AN APPLICATION OF LINEAR DISCRIMINANT FUNCTION TO EXTERNAL MEASUREMENTS OF FIN WHALE

TADAYOSHI ICHIHARA

INTRODUCTION

Since the external measurements on various parts of whales were begun with southern blue and fin whales by Mackintosh & Wheeler (1929), these have been carried out in different areas. Fujino (1954) took up the body proportions of fin whales caught in the northern Pacific, the adjacent waters to Japan and the Antarctic Ocean to study their races with relation to numbers of corpora luteum accumulated in female ovaries, since when many whales have been measured by scientists in Japan.

In this paper, it is discussed whether the general shape of fin whale is different or not in various geographical areas. The measurements of the corresponding parts of whales have fairly similar values for the same species taken in the different areas and so there are overlaps to some extent among the frequency distribution curves of these corresponding measurements. Consequently, it is desirable to decrease these overlaps and to find out the differences of the shapes of whales among various areas through the compounds of several external measurements. From this point, I here try to apply the method of Fisher's linear discriminant function to the classification of the general shapes of fin whales in the North Pacific and clarify where helps the discrimination among measurements. This paper follows the report 'On the Body Proportions of the Fin Whales (*Balaenoptera physalus* (L)) caught in the northern Pacific Ocean (I)' by Fujino (1954).

Grateful acknowledgements are due to the Japanese government whaling inspectors and the staff of the whaling companies who cooperated in the investigation. I am also indebted to Dr. Hideo Omura, the director and Mr. Kazuo Fujino, the Whales Research Institute, for their helps and advices during this work. I am also grateful to Dr. Motosaburo Masuyama and Dr. Kosei Takahashi, the Department of Internal Medicine and Physical Therapy, Fuculty of Medicine, the University of Tokyo, for their valuable suggestions in the application of linear discriminant function to this study. Finally, I should like to thank Mr. Shigeo Imamura, the Mitsui Mining Company for his help with the calculation to obtain the discriminant coefficient through I. B. M. Calculation Punch 602 A.

WHALING GROUND AND SEASON

Fin whales have been caught recently in both the adjacent waters to Aleutian Islands and to Japan proper in the North Pacific by the Japanese whaling companies. Their whaling grounds are generally divided into three areas in the present problem as shown in figure 1.

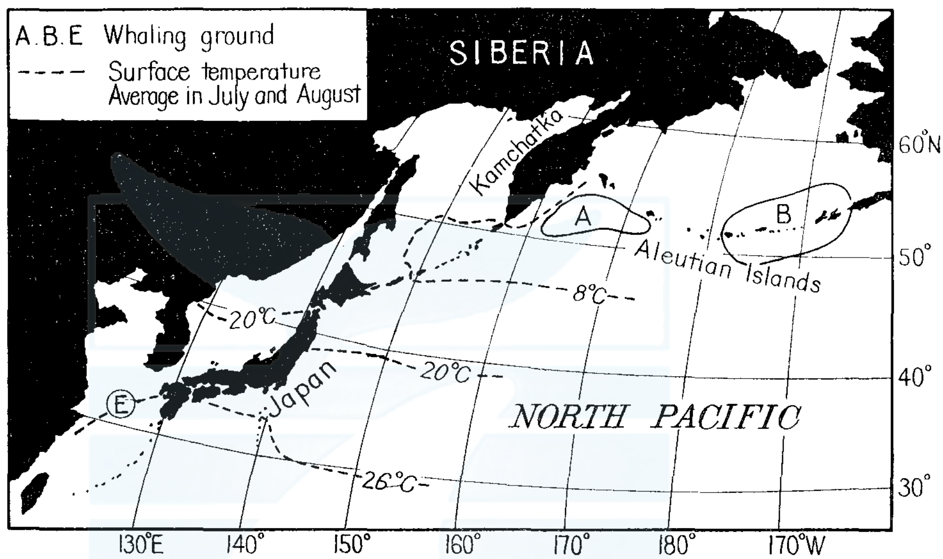

Fig. 1. Distribution of whaling grounds, related to surface temperatures in the North Pacific.

Area A—The west side waters of Aleutian Islands; Area B—The east side waters of Aleutian Islands; Area E—Northern part of East China Sea, i.e., the west side waters of Kyushu which is the southern island in Japan

It is possible to put area A and B as a whaling ground in the northern Pacific. But they are divided here for the convenience of the sample arrangements, because Japanese factory ships acted in the west side waters of Aleutian Islands, area A, in 1952 and 1953. The comparison of general shape of fin whale between A and E is studied in this paper and the materials are based on the results of biological investigations in 1952 and 1953 in area A and in 1955 in area E respectively. Although the details of oceanographical studies affecting the migration of whales are not discussed here, it is necessary to notice the temperatures of water surfaces showing the geographical difference between two areas. The mean temperature of water surface was about 7°C with its range 3 to 11°C in area A, while it was about 27°C with its range 21 to 28°C in area E for the whaling seasons.

The whaling seasons covered September from July in 1952 and October from May in 1953 in area A and the maximum catch was between June and August while these covered October from July and the maximum catch was in August and September in area E in 1955. Therefore Japanese factory ships and the land stations acted for fin whales from May to October in the North Pacific.

It is important to consider the various parts of whales increasing with growth, when their shapes are compared. It is rather difficult to discuss the shape of whales caught in very different seasons, chiefly because there is a close relation between growth of bone and season of migration in whales (Laws & Purves, 1956). As mentioned above, the whales examined are caught in different areas but about the same seasons.

VALIDITY OF SAMPLE

The comparison of size distribution between 1952 and 1953 are necessary in area A, before the discussion on size distributions between area A and E. It is seen in table 1 that the size distributions are remarkably constant in male and female in area A for two years. The modes of length of male fin whales caught are 18 metres and their ranges are 16 to 20 metres, while the modes of female whales caught are 19 metres and their ranges are 17 to 21 metres for two years. There is the same tendency in whales measured as in ones caught. Judging from the length of whales above mentioned, there are no remarkable biases between size distributions in 1952 and 1953.

As shown table 1, it is here possible to put the samples of two years together in area A. In area E, the modes are 17 metres in male and 18 metres in female, and the ranges are 15 to 19 metres in male and 15 to 21 metres in female respectively as seen in the size distributions. So there are larger modes in area A than in area E by 1 metre in the size distributions for both sexes.

It is difficult to discuss the races of fin whales except the difference of their size distributions but their size limits in catch are not looked over, which are 16 metres in area A and 15 metres in area E and affect their apparent size distributions. The relations between individuals caught and ones measured are shown as histograms of their percentages to total at each length of whale in metre in figure 2. The whales are actually selected in catch, especially in measurements, but they are here considered as the random representatives in the whale groups migrating to the same areas.

The methods of measurements for various parts of whales followed

TABLE 1. RELATION BETWEEN WHALES CAUGHT AND WHALES MEASURED IN TWO AREAS IN DIFFERENT YEARS IN THE NORTH PACIFIC

a. Male fin whale

Length of whale in metre	Area A												Area E			
	1952				1953				1952-3				1955			
	Catch Act. no.	%	Whales measured	%	Catch Act. no.	%	Whales measured	%	Catch Act. no.	%	Whales measured	%	Catch Act. no.	%	Whales measured	%
15	—	—	—	—	—	—	—	—	—	—	—	—	20	16.4	16	14.3
16	1	1.0	—	—	4	1.7	1	2.4	5	1.5	1	1.5	28	23.0	27	24.1
17	28	26.9	6	24.0	83	34.9	12	29.3	111	32.5	18	27.3	47	38.4	43	38.4
18	49	47.1	11	44.0	106	44.5	19	46.3	155	45.2	30	45.4	23	18.9	22	19.6
19	25	24.0	8	32.0	43	18.1	9	22.0	68	19.9	17	25.8	4	3.3	4	3.6
20	1	1.0	—	—	2	0.8	—	—	3	0.9	—	—	—	—	—	—
Total	104	100.0	25	100.0	238	100.0	41	100.0	342	100.0	66	100.0	122	100.0	112	100.0

b. Female fin whale

Length of whale in metre	Area A												Area E			
	1952				1953				1952-3				1955			
	Catch Act. no.	%	Whales measured	%	Catch Act. no.	%	Whales measured	%	Catch Act. no.	%	Whales measured	%	Catch Act. no.	%	Whales measured	%
15	—	—	—	—	—	—	—	—	—	—	—	—	12	11.7	9	9.6
16	—	—	—	—	—	—	—	—	—	—	—	—	6	5.8	6	6.5
17	12	11.0	2	13.3	26	11.2	3	6.1	38	11.1	5	7.8	27	26.2	24	25.8
18	22	20.2	3	20.0	62	26.7	14	28.7	84	24.6	17	26.6	35	34.0	32	34.5
19	45	41.3	7	46.7	88	37.9	23	46.9	133	39.0	30	46.8	19	18.4	18	19.4
20	28	25.7	3	20.0	51	22.0	8	16.3	79	23.2	11	17.2	3	2.9	3	3.2
21	2	1.8	—	—	5	2.2	1	2.0	7	2.1	1	1.6	1	1.0	1	1.0
Total	109	100.0	15	100.0	232	100.0	49	100.0	341	100.0	64	100.0	103	100.0	93	100.0

ones of *Discovery Reports* vol. 1 by Mackintosh & Wheeler (1929). The next ten parts showing the general shapes of fin whales are used in this present problem.

1. Total length.
5. Tip of snout to centre of eye.
6. Tip of snout to tip of flipper.
8. Notch of flukes to posterior emargination of dorsal fin.
10. Notch of flukes to centre of anus.
11. Notch of flukes to centre of umbilicus.
12. Notch of flukes to end of ventral grooves.
13. Centre of anus to centre of reproductive aperture.
14. Dorsal fin, vertical height.
15. Dorsal fin, length of base.

The admitted data on the next parts are shown too in figure 3 a, b.

7. Centre of eye to centre of ear.
17. Flipper, tip to anterior end of lower border.
19. Flipper, greatest width.

The next men have responsibilities for the measurements in a respective season and area.

