(DW-113-79)	M	20	20	0	20	0
5263	(DW-114-79)	M	18	17	-1	21	3
5264	(DW-115-79)	M	22	22	0	22	0
5265	(DW-116-79)	M	9	9	0	10	1
5266	(DW-117-79)	M	18	20	2	19	1
5267	(DW-118-79)	M	21	21	0	21	0
5268	(DW-119-79)	M	8	9	1	7	-1
5269	(DW-120-79)	M	17	15	-2	17	0
5270	(DW-121-79)	M	17	17	0	18	1
5271	(DW-122-79)	M	19	19	0	20	1
5272	(DW-123-79)	M	17	15	-2	13	-4
5273	(DW-124-79)	M	19	19	0	21	2
5274	(DW-125-79)	M	8	9	1	9	1
5275	(DW-126-79)	M	16	16	0	15	-1
5276	(DW-127-79)	M	22	22	0	22	0
5277	(DW-128-79)	M	20	19	-1	20	0
5278	(DW-130-79)	M	21	19	-2	19	-2
5279	(DW-131-79)	M	6	6	0	7	1
5280	(DW-132-79)	M	20	20	0	20	0
5281	(DW-133-79)	M	30	29	-1	24	-6
5282	(DW-134-79)	M	16	16	0	16	0
5283	(DW-135-79)	F	12	12	0	9	-3
5284	(DW-136-79)	F	19	21	2	21	2
5285	(DW-137-79)	M	12	12	0	18	6
5286	(DW-138-79)	M	~28	29	1	20	-8
5287	(DW-139-79)	M	10	9	-1	11	1
5288	(DW-140-79)	M	21	20	-1	22	1
5289	(DW-141-79)	M	27	26	-1	26	-1
5290	(DW-142-79)	M	16	16	0	17	1
5291	(DW-143-79)	M	17	17	0	17	0
5292	(DW-144-79)	F	~23	21	-2	>15	-8
5293	(DW-145-79)	F	~20			17	-3
5294	(DW-146-79)	F	12	13	1	13	1

APPENDIX B

Ages of walruses in the catch samples from Gambell, Savoonga, and Diomede, spring 1980. Ages preceded by the symbol ~ are "best estimates" as described in the text. Those preceded by the symbol > are conservative estimates in instances where the tooth appeared to be from an animal much older than the reading indicated. At center is the age determined in this study (Fay), compared at right with the age determined by inexperienced Fish and Wildlife Service personnel (FWS) and the difference (Diff.) between them.

1980 WALRUS CATCH SAMPLE (AGES FROM TEETH) -- DIOMEDE

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2	(DW-300-80)	F	24	21	-3
3	(DW-301-80)	F	18	15	-3
4	(DW-249-80)	F	14	14	0
5	(DW-299-80)	M	13	16	3
6	(DW-298-80)	F	21	14	-7
7	(DW-297-80)	F	20	12	-8
8	(DW-296-80)	F	9	10	1
9	(DW-295-80)	F	10	9	-1
10	(DW-294-80)	F	~10	9	-1
11	(DW-293-80)	F	12	11	-1
12	(DW-292-80)	F	~25	15	-10
13	(DW-291-80)	F	21	21	0
14	(DW-290-80)	F	~20	10	-10
15	(DW-289-80)	F	19	13	-6
16	(DW-288-80)	F	21	15	-6
17	(DW-287-80)	F	15	16	1
18	(DW-286-80)	F	19	14	-5
19	(DW-280-80)	M	11	14	3
20	(DW-279-80)	M	20	22	2
21	(DW-285-80)	F	8	8	0
22	(DW-284-80)	F	20	17	-3
23	(DW-283-80)	M	~30	30	0
24	(DW-277-80)	M	26	23	-3
25	(DW-276-80)	M	20	20	0
27	(DW-274-80)	F	11	13	2
30	(DW-271-80)	F	16	15	-1
31	(DW-269-80)	F	7	9	2
32	(DW-268-80)	F	9	10	1
33	(DW-267-80)	F	12	11	-1
42	(DW-257-80)	F	10	12	2
45	(DW-254-80)	F	14	11	-3
47	(DW-252-80)	F	24	15	-9
48	(DW-251-80)	F	~25	22	-3
49	(DW-250-80)	F	~33	24	-9
50	(DW-248-80)	F	32	10	-22
53	(DW-278-80)	M	10	10	0
55	(DW-247-80)	F	17	17	0
56	(DW-246-80)	F	~30	10	-20
60	(DW-241-80)	F	10	16	6
61	(DW-240-80)	F	~23	11	-12
62	(DW-239-80)	F	~ 9	11	2
63	(DW-238-80)	F	29	15	-14
64	(DW-237-80)	F	14	13	-1

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
65	(DW-236-80)	F	18	14	-4
66	(DW-235-80)	F	31	>21	-10
67	(DW-234-80)	F	11	15	4
68	(DW-233-80)	F	~9	8	-1
69	(DW-232-80)	F	16	9	-7
70	(DW-231-80)	F	19	16	-3
71	(DW-230-80)	F	14	10	-4
72	(DW-229-80)	F	10	9	-1
73	(DW-228-80)	F	>23	17	-6
86	(DW-215-80)	F	22	16	-6
91	(DW-210-80)	F	23	>15	-8
92	(DW-209-80)	F	18	11	-7
93	(DW-208-80)	F	22	14	-8
94	(DW-207-80)	F	17	12	-5
95	(DW-205-80)	M	24	20	-4
96	(DW-204-80)	M	12	13	1
97	(DW-203-80)	M	21	19	-2
98	(DW-202-80)	M	13	13	0
100	(DW-199-80)	M	14	12	-2
101	(DW-198-80)	M	13	11	-2
102	(DW-190-80)	M	21	17	-4
103	(DW-189-80)	M	19	22	3
105	(DW-186-80)	M	13	14	1
106	(DW-185-80)	M	27	32	5
107	(DW-184-80)	M	16	17	1
108	(DW-183-80)	M	27	23	-4
109	(DW-188-80)	M	17	18	1
110	(DW-182-80)	M	16	18	2
111	(DW-181-80)	M	14	15	1
112	(DW-180-80)	M	9	13	4
114	(DW-178-80)	M	16	15	-1
115	(DW-177-80)	M	18	17	-1
116	(DW-176-80)	M	19	20	1
117	(DW-175-80)	F	3	3	0
118	(DW-174-80)	F	13	9	-4
119	(DW-173-80)	F	27	21	-6
120	(DW-172-80)	F	>28	15	-13
121	(DW-171-80)	F	15	14	-1
122	(DW-170-80)	F	18	14	-4
123	(DW-169-80)	F	20	17	-3
124	(DW-168-80)	F	~12	10	-2
125	(DW-167-80)	F	17	13	-4
126	(DW-166-80)	F	25	17	-8
127	(DW-165-80)	F	25	21	-4
128	(DW-164-80)	F	>19	12	-7
129	(DW-163-80)	F	13	17	4
130	(DW-162-80)	F	15	13	-2
131	(DW-161-80)	F	13	12	-1
132	(DW-160-80)	F	8	11	3
133	(DW-159-80)	F	23	18	-5

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
135	(DW-157-80)	F	20	13	-7
136	(DW-156-80)	F	13	14	1
137	(DW-155-80)	F	15	13	-2
138	(DW-154-80)	F	16	14	-2
139	(DW-152-80)	F	27	24	-3
140	(DW-151-80)	F	~40	21	-19
141	(DW-153-80)	F	19	17	-2
142	(DW-150-80)	F	23	20	-3
143	(DW-149-80)	F	21	14	-7
144	(DW-148-80)	F	13	15	2
145	(DW-147-80)	F	12	12	0
146	(DW-146-80)	F	24	21	-3
148	(DW-144-80)	F	19	16	-3
149	(DW-143-80)	F	26	19	-7
150	(DW-142-80)	F	5	8	3
151	(DW-141-80)	F	>14	13	-1
152	(DW-140-80)	F	15	14	-1
153	(DW-139-80)	F	16	16	0
154	(DW-138-80)	F	>21	12	-9
155	(DW-137-80)	M	7	12	5
156	(DW-136-80)	M	17	17	0
157	(DW-135-80)	F	18	14	-4
158	(DW-134-80)	F	7	8	1
159	(DW-133-80)	F	11	10	-1
160	(DW-132-80)	F	12	11	-1
161	(DW-131-80)	F	~25	16	-9
162	(DW-130-80)	F	18	17	-1
163	(DW-129-80)	F	22	11	-11
164	(DW-128-80)	F	17	12	-5
165	(DW-127-80)	F	7	13	6
166	(DW-126-80)	F	21	16	-5
167	(DW-125-80)	F	~25	17	-8
168	(DW-124-80)	M	17	21	4
169	(DW-123-80)	M	13	13	0
170	(DW-122-80)	F	23	>17	-6
172	(DW-120-80)	F	22	11	-11
173	(DW-119-80)	F	17	11	-6
174	(DW-118-80)	F	21	12	-9
175	(DW-117-80)	F	21	16	-5
176	(DW-116-80)	F	18	12	-6
177	(DW-115-80)	F	13	12	-1
178	(DW-114-80)	M	24	17	-7
179	(DW-113-80)	M	27	21	-6
180	(DW-112-80)	M	18	20	2
181	(DW-111-80)	M	19	21	2

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
182	(DW-110-80)	M	17	17	0
183	(DW-109-80)	M	25	24	-1
184	(DW-108-80)	M	25	22	-3
185	(DW-107-80)	M	18	16	-2
186	(DW-106-80)	M	16	19	3
187	(DW-105-80)	M	27	25	-2
188	(DW-104-80)	M	17	18	1
189	(DW-103-80)	M	25	25	0
190	(DW-102-80)	M	27	24	-3
191	(DW-101-80)	M	23	18	-5
192	(DW-100-80)	M	21	21	0
193	(DW-200-80)	M	12	14	2
194	(DW-197-80)	F	~21	18	-3
195	(DW-196-80)	M	10	13	3
196	(DW-195-80)	M	14	18	4
197	(DW-194-80)	M	21	23	2
198	(DW-193-80)	M	14	13	-1
199	(DW-192-80)	M	9	11	2
200	(DW-191-80)	M	15	18	3
201	(DW-099-80)	M	20	18	-2
202	(DW-098-80)	M	18	20	2
203	(DW-097-80)	M	20	19	-1
204	(DW-096-80)	M	19	18	-1
205	(DW-095-80)	M	20	19	-1
206	(DW-094-80)	M	23	20	-3
207	(DW-093-80)	M	28	32	4
208	(DW-092-80)	F	27	15	-12
209	(DW-091-80)	F	14	13	-1
210	(DW-090-80)	F	17	15	-2
211	(DW-242-80)	F	~30	16	-14
212	(DW-089-80)	F	~16	20	4
213	(DW-088-80)	F	>16	13	3
214	(DW-087-80)	F	14	16	2
215	(DW-086-80)	F	22	14	-8
216	(DW-085-80)	F	10	12	2
217	(DW-084-80)	F	21	18	-3
218	(DW-083-80)	F	29	14	-15
219	(DW-082-80)	F	~20	12	-8
220	(DW-081-80)	M	25	15	-10
221	(DW-080-80)	F	21	16	-5
222	(DW-079-80)	F	17	16	-1
223	(DW-078-80)	F	17	15	-2
224	(DW-077-80)	F	17	18	1
225	(DW-076-80)	M	18	20	2
226	(DW-075-80)	M	15	17	2

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
227	(DW-074-80)	M	18	21	3
228	(DW-073-80)	F	23	16	-7
229	(DW-072-80)	F	>12	11	-1
230	(DW-071-80)	F	9	10	1
231	(DW-070-80)	F	20	13	-7
232	(DW-069-80)	F	24	15	-9
233	(DW-068-80)	M	16	16	0
234	(DW-067-80)	F	9	10	1
235	(DW-066-80)	M	14	15	1
236	(DW-065-80)	M	19	19	0
237	(DW-064-80)	M	23	20	-3
238	(DW-063-80)	F	12	13	1
239	(DW-062-80)	F	9	9	0
240	(DW-061-80)	F	10	10	0
241	(DW-060-80)	F	19	16	-3
242	(DW-059-80)	F	8	11	3
243	(DW-058-80)	F	11	20	9
244	(DW-057-80)	F	11	13	2
245	(DW-056-80)	M	15	20	5
246	(DW-055-80)	M	14	19	5
247	(DW-054-80)	M	22	23	1
248	(DW-053-80)	M	9	14	5
249	(DW-052-80)	M	20	18	-2
250	(DW-051-80)	M	24	22	-2
251	(DW-050-80)	M	8	9	1
252	(DW-049-80)	M	18	20	2
253	(DW-048-80)	M	16	19	3
254	(DW-047-80)	M	17	20	3
255	(DW-046-80)	F	17	16	-1
256	(DW-045-80)	F	13	13	0
257	(DW-044-80)	M	13	14	1
258	(DW-043-80)	M	17	18	1
259	(DW-042-80)	F	13	14	1
260	(DW-041-80)	F	>16	14	-2
262	(DW-039-80)	F	19	14	-5
264	(DW-037-80)	F	14	14	0
265	(DW-036-80)	F	~20	16	-4
267	(DW-034-80)	F	~15	12	-3
268	(DW-033-80)	M	17	21	4
269	(DW-032-80)	M	19	19	0
277	(DW-024-80)	M	12	12	0
278	(DW-023-80)	M	21	19	-2
279	(DW-022-80)	M	22	23	1
280	(DW-021-80)	M	22	23	1
281	(DW-020-80)	M	26	30	4

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
282	(DW-019-80)	M	16	19	3
283	(DW-018-80)	M	17	21	4
284	(DW-017-80)	M	22	21	-1
285	(DW-016-80)	M	20	20	0
286	(DW-015-80)	M	20	23	3
287	(DW-014-80)	M	22	19	-3
288	(DW-013-80)	M	20	17	-3
289	(DW-012-80)	M	18	17	-1
292	(DW-009-80)	M	19	16	-3
293	(DW-008-80)	F	18		
294	(DW-007-80)	F	18		
295	(DW-006-80)	F	22		
296	(DW-005-80)	F	15		
297	(DW-004-80)	F	19		
298	(DW-003-80)	F	12		

1980 WALRUS CATCH SAMPLE (AGES FROM TEETH) -- SAVOONGA

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
301	(SW-001-80)	M	21	22	1
302	(SW-002-80)	M	26	25	-1
303	(SW-003-80)	M	23	20	-3
304	(SW-004-80)	M	25	20	-5
305	(SW-005-80)	M	24	21	-3
306	(SW-006-80)	M	25	25	0
307	(SW-007-80)	M	18	24	6
308	(SW-008-80)	M	16	19	3
309	(SW-009-80)	M	21	22	1
310	(SW-010-80)	M	21	20	-1
311	(SW-011-80)	M	19	20	1
312	(SW-012-80)	M	23	15	-8
313	(SW-013-80)	F	14	9	-5
314	(SW-014-80)	M	23	21	-2
315	(SW-015-80)	M	14	15	1
316	(SW-016-80)	M	16	15	-1
317	(SW-017-80)	M	17	21	4
318	(SW-018-80)	M	18	19	1
319	(SW-019-80)	M	12	15	3
320	(SW-020-80)	F	25	14	-11
321	(SW-021-80)	M	18	17	-1
322	(SW-022-80)	M	~25	12	-13
323	(SW-023-80)	M	16	15	-1
324	(SW-024-80)	M	17	17	0
325	(SW-025-80)	F	24	17	-7
326	(SW-026-80)	M	14	15	1
327	(SW-027-80)	M	19	22	3
328	(SW-028-80)	M	20	20	0
329	(SW-029-80)	M	19	18	-1
330	(SW-030-80)	M	19	20	1
331	(SW-031-80)	M	24	22	-2
332	(SW-032-80)	M	28	20	-8
333	(SW-033-80)	M	24	21	-3
334	(SW-034-80)	M	14	15	1
335	(SW-035-80)	M	18	19	1
336	(SW-036-80)	M	14	14	0
337	(SW-037-80)	M	13	14	1
338	(SW-038-80)	M	21	20	-1
339	(SW-039-80)	M	12	13	1
340	(SW-040-80)	M	15	16	1
341	(SW-041-80)	M	15	15	0
342	(SW-042-80)	M	17	19	2
343	(SW-043-80)	M	19	18	-1

