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In recent years, Soviet and American surveys have indicated a considerable increase in number of the Pacific walruses (up to 270-290 thousand individuals), accompanied by expansion of the limits of their geographical range. At the same time, a decrease in the rate of reproduction has been observed, based on computation and analysis of the makeup of the herds on ice and an increase in average age of the producing females. The recorded general ageing of the population bears witness to stabilization of its numbers, but it could also convert into a depressive state.

The materials obtained on this cruise were to have tested that hypothesis and to have contributed to disclosure of the mechanism causing reduction in the rate of growth in numbers of the subspecies.

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Regional specialists on marine mammals set out on the expedition. From the Soviet side were: A. A. Kibal'chich (Moscow, VNIRO), Iu. A. Bukhtiiarov (Magadan, MoTINRO), and A. G. Somov (Magadan, Okhotskrybvod). From the American side were: F. Fay (University of Alaska, Fairbanks), B. Nelson (Alaska Dept. of Fish and Game, Nome), and J. Sease (University of Alaska).

During the cruise, which took place from 26 July to 4 September, we examined the western part of the Chukchi Sea, from Bering Strait to Cape Schmidt and from the Chukchi coast to Herald Island, which included practically all possible areas of distribution of walruses in the Soviet sector of the Chukchi Sea (see Fig.).

The ice conditions for navigation in 1983 in the Chukchi Sea were extremely heavy. A large part of the region was covered by massive, solid pack ice, in which a branch of the Herald current had created an ice-free area in shape of a wedge, the points directed toward Wrangel and Herald Islands.

Walruses on the ice were met first in the northern edge of the nearshore ice field in the vicinity of Koliuchin Island. The herds on this ice were made up mainly of males. Farther to the west, the herds were predominantly females with young of different ages, and in the northwestern direction, adult males were recorded individually (see Fig.). The walruses formed concentrated herds usually in the edge of the ice, if it was habitable and to some degree open. Most often, the concentrations consisted of many tens of groups; sometimes they numbered in the hundreds of groups. In each group were from one to a hundred walruses.

During the cruise, 63 male and 411 female Pacific walruses were taken. The age composition of the sample (Table 1-3) does not express the actual proportions of the age groups in the herds, since the animals were killed on the basis of their maturity. Of the females, the most numerous category was the middle-aged animals, from 10 to 18 years old, the proportion of which came to about 75% of the sample. In the sample also were a few young males, apparently accepted into the female herds.

Analysis of the state of the sexual organs of the females, 379 of which were sexually mature, showed that 101 (26.6%) were pregnant, 125 (33%) were lactating, and 141 (37.2%) were barren (i.e., had not given birth in the same year and were not pregnant). Judging from the placental scars and
p. 57 associated corpora lutea, 116 ((30.6%) of the females had given birth in 1983, and 13 (11.5%) impregnated in 1983 already had aborted. Of the number giving birth in the same year (116 specimens), only 85 were lactating at the time when the sample was taken. Therefore, 26.5% of the females, apparently, already had lost their progeny. This is a very large proportion of young lost in the first 4 months of life. The small total number of lactating females (33%) also testifies to the high mortality. Over the two years of milk feeding, there should be significantly more. Of interest were two females, 10 and 14 years old, both of which were lactating and pregnant.