Area A {1952 K. Fujino / 1953 T. Nemoto} The Whales Research Institute

Area E 1955 {K. Mizue / S. Koga} Faculty of Fisheries, the Nagasaki University

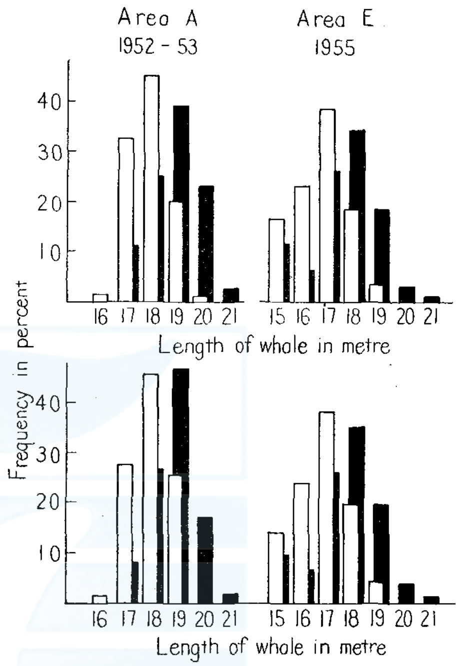

Fig. 2. The histograms showing percentage size frequency distributions of fin whales in two areas in the North Pacific.
The upper: whales caught
The lower: whales measured
[ ]: Male [■]: Female

It is important to see the relation between total length and length of various parts of whales, considering changes following growth. If the lengths of various parts are converted to percentages of the total length, their relations are seen in figure 3. The values are plotted as average percentage length of parts against total length of whales in different areas for comparative purposes. Figure 3 is based on the following individuals measured. Individuals in area A contain whales measured in 1954.

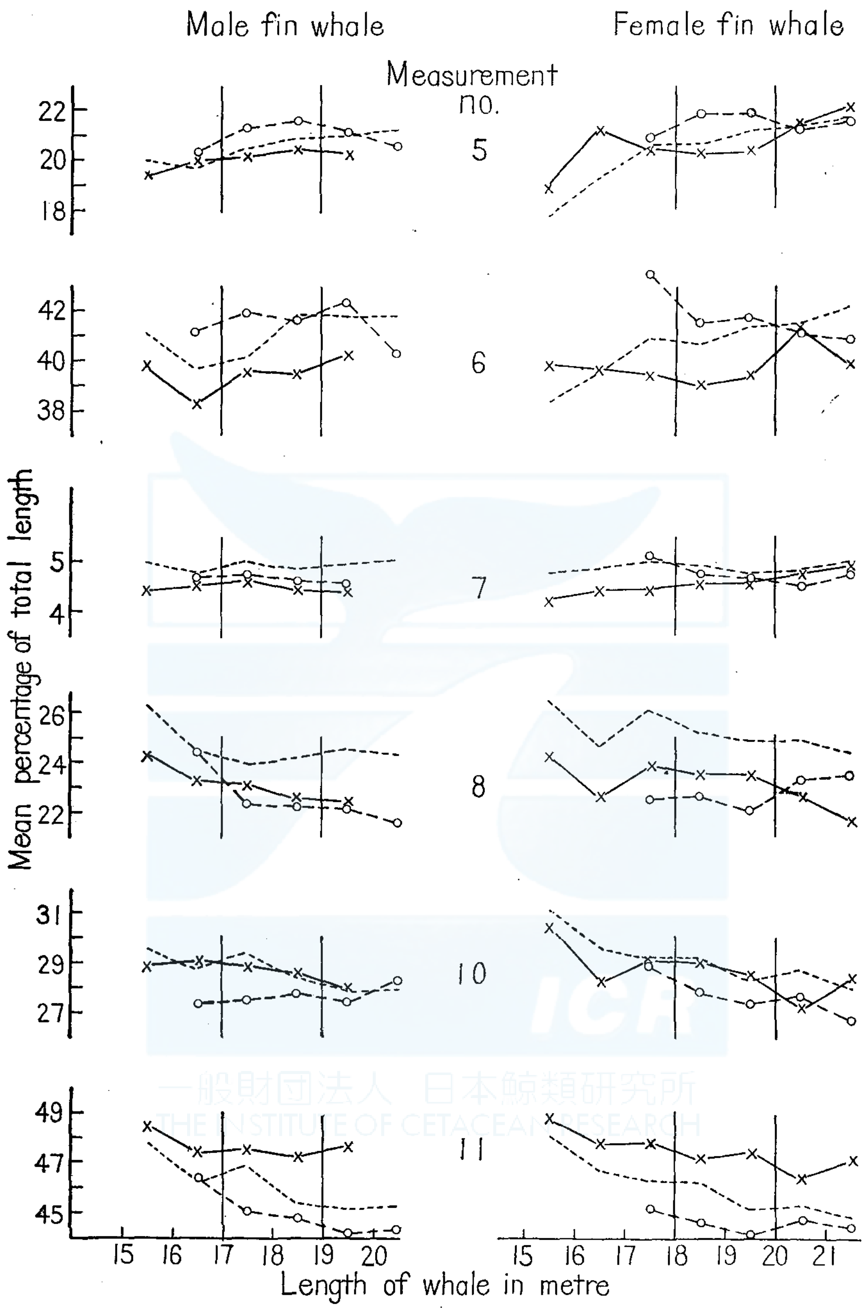

Fig. 3. a. The mean value of each measurement expressed as percentage of total length.

○——○ Whales in area A ------- Whales at South Georgia in the Antarctic.
×——× Whales in area E (Cited from *Discovery Report* vol. 1)

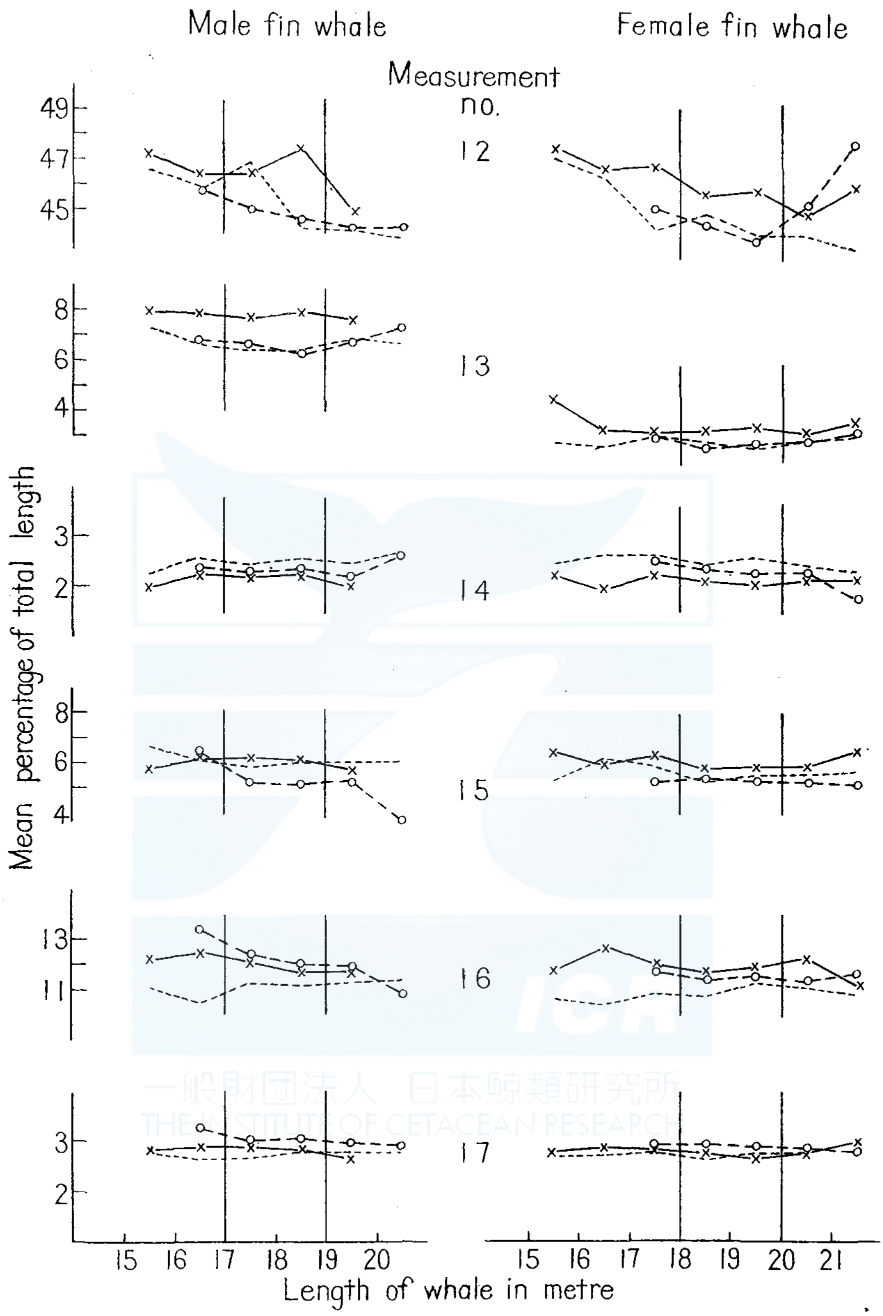

Fig. 3. b. The mean value of each measurement expressed as percentage of total length.

		Male						Female						
		Length of whale in metre						Length of whale in metre						
Area	Year	15	16	17	18	19	20	15	16	17	18	19	20	21
A	1952–54	—	2	18	36–8	18–9	0–1	—	—	6–7	19–20	31–2	12–6	1–2
E	1955	16	27	43	22	4	—	9	6	24	32	18	3	1

It is apparent that there are considerable correlation between the length of some parts and total length of whale for both sexes. Fujino (1954) studied partly this connection using correlation coefficient, and precise studies on the differences of shapes demand the due consideration on those correlations. Unfortunately, there are sparse data for small and large fin whale and yet no accurate method available for determining age of fin whale, so the details of rates of growth for various parts are not here discussed. It is necessary to set up several discriminant formulae for each length layer of both sexes of fin whales to analyse whether the shapes of fin whales are different or not between area A and E, because of those correlations. Furthermore it is necessary to study significant differences of the mean lengths between area A and E at each length layer of whales before the treatment of samples. The length layers showing maximum numbers of individuals measured are 17, 18 meters in male, 18, 19 metres in female respectively in area A and E as shown in table 1 a, b and figure 2. The actual mean lengths of fin whales measured are tabulated in table 2.