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
344	(SW-044-80)	M	16	19	3
345	(SW-045-80)	M	13	14	1
346	(SW-046-80)	M	17	16	-1
347	(SW-047-80)	M	16	18	2
348	(SW-048-80)	M	18	18	0
349	(SW-049-80)	M	23	22	-1
350	(SW-050-80)	M	23	20	-3
351	(SW-051-80)	M	21	20	-1
352	(SW-052-80)	M	10	9	-1
353	(SW-053-80)	M	17	18	1
354	(SW-054-80)	M	13	13	0
355	(SW-055-80)	M	18	19	1
356	(SW-056-80)	M	20	21	1
357	(SW-057-80)	M	21	17	-4
359	(SW-059-80)	M	25	21	-4
360	(SW-060-80)	M	13	17	4
363	(SW-063-80)	F	~20	15	-5
364	(SW-064-80)	M	15	15	0
365	(SW-065-80)	M	12	13	1
366	(SW-066-80)	F	14	12	-2
367	(SW-067-80)	M	14	16	2
368	(SW-068-80)	M	19	18	-1
369	(SW-069-80)	M	15	17	2
370	(SW-070-80)	M	14	17	3
371	(SW-071-80)	M	21	20	-1
372	(SW-072-80)	M	15	13	-2
373	(SW-073-80)	M	20	17	-3
374	(SW-074-80)	M	23	22	-1
375	(SW-075-80)	M	25	24	-1
376	(SW-076-80)	M	18	18	0
377	(SW-077-80)	M	19	20	1
378	(SW-078-80)	M	16	15	-1
379	(SW-079-80)	M	15	17	2
380	(SW-080-80)	M	21	25	4
381	(SW-081-80)	M	31	19	-12
382	(SW-082-80)	M	16	15	-1
383	(SW-083-80)	M	3	5	2
384	(SW-084-80)	M	14	16	2
385	(SW-085-80)	M	28	23	-5
386	(SW-086-80)	M	18	18	0
387	(SW-087-80)	M	11	12	1
388	(SW-088-80)	M	23	22	-1
389	(SW-089-80)	M	23	25	2
390	(SW-090-80)	M	18	20	2
391	(SW-091-80)	M	18	24	6

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
392	(SW-092-80)	M	27	22	-5
393	(SW-093-80)	M	18	19	1
394	(SW-094-80)	M	18	23	5
395	(SW-095-80)	M	26	16	-10
396	(SW-096-80)	M	16	15	-1
397	(SW-097-80)	M	17	16	-1
398	(SW-098-80)	M	26	21	-5
399	(SW-099-80)	M	18	16	-2
400	(SW-100-80)	M	15	14	-1
401	(SW-101-80)	M	18	20	2
402	(SW-102-80)	M	18	19	1
403	(SW-103-80)	F	10	9	-1
404	(SW-104-80)	M	19	19	0
405	(SW-105-80)	M	15	17	2
406	(SW-106-80)	F	12	13	1
407	(SW-107-80)	M	15	16	1
408	(SW-108-80)	M	17	20	3
409	(SW-109-80)	M	21	18	-3
410	(SW-110-80)	M	27	20	-7
411	(SW-111-80)	M	12	13	1
412	(SW-112-80)	M	25	22	-3
413	(SW-113-80)	M	17	17	0
414	(SW-114-80)	M	27	28	1
415	(SW-115-80)	M	28	24	-4
416	(SW-116-80)	M	22	25	3
417	(SW-117-80)	M	14	16	2
418	(SW-118-80)	M	12	17	5
419	(SW-119-80)	M	16	10	-6
420	(SW-120-80)	M	16	13	-3
421	(SW-121-80)	M	21	19	-2
422	(SW-122-80)	M	16	16	0
423	(SW-123-80)	M	18	22	4
424	(SW-124-80)	M	17	17	0
425	(SW-125-80)	M	7	9	2
426	(SW-126-80)	M	16	16	0
427	(SW-127-80)	M	18	17	-1
428	(SW-128-80)	M	22	18	-4
429	(SW-129-80)	M	22	23	1
430	(SW-130-80)	M	22	18	-4
431	(SW-131-80)	M	20	27	7
432	(SW-132-80)	M	8	11	3
433	(SW-133-80)	M	8	10	2
434	(SW-134-80)	M	8	11	3
435	(SW-135-80)	M	23	21	-2
436	(SW-136-80)	M	17	18	1

Acqu. No.	Field No.	Sex	Age per		Diff.
			Fay	FWS	
437	(SW-137-80)	M	19	19	0
438	(SW-138-80)	M	15	18	3
439	(SW-139-80)	M	25	33	8
440	(SW-140-80)	M	21	20	-1
441	(SW-141-80)	M	26	19	-7
442	(SW-142-80)	M	15	16	1
443	(SW-143-80)	M	10	13	3
444	(SW-144-80)	M	13	14	1
445	(SW-145-80)	M	20	17	-3
446	(SW-146-80)	M	5	5	0
447	(SW-147-80)	M	17	19	2
448	(SW-148-80)	F	21	16	-5
449	(SW-149-80)	M	18	20	2
450	(SW-150-80)	M	16	16	0
451	(SW-151-80)	M	15	16	1
452	(SW-152-80)	M	13	15	2
453	(SW-153-80)	M	18	19	1
506	(SW-206-80)	F	18	10	-8
523	(SW-223-80)	F	8	6	-2
530	(SW-230-80)	F	>14	11	-3
563	(SW-263-80)	F	19	13	-6
564	(SW-264-80)	F	22	12	-10
565	(SW-265-80)	F	17	11	-6
569	(SW-269-80)	F	17	16	-1
593	(SW-293-80)	F	20	13	-7
609	(SW-309-80)	F	20	20	0

1980 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- GAMBELL

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
636	(GW-001-80)	M	12	16	4
637	(GW-002-80)	M	22	22	0
638	(GW-003-80)	M	7	9	2
639	(GW-004-80)	M	19	16	-3
640	(GW-005-80)	F	17		
641	(GW-006-80)	F	17		
642	(GW-007-80)	F	35		
643	(GW-008-80)	F	16		
644	(GW-009-80)	F	20		
645	(GW-010-80)	F	5		
646	(GW-011-80)	F	15		
647	(GW-012-80)	F	16		
648	(GW-013-80)	F	18		
649	(GW-014-80)	F	>14		
650	(GW-015-80)	F	>13		
651	(GW-016-80)	F	12		
653	(GW-018-80)	F	16		
654	(GW-019-80)	F	22		
655	(GW-020-80)	F	24		
656	(GW-021-80)	M	15		
657	(GW-022-80)	F	31		
658	(GW-023-80)	F	12		
659	(GW-024-80)	F	12		
660	(GW-025-80)	F	20		
661	(GW-026-80)	F	12		
662	(GW-027-80)	F	12		
664	(GW-029-80)	F	14		
665	(GW-030-80)	F	21		
666	(GW-031-80)	F	15		
669	(GW-034-80)	F	10		
670	(GW-035-80)	F	23		
671	(GW-036-80)	F	13		
676	(GW-041-80)	M	17	20	3
677	(GW-042-80)	M	21	20	-1
678	(GW-043-80)	F	17		
679	(GW-044-80)	F	21		
680	(GW-045-80)	F	13		
681	(GW-046-80)	F	31		
682	(GW-047-80)	F	20		
683	(GW-048-80)	M	19	17	-2
684	(GW-049-80)	M	18	23	5
685	(GW-050-80)	M	12	13	1
686	(GW-051-80)	M	18	19	1

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
687	(GW-052-80)	F	16		
688	(GW-053-80)	F	18		
689	(GW-054-80)	F	11		
690	(GW-055-80)	F	14		
691	(GW-056-80)	F	23		
692	(GW-057-80)	F	21		
695	(GW-060-80)	F	10		
696	(GW-061-80)	M	10	11	1
697	(GW-062-80)	M	24	24	0
699	(GW-064-80)	F	14		
700	(GW-065-80)	F	20		
701	(GW-066-80)	F	26		
702	(GW-067-80)	F	20		
703	(GW-068-80)	F	15		
704	(GW-069-80)	F	16		
705	(GW-070-80)	F	20		
706	(GW-071-80)	M	16	17	1
707	(GW-072-80)	F	9		
708	(GW-073-80)	F	27		
709	(GW-074-80)	F	28		
710	(GW-075-80)	F	27		
711	(GW-076-80)	F	8		
712	(GW-077-80)	F	20		
713	(GW-078-80)	F	14		
714	(GW-079-80)	F	14		
715	(GW-080-80)	F	14		
716	(GW-081-80)	F	18		
717	(GW-082-80)	F	13		
718	(GW-083-80)	F	19		
719	(GW-084-80)	F	13		
720	(GW-085-80)	F	12		
724	(GW-089-80)	M	25	26	1
725	(GW-090-80)	M	13	16	3
726	(GW-091-80)	M	21	20	-1
727	(GW-092-80)	M	25	25	0
728	(GW-093-80)	M	14	14	0
729	(GW-094-80)	F	20		
730	(GW-095-80)	F	19		
731	(GW-096-80)	F	19		
732	(GW-097-80)	F	25		
733	(GW-098-80)	F	22		
734	(GW-099-80)	F	22		
735	(GW-100-80)	F	6		
736	(GW-101-80)	F	19		
737	(GW-102-80)	F	22		

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
738	(GW-103-80)	F	29		
739	(GW-104-80)	F	>17		
740	(GW-105-80)	F	31		
741	(GW-106-80)	F	11		
742	(GW-107-80)	F	16		
743	(GW-108-80)	F	>16		
744	(GW-109-80)	F	21		
745	(GW-110-80)	F	10		
746	(GW-111-80)	F	13		
747	(GW-112-80)	F	9		
748	(GW-113-80)	F	21		
749	(GW-114-80)	F	14		
750	(GW-115-80)	F	18		
752	(GW-117-80)	F	8		
753	(GW-118-80)	F	15		
754	(GW-119-80)	F	20		
755	(GW-120-80)	F	6		
756	(GW-121-80)	F	17		
757	(GW-122-80)	M	8	15	7
758	(GW-123-80)	F	>16		
759	(GW-124-80)	F	26		
760	(GW-125-80)	F	25		
761	(GW-126-80)	F	15		
762	(GW-127-80)	F	12		
763	(GW-128-80)	F	9		
764	(GW-129-80)	F	13		
765	(GW-130-80)	F	14		
766	(GW-131-80)	F	20		
767	(GW-132-80)	F	15		
768	(GW-133-80)	F	22		
769	(GW-134-80)	F	12		
770	(GW-135-80)	F	17		
771	(GW-136-80)	F	24		
772	(GW-137-80)	F	26		
773	(GW-138-80)	M	22	23	1
774	(GW-139-80)	M	19	23	4
775	(GW-140-80)	F	10		
777	(GW-142-80)	F	13		
778	(GW-143-80)	F	11		
779	(GW-144-80)	M	21	24	3
780	(GW-145-80)	M	20	17	-3
781	(GW-146-80)	M	19	19	0
782	(GW-147-80)	F	11		
783	(GW-148-80)	F	14		
784	(GW-149-80)	F	14		

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
785	(GW-150-80)	F	18		
786	(GW-151-80)	F	16		
787	(GW-152-80)	F	24		
788	(GW-153-80)	F	13		
789	(GW-154-80)	F	16		
790	(GW-155-80)	F	25		
791	(GW-156-80)	F	13		
792	(GW-157-80)	F	14		
793	(GW-158-80)	F	17		
794	(GW-159-80)	F	14		
795	(GW-160-80)	F	13		
796	(GW-161-80)	F	12		
797	(GW-162-80)	F	15		
798	(GW-163-80)	F	22		
799	(GW-164-80)	M	25	23	-2
800	(GW-165-80)	F	34		
801	(GW-166-80)	F	19		
802	(GW-167-80)	M	5	8	3
803	(GW-168-80)	F	21		
804	(GW-169-80)	F	31		
805	(GW-170-80)	M	13	13	0
806	(GW-171-80)	M	19	20	1
807	(GW-172-80)	M	21	25	4
808	(GW-173-80)	M	8	10	2
809	(GW-174-80)	M	8	10	2
810	(GW-175-80)	F	13		
811	(GW-176-80)	M	11	19	8
812	(GW-177-80)	M	8	10	2
813	(GW-178-80)	F	9		
814	(GW-179-80)	F	16		
815	(GW-180-80)	F	8		
816	(GW-181-80)	F	15		
817	(GW-182-80)	F	8		
818	(GW-183-80)	M	18	24	6
819	(GW-184-80)	F	18		
820	(GW-185-80)	M	19	26	7
821	(GW-186-80)	M	18	20	2
822	(GW-187-80)	F	18		
823	(GW-188-80)	M	17	21	4
824	(GW-189-80)	F	19		
826	(GW-191-80)	M	15	17	2
829	(GW-194-80)	F	16		
830	(GW-195-80)	M	23	25	2
831	(GW-196-80)	M	20	20	0
832	(GW-197-80)	F	12		

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
833	(GW-198-80)	F	13		
834	(GW-199-80)	M	23	18	-5
835	(GW-200-80)	M	26	24	-2
836	(GW-201-80)	M	19	18	-1
837	(GW-202-80)	M	6	8	2
838	(GW-203-80)	M	6	9	3
839	(GW-204-80)	F	14		
840	(GW-205-80)	F	14		
842	(GW-207-80)	M	22	24	2
843	(GW-208-80)	M	10	14	4
844	(GW-209-80)	M	14	14	0
845	(GW-210-80)	M	13	15	2
846	(GW-211-80)	M	18	16	-2
847	(GW-212-80)	F	24		
848	(GW-213-80)	F	23		
849	(GW-214-80)	F	10		
850	(GW-215-80)	F	9		
851	(GW-216-80)	F	31		
852	(GW-217-80)	F	16		
853	(GW-218-80)	F	9		
854	(GW-219-80)	F	15		
855	(GW-220-80)	F	11		
856	(GW-221-80)	F	14		
857	(GW-222-80)	F	10		
858	(GW-223-80)	M	20	20	0
859	(GW-224-80)	F	13		
860	(GW-225-80)	F	17		
861	(GW-226-80)	F	21		
862	(GW-227-80)	F	16		
863	(GW-228-80)	F	17		
864	(GW-229-80)	F	19		
935	(GW-300-80)	M	6	9	3
936	(GW-301-80)	M	18	17	-1
937	(GW-302-80)	M	12	13	1
938	(GW-303-80)	M	22	21	-1
939	(GW-304-80)	M	22	16	-6
940	(GW-305-80)	M	24	22	-2
941	(GW-306-80)	M	23	24	1
942	(GW-307-80)	M	22	21	-1
943	(GW-308-80)	M	8	10	2
944	(GW-309-80)	M	9	10	1
945	(GW-310-80)	M	22	22	0
946	(GW-311-80)	F	13		
947	(GW-312-80)	F	22		
948	(GW-313-80)	F	21		

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
949	(GW-314-80)	F	22		
951	(GW-316-80)	M	16	17	1
952	(GW-317-80)	M	9	10	1
953	(GW-318-80)	F	25		
954	(GW-319-80)	F	27		
956	(GW-321-80)	F	5		
957	(GW-322-80)	F	19		
968	(GW-333-80)	F	23		
969	(GW-334-80)	F	17		
970	(GW-335-80)	M	9	8	-1
971	(GW-336-80)	M	25	19	-6
972	(GW-337-80)	M	11	16	5
973	(GW-338-80)	M	18	20	2
974	(GW-339-80)	M	10	12	2
975	(GW-340-80)	M	16	16	0
976	(GW-341-80)	M	28	25	-3
977	(GW-342-80)	M	8	11	3
978	(GW-343-80)	F	10		
979	(GW-344-80)	F	23		
980	(GW-345-80)	M	24	20	-4

APPENDIX C

Ages of walruses in the catch samples from Gambell, Savoonga, and Diomede, spring 1981. Ages preceded by the symbol ~ are "best estimates" as described in the text. Those preceded by the symbol > are conservative estimates in instances where the tooth appeared to be from an animal much older than the reading indicated. At center is the age determined in this study (Fay), compared at right with the age determined by inexperienced Fish and Wildlife Service personnel (FWS) and the difference (Diff.) between them.