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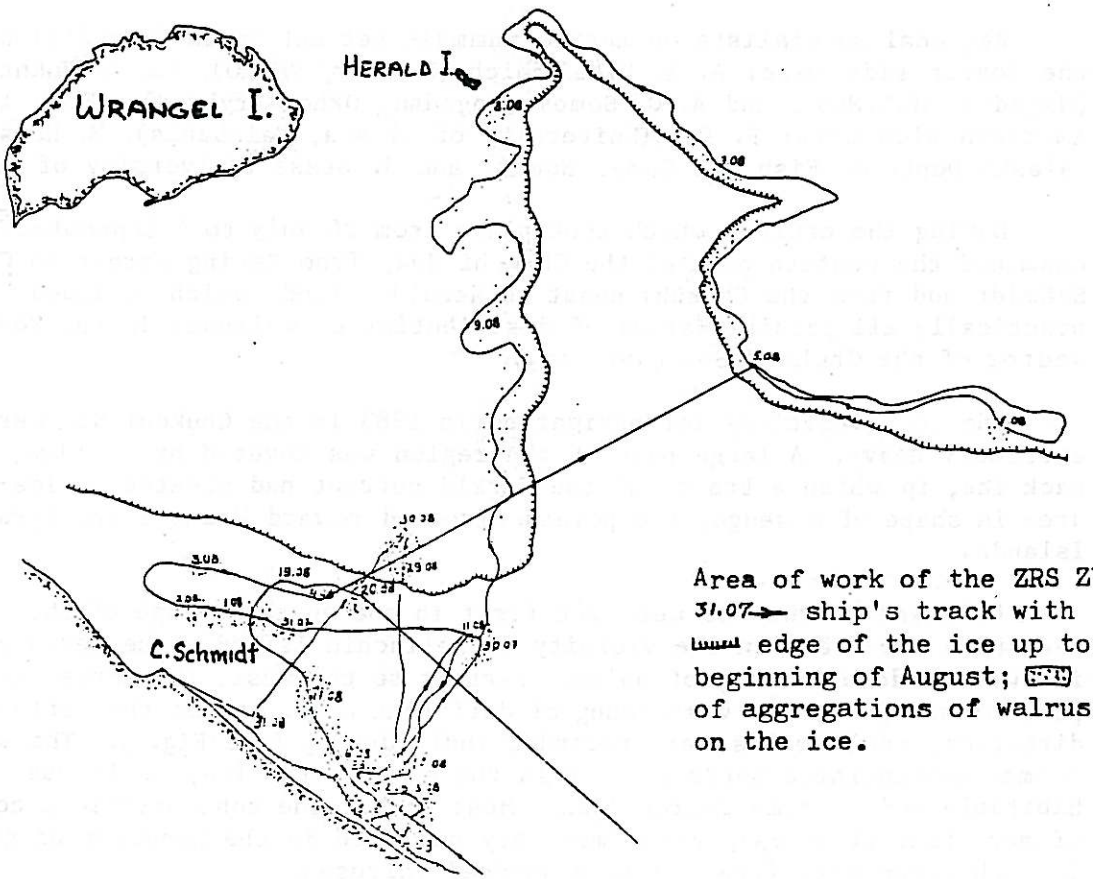

Area of work of the ZRS ZYKOVO: 31.07→ ship's track with date; edge of the ice up to the beginning of August; - area of aggregations of walrus herds on the ice.

pp. 57-58 Table 1. State of the sexual organs of the female walruses.

Age	n	%	Pregnant n	Pregnant %	Lactating	Barren	Bearing in 1983	Lact. from birth	Abort	Juvenile
0	2	0,5	-	-	-	-	-	-	-	2
I	3	0,75	-	-	-	-	-	-	-	3
2	2	0,5	-	-	-	-	-	-	-	2
5	I	0,25	-	-	-	-	-	-	-	I
6	I	0,25	-	-	-	-	-	-	-	I
7	3	0,76	-	-	-	-	-	-	-	3
8	9	2,3	4	44,5	-	3	-	-	-	2
9	I4	3,6	5	35,7	6	3	3	3	-	3
I0	20	5,I	7	35,0	7	4	7	5	I	I
II	27	6,9	9	33,0	7	8	9	6	-	I
I2	37	9,5	I2	32,4	I2	8	I5	I2	I	I
I3	28	7,2	9	32,I	7	I2	7	4	-	-
I4	48	I2,3	I6	33,3	I5	I3	I8	I3	I	-
I5	36	9,2	8	22,2	I0	I2	II	8	3	-
I6	39	I0,0	8	20,5	I2	I7	II	9	2	-
I7	30	7,7	6	20,0	I0	I3	8	7	3	-
I8	35	8,9	7	20,0	I3	I7	I0	9	I	-
I9	I0	2,5	-	-	5	6	4	4	-	-
20	I7	3,9	5	29,4	4	7	4	2	I	-
2I	6	I,5	I	I6,6	I	4	I	-	-	-
22	5	I,3	I	20,0	I	I	3	I	-	-
23	3	0,75	-	-	I	2	I	I	-	-
24	4	I,0	2	50,0	-	2	-	-	-	-
25	2	0,5	-	-	-	2	-	-	-	-
26	3	0,75	I	33,3	I	2	-	-	-	-
27	3	0,75	-	-	-	2	I	-	-	-
28	I	0,25	-	-	-	I	-	-	-	-
29	I	0,25	-	-	I	-	I	I	-	-
3I	I	0,25	-	-	-	-	I	-	-	-
TOTAL	39I		I0I		I25	I4I	II6	85/73%	I3	
From 379 adults			26,6%		33%	37,2%	30,6%		II,5%	