TABLE 2. MEAN LENGTH (IN CM) OF FIN WHALE MEASURED IN AREA A AND E

			Area A		Area E	
Group	Sex	Range of length of whale	Mean length of whale	Individuals measured	Mean length of whale	Individuals measured
I	Male	1700–1799	1762	15	1765	30
II	Male	1800–1899	1843	30	1843	20
III	Female	1800–1899	1853	17	1859	26
IV	Female	1900–1999	1949	29	1940	15

There are no significant differences of mean length between area A and E in the same groups on the 1% level, although there is a little difference in variance. Besides, as all of 10 parts of body must be measured in all individuals for calculations, it is necessary to select actual samples answering this conditions among whales measured. The samples for calculation, therefore, become smaller in table 2 than in table 1, and are 45 whales in group I, 50 in group II, 43 in group III and 44 in group IV in all. The measurements are recorded as the actual length in centimetre well adapted for further use.

STATISTICAL TREATMENT

The method of the linear discriminant function (L. D. F.) by R. A. Fisher is applied to consider the difference of the shape of fin whale between two areas. In the case that there are several measurements for individuals, it is necessary to find out the weight of each measurement as the discriminant coefficient in L. D. F. Furthermore it is desirable to determine a class which an individual belongs to, according to the discriminant value replaced by linear compounds of the measurements.

The discriminant coefficient are determined under the conditions that make it the largest, the difference of the mean discriminant value between two groups to be classified. The theory of L. D. F. is well known as the method of the test for the difference between two mean values, in the case of only one measurement. In other words, the test for the difference between two mean values in a variate is able to be extended to L. D. F. in multivariates. The fundamental conditions are as follows, in the application of the theory above mentioned to the sample of this present problem.

The theory of L. D. F. in large numbers of samples is used for this paper and so it is desirable to take samples more than 100 for each group. However, as the biological investigations on board of the factory ships limit the number of measurements and it is rather difficult to collect large samples in a short time, the calculations here are carried out with 40 to 50 samples in all for each group. The functions set up on such samples are not the population discriminant functions but the sample ones. Therefore, it is necessary to consider the variation based on the sampling errors when we use that discriminant coefficients for the constant discriminant standards and apply them to the method of the classification for individuals. In other words, the sample discriminant coefficients in the small sample approximate gradually to the population ones with further improvement, but those will help us in analysing the measurements to some degree.

As area A is situated in an only part of the extensive northern Pacific, it is natural that different years bring forth the changes of oceanographical conditions. The nutritional level variable affects the rate of growth of aquatic mammals, especially in their younger stages (Laws, 1956), so it is assumable that there are remarkable individual variations in the lengths of parts of fin whales in different years. The means of measurements at each group are tabulated with their 99% confidence limites in table 3 a, b, 4 a and b, for area A and E.

TABLE 3. MEAN LENGTH (AND THEIR 99% CONFIDENT LIMITS) OF BODY PARTS OF FIN WHALES MEASURED IN TWO AREAS IN DIFFERENT YEARS (IN CM)

a. Group I

	Area A				Area E			
	1953			1952	1955			1956
Measure-ment	Lower limit	Mean	Upper limit	Mean	Lower limit	Mean	Upper limit	Mean
No. 5	350.5	370.6	390.6	374.2	352.2	358.9	365.6	359.5
6	702.3	734.4	766.6	748.3	687.2	703.8	720.4	698.6
8	367.7	396.0	424.3	395.0	403.1	411.7	420.3	395.1
10	470.0	493.9	517.7	475.0	494.4	504.4	514.4	504.3
11	775.2	809.4	843.6	786.7	823.0	838.6	854.2	840.3
12	769.6	813.3	857.1	781.7	803.5	820.4	837.2	817.5
13	111.9	127.2	142.6	122.5	129.4	138.5	147.6	146.9
14	34.2	38.4	42.7	39.2	36.4	38.3	40.1	38.3
15	74.2	88.9	103.6	86.7	101.1	108.7	116.4	109.9
Individuals		9		6		30		21-30..
Mean length of whale		1765		1757		1765		—

b. Group II

	Area A				Area E			
	1953			1952	1955			1956
Measure-ment	Lower limit	Mean	Upper limit	Mean	Lower limit	Mean	Upper limit	Mean
No. 5	389.0	400.8	412.6	389.5	363.5	376.6	389.6	379.5
6	746.4	767.6	788.9	778.5	710.0	724.3	738.5	720.4
8	401.8	413.2	424.5	410.0	399.1	417.3	435.4	435.5
10	491.8	505.8	519.8	519.8	513.5	530.7	547.8	514.5
11	807.4	821.8	836.3	846.4	843.3	865.6	887.9	859.5
12	794.0	811.8	829.7	847.7	816.8	844.1	871.3	855.9
13	109.5	120.3	131.1	122.3	135.6	148.2	160.7	142.0
14	35.7	40.6	45.5	42.0	37.2	40.4	43.6	41.7
15	80.9	88.9	97.0.	98.0	104.1	112.6	121.0	115.5
Individuals		19		11		20		10-11..
Mean length of whale		1837		1852		1843		—

.. The various parts of individuals are not measured togather.

The whales in area A have the large variation during two years while they in area E have the smaller variation during two years, chiefly because area E has a more narrow and a more simple oceanographical conditions than area A. It is therefore assumable that area E has the whales of the same population in 1956 as in 1955. It is not safe to say that area A has whales of the same population because of its situation near the Continent of Asia in the northern Pacific, but to

TABLE 4. MEAN LENGTH (AND THEIR 99% CONFIDENT LIMITS) OF BODY PARTS OF FIN WHALES MEASURED IN TWO AREAS IN DIFFERENT YEARS (IN CM)

a. Group III

	Area A				Area E			
	1953			1952	1955			1956
Measurement	Lower limit	Mean	Upper limit	Mean	Lower limit	Mean	Upper limit	Mean
No. 5	391.1	404.1	417.2	405.0	365.1	376.2	387.3	382.1
6	743.8	767.9	791.9	760.0	703.3	724.5	745.7	727.0
8	408.2	420.4	432.5	416.7	427.2	440.2	453.2	430.8
10	504.0	514.3	524.6	514.3	527.3	538.4	549.5	534.5
11	809.1	822.9	836.6	838.3	864.8	878.7	892.5	875.5
12	795.9	815.7	835.6	841.7	835.5	853.8	872.2	851.5
13	39.6	50.4	61.1	58.3	53.9	59.7	65.4	60.9
14	38.7	42.1	45.6	44.7	35.8	38.7	41.6	37.7
15	90.2	103.9	117.6	100.0	102.1	108.5	114.9	111.2
Individuals		14		3		26		14–19 ..
Mean length of whale		1851		1863		1859		—

b. Group IV

	Area A				Area E			
	1953			1952	1955			1956
Measurement	Lower limit	Mean	Upper limit	Mean	Lower limit	Mean	Upper limit	Mean
No. 5	413.2	424.6	435.9	420.8	385.6	398.7	411.8	400.9
6	784.0	807.0	830.0	825.0	738.7	769.3	800.0	767.0
8	407.7	426.7	445.8	428.3	436.2	455.8	475.4	442.0
10	523.2	538.3	553.4	516.7	525.6	551.5	577.3	570.6
11	860.8	873.7	886.6	845.0	898.2	922.4	946.6	899.5
12	846.9	863.3	879.6	838.3	849.1	886.9	924.7	893.9
13	48.1	53.3	58.5	60.0	51.8	64.3	76.7	70.5
14	41.3	44.1	46.9	47.8	35.3	38.5	41.7	42.7
15	93.1	103.5	113.9	96.7	100.8	114.7	128.7	120.7
Individuals		23		6		15		5–9 ..
Mean length of whale		1950		1944		1940		—

.. The various parts of individuals are not measured together.

say there are intermingles to some extent among several populations in such feeding area as the northern Pacific. As the means of measurements by different men are stable arbitrarily in 1952 and 1953, it is considered in this paper that the differences of means follow the sampling errors in area A.

NORMALITY OF EACH MEASUREMENT

The studies on the normal distribution of each measurement for each group usually need several hundreds samples, however, it is difficult to have large numbers of samples in whaling areas and assume the type of their population distributions, especially on the decks of factory ships. Fortunately, there are fairly much measurements at South Georgia in *Discovery Reports* vol. 1, and so it is possible to apply measurements of male fin whales 20 metre long to test their normalities. If each value in *Discovery Reports* vol. 1 is plotted in the normal probability paper, the normality of each measurement for fin whales is generally assumed.

HOMOGENEITY OF VARIANCE

It is not easy to study the homogeneity of variance-covariance matrices of two nine-variates for each group in two areas. However, it is possible here to test the homogeneity of variance for the corresponding measurement between two areas at each group. Wheeler's method are applied to this test and 36 unviased variance ratios to be tested are shown in the following table.

TABLE 5. TEST FOR VARIANCE IN EACH MEASUREMENT

	Degree of freedom		Measurement No.								
	n_1	n_2	5	6	8	10	11	12	13	14	15
Group I	14	29	2.07	—	1.93	1.23	1.17	1.60	—	1.79	—
	29	14	—	1.38	—	—	—	—	2.02	—	1.21
Group II	19	29	1.09	—	—	1.45	1.39	1.82	—	—	—
	29	19	—	2.40*	1.38	—	—	—	1.15	1.66	1.00
Group III	16	25	—	—	2.49	—	—	—	1.40	—	2.05
	25	16	1.90	2.06	—	2.92*	1.74	1.81	—	1.73	—
Group IV	14	28	—	1.20	—	1.72	1.37	2.70*	2.87**	—	—
	28	14	1.21	—	1.35	—	—	—	—	1.42	1.07

* $P<0.05$ ** $P<0.01$
Values show variance ratios.

Where the measurements No. 6 in group II, No. 10 in group III and No. 12 in group IV are significant at 5%, besides No. 13 in group IV at 1% level between two areas. Nevertheless it is safe to say the homogeneity of variance-covariance matrices of two nine variates for each group. Chiefly because, from the results of the experiments in constructed normal populations up to this time, such significant differences of variance between corresponding measurements above mentioned do not result in the remarkable wrong conclusion. In other words, it is possible to calculate further assuming the equality of variance-covariance matrices for each groups in this present problem.

PROCESS OF CALCULATION

Setting up four L. D. F. for group I, II, III and IV, I make here group II a representative among other groups to explain the process of calculation for L. D. F., because there is the largest sample in group II among groups, in which male fin whale 1800–1899 centimetre long are contained. The process of calculation are the same for other groups as for group II.