1981 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- GAMBELL

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1060	(GW-001-81)	F	22	16	-6
1061	(GW-002-81)	M	17	19	2
1062	(GW-003-81)	F	19	15	-4
1063	(GW-004-81)	F	~20	11	-9
1064	(GW-005-81)	F	24	11	-13
1065	(GW-006-81)	F	16	14	-2
1066	(GW-007-81)	F	21	12	-9
1067	(GW-008-81)	F	15	8	-7
1068	(GW-009-81)	F	17	13	-4
1069	(GW-010-81)	F	10	10	0
1070	(GW-011-81)	F	23	9	-14
1071	(GW-012-81)	F	15	12	-3
1072	(GW-013-81)	F	18	10	-8
1073	(GW-014-81)	F	8	8	0
1074	(GW-015-81)	F	22	11	-11
1075	(GW-016-81)	F	14	10	-4
1076	(GW-017-81)	F	15	14	-1
1077	(GW-018-81)	M	15	17	2
1078	(GW-019-81)	M	12	15	3
1079	(GW-020-81)	M	18	15	-3
1080	(GW-021-81)	M	19	20	1
1081	(GW-022-81)	M	21	17	-4
1082	(GW-023-81)	F	15	10	-5
1083	(GW-024-81)	F	12	11	-1
1084	(GW-025-81)	M	13	9	-4
1085	(GW-026-81)	M	28	16	-12
1086	(GW-027-81)	M	12	12	0
1087	(GW-028-81)	M	21	18	-3
1088	(GW-029-81)	F	18	10	-8
1089	(GW-030-81)	F	16	9	-7
1090	(GW-031-81)	F	13	11	-2
1091	(GW-032-81)	F	18	14	-4
1092	(GW-033-81)	F	14	11	-3
1093	(GW-034-81)	F	7	8	1
1094	(GW-035-81)	F	~15	11	-4
1095	(GW-036-81)	F	~15	10	-5
1096	(GW-037-81)	F	~15	12	-3
1097	(GW-038-81)	M	23	18	-5
1098	(GW-039-81)	M	25	22	-3
1099	(GW-040-81)	F	~18	12	-6
1100	(GW-041-81)	F	~25	11	-14
1101	(GW-042-81)	F	29	10	-19
1102	(GW-043-81)	F	20	11	-9

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1103	(GW-044-81)	F	16	15	-1
1104	(GW-045-81)	F	17	9	-8
1105	(GW-046-81)	F	~14	11	-3
1106	(GW-047-81)	M	24	21	-3
1107	(GW-048-81)	F	16	11	-5
1108	(GW-049-81)	F	13	11	-2
1109	(GW-050-81)	F	14	11	-3
1110	(GW-051-81)	F	~16	11	-5
1111	(GW-052-81)	F	~16	12	-4
1112	(GW-053-81)	F	18	12	-6
1113	(GW-054-81)	F	17	13	-4
1114	(GW-055-81)	F	13	9	-4
1115	(GW-056-81)	M	9	11	2
1116	(GW-057-81)	M	28	22	-6
1117	(GW-058-81)	M	14	14	0
1118	(GW-059-81)	M	15	14	-1
1119	(GW-060-81)	M	18	14	-4
1120	(GW-061-81)	M	27	17	-10
1121	(GW-062-81)	M	14	14	0
1122	(GW-063-81)	M	14	14	0
1123	(GW-064-81)	M	20	18	-2
1124	(GW-065-81)	M	17	15	-2
1125	(GW-066-81)	M	20	19	-1
1126	(GW-067-81)	M	14	14	0
1127	(GW-068-81)	M	26	20	-6
1128	(GW-069-81)	M	~22	17	-5
1129	(GW-070-81)	M	18	13	-5
1130	(GW-071-81)	M	21	18	-3
1131	(GW-072-81)	M	14	16	2
1132	(GW-073-81)	M	25	18	-7
1133	(GW-074-81)	M	27	16	-11
1134	(GW-075-81)	M	20	18	-2
1135	(GW-076-81)	M	9	10	1
1136	(GW-077-81)	M	21	13	-8
1137	(GW-078-81)	M	22	17	-5
1138	(GW-079-81)	M	25	18	-7
1139	(GW-080-81)	M	18	16	-2
1140	(GW-081-81)	M	16	16	0
1141	(GW-082-81)	M	11	10	-1
1142	(GW-083-81)	M	15	15	0
1143	(GW-084-81)	M	8	9	1
1144	(GW-085-81)	F	24	11	-13
1145	(GW-086-81)	F	~20	7	-13
1146	(GW-087-81)	F	14	10	-4
1147	(GW-088-81)	F	14	10	-4

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1148	(GW-089-81)	F	18	13	-5
1149	(GW-090-81)	F	15	16	1
1150	(GW-091-81)	M	24	18	-6
1151	(GW-092-81)	M	20	19	-1
1152	(GW-093-81)	M	22	19	-3
1153	(GW-094-81)	F	15	12	-3
1154	(GW-095-81)	F	13	11	-2
1155	(GW-096-81)	F	17	10	-7
1156	(GW-097-81)	M	14	14	0
1157	(GW-098-81)	M	14	16	2
1158	(GW-099-81)	M	17	19	2
1159	(GW-100-81)	F	15	10	-5
1160	(GW-101-81)	F	11	9	-2
1161	(GW-102-81)	F	11	9	-2
1162	(GW-103-81)	F	10	9	-1
1163	(GW-104-81)	F	10	11	1
1164	(GW-105-81)	F	17	10	-7
1165	(GW-106-81)	F	13	12	-1
1166	(GW-107-81)	F	10	9	-1
1167	(GW-108-81)	F	28	14	-14
1168	(GW-109-81)	M	23	19	-4
1169	(GW-110-81)	M	26	22	-4
1170	(GW-111-81)	F	11	10	-1
1171	(GW-112-81)	F	11	14	3
1172	(GW-113-81)	F	12	13	1
1173	(GW-114-81)	F	16	10	-6
1174	(GW-115-81)	F	11	9	-2
1175	(GW-116-81)	F	14	14	0
1176	(GW-117-81)	F	~19	11	-8
1177	(GW-118-81)	F	~18	11	-7
1178	(GW-119-81)	F	~19	15	-4
1179	(GW-120-81)	F	9	9	0
1180	(GW-121-81)	F	10	8	-2
1181	(GW-122-81)	F	16	10	-6
1182	(GW-123-81)	F	~13	10	-3
1183	(GW-124-81)	M	15	18	3
1184	(GW-125-81)	M	13	15	2
1185	(GW-126-81)	M	14	15	1
1186	(GW-127-81)	M	24	21	-3
1187	(GW-128-81)	M	17	15	-2
1188	(GW-129-81)	M	11	16	5
1189	(GW-130-81)	M	12	15	3
1190	(GW-131-81)	M	16	18	2
1191	(GW-132-81)	F	12	10	-2
1192	(GW-133-81)	F	17	9	-8

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1193	(GW-134-81)	F	13	10	-3
1194	(GW-135-81)	F	~20	14	-6
1195	(GW-136-81)	M	18	18	0
1196	(GW-137-81)	M	15	23	8
1197	(GW-138-81)	F	~10	8	-2
1198	(GW-139-81)	F	10	11	1
1199	(GW-140-81)	F	15	10	-5
1200	(GW-141-81)	M	7	8	1
1201	(GW-142-81)	F	14	12	-2
1202	(GW-143-81)	F	14	12	-2
1203	(GW-144-81)	F	>16	12	-4
1204	(GW-145-81)	M	20	21	1
1205	(GW-146-81)	M	14	16	2
1206	(GW-147-81)	M	23	21	-2
1208	(GW-149-81)	F	21	11	-10
1209	(GW-150-81)	M	22	21	-1
1210	(GW-151-81)	F	16	12	-4
1211	(GW-152-81)	M	21	18	-3
1212	(GW-153-81)	M	26	19	-7
1213	(GW-154-81)	F	14	12	-2
1214	(GW-155-81)	F	16	12	-4
1215	(GW-156-81)	F	14	14	0
1216	(GW-157-81)	F	15	14	-1
1217	(GW-158-81)	F	16	16	0
1219	(GW-160-81)	M	14	15	1
1220	(GW-161-81)	M	11	14	3
1221	(GW-162-81)	M	12	15	3
1222	(GW-163-81)	M	13	13	0
1223	(GW-164-81)	M	~20	18	-2
1224	(GW-165-81)	M	14	14	0
1225	(GW-166-81)	M	18	15	-3
1226	(GW-167-81)	M	19	21	2
1227	(GW-168-81)	M	18	20	2
1228	(GW-169-81)	M	27	20	-7
1230	(GW-171-81)	M	22	20	-2
1231	(GW-172-81)	M	26	23	-3
1232	(GW-173-81)	M	21	19	-2
1233	(GW-174-81)	M	24	19	-5
1234	(GW-175-81)	M	19	16	-3
1235	(GW-176-81)	M	24	16	-8

1981 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- SAVOONGA

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1236	(SW-001-81)	M	28	20	-8
1237	(SW-002-81)	M	10	12	2
1238	(SW-003-81)	M	12	12	0
1239	(SW-004-81)	M	13	14	1
1240	(SW-005-81)	M	15	16	1
1241	(SW-006-81)	M	15	18	3
1242	(SW-007-81)	M	11	11	0
1243	(SW-008-81)	M	21	15	-6
1244	(SW-009-81)	M	14	14	0
1245	(SW-010-81)	F	23	12	-11
1246	(SW-011-81)	M	9	9	0
1247	(SW-012-81)	M	23	25	2
1248	(SW-013-81)	M	20	24	4
1249	(SW-014-81)	M	26	20	-6
1250	(SW-015-81)	M	13	12	-1
1251	(SW-016-81)	M	27	13	-14
1252	(SW-017-81)	M	17	17	0
1253	(SW-018-81)	M	9	10	1
1254	(SW-019-81)	F	~30	17	-13
1255	(SW-020-81)	F	~25	9	-16
1256	(SW-021-81)	F	15	17	2
1257	(SW-022-81)	M	13	15	2
1258	(SW-023-81)	F	17	11	-6
1259	(SW-024-81)	F	23	11	-12
1260	(SW-025-81)	F	12	10	-2
1261	(SW-026-81)	M	13	14	1
1262	(SW-027-81)	M	21	18	-3
1263	(SW-028-81)	F	23	16	-7
1264	(SW-029-81)	F	16	16	0
1265	(SW-030-81)	M	22	18	-4
1266	(SW-031-81)	M	17	18	1
1267	(SW-032-81)	M	13	16	3
1268	(SW-033-81)	M	26	23	-3
1269	(SW-034-81)	M	16	17	1
1270	(SW-035-81)	M	19	20	1
1271	(SW-036-81)	M	19	14	-5
1272	(SW-037-81)	M	15	17	2
1273	(SW-038-81)	M	26	26	0
1274	(SW-039-81)	M	22	14	-8
1275	(SW-040-81)	F	11	12	1
1276	(SW-041-81)	F	12	9	-3
1277	(SW-042-81)	M	8	9	1
1278	(SW-043-81)	M	18	18	0

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1279	(SW-044-81)	M	17	18	1
1280	(SW-045-81)	M	16	15	-1
1281	(SW-046-81)	M	12	12	0
1282	(SW-047-81)	M	17	17	0
1283	(SW-048-81)	M	15	14	-1
1284	(SW-049-81)	M	16	15	-1
1285	(SW-050-81)	M	14	14	0
1286	(SW-051-81)	M	23	20	-3
1287	(SW-052-81)	M	16	16	0
1288	(SW-053-81)	M	14	15	1
1289	(SW-054-81)	M	18	17	-1
1290	(SW-055-81)	M	17	18	1
1291	(SW-056-81)	M	15	19	4
1292	(SW-057-81)	M	23	23	0
1293	(SW-058-81)	M	25	19	-6
1294	(SW-059-81)	M	18	19	1
1295	(SW-060-81)	M	21	16	-5
1296	(SW-061-81)	M	10	7	-3
1297	(SW-062-81)	M	11	9	-2
1298	(SW-063-81)	M	11	11	0
1299	(SW-064-81)	M	13	13	0
1300	(SW-065-81)	M	22	21	-1
1301	(SW-066-81)	M	16	21	5
1302	(SW-067-81)	F	8	7	-1
1303	(SW-068-81)	F	16	10	-6
1304	(SW-069-81)	M	~26	16	-10
1305	(SW-070-81)	F	14	10	-4
1306	(SW-071-81)	M	21	23	2
1307	(SW-072-81)	M	21	18	-3
1308	(SW-073-81)	F	14	12	-2
1309	(SW-074-81)	M	22	18	-4
1310	(SW-075-81)	M	12	13	1
1311	(SW-076-81)	F	9	7	-2
1312	(SW-077-81)	F	12	10	-2
1313	(SW-078-81)	F	10	6	-4
1314	(SW-079-81)	F	12	11	-1
1315	(SW-080-81)	F	18	14	-4
1316	(SW-081-81)	F	~16	13	-3
1317	(SW-082-81)	F	13	11	-2
1318	(SW-083-81)	F	11	9	-2
1319	(SW-084-81)	F	12	11	-1
1320	(SW-085-81)	F	12	8	-4
1321	(SW-086-81)	F	~28	12	-16
1322	(SW-087-81)	F	15	13	-2
1323	(SW-088-81)	M	16	18	2

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1324	(SW-089-81)	M	21	18	-3
1325	(SW-090-81)	M	13	12	-1
1326	(SW-091-81)	M	20	21	1
1327	(SW-092-81)	M	20	20	0
1328	(SW-093-81)	M	20	19	-1
1329	(SW-094-81)	M	20	16	-4
1330	(SW-095-81)	M	20	17	-3
1331	(SW-096-81)	F	11	9	-2
1332	(SW-097-81)	F	21	10	-11
1333	(SW-098-81)	F	13	11	-2
1334	(SW-099-81)	F	9	8	-1
1335	(SW-100-81)	F	12	6	-6
1336	(SW-101-81)	M	13	14	1
1337	(SW-102-81)	M	18	17	-1
1338	(SW-103-81)	M	13	14	1
1339	(SW-104-81)	F	≤13	14	1
1340	(SW-105-81)	M	12	13	1
1341	(SW-106-81)	M	25	13	-12
1342	(SW-107-81)	M	12	13	1
1343	(SW-108-81)	M	15	15	0
1344	(SW-109-81)	M	24	19	-5
1345	(SW-110-81)	M	19	17	-2
1346	(SW-111-81)	M	19	16	-3
1347	(SW-112-81)	F	9	9	0
1348	(SW-113-81)	F	11	11	0
1349	(SW-114-81)	F	18	8	-10
1350	(SW-115-81)	F	17	9	-8
1351	(SW-116-81)	F	17	8	-9
1352	(SW-117-81)	F	15	9	-6
1353	(SW-118-81)	M	24	18	-6
1354	(SW-119-81)	M	12	14	2
1355	(SW-120-81)	F	15	10	-5
1356	(SW-121-81)	F	11	7	-4
1357	(SW-122-81)	F	≤15	10	-5
1358	(SW-123-81)	F	10	8	-2
1359	(SW-124-81)	F	23	24	1
1360	(SW-125-81)	M	10	10	0
1361	(SW-126-81)	M	16	14	-2
1362	(SW-127-81)	F	10	10	0
1363	(SW-128-81)	M	9	12	3
1364	(SW-129-81)	M	10	12	2
1365	(SW-130-81)	M	10	11	1
1366	(SW-131-81)	F	≤20	9	-11
1367	(SW-132-81)	F	18	13	-5
1368	(SW-133-81)	M	22	16	-6