pp. 58-59 Table 2. Size-weight characteristics of the female walruses.

Age	n	Weight (kg)	Zoological length (cm)	Standard l. (cm)	Blubber thickness (mm)
0	2	80-90 / 85	I29-I4I / I35	II9-I30 / I25	I9-I9 / I9
I	3	I05-I70 / I38	I60-I80 / I69	I55-I73 / I62	I5-23 / I8
2	2	250-350 / 300	206-208 / 207	I95-I97 / I96	I7-I7 / I7
5	I	320	250	23I	25
6	I	460	257	239	24

Table 2. Continued

Age	n	Weight (kg)	Zoological lengt. (cm)	Standard length (cm)	Blubber thickness (mm)
7	3	450-460 453	257-264 260	240-240 240	2I-30 25
8	9	325-7I0 499	242-299 27I	227-278 25I	I5-44 25
9	I4	4I0-850 5I2	25I-3I3 277	228-288 256	I4-43 26
I0	20	350-750 538	257-3II 282	239-286 259	I6-39 27
II	27	450-775 622	27I-3I0 289	250-286 267	I6-44 29
I2	37	400-850 584	262-303 287	240-295 266	I3-59 3I
I3	28	450-750 623	266-305 288	246-283 267	I8-38 27
I4	48	450-830 634	265-3I3 298	248-290 275	I5-48 29
I5	36	450-800 608	270-303 286	243-284 265	I8-42 28
I6	39	5I0-850 636	283-306 299	263-28I 272	2I-50 33
I7	30	450-850 657	263-3I7 295	243-295 272	I3-55 30
I8	35	450-950 648	256-3I6 293	229-296 272	I8-50 28
I9	I0	470-650 580	279-299 289	260-277 267	I9-37 27
20	I7	5I0-975 665	289-325 298	256-297 275	22-38 3I
2I	6	500-I020 748	282-324 305	263-30I 28I	I4-43 29
22	5	525-750 623	279-30I 289	263-28I 269	I3-34 27
23-3I	I8	525-800 664	278-305 288	263-28I 272	I9-40 29

Footnote: Numerator = range; denomenator = mean; where n is 1, the actual values for the specimen are given.

p. 60 Table 3. Size-weight characteristics of the male walruses.

Age	n	Avg. wt. (kg)	Zoological leng. (cm)	Standard length (cm)	Blubber thickness (mm)
I	2	I75	I72	I65	I8
2	4	238	208	20I	I8
5	I	350	240	228	I0
6	3	350	25I	24I	2I
7	4	395	259	256	22
8	4	442	277	242	25
9	3	425	259	258	25
I0	4	525	277	258	23
II	7	544	280	300	26
I2	2	735	309	268	25
I3	6	578	294	282	25
I4	3	603	303	285	22
I5	2	6I5	306	298	27
I6	2	9I0	323	28I	33
I7	I	750	3I0	296	25
I8	2	687	3I2	337	30
20	3	I490	4I0	304	27
2I	3	9II	332	306	29
22	I	930	332	3I4	34
23	I	950	34I	33I	32
26	I	II00	350	-	I6
30	I	I280	-		-

Data on the fertility of females obtained in different regions are presented in Tale 4.