TABLE 6. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP II IN AREA A

					X_1	X_2	X_3	X_4	X_5		X_6		X_7	Discri-minant value
				Measurement No.										
Year	Date Caught		Whale No.	1	5	6	8	10	11	12	13	14	15	$Y_{II\cdot a}$
1952	Sept.	10	261	1805	385	730	390	490	780	850	120	40	120	17.58
	July	22	14	1820	400	771	400	490	790	810	120	36	90	11.17
	Aug.	25	170	1830	360	750	410	510	890	890	110	40	90	15.53
	Sept.	3	222	1830	365	720	430	520	860	880	120	40	80	17.05
	〃	10	259	1854	400	780	400	530	850	840	140	40	110	17.79
	〃	14	276	1856	400	830	420	510	850	850	130	50	90	10.24
	Aug.	13	113	1861	370	765	400	520	850	830	120	45	90	14.41
	Sept.	4	223	1863	370	770	430	520	830	810	120	45	90	13.87
	〃	16	288	1870	400	780	400	530	850	850	130	40	100	15.80
	Aug.	24	162	1890	410	835	420	570	880	850	120	46	120	16.37
	〃	8	83	1894	425	825	410	525	880	865	115	40	98	11.94
1953	July	9	344	1800	390	770	400	500	830	500	130	46	90	13.42
	Sept.	5	576	1800	380	700	440	525	800	770	105	36	90	17.51
	Aug.	9	466	1815	410	755	405	490	820	820	130	55	90	13.94
	Sept.	15	629	1815	385	680	420	500	825	825	125	33	75	17.86
	〃	5	584	1820	430	755	445	505	805	775	115	39	70	11.10
	〃	27	690	1820	395	770	410	480	810	790	145	47	90	13.24
	July	15	380	1830	400	805	390	520	860	880	90	48	110	12.10
	Aug.	9	467	1830	420	780	405	480	805	795	135	43	95	12.30
	Sept.	18	644	1830	415	780	415	490	810	810	130	40	95	12.61
	May	21	3	1830	370	770	440	570	820	800	80	40	70	10.46
	Sept.	16	638	1835	385	755	415	515	825	820	130	44	100	16.47
	July	27	415	1840	400	785	405	515	855	845	115	35	65	9.46
	Aug.	3	451	1840	430	805	405	485	810	805	110	48	85	7.78
	〃	31	567	1840	405	760	400	490	790	790	120	40	110	14.54
	〃	28	533	1845	405	785	390	490	800	795	115	30	85	9.31
	〃	27	525	1860	375	795	390	515	845	845	140	45	95	13.81
	Sept.	9	609	1875	425	770	430	515	810	790	115	43	90	12.91
	July	27	259	1890	400	805	415	520	870	830	120	23	95	12.90
	Sept.	25	670	1890	395	760	430	505	825	810	135	36	90	14.97
Mean	—	—	—	1843	396.7	771.4	411.0	510.8	830.8	825.0	120.0	41.1	92.3	13.61

Measurements in 1952 are cited from *the Scientific Reports of the Whales Research Institute*, No. 9, pp. 152–3.

TABLE 7. MEASUREMENTS IN CM AND DISCRIMINENT VALUES FOR GROUP II IN AREA E

Year	Date Caught		Whale No.	1	5 (X_1)	6 (X_2)	8 (X_3)	10 (X_4)	11 (X_5)	12	13 (X_6)	14	15 (X_7)	Discriminant value $Y_{II \cdot e}$
1955	Aug.	4	18	1829	444	744	439	518	793	739	147	50	96	17.71*
	〃	7	27	1890	380	701	426	505	884	818	152	40	98	23.02
	〃	11	39	1829	350	732	411	502	853	833	139	43	96	18.34*
	〃	14	42	1829	357	732	441	549	884	865	152	38	96	22.48
	〃	17	53	1829	357	732	426	487	853	798	111	43	103	17.00*
	〃	24	83	1890	375	732	469	549	904	875	142	38	114	24.98
	〃	27	94	1829	357	701	413	502	865	860	164	32	101	23.40
	Sept.	4	110	1859	378	711	426	566	914	873	154	45	119	28.50
	〃	10	130	1829	365	701	406	528	863	853	170	45	93	23.80
	〃	10	135	1859	383	749	469	549	870	853	167	45	129	26.54
	〃	12	142	1829	396	732	421	518	853	840	137	32	109	20.78
	〃	13	148	1859	396	777	385	591	823	815	137	35	114	20.00
	〃	15	158	1829	383	721	401	492	840	823	177	43	121	24.24
	〃	16	159	1829	375	686	350	538	914	886	121	40	129	27.14
	〃	16	162	1829	357	732	426	535	868	865	180	35	119	26.20
	〃	23	194	1829	375	749	406	549	853	835	121	35	119	20.75
	〃	23	195	1890	380	718	426	543	896	926	121	43	134	26.08
	〃	25	201	1829	373	724	431	556	914	894	152	38	109	25.72
	Oct.	5	211	1829	370	723	393	518	800	777	162	45	131	24.21
	〃	5	217	1829	380	688	380	518	868	853	157	43	121	26.83
Mean	—		—	1843	376.6	724.3	417.3	530.7	865.6	844.1	148.2	40.4	112.6	23.38

* Individuals marked have the discriminant values belonging to area A.
Standard discriminant value: $Y_{II \cdot G}=18.50$.
Individual discriminant value: $Y_{II}=b_1X_1+b_2X_2+\cdots+b_7X_7$.

It is convenient to study the significant differences between corresponding means in two areas at each measurement before setting up L.D.F. From the result tested, the measurements Nos. 5, 6, 10, 11, 13, and 15 are significant on the 1% level between two areas. However, it is more necessary to combine six measurements above mentioned with the measurement No. 8 to make the precision for discrimination higher, because only each measurement has little contribution to classification. As all measurements of individuals contribute to calculation in the following procedure, measurements available are shown as $X_{1,2,\cdots,7}$ in table 6 and 7.

If 7 measurements are replaced by a linear compound, L. D. F. is

$$Y=b_1X_1+b_2X_2+\cdots+b_7X_7$$

Then if (Wij) is the matrix of unbiased variance given by the sum of the matrices of variation for each measurement in two areas and (di) is the vector of difference between corresponding measurements in two areas, $(bi)=(W^{ij})(di)$. (W^{ij}) is the reciprocal of (W_{ij}).

The actual length of various parts of fin whales give $(W^{ij})(di)$, so the coefficients of the linear discriminant function are given by the equation.

$$
\begin{aligned}
392.489 b_1+232.686 b_2+7.505 b_3-40.642 b_4-193.089 b_5+5.278 b_6+18.159 b_7 &= -20.116\\
232.686 b_1+910.694 b_2+0.599 b_3+198.720 b_4+109.122 b_5-22.745 b_6+73.923 b_7 &= -47.117\\
7.505 b_1+0.599 b_2+978.370 b_3+105.203 b_4+51.896 b_5+1.068 b_6-89.849 b_7 &= 6.250\\
-40.642 b_1+198.720 b_2+105.203 b_3+574.311 b_4+331.966 b_5-98.082 b_6+54.275 b_7 &= 19.817\\
-193.089 b_1+109.122 b_2+51.896 b_3+331.966 b_4+997.741 b_5-49.433 b_6+43.474 b_7 &= 34.767\\
5.278 b_1-22.745 b_2+1.068 b_3-98.082 b_4-49.433 b_5+416.511 b_6+17.945 b_7 &= 28.150\\
18.159 b_1+73.923 b_2-89.849 b_3+54.275 b_4+43.474 b_5+17.945 b_6+172.645 b_7 &= 20.283
\end{aligned}
$$

Solving, $b_1=0,0027$, $b_2=-0.0735$, $b_3=0.0120$, $b_4=0.0427$, $b_5=0.0266$, $b_6=0.0713$, and $b_7=0.1274$. So that the discriminant function is

$$
\begin{aligned}
Y_{II} = &\, 0.0027X_1-0.0735X_2+0.0120X_3+0.0427X_4+0.0266X_5+0.0713X_6\\
&+0.1274X_7.
\end{aligned}
$$

Where (W_{ij}) estimates the population variance matrix of the normal population in 7 variates, as if the unviased variance U^2 estimates the population variance in 1 variate. Therefore, it is possible to calculate $\sum bidi$ corresponding to Mahalanobis' D^2 to study the significant difference of the shape of fin whales between area A and E for group II.

$$\sum bidi=b_1d_1+b_2d_2+\cdots+b_7d_7=9.844$$

Let N_1 and N_2 be the samples drawn from two areas, to test for the differences in mean values of Y the statistic is

$$\frac{N_1N_2(N_1+N_2-1-7)}{(N_1+N_2)(N_1+N_2-2)}\cdot\frac{\sum bidi}{7}=\frac{30\times 20\times 42}{50\times 48\times 7}\times 9.844=14.766$$

which as a variance ratio with 7 and 42 degrees of freedom is significant at 1% level.

In table 6 and 7, Y_{II} given by a linear compound of 7 measurements is tabulated. If the mean values $\overline{Y}_{II\cdot a}$, $\overline{Y}_{II\cdot e}$ are obtained for the individuals of two areas, the limit value for the classification is given by the next formula. Standard discriminant value is

$$Y_{II \cdot G} = \frac{\overline{Y}_{II \cdot a} + \overline{Y}_{II \cdot e}}{2}$$

$\overline{Y}_{II \cdot e}$ exceeds $\overline{Y}_{II \cdot a}$ in this present problem and Y of individual determines which he belongs to area A or E. In other words, if Y of individual examined exceeds $Y_{II \cdot G}$, he belongs to area E and if $Y_{II \cdot G}$ exceeds his Y he belongs to area A. The area to which individual examined belongs is identified by the standard value $Y_{II \cdot G}$ for group II, so the method of L. D. F. is applied to the classification of individuals.

TABLE 8. THE CHANCE FOR MISCLASSIFICATION FOR GROUP II

Discriminant basis		Chance for misclassification			
Measurement	X	$\lvert h\rvert$	σ_Y	$ts=\lvert h\rvert/\sigma_Y$	$Pr\{t\geqq ts\}$
No. 5**	X_1	10.058	19.811	0.508	31%
6**	X_2	23.559	30.178	0.781	22
8	X_3	3.125	31.279	0.100	46
10**	X_4	9.909	23.965	0.414	34
11**	X_5	17.384	31.587	0.550	29
12		9.526	36.078	0.264	40
13**	X_6	14.075	20.409	0.690	25
14		0.350	5.801	0.060	50
15**	X_7	10.142	13.139	0.772	22
	$X_{1,2,\ldots,7}$	4.922	3.138	1.569	6

** $P<0.01$

The marks show the significant differences between corresponding mean values in two areas.