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1369	(SW-134-81)	F	11	9	-2
1370	(SW-135-81)	M	16	11	-5
1371	(SW-136-81)	M	15	11	-4
1372	(SW-137-81)	M	11	13	2
1373	(SW-138-81)	M	12	12	0
1374	(SW-139-81)	M	16	15	-1
1375	(SW-140-81)	M	21	18	-3
1376	(SW-141-81)	M	14	16	2
1377	(SW-142-81)	M	18	15	-3
1378	(SW-143-81)	M	10	10	0
1379	(SW-144-81)	M	14	14	0
1380	(SW-145-81)	M	12	12	0
1381	(SW-146-81)	M	12	13	1
1382	(SW-147-81)	M	22	20	-2
1383	(SW-148-81)	M	18	14	-4
1384	(SW-149-81)	F	12	9	-3
1385	(SW-150-81)	F	7	7	0
1386	(SW-151-81)	F	16	14	-2
1387	(SW-152-81)	F	13	12	-1
1388	(SW-153-81)	F	14	10	-4
1389	(SW-154-81)	F	~20	12	-8
1390	(SW-155-81)	F	11	9	-2
1391	(SW-156-81)	F	17	8	-9
1392	(SW-157-81)	F	12	9	-3
1393	(SW-158-81)	F	10	11	1
1394	(SW-159-81)	F	17	13	-4
1395	(SW-160-81)	F	17	9	-8
1396	(SW-161-81)	F	16	10	-6
1397	(SW-162-81)	F	13	8	-5
1398	(SW-163-81)	F	20	10	-10
1399	(SW-164-81)	F	10	9	-1
1400	(SW-165-81)	F	8	7	-1
1401	(SW-166-81)	F	15	12	-3
1402	(SW-167-81)	F	10	8	-2
1403	(SW-168-81)	F	6	6	0
1404	(SW-169-81)	F	13	8	-5
1405	(SW-170-81)	F	10	8	-2
1406	(SW-171-81)	F	20	15	-5
1407	(SW-172-81)	F	12	8	-4
1408	(SW-173-81)	F	19	10	-9
1409	(SW-174-81)	F	23	10	-13
1410	(SW-175-81)	F	12	10	-2
1412	(SW-177-81)	F	11	8	-3
1413	(SW-178-81)	F	10	10	0
1414	(SW-179-81)	F	23	15	-8

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1415	(SW-180-81)	F	10	6	-4
1416	(SW-181-81)	F	11	10	-1
1417	(SW-182-81)	F	11	9	-2
1418	(SW-183-81)	F	≤15	8	-7
1419	(SW-184-81)	F	10	8	-2
1420	(SW-185-81)	F	14	8	-6
1421	(SW-186-81)	F	20	12	-8
1422	(SW-187-81)	F	15	9	-6
1423	(SW-188-81)	F	13	12	-1
1424	(SW-189-81)	F	14	11	-3
1425	(SW-190-81)	F	32	10	-22
1426	(SW-191-81)	F	18	10	-8
1427	(SW-192-81)	F	23	15	-8
1428	(SW-193-81)	F	≤25	14	-11
1429	(SW-194-81)	F	26	17	-9
1430	(SW-195-81)	F	17	12	-5
1431	(SW-196-81)	F	27	11	-16
1432	(SW-197-81)	F	11	10	-1
1433	(SW-198-81)	F	13	9	-4
1434	(SW-199-81)	F	23	13	-10
1435	(SW-200-81)	F	12	10	-2
1436	(SW-201-81)	F	>25	10	-15
1437	(SW-202-81)	F	>15	11	-4

1981 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- DIOMEDE

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1438	(DW-001-81)	F	16	13	-3
1439	(DW-002-81)	M	18	17	-1
1440	(DW-003-81)	M	13	14	1
1441	(DW-004-81)	M	15	14	-1
1442	(DW-005-81)	F	17	12	-5
1443	(DW-006-81)	F	~18	10	-8
1444	(DW-007-81)	F	21	10	-11
1445	(DW-008-81)	F	12	7	-5
1446	(DW-009-81)	F	15	9	-6
1447	(DW-010-81)	M	11	11	0
1448	(DW-011-81)	M	11	9	-2
1449	(DW-012-81)	F	12	10	-2
1450	(DW-013-81)	F	26	14	-12
1451	(DW-014-81)	F	24	14	-10
1452	(DW-105-81)	F	18	11	-7
1453	(DW-016-81)	F	14	10	-4
1454	(DW-017-81)	F	15	12	-3
1455	(DW-018-81)	F	15	9	-6
1456	(DW-019-81)	F	15	10	-5
1457	(DW-020-81)	F	18	16	-2
1458	(DW-021-81)	F	12	7	-5
1459	(DW-022-81)	F	10	8	-2
1460	(DW-023-81)	F	15	12	-3
1461	(DW-024-81)	F	9	8	-1
1462	(DW-025-81)	F	20	9	-11
1463	(DW-026-81)	F	18	10	-8
1464	(DW-027-81)	F	8	6	-2
1465	(DW-028-81)	F	9	8	-1
1466	(DW-029-81)	M	23	22	-1
1467	(DW-030-81)	M	9	12	3
1468	(DW-031-81)	F	11	8	-3
1469	(DW-032-81)	M	16	18	2
1470	(DW-033-81)	M	20	20	0
1471	(DW-034-81)	F	15	11	-4
1472	(DW-035-81)	M	23	21	-2
1473	(DW-036-81)	M	16	17	1
1474	(DW-037-81)	M	12	14	2
1475	(DW-038-81)	F	20	11	-9
1476	(DW-039-81)	F	14	11	-3
1477	(DW-040-81)	F	~20	11	-9
1478	(DW-041-81)	F	12	9	-3
1479	(DW-042-81)	F	13	15	2
1480	(DW-043-81)	F	12	7	-5

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1481	(DW-044-81)	F	9	7	-2
1482	(DW-045-81)	F	19	10	-9
1483	(DW-046-81)	M	13	15	2
1484	(DW-047-81)	F	14	7	-7
1485	(DW-048-81)	F	15	12	-3
1486	(DW-049-81)	F	15	11	-4
1487	(DW-050-81)	M	6	7	1
1488	(DW-051-81)	F	16	13	-3
1489	(DW-052-81)	F	9	8	-1
1490	(DW-053-81)	F	9	6	-3
1491	(DW-054-81)	F	~21	7	-14
1492	(DW-055-81)	F	15	12	-3
1493	(DW-056-81)	F	11	10	-1
1494	(DW-057-81)	F	~20	7	-13
1495	(DW-058-81)	F	17	9	-8
1496	(DW-059-81)	F	12	8	-4
1497	(DW-060-81)	F	13	11	-2
1498	(DW-061-81)	F	14	11	-3
1499	(DW-062-81)	F	13	9	-4
1500	(DW-063-81)	F	9	8	-1
1501	(DW-064-81)	F	>16	9	-7
1502	(DW-065-81)	F	26	8	-18
1503	(DW-066-81)	F	10	9	-1
1504	(DW-067-81)	M	21	16	-5
1505	(DW-068-81)	F	21	13	-8
1506	(DW-069-81)	M	7	9	2
1507	(DW-070-81)	F	12	11	-1
1508	(DW-071-81)	F	>12	9	-3
1509	(DW-072-81)	F	17	10	-7
1510	(DW-073-81)	F	17	9	-8
1511	(DW-074-81)	F	21	12	-9
1512	(DW-075-81)	F	~20	9	-11
1513	(DW-076-81)	M	19	14	-5
1514	(DW-077-81)	M	18	15	-3
1515	(DW-078-81)	F	11	7	-4
1516	(DW-079-81)	F	16	9	-7
1517	(DW-080-81)	F	20	11	-9
1518	(DW-081-81)	F	15	13	-2
1519	(DW-082-81)	M	22	17	-5
1520	(DW-083-81)	F	8	6	-2
1521	(DW-084-81)	F	~18	11	-7
1522	(DW-085-81)	F	~25	13	-12
1523	(DW-086-81)	F	14	11	-3
1524	(DW-087-81)	F	10	7	-3
1525	(DW-088-81)	F	16	11	-5

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1526	(GW-089-81)	F	33	10	-23
1527	(DW-090-81)	F	~21	11	-10
1528	(DW-091-81)	F	>14	10	-4
1529	(DW-092-81)	F	16	10	-6
1530	(DW-093-81)	F	16	14	-2
1531	(DW-094-81)	M	18	18	0
1532	(DW-095-81)	F	18	11	-7
1533	(DW-096-81)	F	15	11	-4
1534	(DW-097-81)	F	8	6	-2
1535	(DW-098-81)	F	18	13	-5
1536	(DW-099-81)	F	20	14	-6
1537	(DW-100-81)	F	8	6	-2
1538	(DW-101-81)	M	6	8	2
1539	(DW-102-81)	F	24	12	-12
1540	(DW-103-81)	F	13	11	-2
1541	(DW-104-81)	F	13	8	-5
1542	(DW-105-81)	F	28	6	-22
1543	(DW-106-81)	F	19	11	-8
1544	(DW-107-81)	F	12	8	-4
1545	(DW-108-81)	F	17	15	-2
1546	(DW-109-81)	F	8	10	2
1547	(DW-110-81)	F	8	8	0
1548	(DW-111-81)	F	14	12	-2
1549	(DW-112-81)	F	11	12	1
1550	(DW-113-81)	F	10	11	1
1551	(DW-114-81)	F	~15	11	-4
1552	(DW-115-81)	F	13	12	-1
1553	(DW-116-81)	F	11	10	-1
1554	(DW-117-81)	F	13	11	-2
1555	(DW-118-81)	F	21	13	-8
1556	(DW-119-81)	F	12	10	-2
1557	(DW-120-81)	M	10	10	0
1558	(DW-121-81)	F	14	11	-3
1559	(DW-122-81)	F	9	8	-1
1560	(DW-123-81)	F	11	10	-1
1561	(DW-124-81)	F	10	7	-3
1562	(DW-125-81)	F	11	9	-2
1563	(DW-126-81)	F	10	7	-3
1564	(DW-127-81)	F	12	8	-4
1565	(DW-128-81)	F	32	12	-20
1566	(DW-129-81)	F	13	7	-6
1567	(DW-130-81)	F	>22	10	-12
1568	(DW-131-81)	M	~30	18	-12
1569	(DW-132-81)	F	>20	11	-9
1570	(DW-133-81)	F	~23	12	-11

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1571	(DW-134-81)	F	12	11	-1
1572	(DW-135-81)	F	26	11	-15
1573	(DW-136-81)	F	18	15	-3
1574	(DW-137-81)	M	29	15	-14
1575	(DW-138-81)	F	28	16	-12
1576	(DW-139-81)	F	6	7	1
1577	(DW-140-81)	M	17	17	0
1578	(DW-141-81)	M	11	13	2
1579	(DW-142-81)	M	11	13	2
1580	(DW-143-81)	M	15	17	2
1581	(DW-144-81)	M	11	11	0
1582	(DW-145-81)	F	15	10	-5
1583	(DW-146-81)	M	13	11	-2
1584	(DW-147-81)	F	13	11	-2
1585	(DW-148-81)	M	11	11	0
1586	(DW-149-81)	M	15	14	-1
1587	(DW-150-81)	F	12	12	0
1588	(DW-151-81)	F	10	7	-3
1589	(DW-152-81)	F	13	10	-3
1590	(DW-153-81)	F	14	8	-6
1591	(DW-154-81)	F	11	10	-1
1592	(DW-155-81)	F	9	6	-3
1593	(DW-156-81)	F	12	10	-2
1594	(DW-157-81)	F	18	10	-8
1595	(DW-158-81)	F	18	13	-5
1596	(DW-159-81)	M	17	16	-1
1597	(DW-160-81)	F	8	7	-1
1598	(DW-161-81)	F	29	15	-14
1599	(DW-162-81)	F	14	11	-3
1600	(DW-163-81)	F	30	13	-17
1601	(DW-164-81)	F	22	13	-9
1602	(DW-165-81)	F	10	9	-1
1603	(DW-166-81)	M	9	10	1
1604	(DW-167-81)	F	15	14	-1
1605	(DW-168-81)	M	9	9	0
1606	(DW-169-81)	F	14	9	-5
1607	(DW-170-81)	M	12	9	-3
1608	(DW-171-81)	F	14	11	-3
1609	(DW-172-81)	F	13	8	-5
1610	(DW-173-81)	F	10	7	-3
1611	(DW-174-81)	F	9	7	-2
1612	(DW-175-81)	F	6	6	0
1613	(DW-176-81)	F	9	7	-2
1614	(DW-177-81)	F	12	11	-1
1615	(DW-178-81)	F	9	8	-1

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1616	(DW-179-81)	F	~26	10	-16
1617	(DW-180-81)	M	9	10	1
1618	(DW-181-81)	F	23	10	-13
1619	(DW-182-81)	M	11	11	0
1620	(DW-183-81)	F	~20	10	-10
1621	(DW-184-81)	F	23	11	-12
1622	(DW-185-81)	M	9	9	0
1623	(DW-186-81)	F	18	10	-8
1624	(DW-187-81)	F	>12	10	-2
1625	(DW-188-81)	F	11	10	-1
1626	(DW-189-81)	F	~16	9	-7
1627	(DW-190-81)	M	10	9	-1
1628	(DW-191-81)	M	24	17	-7
1629	(DW-192-81)	M	14	13	-1
1630	(DW-193-81)	M	10	10	0
1631	(DW-194-81)	M	18	21	3
1632	(DW-195-81)	M	10	11	1
1633	(DW-196-81)	M	14	15	1
1634	(DW-197-81)	M	10	10	0
1635	(DW-198-81)	M	8	8	0
1636	(DW-199-81)	M	10	11	1
1637	(DW-200-81)	F	12	10	-2
1638	(DW-201-81)	M	22	19	-3
1640	(DW-203-81)	M	12	14	2
1642	(DW-205-81)	M	11	12	1
1643	(DW-206-81)	M	17	14	-3
1644	(DW-207-81)	M	11	11	0
1645	(DW-208-81)	M	13	15	2

APPENDIX D

Ages of walruses in the catch samples from Gambell, Savoonga, and Diomede, spring 1982. Ages preceded by the symbol ~ are "best estimates" as described in the text. Those preceded by the symbol > are conservative estimates in instances where the tooth appeared to be from an animal much older than the reading indicated. At center is the age determined in this study (Fay), compared at right with the age determined by inexperienced Fish and Wildlife Service personnel (FWS) and the difference (Diff.) between them.