Attention is drawn to inequality in the data for pregnancy, on the one hand obtained in the eastern part of the Bering Sea and, on the other, in the western part of the Chukchi Sea and vicinity of Wrangel Island. The method for obtaining the material in all of those investigations was identical. The relative quantity of pregnant females in the eastern area of the Bering Sea amounted to about 39% and was nearly the same in the data obtained in different years by several different authors. The percent of
p. 61 pregnant, sexually mature females in the vicinity of Wrangel Island, however, was significantly lower (26%). Such a difference may be explained by geographical segregation of the females that are in different physiological states, analogous with the segregation of males and females in the summertime. It is possible also to hypothesize about the existence of two population groups with different rates of reproduction, which in the summertime migrate into different areas of the Chukchi Sea (eastern and western). A third hypothesis concerns the potential for defective calculation of the proportion of pregnant females in summer and autumn, due to the possibility of variation in the latent [=delayed implantation] period. Right now the lowest proportion of pregnancies appears to be in the Wrangel migrational group.

Table 4. Fertility of the females.

Author (year)	% Pregnant	Place of collection of material
Buckley (1958)	39	Eastern part of Bering Sea
Scott (1959)	39	" " " " "
Mansfield (1958)	35	Canadian sector of the Arctic
Fay (1955)	39	Eastern part of Bering Sea
Burns (1965)	40	" " " " "
Krylov (1966)	25.9	Western part of Bering Sea and vicinity of Wrangel Island
Fedoseev & Gol'tsev (1975)	46	Per material of Krylov and Burns
Fay (1982)	38	Eastern part of Bering Sea
Author's data (1972-74)	26	Vicinity of Wrangel Island
(1976)	40	Eastern part of Bering Sea
(1978)	29	Western part of Chukchi Sea
(1981)	41	Eastern part of Bering Sea
(1983)	26.6	Western part of Chukchi Sea

To determine the cause of this recorded phenomenon, it is necessary to collect material on the productivity of female walruses from the eastern Chukchi Sea (American side) in July and August, as well as to obtain data on
p. 62 the state of the sexual organs of the females in winter. The needed materials possibly can be obtained if a cruise can be organized into the eastern part of the Chukchi Sea in July-August and for collection of a sample in the winter time.

At the time of the reported cruise, the size-weight characteristics were obtained of the harvested walruses (Tables 2,3).

In the stomach of six of the walruses (4 females, 2 males), parts of ringed seals were discovered, the partly digested remains of which weighed up to 10 kg. In addition to pieces of skin with fat having an area of up to 80 cm^2, there were pieces of flippers and vibrissal pads in the stomachs. All of the "carnivores" had a characteristic feature, namely deep transverse scratches on their tusks. An especially large proportion of such scratches were noted on the inner surface of the tusks. One was a 20-year-old male that had a weight of 1950 kg., zoological length of 423 cm, thickness of fat layer 35 mm, length of tusks 56 cm, and os penis 51 cm. To judge from its age and size, this was physically a mature male. At the same time, however, he had none of the bosses ("shishki") on the neck and chest that usually are present in males of this age; furthermore, the length of his os penis was significantly less than the average, and the ratio of the weight of his

testes to the weight of the body (0.513%) was characteristic of juvenile males. The remaining "carnivores" had nothing apart from the scratched tusks to identify them [as being different], and they lay in groups with other animals. Only one, an 8-year-old pregnant female, was located far from a herd of walruses.

At the time of the cruise materials for histological investigation also were gathered, and those, at present, are being processed to obtain more precise data on the mortality of the young of the year in the first 4 months of life. A histological investigation of the state of the ovaries of the females also is planned.