However, it is sometimes seen that Y of the individuals belonging to area A exceed $Y_{II \cdot G}$ and $Y_{II \cdot G}$ exceed Y of the individuals belonging to area E. In such a case, the frequency distribution curves of Y_{II} in two areas overlap each other and the overlaping area shows indirectly the probability for wrong classification by L. D. F. The probability for the misclassification are given by

$$ts = \frac{|h|}{\sigma_{YII}}$$

$$h = Y_{II \cdot G} - \overline{Y}_{II.a} = Y_{IIG} - \overline{Y}_{II \cdot e}$$

where σ_{YII} is the standard deviation of Y_{II}.

The frequency distribution curves of $Y_{II \cdot a}$ and $Y_{II \cdot e}$ are normally standarized by $|h|/\sigma_{YII}$. It is shown in table 8 with the chance for misclassification that the degree of precision for identification is higher in the linear compound of 7 measurements than in only one measurement.

The chance of wrong classification is about 6% when 7 measurements are replaced by a linear compound, while it is about 22% in the measurement No. 6, 15 showing the minimum values of the chance for misclassification among all measurements. The frequency distributions of Y for individuals in area A and E are shown in figure 4 as histograms.

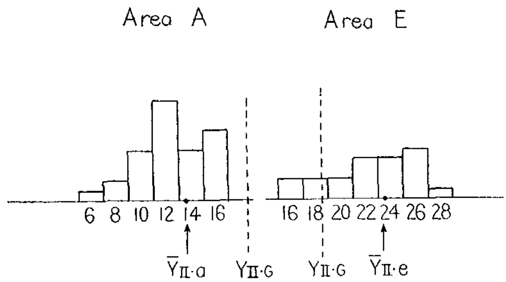

Fig. 4. The distributions of the discriminant values for group II
$Y_{II}=b_1X_1+b_2X_2+\cdots+b_7X_7$

The same procedure for calculation as shown above gives us the discriminant coefficients for other groups. The linear discriminant functions given as a compound of 7 measurements are

Group I. $Y_1=0.0320X_1-0.0556X_2+0.0346X_3+0.0031X_4$
$+0.0325X_5+0.0008X_6+0.1201X_7$

Group III. $Y_{III}=-0.0673X_1-0.0131X_2+0.0464X_3+0.0070X_4$
$+0.1032X_5+0.0835X_6-0.3050X_7$

Group VI. $Y_{IV}=-0.0826X_1+0.0042X_2+0.0646X_3-0.0082X_4$
$+0.0456X_5+0.0583X_6-0.3190X_7$

To test for the differences in mean values of Y the statistics are for each group

Group I. $\frac{15\times30\times37}{45\times43\times7}\times5.834=7.171$

Group III. $\frac{17\times26\times35}{43\times41\times7}\times10.894=13.656$

Group IV. $\frac{29\times15\times36}{44\times42\times7}\times8.708=10.542$

Which as variance ratios with 7 and 37 degrees of freedom for group I, 7 and 35 degrees of freedom for group III and, 7 and 36 degrees of freedom for group IV are significant on 1% level. The degrees of precision for classification are tabulated in table 9, a, b, c, for group I, III and IV. The distributions of Y for individuals in area A and E are tabulated in tables 10 to 15 and shown as histograms showing frequency distributions for group I, III and IV in figure 5.

X_7 of female fin whales for group III or IV is measurement No. 14.

TABLE 9. THE CHANCES FOR MISCLASSIFICATION FOR EACH GROUPS

a. group I.

Discriminant basis		Chance for misclassification			
Measurement	X	$\|h\|$	σ_Y	$ts=\|h\|/\sigma_Y$	$Pr\{t\geqq ts\}$
No. 5**	X_1	6.567	15.331	0.428	33%
6**	X_2	18.117	31.457	0.576	28
8	X_3	8.067	19.489	0.414	34
10**	X_4	9.034	20.699	0.436	33
11**	X_5	19.134	31.788	0.602	27
12		9.850	36.582	0.269	40
13**	X_6	6.600	16.573	0.398	34
14		0.233	4.116	0.057	50
15**	X_7	10.033	14.753	0.680	25
	$X_{1,2,\cdots,7}$	2.937	2.424	1.210	11

b. group III.

Discriminant basis		Chance for misclassification			
Measurement	X	$\|h\|$	σ_Y	$ts=\|h\|/\sigma_Y$	$Pr\{t\geqq ts\}$
No. 5**	X_1	14.051	18.328	0.767	22%
6**	X_2	20.986	34.756	0.604	27
8**	X_3	10.224	20.774	0.492	31
10**	X_4	12.026	17.507	0.687	25
11**	X_5	26.553	23.126	1.148	13
12**		16.776	30.528	0.550	29
13*	X_6	3.945	11.350	0.348	37
14*	X_7	1.967	4.737	0.415	33
15		2.633	13.829	0.190	49
	$X_{1,2,\cdots,7}$	5.447	3.301	1.650	5

c. group IV.

Discriminant basis		Chance for misclassification			
Measurement	X	$\|h\|$	σ_Y	$ts=\|h\|/\sigma_Y$	$Pr\{t\geqq ts\}$
No. 5**	X_1	12.531	18.191	0.689	25%
6**	X_2	20.679	37.681	0.549	29
8**	X_3	14.366	28.334	0.507	31
10	X_4	8.837	28.594	0.309	33
11**	X_5	27.321	28.517	0.958	17
12		14.415	25.618	0.563	29
13	X_6	4.806	12.161	0.395	34
14**	X_7	3.215	4.698	0.684	25
15*		6.332	18.568	0.341	37
	$X_{1,2,\cdots,7}$	4.354	2.951	1.475	7

* $P<0.05$ ** $P<0.01$

The marks show the significant differences between corresponding mean values in two areas.

The position of end of ventral grooves is not rather clearer in fin whale than in sei whale and so it is difficult to determine that accurate position in the former. Japanese scientists are unanimous for the determination of this position, however which is arbitrary speaking objectively. Therefore, that measurement No. 12 is not contained within the linear components for L. D. F. In the test for differences between the corresponding measurements Nos. 12 and 13 for group IV in two areas, it is obliged to use Cochran-cox' method because those measurements have different variances in two areas as shown in table 5.

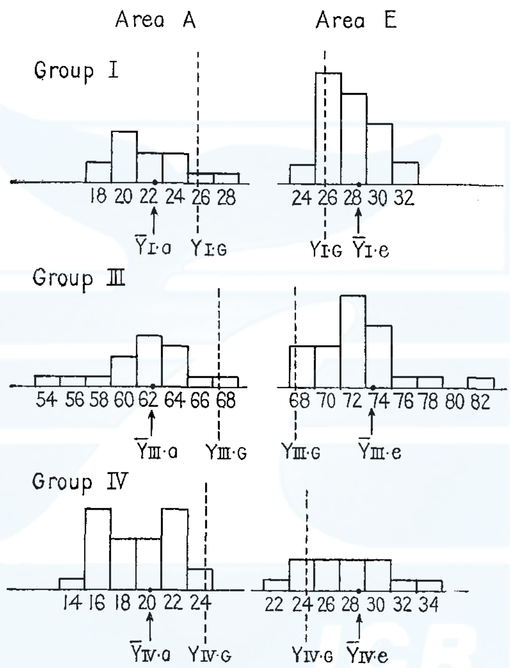

Fig. 5. The distributions of the discriminant values for each group.
$Y=b_1X_1+b_2X_2+\cdots+b_7X_7$

DISCUSSION AND CONCLUSION

According to Omura (1950), fin whales are mature over 60 ft. (18.3 metre), or 61 ft. (18.6 metre) long in female and over 58 ft. (17.7 metre) or 59 ft. (18.0 metre) long in male respectively in the adjacent waters to Japan. The length of fin whale at sexual maturity is about the same in the north hemisphere (Jonsgard, 1952), especially in the North Pacific (Matsuura & Maeda, 1942, Pike, 1953) as in the adjacent waters to Japan. In the area E, the data of general biological investigation are now being arranged. It can at least be said, however, that the length of sexual maturity of fin whale does not only exceed the bordor according to Omura, but also it is there fairly smaller (Mizue, 1956).

As there are sparse samples over and below 17 or 18 metres of the length in male fin whale and 18 or 19 metres in female in area A and E, it is difficult to smooth completely the curves in figure 3 for the comparative purposes. However it is assumable that there are the points of infection of curves in area E at 17 or 18 metres in male length and 18 and 19 metres in female length, and which may suggest that the length of whale at sexual maturity in area E is fairly

TABLE 10. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP I IN AREA A

					X_1	X_2	X_3	X_4	X_5		X_6		X_7	
				Measurement No.										Discriminant value
Year	Date Caught		Whale No.	1	5	6	8	10	11	12	13	14	15	$Y_{I\cdot a}$
1952	Aug.	20	135	1728	390	765	380	470	790	770	110	50	90	21.22
	Sept.	10	263	1738	365	740	400	470	730	720	125	35	90	20.47
	〃	14	281	1760	385	780	360	470	780	780	110	40	100	20.31
	Aug.	25	167	1770	400	770	400	480	780	760	130	30	70	19.18
	〃	25	169	1770	340	715	430	510	840	840	120	40	100	26.99*
	July	28	38	1776	365	720	400	450	800	820	140	40	70	21.40
1953	〃	8	338	1720	375	680	415	500	800	830	140	34	105	28.83*
	Sept.	4	571	1755	365	720	370	495	815	815	125	35	80	22.18
	Aug.	27	526	1760	370	725	360	460	875	875	120	40	80	23.55
	June	25	251	1770	380	745	415	510	800	800	140	46	95	24.20
	Sept.	16	637	1770	390	755	370	480	820	770	150	37	80	21.17
	July	26	407	1775	400	785	435	485	770	770	125	41	65	18.64
	Sept.	4	574	1775	350	740	390	475	775	775	125	35	100	22.32
	June	26	257	1780	360	740	410	510	810	865	110	38	110	25.77*
	July	3	304	1780	345	720	399	530	820	820	110	40	95	24.60
Mean	—	—	—	1762	372.0	740.0	395.6	486.3	800.3	800.7	125.3	38.7	88.7	22.73

Measurements in 1952 are cited from *the Scientific Reports of the Whales Research Institute*, No. 9, p. 152.