1982 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- GAMBELL

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1783	(GW-001-82)	M	19	20	1
1784	(GW-002-82)	M	17	19	2
1785	(GW-003-82)	M	26	25	-1
1786	(GW-004-82)	M	21	21	0
1787	(GW-005-82)	M	23	21	-2
1788	(GW-006-82)	M	19	20	1
1789	(GW-007-82)	M	17	19	2
1790	(GW-008-82)	M	21	23	2
1791	(GW-009-82)	M	23	22	-1
1792	(GW-010-82)	M	18	19	1
1793	(GW-011-82)	M	26	23	-3
1795	(GW-013-82)	M	12	13	1
1796	(GW-014-82)	F	18	16	-2
1797	(GW-015-82)	F	16	18	2
1798	(GW-016-82)	F	9	12	3
1799	(GW-017-82)	F	13	15	2
1800	(GW-018-82)	F	18	14	-4
1802	(GW-020-82)	F	>19	12	-7
1803	(GW-021-82)	F	16	15	-1
1804	(GW-022-82)	M	22	20	-2
1805	(GW-023-82)	M	8	12	4
1806	(GW-024-82)	M	23	22	-1
1807	(GW-025-82)	F	14	11	-3
1808	(GW-026-82)	M	20	23	3
1809	(GW-027-82)	M	25	25	0
1810	(GW-028-82)	M	20	21	1
1811	(GW-029-82)	M	23	24	1
1812	(GW-030-82)	F	15	14	-1
1813	(GW-031-82)	F	25	16	-9
1814	(GW-032-82)	M	20	25	5
1815	(GW-033-82)	M	18	21	3
1816	(GW-034-82)	M	25	27	2
1817	(GW-035-82)	M	29	26	-3
1818	(GW-036-82)	M	21	23	2
1819	(GW-037-82)	F	14	14	0
1820	(GW-038-82)	F	14	17	3
1821	(GW-039-82)	F	14	16	2
1822	(GW-040-82)	F	15	17	2
1823	(GW-041-82)	F	11	12	1
1824	(GW-042-82)	F	≤16	16	0
1825	(GW-043-82)	F	15	15	0
1826	(GW-044-82)	F	17	14	-3
1827	(GW-045-82)	F	13	15	2

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1828	(GW-046-82)	F	12	10	-2
1829	(GW-047-82)	F	16	13	-3
1830	(GW-048-82)	M	30	27	-3
1831	(GW-049-82)	M	13	19	6
1832	(GW-050-82)	F	20	15	-5
1834	(GW-052-82)	F	≤24	15	-9
1835	(GW-053-82)	F	19	17	-2
1836	(GW-054-82)	F	13	12	-1
1837	(GW-055-82)	M	23	23	0
1838	(GW-056-82)	F	≤15	14	-1
1839	(GW-057-82)	F	>15	12	-3
1841	(GW-059-82)	F	10	14	4
1842	(GW-060-82)	F	≤21	15	-6
1843	(GW-061-82)	F	18	15	-3
1844	(GW-062-82)	F	13	14	1
1845	(GW-063-82)	F	13	14	1
1846	(GW-064-82)	F	23	16	-7
1847	(GW-065-82)	F	10	12	2
1849	(GW-067-82)	M	18	21	3
1850	(GW-068-82)	F	21	11	-10
1851	(GW-069-82)	M	19	13	-6
1853	(GW-071-82)	F	19	19	0
1854	(GW-072-82)	F	27	17	-10
1855	(GW-073-82)	F	18	17	-1
1856	(GW-074-82)	F	12	14	2
1857	(GW-075-82)	M	11	12	1
1858	(GW-076-82)	F	32	17	-15
1859	(GW-077-82)	F	18	14	-4
1860	(GW-078-82)	F	16	14	-2
1861	(GW-079-82)	F	14	14	0
1862	(GW-080-82)	F	28	14	-14
1863	(GW-081-82)	F	10	13	3
1864	(GW-082-82)	F	11	12	1
1865	(GW-083-82)	F	16	9	-7
1868	(GW-086-82)	F	15	11	-4
1869	(GW-087-82)	F	≤23	15	-8
1870	(GW-088-82)	M	19	19	0
1871	(GW-089-82)	F	7	7	0
1872	(GW-090-82)	F	24	18	-6
1873	(GW-091-82)	F	22	18	-4
1874	(GW-092-82)	F	11	15	4
1875	(GW-093-82)	F	20	15	-5
1876	(GW-094-82)	F	13	16	3
1878	(GW-096-82)	F	9	12	3
1879	(GW-097-82)	M	16	16	0

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1880	(GW-098-82)	M	22	22	0
1881	(GW-099-82)	M	16	22	6
1882	(GW-100-82)	M	24	21	-3
1883	(GW-101-82)	M	23	25	2
1884	(GW-102-82)	F	24	17	-7
1885	(GW-103-82)	F	24	12	-12
1886	(GW-104-82)	F	12	10	-2
1887	(GW-105-82)	F	13	11	-2
1888	(GW-106-82)	F	11	14	3
1889	(GW-107-82)	F	18	15	-3
1890	(GW-108-82)	F	15	17	2
1891	(GW-109-82)	F	19	15	-4
1892	(GW-110-82)	M	20	19	-1
1893	(GW-111-82)	F	16	14	-2
1894	(GW-112-82)	F	14	15	1
1895	(GW-113-82)	F	21	13	-8
1896	(GW-114-82)	M	15	18	3
1897	(GW-115-82)	M	14	18	4
1898	(GW-116-82)	M	14	21	7
1899	(GW-117-82)	F	11	12	1
1900	(GW-118-82)	F	~15	11	-4
1901	(GW-119-82)	F	~19	12	-7
1902	(GW-120-82)	F	11	12	1
1903	(GW-121-82)	F	14	13	-1
1904	(GW-122-82)	F	22	22	0
1905	(GW-123-82)	F	~17	16	-1
1906	(GW-124-82)	F	~18	16	-2
1907	(GW-125-82)	F	10	10	0
1908	(GW-126-82)	M	10	12	2
1909	(GW-127-82)	M	28	29	1
1910	(GW-128-82)	F	20	13	-7
1951	(GW-051-82)	F	~20	13	-7
1952	(GW-058-82)	F	16	16	0
1953	(GW-129-82)	M	19	26	7
1954	(GW-130-82)	F	19	18	-1
1955	(GW-131-82)	F	~28	13	-15
1956	(GW-132-82)	M	6	14	8
1957	(GW-133-82)	F	19	13	-6
1958	(GW-134-82)	F	~20	18	-2
1959	(GW-135-82)	F	~14	15	1
1960	(GW-136-82)	F	13	12	-1
1961	(GW-137-82)	F	~19	19	0
1962	(GW-138-82)	M	21	24	3
1963	(GW-139-82)	F	14	13	-1
1964	(GW-140-82)	F	12	14	2

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
1965	(GW-141-82)	F	15	16	1
1966	(GW-142-82)	F	21	14	-7
1967	(GW-143-82)	F	12	15	3
1968	(GW-144-82)	F	10	15	5
1969	(GW-145-82)	F	13	14	1
1970	(GW-146-82)	F	20	21	1
1973	(GW-149-82)	F	13	14	1
1974	(GW-150-82)	F	~24	17	-7
1975	(GW-151-82)	F	15	10	-5
1976	(GW-152-82)	F	23	16	-7
1977	(GW-153-82)	F	21	14	-7
1978	(GW-154-82)	M	25	26	1
1979	(GW-155-82)	M	20	22	2
1980	(GW-156-82)	M	22	22	0
1981	(GW-157-82)	F	14	13	-1
1982	(GW-158-82)	F	16	13	-3
1983	(GW-159-82)	F	14	13	-1
1984	(GW-160-82)	M	23	22	-1
1985	(GW-161-82)	F	16	15	-1
1986	(GW-162-82)	M	20	22	2
1987	(GW-163-82)	F	12	14	2
1988	(GW-164-82)	F	13	16	3
1989	(GW-165-82)	F	12	9	-3
1990	(GW-166-82)	F	>25	11	-14
1991	(GW-167-82)	F	19	14	-5
1993	(GW-169-82)	F	24	15	-9
1995	(GW-171-82)	F	23	13	-10
1997	(GW-173-82)	M	31	33	2
1998	(GW-174-82)	F	19	15	-4
1999	(GW-175-82)	F	~15	14	-1
2000	(GW-176-82)	F	23	14	-9
2001	(GW-177-82)	F	~16	13	-3
2002	(GW-178-82)	F	13	14	1
2004	(GW-180-82)	M	14	14	0
2005	(GW-181-82)	F	~25	16	-9
2006	(GW-182-82)	F	16	13	-3
2007	(GW-183-82)	F	16	14	-2
2008	(GW-184-82)	F	11	15	4
2009	(GW-185-82)	F	17	20	3
2010	(GW-186-82)	M	24	25	1
2011	(GW-187-82)	F	15	16	1
2012	(GW-188-82)	M	23	25	2
2013	(GW-189-82)	F	~20	16	-4
2014	(GW-190-82)	M	20	18	-2
2015	(GW-191-82)	F	~25	13	-12

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2016	(GW-192-82)	F	21	14	-7
2017	(GW-193-82)	F	15	14	-1
2018	(GW-194-82)	M	27	29	2
2019	(GW-195-82)	F	10	12	2
2020	(GW-196-82)	M	16	18	2
2021	(GW-197-82)	M	16	16	0
2022	(GW-198-82)	M	23	26	3
2023	(GW-199-82)	M	25	25	0
2024	(GW-200-82)	F	8	9	1
2025	(GW-201-82)	M	9	10	1
2026	(GW-202-82)	M	14	16	2
2027	(GW-203-82)	M	10	12	2
2028	(GW-204-82)	F	23	16	-7
2029	(GW-205-82)	F	23	17	-6
2030	(GW-206-82)	M	22	23	1
2031	(GW-207-82)	F	13	12	-1
2032	(GW-208-82)	F	22	15	-7
2033	(GW-209-82)	M	10	13	3
2034	(GW-210-82)	M	12	13	1
2035	(GW-211-82)	F	~19	15	-4
2036	(GW-212-82)	F	13	13	0
2037	(GW-213-82)	F	~27	12	-15
2038	(GW-214-82)	F	11	12	1
2039	(GW-215-82)	M	15	14	-1
2040	(GW-216-82)	F	13	17	4
2041	(GW-217-82)	M	25	17	-8
2042	(GW-218-82)	M	10	11	1
2043	(GW-219-82)	F	20	15	-5
2044	(GW-220-82)	F	13	12	-1
2045	(GW-221-82)	F	14	12	-2
2046	(GW-222-82)	F	14	14	0
2047	(GW-223-82)	M	21	23	2
2048	(GW-224-82)	M	24	25	1
2049	(GW-225-82)	M	22	24	2
2050	(GW-226-82)	M	16	16	0
2051	(GW-227-82)	M	19	21	2
2052	(GW-228-82)	M	23	21	-2
2053	(GW-229-82)	M	25	26	1
2054	(GW-230-82)	M	15	17	2
2055	(GW-231-82)	F	~25	13	-12
2056	(GW-232-82)	F	18	12	-6
2057	(GW-233-82)	M	22	22	0
2058	(GW-234-82)	M	23	25	2
2059	(GW-235-82)	M	25	24	-1
2060	(GW-237-82)	F	15	12	-3
2061	(GW-238-82)	F	14	12	-2

1982 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- SAVOONGA

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2177	(SW-001-82)	F	16	15	-1
2178	(SW-002-82)	F	20	17	-3
2179	(SW-003-82)	F	~24	14	-10
2180	(SW-004-82)	F	~30	20	-10
2181	(SW-005-82)	F	~20		
2182	(SW-006-82)	F	12		
2183	(SW-007-82)	M	22		
2184	(SW-008-82)	M	23		
2185	(SW-009-82)	F	12	14	2
2186	(SW-010-82)	F	~16		
2187	(SW-011-82)	F	22		
2188	(SW-012-82)	F	~20	20	0
2189	(SW-013-82)	F	9	11	2
2190	(SW-014-82)	F	18	19	1
2192	(SW-016-82)	F	29	19	-10
2193	(SW-017-82)	F	21	19	-2
2194	(SW-018-82)	M	8	10	2
2195	(SW-019-82)	F	10	12	2
2196	(SW-020-82)	F	19	14	-5
2197	(SW-021-82)	F	24	20	-4
2198	(SW-022-82)	F	13	13	0
2199	(SW-023-82)	F	29	13	-16
2200	(SW-024-82)	F	15	13	-2
2201	(SW-025-82)	F	27	19	-8
2203	(SW-027-82)	F	25	17	-8
2204	(SW-028-82)	F	~28	19	-9
2205	(SW-029-82)	F	12	14	2
2206	(SW-030-82)	F	17		
2207	(SW-031-82)	F	21	16	-5
2209	(SW-033-82)	F	~19	13	-6
2210	(SW-034-82)	F	12	13	1
2211	(SW-035-82)	F	14	16	2
2212	(SW-036-82)	M	18	18	0
2213	(SW-037-82)	F	6	11	5
2214	(SW-038-82)	M	15	16	1
2215	(SW-039-82)	F	5	11	6
2216	(SW-040-82)	M	21	21	0
2217	(SW-041-82)	M	21	22	1
2218	(SW-042-82)	F	32	30	-2
2219	(SW-043-82)	F	14	17	3
2220	(SW-044-82)	F	~23	13	-10
2221	(SW-045-82)	F	32	31	-1
2222	(SW-046-82)	F	19	13	-6

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2223	(SW-047-82)	M	10	10	0
2224	(SW-048-82)	M	11	12	1
2225	(SW-049-82)	F	~25	13	-12
2226	(SW-050-82)	F	17	22	5
2227	(SW-051-82)	F	16	18	2
2228	(SW-052-82)	F	>16	14	-2
2229	(SW-053-82)	F	32	15	-17
2230	(SW-054-82)	M	19	15	-4
2231	(SW-055-82)	M	11	20	9
2232	(SW-056-82)	M	12	12	0
2233	(SW-057-82)	M	9	11	2
2234	(SW-058-82)	M	8	11	3
2235	(SW-059-82)	M	11	14	3
2236	(SW-060-82)	M	10	12	2
2237	(SW-061-82)	M	15	17	2
2238	(SW-062-82)	M	30	29	-1
2239	(SW-063-82)	M	21	23	2
2240	(SW-064-82)	M	10	12	2
2241	(SW-065-82)	M	25	25	0
2242	(SW-066-82)	M	26	27	1
2243	(SW-067-82)	M	24	25	1
2244	(SW-068-82)	M	11	14	3
2245	(SW-069-82)	M	26	27	1
2246	(SW-070-82)	M	30	28	-2
2247	(SW-071-82)	M	23	22	-1
2248	(SW-072-82)	M	23	21	-2
2249	(SW-073-82)	M	19	20	1
2250	(SW-074-82)	M	19	24	5
2251	(SW-075-82)	M	15	14	-1
2252	(SW-076-82)	M	17		
2253	(SW-077-82)	M	29		
2254	(SW-078-82)	M	19	16	-3
2255	(SW-079-82)	M	20	24	4
2256	(SW-080-82)	M	24	26	2
2257	(SW-081-82)	F	20	17	-3
2258	(SW-082-82)	M	20	16	-4
2259	(SW-083-82)	M	14	16	2
2260	(SW-084-82)	M	23	24	1
2261	(SW-085-82)	M	19	20	1
2262	(SW-086-82)	M	8	10	2
2263	(SW-087-82)	M	27	27	0
2264	(SW-088-82)	M	14	18	4
2265	(SW-089-82)	M	13	14	1
2266	(SW-090-82)	M	24	25	1
2267	(SW-091-82)	M	15	18	3

Acqu. No.	Field No.	Sex	Age per		Diff.
			Fay	FWS	
2268	(SW-092-82)	M	22	24	2
2269	(SW-093-82)	M	18	19	1
2270	(SW-094-82)	M	12	14	2
2271	(SW-095-82)	M	15	16	1
2272	(SW-096-82)	M	22	24	2
2273	(SW-097-82)	M	~16	14	-2
2274	(SW-098-82)	M	12	13	1
2275	(SW-099-82)	M	9	12	3
2276	(SW-100-82)	M	13	13	0
2277	(SW-101-82)	F	~16	15	-1

1982 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- DIOMEDE

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2062	(DW-001-82)	F	21	14	-7
2063	(DW-002-82)	F	16	16	0
2064	(DW-003-82)	F	11	11	0
6065	(DW-004-82)	F	13	15	2
2066	(DW-005-82)	F	15	11	-4
2067	(DW-006-82)	F	10	9	-1
2068	(DW-007-82)	F	12	12	0
2069	(DW-008-82)	F	~20	16	-4
2070	(DW-009-82)	F	12	12	0
2071	(DW-010-82)	F	11	10	-1
2072	(DW-011-82)	F	~40	20	-20
2073	(DW-012-82)	F	22	15	-7
2074	(DW-013-82)	F	16	13	-3
2075	(DW-014-82)	F	14	11	-3
2076	(DW-015-82)	F	12	11	-1
2077	(DW-016-82)	M	10	12	2
2078	(DW-017-82)	F	9	9	0
2079	(DW-018-82)	F	15	12	-3
2080	(DW-019-82)	F	16	15	-1
2081	(DW-020-82)	F	21		
2082	(DW-021-82)	F	24	25	1
2083	(DW-022-82)	F	21	12	-9
2084	(DW-023-82)	F	15	15	0
2085	(DW-024-82)	F	14	14	0
2086	(DW-025-82)	F	10	11	1
2087	(DW-026-82)	F	18	13	-5
2088	(DW-027-82)	F	21	16	-5
2089	(DW-028-82)	F	24	14	-10
2090	(DW-029-82)	M	7	9	2
2091	(DW-030-82)	F	33	16	-17
2092	(DW-031-82)	F	7	8	1
2093	(DW-032-82)	F	16	12	-4
2094	(DW-033-82)	F	~13	11	-2
2095	(DW-034-82)	F	~15	11	-4
2096	(DW-035-82)	F	9	9	0
2097	(DW-036-82)	F	12	13	1
2098	(DW-037-82)	F	8	10	2
2099	(DW-038-82)	F	>17	13	-4
2100	(DW-039-82)	F	14	15	1
2101	(DW-040-82)	F	7	9	2
2102	(DW-041-82)	F	25	15	-10
2103	(DW-042-82)	M	8		
2104	(DW-043-82)	F	15	13	-2

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2105	(DW-044-82)	F	11	13	2
2106	(DW-045-82)	F	13	13	0
2107	(DW-046-82)	F	10	11	1
2108	(DW-047-82)	F	15	15	0
2109	(DW-048-82)	F	6		
2110	(DW-049-82)	F	13	13	0
2111	(DW-050-82)	F	11	10	-1
2112	(DW-051-82)	F	28	10	-18
2113	(DW-052-82)	F	21	12	-9
2114	(DW-053-82)	F	>14	12	-2
2115	(DW-054-82)	F	11	11	0
2116	(DW-055-82)	F	18		
2117	(DW-056-82)	F	11	12	1
2118	(DW-057-82)	F	14	13	-1
2119	(DW-058-82)	F	17	17	0
2120	(DW-059-82)	F	15	11	-4
2121	(DW-060-82)	F	15	13	-2
2122	(DW-061-82)	F	21	15	-6
2123	(DW-062-82)	F	16	16	0
2124	(DW-063-82)	F	~25	14	-11
2125	(DW-064-82)	F	12	14	2
2126	(DW-065-82)	F	23	20	-3
2127	(DW-066-82)	M	~20	14	-6
2128	(DW-067-82)	F	11	13	2
2129	(DW-068-82)	F	22	>16	-6
2130	(DW-069-82)	F	~20	>14	-6
2131	(DW-070-82)	F	~17		
2132	(DW-071-82)	F	11		
2133	(DW-072-82)	F	11		
2134	(DW-073-82)	F	8	11	3
2135	(DW-074-82)	F	~20		
2136	(DW-075-82)	F	12		
2137	(DW-076-82)	F	22	16	-6
2138	(DW-077-82)	F	26	15	-11
2139	(DW-078-82)	F	17		
2140	(DW-079-82)	F	~28		
2141	(DW-080-82)	F	19	19	0
2142	(DW-081-82)	M	10		
2143	(DW-082-82)	M	20		
2144	(DW-083-82)	M	11		
2145	(DW-084-82)	M	20	21	1
2146	(DW-085-82)	M	18		
2147	(DW-086-82)	M	22	23	1
2148	(DW-087-82)	M	19	20	1
2149	(DW-088-82)	M	~16	18	2

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2150	(DW-089-82)	M	11	14	3
2151	(DW-090-82)	M	23	21	-2
2278	(DW-091-82)	M	14	15	1
2279	(DW-092-82)	M	23	26	3
2280	(DW-094-82)	F	17	17	0
2281	(DW-095-82)	F	10	11	1
2282	(DW-096-82)	M	8	9	1
2283	(DW-097-82)	F	16	14	-2
2284	(DW-098-82)	M	16	17	1
2285	(DW-099-82)	M	20	22	2
2286	(DW-100-82)	M	18	18	0
2287	(DW-101-82)	F	22	13	-9
2288	(DW-102-82)	F	12	10	-2
2289	(DW-103-82)	F	28	15	-13
2290	(DW-104-82)	F	11	12	1
2291	(DW-105-82)	F	11	12	1
2292	(DW-106-82)	F	~20	15	-5
2293	(DW-107-82)	F	20	14	-6
2294	(DW-108-82)	F	~32	21	-11
2295	(DW-109-82)	F	14	10	-4
2296	(DW-110-82)	F	19	14	-5
2297	(DW-111-82)	F	~30	20	-10
2298	(DW-112-82)	F	15	15	0
2299	(DW-113-82)	M	10	11	1
2300	(DW-114-82)	F	~29	20	-9
2301	(DW-115-82)	F	27	16	-11
2302	(DW-116-82)	F	~25	10	-15
2303	(DW-117-82)	F	32	15	-17
2304	(DW-118-82)	M	5	9	4
2305	(DW-119-82)	F	~34	18	-16
2306	(DW-120-82)	F	14	10	-4
2307	(DW-121-82)	F	15	13	-2
2308	(DW-122-82)	F	14	15	1
2309	(DW-123-82)	F	10	15	5
2310	(DW-124-82)	F	34	15	-19
2311	(DW-125-82)	F	27	11	-16
2312	(DW-126-82)	F	8	11	3
2313	(DW-127-82)	F	22	12	-10
2314	(DW-128-82)	F	14	16	2
2315	(DW-129-82)	F	19	14	-5
2316	(DW-130-82)	F	14	16	2
2317	(DW-131-82)	F	20	13	-7
2318	(DW-132-82)	M	11	13	2
2319	(DW-133-82)	F	>22	9	-13
2320	(DW-134-82)	F	14	13	-1

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2321	(DW-135-82)	F	18	17	-1
2322	(DW-136-82)	F	~30	20	-10
2323	(DW-137-82)	M	10	11	1
2324	(DW-138-82)	M	8	9	1
2325	(DW-139-82)	F	14	13	-1
2326	(DW-140-82)	F	15	11	-4
2327	(DW-141-82)	F	26	14	-12
2328	(DW-142-82)	M	16	17	1
2329	(DW-143-82)	F	27	13	-14
2330	(DW-144-82)	F	15	13	-2
2331	(DW-145-82)	F	14	11	-3
2332	(DW-146-82)	F	28	15	-13
2333	(DW-147-82)	M	11	11	0
2334	(DW-148-82)	F	16	16	0
2335	(DW-149-82)	F	8	10	2
2336	(DW-150-82)	F	8	10	2
2337	(DW-151-82)	F	>13	11	-2
2338	(DW-152-82)	F	10	11	1
2339	(DW-153-82)	M	3	8	5
2340	(DW-154-82)	F	16	12	-4
2341	(DW-155-82)	M	9	10	1
2342	(DW-156-82)	F	~27	11	-16
2343	(DW-157-82)	F	~32	13	-19
2344	(DW-158-82)	F	~22	13	-9
2345	(DW-159-82)	F	17	13	-4
2346	(DW-160-82)	F	16	13	-3
2347	(DW-161-82)	F	11	12	1
2348	(DW-162-82)	F	36	21	-15
2349	(DW-163-82)	F	14	13	-1
2350	(DW-164-82)	M	12	13	1
2351	(DW-165-82)	M	14	13	-1
2352	(DW-166-82)	F	16	14	-2
2353	(DW-167-82)	M	22	15	-7
2354	(DW-168-82)	F	31	13	-18
2355	(DW-169-82)	F	8	7	-1
2356	(DW-170-82)	F	11	9	-2
2357	(DW-171-82)	F	16	13	-3
2361	(DW-175-82)	M	16	11	-5
2362	(DW-176-82)	M	15	15	0
2365	(DW-179-82)	M	20	18	-2
2367	(DW-181-82)	M	12	11	-1
2370	(DW-184-82)	F	~31	12	-19
2371	(DW-185-82)	F	36	15	-21

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2372	(DW-186-82)	F	10	9	-1
2373	(DW-187-82)	F	14	13	-1
2374	(DW-188-82)	F	26	11	-15
2375	(DW-189-82)	F	16	13	-3
2376	(DW-190-82)	M	18	20	2
2377	(DW-191-82)	F	19	10	-9
2378	(DW-192-82)	F	18	13	-5
2379	(DW-193-82)	F	11	9	-2
2380	(DW-194-82)	F	19	12	-7
2381	(DW-195-82)	F	10	11	1
2382	(DW-196-82)	F	10	12	2
2383	(DW-197-82)	M	16	14	-2
2384	(DW-198-82)	M	7	9	2
2386	(DW-200-82)	F	14	12	-2
2387	(DW-201-82)	F	15	10	-5
2388	(DW-202-82)	F	24	17	-7
2389	(DW-203-82)	F	15	14	-1
2390	(DW-204-82)	F	20	17	-3
2392	(DW-206-82)	M	14	15	1
2393	(DW-207-82)	F	>15	11	-4
2394	(DW-208-82)	F	13	10	-3
2395	(DW-209-82)	F	12	11	-1
2396	(DW-210-82)	F	9	9	0
2397	(DW-211-82)	F	12	11	-1
2398	(DW-212-82)	F	>19	14	-5
2399	(DW-213-82)	F	9	9	0
2400	(DW-214-82)	F	15	10	-5
2401	(DW-215-82)	F	19	12	-7
2402	(DW-216-82)	M	11	9	-2
2403	(DW-217-82)	M	16	15	-1
2404	(DW-218-82)	M	5	8	3
2405	(DW-219-82)	M	8	10	2
2407	(DW-221-82)	F	>12	12	0
2408	(DW-222-82)	F	10	10	0
2409	(DW-223-82)	F	13	12	-1
2410	(DW-224-82)	F	>24	>12	-12
2411	(DW-225-82)	F	25	14	-11
2412	(DW-226-82)	F	16	14	-2
2413	(DW-227-82)	F	31	15	-16
2414	(DW-228-82)	F	19	13	-6
2415	(DW-229-82)	F	13	14	1
2416	(DW-230-82)	M	19	16	-3
2417	(DW-231-82)	M	19	17	-2
2418	(DW-232-82)	M	23	22	-1
2419	(DW-233-82)	M	12	11	-1

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2420	(DW-234-82)	M	29	27	-2
2421	(DW-235-82)	M	23	23	0
2422	(DW-236-82)	M	15	12	-3
2425	(DW-239-82)	M	22	20	-2
2426	(DW-240-82)	M	19	15	-4
2427	(DW-241-82)	M	~25	14	-11
2428	(DW-242-82)	M	21	19	-2
2429	(DW-243-82)	M	16	16	0
2430	(DW-244-82)	M	15	15	0

APPENDIX E

Ages of walruses in the catch samples from Gambell, Savoonga, and Diomede, spring 1983. Ages preceded by the symbol ∿ are "best estimates" as described in the text. Those preceded by the symbol > are conservative estimates in instances where the tooth appeared to be from an animal much older than the reading indicated. At center is the age determined in this study (Fay), compared at right with the age determined by inexperienced Fish and Wildlife Service personnel (FWS) and the difference (Diff.) between them.

1983 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- SAVOONGA

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2546	(SW-002-83)	M	11	11	0
2547	(SW-003-83)	M	8	7	-1
2548	(SW-004-83)	M	27	27	0
2549	(SW-005-83)	M	27		
2550	(SW-006-83)	M	6	8	2
2551	(SW-007-83)	M	15	15	0
2552	(SW-008-83)	M	25	25	0
2553	(SW-009-83)	M	13		
2554	(SW-010-83)	M	17		
2555	(SW-011-83)	M	19	18	-1
2556	(SW-012-83)	M	4	5	1
2557	(SW-013-83)	F	33	18	-15
2558	(SW-014-83)	M	16	16	0
2559	(SW-015-83)	M	22	22	0
2560	(SW-016-83)	M	24	21	-3
2561	(SW-017-83)	M	8	11	3
2562	(SW-018-83)	F	18	12	-6
2563	(SW-019-83)	M	15	16	1
2564	(SW-020-83)	M	25	22	-3
2565	(SW-021-83)	F	≤17	8	-9
2566	(SW-022-83)	M	11	15	4
2567	(SW-023-83)	F	16	16	0
2568	(SW-024-83)	M	11	12	1
2569	(SW-025-83)	M	23	20	-3
2570	(SW-026-83)	M	23	16	-7
2571	(SW-027-83)	F	10	6	-4
2572	(SW-028-83)	F	18	15	-3
2573	(SW-029-83)	F	20	13	-7
2574	(SW-030-83)	M	12	10	-2
2575	(SW-031-83)	F	22	11	-11
2576	(SW-032-83)	F	≤18	>4	-14
2577	(SW-033-83)	F	15	7	-8
2578	(SW-034-83)	F	17	10	-7
2579	(SW-035-83)	M	15	11	-4
2580	(SW-036-83)	M	31	17	-14
2581	(SW-037-83)	M	11	12	1
2582	(SW-038-83)	M	12	13	1
2583	(SW-039-83)	M	8	9	1
2584	(SW-040-83)	F	10	10	0
2585	(SW-041-83)	M	12	11	-1
2586	(SW-042-83)	M	21	9	-12
2587	(SW-043-83)	M	29	25	-4
2588	(SW-044-83)	M	25	19	-6

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2589	(SW-045-83)	F	24	11	-13
2590	(SW-046-83)	F	13	10	-3
2591	(SW-047-83)	M	20	19	-1
2592	(SW-048-83)	F	16	14	-2
2593	(SW-049-83)	F	10	6	-4
2594	(SW-050-83)	M	20	19	-1
2595	(SW-051-83)	M	15	13	-2
2597	(SW-053-83)	M	13	15	2
2603	(SW-059-83)	M	16	14	-2
2604	(SW-060-83)	M	17	15	-2
2605	(SW-061-83)	M	10	10	0
2606	(SW-062-83)	M	26	24	-2
2607	(SW-063-83)	F	12	9	-3
2608	(SW-064-83)	F	13	12	-1
2609	(SW-065-83)	F	17	16	-1
2610	(SW-066-83)	M	14	9	-5
2611	(SW-067-83)	F	11	7	-4
2612	(SW-068-83)	F	≤33	11	-22
2613	(SW-069-83)	F	≤33	9	-24
2614	(SW-070-83)	F	≤23	11	-12
2616	(SW-072-83)	M	13	14	1
2617	(SW-073-83)	M	16	15	-1
2618	(SW-074-83)	M	17	21	4
2619	(SW-075-83)	F	21	10	-11
2620	(SW-076-83)	F	34	14	-20
2622	(SW-078-83)	M	22	15	-7
2623	(SW-079-83)	F	≤16	7	-9
2624	(SW-080-83)	F	≤25	10	-15
2625	(SW-081-83)	F	≤23	8	-15
2627	(SW-083-83)	M	23	24	1
2628	(SW-084-83)	M	17	19	2
2629	(SW-085-83)	M	18	15	-3
2630	(SW-086-83)	M	28	17	-11
2631	(SW-087-83)	M	20	17	-3
2632	(SW-088-83)	F	22	11	-11
2633	(SW-089-83)	F	23	8	-15
2634	(SW-090-83)	F	27	14	-13
2635	(SW-091-83)	M	13	14	1
2636	(SW-092-83)	M	25	19	-6
2637	(SW-093-83)	M	24	20	-4
2638	(SW-094-83)	F	30	28	-2
2639	(SW-095-83)	F	13	13	0
2640	(SW-096-83)	F	13	12	-1
2641	(SW-097-83)	F	≤25	12	-13
2642	(SW-098-83)	M	16	16	0