* Individuals marked have the discriminant values belonging to area E.

smaller than one in the other waters near Japan and the northern Pacific. Because the fin whales in the northern Pacific have the points of infection of curves at 18 metres (a. 59 ft.) or 19 metres (a. 62 ft.), after sexual maturities (Fujino, 1954). The fin whales at South Georgia in the Antarctic have the points of infection of curves soon after sexual maturities at 19.5 metres (a. 64 ft.) in males and 20 metres (a. 66 ft.) in females judging from the figures of external proportions in *Discovery Reports* vol. 1.

It can be said statistically that there are the differences of the general shapes of fin whales between area A and area E in the North Pacific and fin whales have longer heads and shorter tails in area A than in area E. However, it is more desirable to classify whales into two areas through their external measurements. Discussion on this connection are as follows.

TABLE 11. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP I IN AREA E

Year	Date Caught	Whale No.	1	5 (X_1)	6 (X_2)	8 (X_3)	10 (X_4)	11 (X_5)	12	13 (X_6)	14	15 (X_7)	Discriminant value $Y_{I\cdot e}$
1955	Aug. 14	44	1798	380	732	426	487	838	815	137	35	103	27.43
	〃 17	57	1768	357	718	396	502	853	853	137	43	111	27.92
	〃 19	63	1737	352	686	416	500	823	805	119	38	88	26.48
	〃 20	64	1737	340	688	406	518	810	777	114	40	98	26.47
	〃 20	65	1707	370	660	408	505	803	777	131	38	98	28.80
	〃 21	71	1768	352	701	441	518	838	838	139	38	111	29.83
	〃 23	74	1707	337	640	418	487	823	805	114	40	106	30.74
	〃 23	76	1707	340	671	408	487	823	803	114	35	91	26.97
	〃 24	81	1707	370	701	396	469	896	878	134	35	96	28.78
	〃 24	82	1798	340	701	413	533	853	825	142	35	98	27.45
	〃 25	86	1768	375	732	431	487	823	787	137	38	101	26.71
	〃 26	88	1798	355	671	408	507	868	850	139	38	114	31.75
	〃 30	95	1798	365	732	444	543	853	828	126	38	101	27.98
	〃 31	101	1737	355	620	408	533	843	828	131	35	91	31.09
	Sept. 3	107	1707	347	671	406	482	808	808	124	35	83	25.67*
	〃 4	112	1798	352	732	444	549	899	865	139	38	131	32.69
	〃 5	114	1798	347	686	426	518	884	838	152	32	103	30.53
	〃 6	117	1798	360	701	408	518	853	873	124	35	101	28.22
	〃 7	118	1798	360	732	426	487	823	815	162	43	111	27.28
	〃 10	131	1798	373	762	383	505	833	823	167	45	121	26.12
	〃 11	136	1768	373	732	416	495	833	823	182	35	114	28.07
	〃 13	146	1798	370	701	401	487	853	838	152	43	103	28.46
	〃 13	147	1707	350	676	385	492	823	800	164	40	129	30.83
	〃 19	173	1768	378	732	396	487	865	845	109	40	111	28.14
	〃 19	174	1798	368	747	403	505	833	823	116	38	131	28.65
	〃 19	177	1768	345	732	380	497	742	711	159	40	126	24.40
	〃 20	178	1737	357	691	418	502	843	810	157	40	142	33.60
	〃 20	179	1798	388	732	424	502	803	789	144	45	129	29.65
	〃 21	186	1798	355	732	426	490	868	858	152	43	129	30.74
	〃 25	200	1768	355	701	391	540	848	823	139	30	91	26.19
Mean	—	—	1765	358.9	703.8	411.7	504.4	838.6	820.4	138.5	38.3	108.7	28.59

* Individuals marked have the discriminant value belonging to area A.
Standard discriminant value: $Y_{I\cdot G}=25.66$.
Individual discriminant value: $Y_I=b_1X_1+b_2X_2+\cdots+b_7X_7$.

The measurements showing the significancy of difierences between area A and E are Nos. 5, 6, 10, 11, 13 and 15 for male fin whale groups I, II, while Nos. 5, 6, 8, 11 and 14 for female fin whale groups III, IV.

Consequently, there are common measurements, Nos. 5, 6, 11, for both sexes, and male whales have 6 common measurements applicable to classification into area A and E, and female whales have 5. As shown in table 8 and table 9 a, b, c, the measurements showing the significant difference are more regular in male than in female, it is seen, however, that there are smaller chances for misclassification in female than in male. The chances for misclassification according to measurement No. 11 are 13% for group III and 17% for group IV respectively, while 27%

TABLE 12. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP III IN AREA A

					X_1	X_2	X_3	X_4	X_5		X_6	X_7		Discriminant value
				Measurement No.										
Year	Date Caught		Whale no.	1	5	6	8	10	11	12	13	14	15	$Y_{III \cdot a}$
1952	Sept.	16	287	1818	400	755	400	510	820	850	60	47	120	60.62
	〃	10	264	1876	405	760	435	523	825	825	55	42	95	63.56
	Aug.	8	79	1894	410	765	415	510	870	850	60	45	85	66.28
1953	〃	17	477	1810	395	785	420	525	820	835	75	42	125	64.37
	Sept.	4	572	1810	398	740	385	505	800	775	30	38	90	58.39
	〃	5	579	1810	370	705	420	525	835	835	60	40	80	68.00*
	〃	18	646	1835	415	760	415	495	830	830	45	46	85	60.22
	July	28	425	1845	410	780	430	525	825	845	50	43	80	62.02
	〃	2	298	1850	430	790	415	500	800	800	60	52	120	55.18
	〃	19	383	1850	410	800	410	500	800	810	40	46	115	56.32
	〃	8	339	1860	425	770	410	520	850	840	60	38	110	65.11
	June	29	282	1865	410	760	435	515	845	800	45	44	125	63.78
	〃	30	283	1865	380	770	445	540	800	770	60	39	120	64.44
	Sept.	5	577	1865	395	735	410	505	820	800	45	46	85	60.70
	Aug.	25	521	1870	415	820	420	505	835	825	65	40	115	63.75
	July	7	326	1890	405	790	435	520	830	810	30	38	105	62.79
	Sept.	27	689	1895	400	745	435	520	830	845	40	38	100	64.55
Mean	—	—	—	1853	404.3	766.5	419.7	514.3	825.6	820.3	51.8	42.6	103.2	62.36

Measurements in 1952 are cited from the *Scientific Reports of the Whales Research Institute*, No. 9, p. 154.

* Individual marked has the discriminant value belonging to area E.

for group I and 29% for group II respectively. The differences of 1% or 2% for probabilities are out of the question but it is safe to say that female has more reliable measurement No. 11 for classification than male. The measurement No. 6 is remarkably constant for both sexes with 22 to 29% of the chances for misclassification. The measurement No. 5 is applicable to the classification for female with 22 to 25% of chance for misclassification, while it is not for male with 31 to 31%. The measurement No. 15 is applicable to the classification for male with 22 to 25% and contribute remarkably to the calculation for $\sum bidi$ corresponding to

Mahalanobis' D^2, however, it is rather unsatisfactory measurement as it is very difficult to say where the anterior part of the fin begin, although Japanese scientists are unanimous for the determination of those positions. If necessary, it is appropriate to calculate again except No. 15 in the future.

TABLE 13. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP III IN AREA E

Year	Date Caught		Whale No.		X_1	X_2	X_3	X_4	X_5		X_6	X_7		Discriminant value
				Measurement No.										
				1	5	6	8	10	11	12	13	14	15	$Y_{III \cdot e}$
1955	Aug.	5	23	1859	378	777	413	518	838	798	55	32	106	68.49
	〃	6	24	1890	370	671	446	564	884	865	65	38	96	76.06
	〃	6	25	1890	388	739	439	556	868	818	45	32	98	72.04
	〃	7	28	1829	365	732	441	549	884	833	55	35	96	75.66
	〃	9	35	1890	332	701	457	579	914	889	60	32	91	83.31
	〃	16	51	1859	388	701	457	535	838	805	60	38	119	69.56
	〃	17	54	1859	383	762	418	533	884	823	50	38	98	71.18
	〃	23	73	1890	360	732	457	549	884	884	40	40	109	73.60
	〃	26	89	1829	355	732	457	533	865	840	50	38	109	73.31
	〃	26	92	1890	378	793	472	559	899	894	60	45	116	74.05
	〃	30	96	1890	391	762	487	579	899	899	50	40	106	75.11
	〃	30	97	1890	401	732	457	549	884	855	58	40	106	72.34
	〃	31	102	1829	380	718	424	518	884	848	65	32	93	75.22
	Sept.	2	105	1829	393	681	451	535	870	863	60	38	116	72.51
	〃	2	106	1829	370	671	467	533	870	843	60	35	116	75.83
	〃	5	115	1829	378	732	439	518	884	801	58	45	109	71.31
	〃	11	137	1829	434	747	436	518	860	835	81	40	142	68.18*
	〃	11	138	1890	365	767	436	549	884	855	68	43	121	73.36
	〃	16	163	1829	365	657	446	518	838	840	68	32	103	73.55
	〃	22	192	1829	365	671	441	549	884	868	45	45	114	72.21
	〃	24	199	1859	385	732	408	533	868	865	50	30	106	71.77
	〃	27	205	1890	391	732	457	540	843	830	71	43	109	68.89
	Oct.	1	208	1859	365	732	416	530	884	853	71	38	91	74.43
	〃	5	215	1859	340	779	411	549	880	853	68	48	116	71.68
	〃	5	216	1829	365	732	375	502	899	909	55	38	109	72.59
	〃	13	223	1890	396	652	436	502	957	934	83	50	126	79.00
Mean	—	—	—	1859	376.2	724.5	440.2	538.3	878.7	853.8	59.7	38.7	108.5	73.28

* Individual marked has the discriminant value belonging to area A.
Standard discriminant value: $Y_{III \cdot G}=67.82$.
Individual discriminant value: $Y_{III}=b_1X_1+b_2X_2+\cdots+b_7X_7$.