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2643	(SW-099-83)	F	26	13	-13
2644	(SW-100-83)	F	18	9	-9
2645	(SW-101-83)	F	16	10	-6
2646	(SW-102-83)	M	13	13	0
2647	(SW-103-83)	F	11	8	-3
2648	(SW-104-83)	F	13	12	-1
2649	(SW-105-83)	M	16	16	0
2650	(SW-106-83)	F	14	7	-7
2651	(SW-107-83)	M	15	13	-2
2652	(SW-108-83)	M	18	18	0
2653	(SW-109-83)	M	23	23	0
2655	(SW-111-83)	F	~10	7	-3
2656	(SW-112-83)	F	~20	10	-10
2658	(SW-114-83)	M	20	21	1
2659	(SW-115-83)	M	26	12	-14
2660	(SW-116-83)	M	10	11	1
2661	(SW-117-83)	F	12	9	-3
2662	(SW-118-83)	F	10	9	-1
2663	(SW-119-83)	F	13	7	-6
2664	(SW-120-83)	F	24	13	-11
2665	(SW-121-83)	F	17	7	-10
2666	(SW-122-83)	F	19	10	-9
2667	(SW-123-83)	F	16	10	-6
2668	(SW-124-83)	F	19	11	-8
2669	(SW-125-83)	F	12	11	-1
2670	(SW-126-83)	F	~18	10	-8
2671	(SW-127-83)	F	14	6	-8
2672	(SW-128-83)	F	8	7	-1
2673	(SW-129-83)	M	22	20	-2
2674	(SW-130-83)	F	9	11	2

1983 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- GAMBELL

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2675	(GW-001-83)	M	17	16	-1
2676	(GW-002-83)	F	18	9	-9
2677	(GW-003-83)	F	16	10	-6
2678	(GW-004-83)	M	~20	8	-12
2679	(GW-005-83)	M	22	22	0
2680	(GW-006-83)	M	28	28	0
2681	(GW-007-83)	M	25	25	0
2682	(GW-008-83)	F	16	9	-7
2683	(GW-009-83)	F	~18	13	-5
2684	(GW-010-83)	M	13	17	4
2685	(GW-011-83)	F	16	9	-7
2686	(GW-012-83)	F	~30	13	-17
2687	(GW-013-83)	F	17	11	-6
2688	(GW-014-83)	F	14	10	-4
2689	(GW-015-83)	M	25	23	-2
2690	(GW-016-83)	F	~15	8	-7
2691	(GW-017-83)	M	21	20	-1
2692	(GW-018-83)	F	~21	14	-7
2693	(GW-019-83)	F	16	12	-4
2694	(GW-020-83)	F	19	13	-6
2695	(GW-021-83)	M	18	23	5
2696	(GW-022-83)	F	~16	11	-5
2697	(GW-023-83)	M	18	25	7
2698	(GW-024-83)	M	17	18	1
2699	(GW-026-83)	F	~15	8	-7
2700	(GW-027-83)	F	~35	11	-24
2701	(GW-028-83)	M	24	23	-1
2702	(GW-029-83)	F	20	13	-7
2703	(GW-030-83)	M	15	17	2
2704	(GW-031-83)	M	25	27	2
2705	(GW-032-83)	M	12	12	0
2706	(GW-033-83)	F	~20	12	-8
2707	(GW-034-83)	M	26	26	0
2708	(GW-035-83)	M	26	26	0
2709	(GW-036-83)	M	19	21	2
2710	(GW-037-83)	M	21	22	1
2711	(GW-038-83)	M	24	23	-1
2712	(GW-039-83)	F	16	11	-5
2713	(GW-040-83)	F	14	13	-1
2714	(GW-041-83)	F	12	9	-3
2715	(GW-042-83)	F	13	13	0
2716	(GW-043-83)	F	19	11	-8
2717	(GW-044-83)	F	~20	16	-4

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2718	(GW-045-83)	M	22	22	0
2719	(GW-046-83)	M	20	21	1
2720	(GW-047-83)	M	22	20	-2
2721	(GW-048-83)	M	26	20	-6
2722	(GW-049-83)	M	23	23	0
2723	(GW-050-83)	M	21	25	4
2724	(GW-051-83)	F	23	16	-7
2725	(GW-052-83)	M	20	19	-1
2726	(GW-053-83)	M	17	18	1
2727	(GW-054-83)	M	24	25	1
2728	(GW-055-83)	M	22	23	1
2729	(GW-056-83)	M	26	24	-2
2730	(GW-057-83)	F	14	11	-3
2731	(GW-058-83)	M	24	23	-1
2732	(GW-059-83)	F	21	12	-9
2733	(GW-060-83)	F	~23	9	-14
2734	(GW-061-83)	F	13	12	-1
2735	(GW-062-83)	F	11	10	-1
2736	(GW-063-83)	M	16	18	2
2737	(GW-064-83)	M	26	25	-1
2738	(GW-065-83)	M	14	8	-6
2739	(GW-066-83)	F	23	11	-12
2740	(GW-067-83)	M	20	22	2
2741	(GW-068-83)	M	20	20	0
2742	(GW-069-83)	M	20	20	0
2744	(GW-071-83)	F	~19	15	-4
2745	(GW-072-83)	M	13	13	0
2746	(GW-073-83)	F	13	11	-2
2747	(GW-074-83)	F	~40	14	-26
2748	(GW-075-83)	M	22	16	-6
2749	(GW-076-83)	M	11	12	1
2750	(GW-077-83)	M	21	23	2
2751	(GW-078-83)	F	14	9	-5
2752	(GW-079-83)	F	24	13	-11
2753	(GW-080-83)	F	7	8	1
2754	(GW-081-83)	M	13	15	2
2755	(GW-082-83)	F	11	10	-1
2756	(GW-083-83)	M	23	26	3
2757	(GW-084-83)	M	25	25	0
2758	(GW-085-83)	M	23	23	0
2759	(GW-086-83)	M	20	20	0
2760	(GW-087-83)	M	15	16	1
2761	(GW-088-83)	M	21	21	0
2762	(GW-089-83)	F	~23	13	-10
2763	(GW-090-83)	M	29	25	-4

Acqu. No.	Field No.	Sex	Age per		Diff.
			Fay	FWS	
2764	(GW-091-83)	M	26	26	0
2765	(GW-092-83)	M	23	24	1
2766	(GW-093-83)	M	21	20	-1
2767	(GW-094-83)	M	27	24	-3
2768	(GW-095-83)	M	14	16	2
2769	(GW-096-83)	M	22	17	-5
2770	(GW-097-83)	M	25	26	1
2771	(GW-098-83)	F	11	9	-2
2772	(GW-099-83)	F	16	11	-5
2773	(GW-101-83)	F	23	13	-10
2774	(GW-102-83)	F	23	10	-13
2775	(GW-103-83)	M	20	24	4
2776	(GW-104-83)	M	21	21	0
2777	(GW-105-83)	F	17	10	-7
2778	(GW-106-83)	M	28	27	-1
2779	(GW-107-83)	M	21	13	-8
2780	(GW-108-83)	F	17	14	-3
2781	(GW-109-83)	F	12	12	0
2782	(GW-110-83)	M	12	14	2
2783	(GW-111-83)	M	15	15	0
2784	(GW-112-83)	M	23	25	2
2785	(GW-113-83)	M	17	17	0
2786	(GW-114-83)	M	23	20	-3

1983 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- DIOMEDE

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2787	(DW-001-83)	M	18	19	1
2788	(DW-002-83)	M	15	19	4
2789	(DW-003-83)	F	11	9	-2
2790	(DW-004-83)	F	~21	15	-6
2791	(DW-005-83)	F	20	14	-6
2792	(DW-006-83)	F	12	10	-2
2793	(DW-007-83)	F	~28	14	-14
2794	(DW-008-83)	F	27	14	-13
2795	(DW-009-83)	F	31	17	-14
2796	(DW-010-83)	F	17	10	-7
2797	(DW-011-83)	F	21	10	-11
2798	(DW-012-83)	F	25	12	-13
2799	(DW-013-83)	F	14	11	-3
2800	(DW-014-83)	M	26	26	0
2801	(DW-015-83)	F	14	8	-6
2802	(DW-016-83)	F	16	12	-4
2803	(DW-017-83)	F	17	11	-6
2804	(DW-018-83)	F	19	12	-7
2805	(DW-019-83)	F	~23	9	-14
2806	(DW-020-83)	F	13	12	-1
2807	(DW-021-83)	F	19	16	-3
2808	(DW-022-83)	F	11	9	-2
2809	(DW-023-83)	F	16	13	-3
2810	(DW-024-83)	F	~15	17	2
2811	(DW-025-83)	F	19	9	-10
2812	(DW-026-83)	F	22	16	-6
2813	(DW-027-83)	F	18	10	-8
2814	(DW-028-83)	F	20	9	-11
2815	(DW-029-83)	F	22	13	-9
2816	(DW-030-83)	F	19	16	-3
2817	(DW-031-83)	F	16	14	-2
2818	(DW-032-83)	M	19	17	-2
2819	(DW-033-83)	M	26	30	4
2820	(DW-034-83)	M	19	18	-1
2821	(DW-035-83)	M	12	15	3
2822	(DW-036-83)	M	21	22	1
2823	(DW-037-83)	M	21	24	3
2824	(DW-038-83)	F	11	9	-2
2825	(DW-039-83)	M	14	16	2
2826	(DW-040-83)	M	18	21	3
2827	(DW-041-83)	M	13	18	5
2828	(DW-042-83)	M	13	19	6
2829	(DW-043-83)	M	21	22	1

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2830	(DW-044-83)	M	20	21	1
2831	(DW-045-83)	M	13	13	0
2832	(DW-046-83)	M	24	24	0
2833	(DW-047-83)	M	26	29	3
2834	(DW-049-83)	M	21		
2835	(DW-049-83)	M	11	14	3
2836	(DW-050-83)	M	24	22	-2
2837	(DW-051-83)	M	21	22	1
2838	(DW-052-83)	M	15	18	3
2839	(DW-053-83)	M	14	15	1
2840	(DW-054-83)	M	24	23	-1
2841	(DW-055-83)	M	15	15	0
2842	(DW-056-83)	F	~20	10	-10
2843	(DW-057-83)	F	13	18	5
2844	(DW-058-83)	M	27	23	-4
2845	(DW-059-83)	M	15		
2846	(DW-060-83)	M	23		
2847	(DW-061-83)	M	23		
2848	(DW-062-83)	M	23	26	3
2849	(DW-063-83)	M	19	19	0
2850	(DW-064-83)	M	16	21	5
2851	(DW-065-83)	M	23	22	-1
2852	(DW-066-83)	M	20	22	2
2853	(DW-067-83)	M	27	28	1
2854	(DW-068-83)	M	~25	18	-7
2855	(DW-069-83)	M	22	21	-1
2856	(DW-070-83)	M	14	12	-2
2857	(DW-071-83)	M	23	23	0
2858	(DW-072-83)	M	23	26	3
2859	(DW-073-83)	M	21	22	1
2860	(DW-074-83)	M	24	26	2
2861	(DW-075-83)	F	13	8	-5
2862	(DW-076-83)	M	8	11	3
2863	(DW-077-83)	M	5	6	1
2864	(DW-078-83)	M	7	8	1
2865	(DW-079-83)	M	11	12	1
2866	(DW-080-83)	F	12		
2867	(DW-081-83)	F	8	7	-1
2868	(DW-082-83)	F	12	5	-7
2869	(DW-083-83)	F	4	4	0
2870	(DW-084-83)	M	17	17	0
2871	(DW-085-83)	M	10	10	0
2872	(DW-086-83)	F	~18	7	-11
2873	(DW-087-83)	M	12	15	3
2874	(DW-088-83)	M	7	9	2

Acqu. No.	Field No.	Sex	Age per Fay	Age per FWS	Diff.
2875	(DW-089-83)	F	26	8	-18
2876	(DW-090-83)	F	>40	14	-26
2877	(DW-091-83)	F	22	12	-10
2878	(DW-092-83)	F	~20	11	-9
2879	(DW-093-83)	F	10	9	-1
2880	(DW-094-83)	M	12	14	2
2881	(DW-095-83)	F	32		
2882	(DW-096-83)	M	10	7	-3
2883	(DW-097-83)	M	22	22	0
2884	(DW-098-83)	F	~29	17	-12
2885	(DW-101-83)	F	15	16	1
2886	(DW-102-83)	M	23	23	0
2887	(DW-103-83)	M	22	24	2
2888	(DW-104-83)	M	19	23	4
2889	(DW-105-83)	M	26	26	0
2890	(DW-106-83)	M	23	23	0
2891	(DW-107-83)	M	22	24	2
2892	(DW-108-83)	M	25	27	2
2893	(DW-109-83)	M	16	16	0
2894	(DW-110-83)	M	19	20	1
2895	(DW-111-83)	M	10	11	1
2896	(DW-112-83)	M	26		
2897	(DW-113-83)	M	22	24	2
2898	(DW-114-83)	M	19	22	3
2899	(DW-115-83)	M	17	18	1
2900	(DW-116-83)	M	22	22	0
2901	(DW-117-83)	M	19		
2902	(DW-118-83)	M	22	23	1
2903	(DW-119-83)	M	24	23	-1
2904	(DW-120-83)	M	27	29	2
2905	(DW-121-83)	M	16	16	0

APPENDIX F

Ages determined in this study for walruses in the catch samples from Gambell, Savoonga, and Diomede, spring 1984. Ages preceded by the symbol > are conservative estimates in instances where the tooth appeared to be from an animal much older than the reading indicated. A number of teeth indicated as "missing" probably were misnumbered, as several acquisition numbers had more than one tooth. Where the latter were from different sexes, the one corresponding to the indicated sex was assumed to be the correct one for that specimen. Where the sexes were the same, the choice was arbitrary. In each case, the "extra" tooth is indicated, for example as "+ F 24," meaning in this case that it was a female 24 years old. In one case, the number "41200" was assumed to have been equivalent to 4120; in another, the number on one side of the tooth was "4325" and on the other, "4329," both of which also appeared on other teeth.