In this paper No. 15 is contained among the linear compounds of 7 measurements. The discussions on the reason why female has less chance for wrong classification than male demand larger samples. Studies on the individual biases of scientists for the measurements are also necessary and these should have been carried out when the method of measurements of various parts of whales were planned. Although some designs of experiments help analysis for these biases, it is a method to study them indirectly through the actual use of the sample

TABLE 14. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP IV IN AREA A

				X_1	X_2	X_3	X_4	X_5		X_6	X_7		
			Measurement No.										Discriminant value
Year	Date Caught	Whale No.	1	5	6	8	10	11	12	13	14	15	$Y_{IV \cdot a}$
1952	Sept. 14	274	1934	450	820	410	500	830	830	50	42	110	16.03
	〃 9	257	1934	420	800	420	510	810	800	60	50	70	16.10
	July 31	49	1940	400	820	420	550	840	810	60	50	70	18.88
	Sept. 14	282	1940	410	860	430	520	870	870	60	45	100	22.08
	〃 15	286	1950	415	810	430	500	900	880	80	45	100	24.15
	July 27	34	1960	430	840	460	520	820	840	50	55	130	16.22
1953	〃 11	361	1910	410	810	400	500	820	820	40	49	110	15.37
	〃 20	388	1915	415	805	435	480	850	830	50	40	90	22.18
	Aug. 28	536	1915	420	815	430	545	875	865	60	46	120	20.76
	June 27	266	1920	415	780	445	570	850	850	50	40	60	21.99
	July 12	368	1920	435	785	430	520	890	880	50	38	150	22.26
	Aug. 3	454	1920	430	875	410	535	870	860	55	45	130	18.78
	〃 31	568	1930	430	800	410	515	855	835	50	38	100	19.89
	Sept. 25	672	1930	395	785	445	535	850	840	55	38	90	24.88*
	〃 25	671	1935	430	850	415	555	885	865	55	50	95	17.92
	〃 5	585	1940	460	820	445	535	875	865	70	38	90	21.67
	July 5	311	1950	400	745	420	515	880	850	75	43	120	23.78
	Sept. 27	692	1950	410	795	390	565	880	860	45	48	85	17.47
	June 28	269	1955	425	750	410	520	885	870	60	41	110	21.04
	Sept. 8	603	1965	475	850	435	540	865	855	55	44	100	16.62
	Aug. 28	530	1965	430	745	410	525	880	880	55	50	110	17.18
	Sept. 15	632	1965	455	745	530	590	850	800	50	57	100	18.44
	July 6	315	1970	430	830	440	550	920	920	40	44	115	22.13
	Sept. 13	624	1970	420	805	460	565	895	870	45	44	90	23.17
	July 8	337	1980	430	810	420	550	910	895	50	40	100	22.16
	Aug. 3	455	1985	400	815	440	530	865	915	60	48	100	22.09
	〃 29	539	1985	405	815	370	525	885	885	65	45	115	19.36
	Sept. 25	655	1985	430	885	450	580	890	880	45	46	100	21.05
	〃 15	634	1995	415	845	375	535	870	865	45	43	100	17.69
Mean	— —	—	1949	423.8	810.7	427.1	533.8	867.8	858.1	54.7	44.9	102.1	20.05

Measurements in 1952 are cited from *the Scientific Reports of the Whales Research Institute*, No. 9, p. 154.

* Individual marked has the discriminant value belonging to area E.

linear discriminant functions already set up. The sparse samples in different years help these studies to some extent in tables 16 to 23.

As tabulated in tables 16, 18, 20, and 22, the discriminant values of sparse samples for each group in area A in 1954, 1955 and 1956 do not exceed the standard discriminant values Y_G, and most of the discriminant values of samples for each group in area E in 1956 exceed Y_G as shown in tables 17, 19, 21 and 23.

It may suggest that the linear discriminant functions already set up for each group are considerably effective. However the discriminant values of many individuals in area B exceed the standard discriminant values Y_G for each group.

TABLE 15. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP IV IN AREA E

					X_1	X_2	X_3	X_4	X_5		X_6	X_7		Discri-minant value
				Measurement No.										
Year	Date Caught		Whale No.	1	5	6	8	10	11	12	13	14	15	$Y_{IV\cdot e}$
1955	Aug.	8	31	1920	378	732	441	518	884	800	73	35	91	29.49
	〃	11	38	1920	396	777	482	549	929	873	71	43	96	29.97
	〃	23	75	1951	418	808	457	579	914	873	48	43	116	24.40*
	〃	15	46	1951	416	779	457	533	899	863	58	40	129	25.68
	〃	21	67	1981	406	793	477	579	919	825	45	40	111	27.63
	〃	30	98	1981	408	810	469	561	904	894	53	43	116	25.99
	Sept.	1	104	1920	380	747	482	596	980	960	58	35	88	34.90
	〃	8	128	1920	396	762	487	610	945	926	53	32	91	32.92
	〃	14	151	1920	396	767	472	512	957	941	65	43	152	30.52
	〃	17	167	1951	408	774	462	496	914	914	71	43	114	27.46
	〃	17	169	1951	365	681	441	564	955	934	73	40	114	31.62
	〃	20	181	1981	413	823	416	523	894	823	88	35	137	26.66
	〃	22	189	1920	408	793	396	528	868	838	60	35	114	22.80
	〃	24	196	1920	418	793	457	579	960	926	45	32	131	29.77
	Oct.	17	227	1920	375	701	441	549	914	914	103	38	121	31.52
Mean	—	—	—	1940	398.7	769.3	455.8	551.5	922.4	886.9	64.3	38.5	114.7	28.76

* Individual marked has the discriminant value belonging to area A.
Standard discriminant value: $Y_{IV\cdot G}=24.40$.
Individual discriminant value: $Y_{IV}=b_1X_1+b_2X_2+\cdots+b_7X_7$.

Namely, judging from individual discriminant values, there are 3 exceptions which do not belong to area A, among 6 males for group I in area B. Exceptions are 4 among 15 males for group II, 4 among 9 females for group III and 7 among 9 females for group IV in area B. When it is considered further that female has less chance for misclassification than male, the shapes of fin whales are supposed to be different between area A and B. However, if there are no remarkable differences of shapes of fin whales between area A and B, it is possible to say that the sample used for the calculation do not represent fin whales in the northern Pacific and the calculation must be repeated. Unfortunately, there are too sparse data to study this connection in this paper. The sample linear discriminant functions are set in this

TABLE 16. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP I IN THE NORTHERN PACIFIC

Area	Year	Date Caught		Factory ship	Whale No.	Measurement No. 1	X_1 5	X_2 6	X_3 8	X_4 10	X_5 11	12	X_6 13	14	X_7 15	Discriminant value $Y_{I \cdot ab}$
A	1956	Aug.	18	Ky	1247	1780	350	700	405	490	810	790	120	42	85	24.44
B	1954	Sept.	3	B	848	1792	345	695	430	520	860	860	135	45	90	27.76*
		〃	16	〃	985	1740	370	700	440	530	840	860	100	45	90	27.98*
		July	20	K	751	1740	340	720	420	495	780	770	125	45	100	24.37
	1955	〃	29	Ky	1072	1790	370	750	420	540	820	800	130	50	100	25.11
		〃	30	〃	1101	1760	360	730	400	480	810	800	120	42	80	22.29
	1956	Aug.	1	〃	1073	1780	335	705	395	525	840	825	120	38	95	25.62

* Individuals marked have the discriminant values belonging to area E.

TABLE 17. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP I IN AREA E

Year	Date Caught		Whaling Co.	Whale No.	Measurements No. 1	X_1 5	X_2 6	X_3 8	X_4 10	X_5 11	12	X_6 13	14	X_7 15	Discriminant value $Y_{I \cdot e}$
1956	July	30	T	33	1798	390	738	380	515	830	—	140	34	89	23.97*
	Aug.	4	〃	44	1737	342	717	375	485	851	825	134	42	100	25.33*
	〃	7	〃	52	1798	405	767	397	460	789	760	128	42	119	25.51*
	〃	8	〃	55	1737	330	664	382	475	851	825	163	33	118	30.29
	〃	9	〃	59	1737	357	674	382	506	850	821	140	43	114	30.16
	〃	9	〃	60	1707	350	649	370	515	830	795	147	34	119	30.90
	〃	10	〃	63	1768	348	749	410	495	861	840	142	38	108	26.28
	〃	11	〃	69	1798	352	742	410	527	866	842	139	46	124	28.98
	〃	13	〃	73	1798	355	733	400	490	810	—	157	46	142	29.47
	〃	15	〃	85	1798	355	737	406	506	845	822	151	34	119	27.87
	〃	15	〃	86	1798	380	737	380	524	910	870	194	43	116	29.62
	〃	19	〃	94	1737	350	677	388	495	843	820	141	34	108	29.00
	〃	21	〃	98	1737	350	627	390	500	865	840	154	33	100	31.63
	〃	22	〃	101	1737	337	647	358	496	830	848	154	42	120	30.24
	〃	25	〃	105	1707	338	670	400	475	819	800	170	37	103	28.00
	〃	28	〃	114	1737	360	687	390	505	825	820	181	39	105	27.95
	〃	29	〃	117	1798	368	667	351	483	884	852	153	36	96	28.71
	〃	11	N	34	1715	365	720	390	490	800	775	130	35	115	26.58
	〃	11	〃	36	1710	345	690	410	520	860	795	140	39	105	29.15
	Sept.	1	〃	59	1710	360	660	410	495	795	725	115	50	120	30.89
	〃	5	〃	62	1720	345	640	430	500	900	875	131	31	100	33.25

* Individuals marked have the discriminant values belonging to area A.

Standard discriminant value: $Y_{I\ G}=25.66$.

Individual discriminant value: $Y_I=b_1X_1+b_2X_2+\cdots+b_7X_7$.

B: Baikal maru, Ky: Kyokuyo maru } Kyokuyo Hogei Co. K: Kinjo maru, T: Land-station } Taiyo Gyogyo Co.

N: Land-station, Nippon Suisan Co.

TABLE 18. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUB II IN THE NORTHERN PACIFIC

							X_1	X_2	X_3	X_4	X_5		X_6		X_7	Discri-minant value
						Measurement No.										
Area	Year	Date Caught		Fac-tory ship	Whale No.	1	5	6	8	10	11	12	13	14	15	$Y_{II\cdot ab}$
A	1954	June	2	B	59	1898	400	770	440	525	850	880	125	50	70	12.62
		〃	3	〃	61	1890	440	840	420	520	815	815	130	49	70	6.56
	1956	Aug.	19	Ky	1272	1855	385	775	390	490	820	800	125	38	90	11.87
		〃	21	〃	1320	1835	360	745	415	515	860	835	120	41	85	15.45
B	1954	July	1	K	473	1850	370	780	450	510	840	840	120	45	75	11.30
		Aug.	1	〃	895	1840	390	750	430	520	840	830	130	45	80	15.10
		〃	2	〃	908	1860	330	750	430	550	870	860	150	50	80	18.44*
		〃	3	〃	933	1840	350	750	435	535	865	850	130	42	85	16.99
		Sept.	9	B	901	1848	370	750	410	500	810	830	130	43	100	15.70
		〃	19	〃	1030	1800	380	780	410	500	830	830	140	37	90	13.49
		〃	19	〃	1042	1860	380	790	420	540	850	870	130	41	100	15.68
		Aug.	30	〃	806	1861	360	750	390	500	810	790	115	42	110	15.64
		〃	30	〃	807	1865	360	710	395	500	810	780	125	38	100	18.08*
		Sept.	3	〃	840	1861	360	730	440	540	880	900	130	41	80	18.52*
		〃	5	〃	865	1800	380	750	400	490	690	720	120	48	80	8.73
	1955	July	29	Ky	1074	1876	400	820	440	530	830	820	130	41	100	12.81
		〃	31	〃	1115	1820	365	765	400	510	830	810	130	41	110	16.70
	1956	〃	11	〃	511	1850	360	730	415	510	815	790	140	48	100	18.48
		〃	13	〃	572	1860	390	790	415	530	805	770	115	41	100	12.95

* Individuals marked have the discriminant values belonging to area E.