1984 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- SAVOONGA

Acqu. No.	Field No.	Sex	Age per Fay
4047	(SW-001-84)	M	21
4048	(SW-002-84)	M	27
4049	(SW-003-84)	M	15
4050	(SW-004-84)	M	16
4051	(SW-005-84)	M	5
4052	(SW-006-84)	M	21
4053	(SW-007-84)	M	16
4054	(SW-008-84)	M	23
4055	(SW-009-84)	M	16
4056	(SW-010-84)	M	21
4057	(SW-011-84)	M	13
4058	(SW-012-84)	M	22
4059	(SW-013-84)	M	16
4060	(SW-014-84)	M	10
4061	(SW-015-84)	F	17
4062	(SW-016-84)	M	21
4063	(SW-017-84)	M	24
4064	(SW-018-84)	M	17
4065	(SW-019-84)	M	19
4066	(SW-020-84)	M	23
4067	(SW-021-84)	M	21
4068	(SW-022-84)	M	19
4069	(SW-023-84)	M	22
4070	(SW-024-84)	M	21
4071	(SW-025-84)	M	21
4072	(SW-026-84)	M	25
4073	(SW-027-84)	F	28
4074	(SW-028-84)	F	17
4075	(SW-029-84)	M	25
4076	(SW-030-84)	M	17
4077	(SW-031-84)	M	18
4078	(SW-032-84)	F	14
4079	(SW-033-84)	M	30
4080	(SW-034-84)	M	23
4081	(SW-035-84)	M	missing
4082	(SW-036-84)	M	18
4083	(SW-037-84)	M	23
4084	(SW-038-84)	F	23
4085	(SW-039-84)	F	24
4086	(SW-040-84)	M	17
4087	(SW-041-84)	M	33
4088	(SW-042-84)	M	21
4089	(SW-043-84)	M	15

Acqu. No.	Field No.	Sex	Age per Fay	
4090	(SW-044-84)	M	27	
4091	(SW-045-84)	M	21	
4092	(SW-046-84)	M	22	
4093	(SW-047-84)	M	20	
4094	(SW-048-84)	M	15	
4095	(SW-049-84)	M	10	
4096	(SW-050-84)	F	30	
4097	(SW-051-84)	F	18	
4098	(SW-052-84)	M	28	
4099	(SW-053-84)	F	11	
4100	(SW-054-84)	M	17	
4101	(SW-055-84)	M	10	
4102	(SW-056-84)	M	13	
4103	(SW-057-84)	M	19	+ F 24
4104	(SW-058-84)	M	21	+ F 22
4105	(SW-059-84)	M	21	
4106	(SW-060-84)	M	22	
4107	(SW-061-84)	M	20	
4108	(SW-062-84)	M	15	
4109	(SW-063-84)	M	21	
4110	(SW-064-84)	M	14	
4111	(SW-065-84)	M	16	
4112	(SW-066-84)	M	22	
4113	(SW-067-84)	F	11	
4114	(SW-068-84)	M	25	
4115	(SW-069-84)	M	18	
4116	(SW-070-84)	M	22	
4117	(SW-071-84)	M	26	
4118	(SW-072-84)	M	32	
4119	(SW-073-84)	F	12	
4120	(SW-074-84)	F	15	+ F 20 No."41200"
4121	(SW-075-84)	M	23	
4122	(SW-076-84)	M	24	
4123	(SW-077-84)	M	16	
4124	(SW-078-84)	M	13	
4125	(SW-079-84)	F	12	
4126	(SW-080-84)	F	13	
4127	(SW-081-84)	F	18	
4128	(SW-082-84)	F	17	
4129	(SW-083-84)	M	23	
4130	(SW-084-84)	F	13	
4131	(SW-085-84)	F	14	
4132	(SW-086-84)	M	23	
4133	(SW-087-84)	M	19	
4134	(SW-088-84)	M	16	
4135	(SW-089-84)	M	17	

Acqu. No.	Field No.	Sex	Age per Fay
4136	(SW-090-84)	F	16
4137	(SW-091-84)	F	34
4138	(SW-092-84)	F	21
4139	(SW-093-84)	F	28
4140	(SW-094-84)	F	23
4141	(SW-095-84)	F	17
4142	(SW-096-84)	F	16
4143	(SW-097-84)	F	18
4144	(SW-098-84)	F	24
4145	(SW-099-84)	F	18
4146	(SW-100-84)	M	18
4147	(SW-101-84)	M	19
4148	(SW-102-84)	F	12
4149	(SW-103-84)	M	22
4150	(SW-104-84)	F	16
4151	(SW-105-84)	M	10
4152	(SW-106-84)	M	20
4153	(SW-107-84)	F	27
4154	(SW-108-84)	F	11
4155	(SW-109-84)	F	15
4156	(SW-110-84)	F	>17
4157	(SW-111-84)	F	12
4158	(SW-112-84)	F	18
4159	(SW-113-84)	F	19
4160	(SW-114-84)	M	26
4161	(SW-115-84)	M	27
4162	(SW-116-84)	F	27
4163	(SW-117-84)	F	20
4164	(SW-118-84)	F	17
4165	(SW-119-84)	F	14
4166	(SW-120-84)	F	>20
4167	(SW-121-84)	F	18
4168	(SW-122-84)	F	10
4169	(SW-123-84)	M	14
4170	(SW-124-84)	M	19
4171	(SW-125-84)	M	19
4172	(SW-126-84)	M	14
4173	(SW-127-84)	M	16
4174	(SW-128-84)	M	31
4175	(SW-129-84)	M	20
4176	(SW-130-84)	M	17
4177	(SW-131-84)	F	21
4178	(SW-132-84)	F	11
4179	(SW-133-84)	F	16
4180	(SW-134-84)	M	22
4181	(SW-135-84)	M	11

Acqu. No.	Field No.	Sex	Age per Fay
4182	(SW-136-84)	M	10
4183	(SW-137-84)	F	22
4184	(SW-138-84)	F	17
4185	(SW-139-84)	M	14
4186	(SW-140-84)	M	22
4187	(SW-141-84)	F	20
4188	(SW-142-84)	F	14
4189	(SW-143-84)	F	21
4190	(SW-144-84)	F	17

1984 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- GAMBELL

Acqu. No.	Field No.	Sex	Age per Fay
4191	(GW-001-84)	M	23
4192	(GW-002-84)	M	34
4193	(GW-003-84)	M	10
4194	(GW-004-84)	M	17
4195	(GW-005-84)	F	18
4196	(GW-006-84)	F	20
4197	(GW-007-84)	F	20
4198	(GW-008-84)	F	>13
4199	(GW-009-84)	F	11
4200	(GW-010-84)	F	missing
4201	(GW-011-84)	F	21
4202	(GW-012-84)	F	12
4203	(GW-013-84)	F	missing
4204	(GW-014-84)	F	missing
4205	(GW-015a-84)	F	>16
4206	(GW-015b-84)	F	missing
4207	(GW-016-84)	F	17
4208	(GW-017-84)	F	18
4209	(GW-018-84)	F	13
4210	(GW-019-84)	F	15
4211	(GW-020-84)	F	18
4212	(GW-021-84)	F	17
4213	(GW-022-84)	F	20
4214	(GW-023-84)	M	18 + F 19
4215	(GW-024-84)	F	11
4216	(GW-025-84)	F	missing
4217	(GW-026-84)	F	19
4218	(GW-027-84)	F	15
4219	(GW-028-84)	F	13
4220	(GW-029-84)	F	19
4221	(GW-030-84)	F	24
4222	(GW-031-84)	F	21
4223	(GW-032-84)	F	20
4224	(GW-033a-84)	F	20
4225	(GW-033b-84)	F	23
4226	(GW-034-84)	F	14
4227	(GW-035-84)	F	19
4228	(GW-036-84)	M	20
4229	(GW-037-84)	F	21
4230	(GW-038-84)	F	13
4231	(GW-039-84)	F	20
4232	(GW-040-84)	F	23
4233	(GW-041-84)	F	12

Acqu. No.	Field No.	Sex	Age per Fay
4234	(GW-042-84)	F	19
4235	(GW-043-84)	M	29
4236	(GW-044-84)	F	21
4237	(GW-045-84)	F	23
4238	(GW-046-84)	F	>12
4239	(GW-047-84)	F	>15
4240	(GW-048-84)	F	20
4241	(GW-049-84)	F	17 + F 19
4242	(GW-050-84)	F	13
4243	(GW-051-84)	F	missing
4244	(GW-052-84)	F	19
4245	(GW-053-84)	F	12
4246	(GW-054-84)	F	14
4247	(GW-055-84)	F	16
4248	(GW-056-84)	F	10
4249	(GW-057-84)	F	22
4250	(GW-058-84)	F	25
4251	(GW-059-84)	F	17
4252	(GW-060-84)	F	19
4253	(GW-062-84)	F	14
4254	(GW-063-84)	M	10
4255	(GW-064-84)	F	9
4256	(GW-065-84)	F	>15
4257	(GW-066-84)	F	19
4258	(GW-067-84)	F	23
4259	(GW-068-84)	F	missing
4260	(GW-069-84)	F	11
4261	(GW-070-84)	F	6
4262	(GW-071-84)	F	>14
4263	(GW-072-84)	M	23
4264	(GW-073-84)	F	19
4265	(GW-074-84)	F	18
4266	(GW-075-84)	M	21
4267	(GW-076-84)	F	18
4268	(GW-077-84)	F	18
4269	(GW-078-84)	F	15
4270	(GW-079-84)	F	11
4271	(GW-080-84)	F	>14
4272	(GW-081-84)	F	14
4273	(GW-082-84)	F	13
4274	(GW-083-84)	F	17
4275	(GW-084-84)	F	16
4276	(GW-085-84)	F	19
4277	(GW-086-84)	F	33
4278	(GW-087-84)	F	22
4279	(GW-088-84)	M	8

Acqu. No.	Field No.	Sex	Age per Fay	
4280	(GW-089-84)	F	21	
4281	(GW-090-84)	F	24	
4282	(GW-091-84)	F	12	
4283	(GW-092-84)	F	10	
4284	(GW-093-84)	F	13	+ F 20
4285	(GW-094-84)	F	12	
4286	(GW-095-84)	M	14	
4287	(GW-096-84)	M	18	
4288	(GW-097-84)	F	12	
4289	(GW-098-84)	F	missing	
4290	(GW-099-84)	F	18	
4291	(GW-100-84)	F	20	
4292	(GW-101-84)	M	16	
4293	(GW-102-84)	F	25	
4294	(GW-103-84)	F	16	
4295	(GW-104-84)	F	15	
4296	(GW-105-84)	M	>16	
4297	(GW-106-84)	M	17	
4298	(GW-107-84)	F	10	
4299	(GW-108-84)	F	25	
4300	(GW-109-84)	F	19	
4301	(GW-110-84)	F	11	
4302	(GW-111-84)	F	35	
4303	(GW-112-84)	F	18	
4304	(GW-113-84)	F	13	
4305	(GW-114-84)	F	11	
4306	(GW-115-84)	F	12	
4307	(GW-116-84)	F	20	
4308	(GW-117-84)	F	>16	
4309	(GW-118-84)	F	17	
4310	(GW-119-84)	F	22	
4311	(GW-120-84)	F	12	
4312	(GW-121-84)	F	18	
4313	(GW-122-84)	F	17	
4314	(GW-123-84)	F	22	
4315	(GW-124-84)	F	19	
4316	(GW-125-84)	F	18	
4317	(GW-126-84)	F	14	
4318	(GW-127-84)	F	16	+ F 18
4319	(GW-128-84)	F	missing	
4320	(GW-129-84)	F	21	
4321	(GW-130-84)	F	19	
4322	(GW-131-84)	M	13	
4323	(GW-132-84)	F	9	
4324	(GW-133-84)	F	16	
4325	(GW-134-84)	F	12	+ F 25 No. 4325/4329

Acqu. No.	Field No.	Sex	Age per Fay
4326	(GW-135-84)	M	13
4327	(GW-136-84)	F	11
4328	(GW-137-84)	F	missing
4329	(GW-138-84)	M	26
4330	(GW-139-84)	M	23
4331	(GW-140-84)	F	11
4332	(GW-141-84)	F	15
4333	(GW-142-84)	F	21
4334	(GW-143-84)	F	missing
4335	(GW-144-84)	F	10
4336	(GW-145-84)	F	>16
4337	(GW-146-84)	M	17
4338	(GW-147-84)	M	12
4339	(GW-148-84)	M	16 + F 27
4340	(GW-149-84)	M	21
4341	(GW-150-84)	M	18
4342	(GW-151a-84)	M	24
4343	(GW-151b-84)	M	18
4344	(GW-152-84)	M	12
4345	(GW-153-84)	M	13
4346	(GW-154-84)	M	23 + M 13
4347	(GW-155-84)	M	missing
4348	(GW-156-84)	M	13
4349	(GW-157-84)	M	24 + M 15
4350	(GW-158-84)	M	26
4351	(GW-159-84)	M	20
4352	(GW-160-84)	M	20
4353	(GW-161-84)	M	25
4354	(GW-162-84)	M	26
4355	(GW-163-84)	M	8
4356	(GW-164-84)	M	14
4357	(GW-165-84)	M	9
4358	(GW-166-84)	M	17
4359	(GW-167-84)	M	25
4360	(GW-168-84)	M	23
4361	(GW-169-84)	M	20
4362	(GW-170-84)	M	14
4363	(GW-171-84)	M	27
4364	(GW-172-84)	M	9
4365	(GW-173-84)	M	21
4366	(GW-174-84)	M	10
4367	(GW-175-84)	M	8
4368	(GW-176-84)	M	21
4369	(GW-177-84)	M	18
4370	(GW-178-84)	M	26
4371	(GW-179-84)	M	18

Acqu. No.	Field No.	Sex	Age per Fay
4372	(GW-180-84)	M	34
4373	(GW-181-84)	M	26
4374	(GW-182-84)	M	15
4375	(GW-183-84)	M	19
4376	(GW-184-84)	M	25
4377	(GW-185-84)	M	15
4378	(GW-186-84)	M	25
4379	(GW-187-84)	M	25
4380	(GW-188-84)	M	8
4381	(GW-189-84)	M	26

1984 -- WALRUS CATCH SAMPLE (AGES FROM TEETH) -- DIOMEDE

Acqu. No.	Field No.	Sex	Age per Fay	
4382	(DW-001-84)	F	10	
4383	(DW-002-84)	F	10	
4384	(DW-003-84)	F	14	
4385	(DW-004-84)	F	16	
4386	(DW-005-84)	F	20	
4387	(DW-006-84)	F	11	
4388	(DW-007-84)	F	17	
4389	(DW-008-84)	F	>16	
4390	(DW-009-84)	F	7	
4391	(DW-010-84)	F	11	
4392	(DW-011-84)	F	10	
4393	(DW-012-84)	F	10	
4394	(DW-013-84)	F	16	
4395	(DW-014-84)	M	24	
4396	(DW-015-84)	M	22	
4397	(DW-016-84)	M	17	
4398	(DW-017-84)	M	26	
4399	(DW-018-84)	M	20	
4400	(DW-019-84)	M	17	
4401	(DW-020-84)	F	13	
4402	(DW-021-84)	F	24	
4403	(DW-022-84)	F	15	
4404	(DW-023-84)	F	12	
4405	(DW-024-84)	F	14	
4406	(DW-025-84)	F	>14	+ F 26
4407	(DW-026-84)	F	18	
4408	(DW-027-84)	F	22	
4409	(DW-028-84)	F	11	
4410	(DW-029-84)	F	23	
4411	(DW-030-84)	F	23	
4412	(DW-031-84)	F	15	
4413	(DW-032-84)	F	20	
4414	(DW-033-84)	F	13	
4415	(DW-034-84)	F	15	
4416	(DW-035-84)	F	17	
4417	(DW-036-84)	F	18	
4418	(DW-037-84)	F	15	
4419	(DW-038-84)	F	16	
4420	(DW-039-84)	F	20	
4421	(DW-040-84)	F	>15	
4422	(DW-041-84)	F	23	
4423	(DW-042-84)	M	23	
4424	(DW-043-84)	M	22	

Acqu. No.	Field No.	Sex	Age per Fay
4425	(DW-044-84)	M	21
4426	(DW-045-84)	M	23
4427	(DW-046-84)	M	23
4428	(DW-047-84)	M	23
4429	(DW-048-84)	M	17
4430	(DW-049-84)	M	24
4431	(DW-050-84)	M	missing
4450	(DW- ? -84)	M	28