TABLE 19. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP II IN AREA E

						X_1	X_2	X_3	X_4	X_5		X_6		X_7	Discri minan value
					Measurement No.										
Year	Date Caught		Whal-ing Co.	Whale No.	1	5	6	8	10	11	12	13	14	15	$Y_{II\cdot e}$
1956	Aug.	4	T	41	1829	375	722	455	525	860	830	158	41	109	23.85
	〃	5	〃	42	1829	365	677	410	510	914	890	155	42	112	27.56
	〃	7	〃	53	1829	365	737	430	510	868	835	147	41	122	22.87
	〃	13	〃	75	1859	375	742	410	515	879	850	156	43	117	22.80
	〃	15	〃	84	1829	376	737	373	522	838	802	134	53	134	22.53
	〃	25	T	104	1829	340	673	448	530	870	890	142	36	118	27.76
	〃	10	N	32	1860	405	760	420	510	865	880	130	39	120	19.62
	〃	25	〃	53	1800	400	750	430	500	810	790	115	38	115	16.86*

* Individuals marked have the discriminant values belonging to area A.

Standard discriminant value: $Y_{II\cdot G}=18.50$.

Individual discriminant value: $Y_{II}=b_1X_1+b_2X_2+\cdots+b_7X_7$.

TABLE 20. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP III IN THE NORTHERN PACIFIC

							X_1	X_1	X_3	X_4	X_5		X_6	X_7		
						Measurement No.										Discri-minant value
Area	Year	Date Caught		Factory ship	Whale No.	1	5	6	8	10	11	12	13	14	15	$Y_{III \cdot ab}$
A	1954	May	31	B	34	1860	422	805	410	510	810	810	40	40	70	58.38
B		Sept.	2	〃	838	1825	350	740	460	580	860	820	50	40	85	72.88*
		〃	13	〃	951	1850	390	790	430	530	840	840	60	31	90	69.31*
		〃	21	〃	1057	1890	410	820	430	500	870	890	70	50	100	65.50
		June	8	K	145	1860	330	720	460	500	830	830	30	40	85	69.16*
		July	15	〃	672	1800	350	730	450	500	790	772	45	40	85	64.35
		〃	20	〃	754	1815	345	720	405	525	835	835	50	30	90	71.01*
	1955	〃	29	Ky	1073	1845	395	765	450	540	790	770	40	42	100	60.11
	1956	Aug.	3	〃	1136	1830	365	730	420	515	830	790	55	41	90	66.71
		〃	4	〃	1528	1845	390	765	430	480	810	790	50	47	85	60.48

* Individuals marked have the discriminant values belonging to area E.

TABLE 21. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP III IN AREA E

						X_1	X_2	X_3	X_4	X_5		X_6	X_7		
					Measurement No.										Discri-minant value
Year	Date Caught		Whaling Co.	Whale No.	1	5	6	8	10	11	12	13	14	15	$Y_{III \cdot e}$
1956	Aug.	6	T	47	1829	390	737	400	530	835	—	58	38	106	65.79*
	〃	7	〃	51	1859	360	718	430	530	904	885	68	40	133	76.80
	〃	11	〃	72	1829	370	775	415	540	820	795	65	38	111	66.44*
	〃	14	〃	80	1829	376	737	420	534	900	865	53	36	127	74.63
	〃	19	〃	92	1890	368	679	430	540	917	870	49	36	100	77.82
	〃	21	〃	97	1890	380	729	430	530	909	880	79	43	117	75.83
	〃	28	〃	112	1890	390	789	430	550	900	880	66	45	105	71.89
	〃	29	〃	116	1859	390	758	394	530	887	870	77	37	130	72.50
	〃	4	N	19	1800	360	760	380	450	760	730	65	27	75	62.22*
	〃	4	〃	21	1820	384	700	440	510	850	820	66	38	85	70.61
	〃	6	〃	24	1850	380	760	440	540	850	820	54	35	105	70.22
	〃	10	〃	33	1880	400	720	485	550	880	855	55	35	110	74.74

* Individuals marked have the discriminant values belonging to area A.

Standard discriminant value: $Y_{III \cdot G}=67.82$.

Individual discriminant value: $Y_{III}=b_1X_1+b_2X_2+\cdots+b_7X_7$.

paper at any rate but those need other coefficients revised according to the accumulation of data in the future.

The measurements in the present problem do not show the height and width of whales but various parts of whales about parallel to the line from tip of snout to notch of flukes. It is rather difficult to measure accurate height and width for whale but it is possible to represent them in skull measurements, which will be treated in the

TABLE 22. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP IV IN THE NORTHERN PACIFIC

Area	Year	Date Caught	Factory ship	Whale No.	1	5 (X_1)	6 (X_2)	8 (X_3)	10 (X_4)	11 (X_5)	12	13 (X_6)	14 (X_7)	15	Discriminant value $Y_{IV \cdot ab}$
					Measurement No.										
A	1956	Aug. 14	Ky	1211	1945	415	815	445	565	870	850	30	49	100	19.05
		〃 22	〃	1348	1995	415	815	460	555	910	880	60	52	100	22.72
		〃 24	〃	1393	1985	415	855	450	550	870	870	60	40	90	24.28
B	1954	Sept. 8	B	890	1980	405	830	450	550	900	880	50	44	90	24.51*
		〃 20	〃	1054	1950	400	810	440	520	860	840	60	46	120	22.56
		〃 22	〃	1073	1930	380	790	500	610	940	940	70	49	100	32.54*
		Aug. 2	K	909	1940	360	770	455	570	900	910	50	45	95	27.82*
		〃 3	〃	934	1910	380	770	450	580	900	870	90	51	100	26.18
	1955	July 29	Ky	1071	1970	410	820	460	580	910	900	50	52	110	22.36
	1956	〃 6	〃	366	1920	370	810	450	565	910	890	45	32	90	31.49*
		〃 30	〃	1018	1960	380	820	460	560	900	900	80	41	100	29.81*
		Aug. 1	〃	1075	1970	415	835	440	535	895	880	55	39	95	24.84*

* Individuals marked have the discriminant values belonging to area E.

TABLE 23. MEASUREMENTS IN CM AND DISCRIMINANT VALUES FOR GROUP IV IN AREA E

Year	Date Caught	Whaling Co.	Whale No.	1	5 (X_1)	6 (X_2)	8 (X_3)	10 (X_4)	11 (X_5)	12	13 (X_6)	14 (X_7)	15	Discriminant value $Y_{IV \cdot e}$
				Measurement No.										
1956	Aug. 6	T	48	1951	430	795	410	540	860	—	74	47	135	18.42*
〃	19	〃	93	1951	383	760	453	576	935	918	44	36	105	29.81
〃	26	〃	107	1981	385	750	413	566	925	925	85	38	125	28.40
〃	27	〃	111	1920	415	796	407	530	880	907	80	47	120	20.81*
	Sept. 5	N	63	1920	400	770	450	580	910	880	65	35	115	28.68

* Individual marked have the discriminant values belonging to area A.
Standard discriminant value: $Y_{IV \cdot G}=24.40$.
Individual discriminant value: $Y_{IV}=b_1X_1+b_2X_2+\cdots+b_7X_7$.

following papers. Finally, it is more desirable to study the ages at puberty and oestrus cycles of whales in the discussion on their races. Even racial studies on whales demand the determinate evidences available on ages and oestrus cycles.

SUMMARY

The linear discriminant functions (L. D. F.) by R. A. Fisher were applied to consider the differences of general shapes of fin whales between two areas in the North Pacific, and representative 7 measurements in males and females were replaced by linear compounds. The one area

was A, the west side waters of Aleutian Islands and the other area was E, the west side waters of Kyushu which was the southern island in Japan.

Assuming the normality of 7 variates and the homogeneity of the variance-covariance matrices of these two 7 variates, this L. D. F. is known to be the most efficient statistical expression for classification. The validity of these assumptions was statistically checked and no departure from these assumptions was found in this study. The chance of misclassification by using these L. D. F. are 6 to 11% for males and 5 to 7% for females.

With regards to each single variate, measurement No. 5 (Tip of snout to centre of eye), No. 6 (Tip of snout to tip of flipper), No. 10 (Notch of flukes to centre of anus), No. 11 (Notch of flukes to centre of umbilicus), No. 13 (Centre of anus to centre of reproductive aperture), No. 15 (Dorsal fin, length of base) show significant differences between two area for males, and Nos. 5, 6, 8 (Notch of flukes to posterior emargination of dorsal fin), 11, 14 (Dorsal fin, vertical height) for females. However, the chance of misclassification increase, when if we use only one variate.

It is safe statistically to say that there are the different shapes of fin whales between two area in the North Pacific, and fin whales have longer heads and shorter tails in area A than in area E. The sample sizes of area A and area E were 15 and 30 for group I, 30 and 20 for group II, 17 and 26 for group III, 29 and 15 for group IV respectively in this investigation.

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APPENDIX

External measurements of fin whales
The upper figure shows actual length in centimetre
The lower figure shows percentage length to total length
The lower figure in measurement No. 1 is total length in feet

Measurement

- No. 1 Total length
- 3 Tip of snout to blowhole
- 5 Tip of snout to centre of eye
- 6 Tip of snout to tip of flipper
- 7 Eye to ear, centres
- 8 Notch of flukes to posterior emargination of dorsal fin
- 10 Notch of flukes to anus
- 11 Notch of flukes to umbilicus
- 12 Notch of flukes to end of ventral grooves
- 13 Anus to reproductive aperture, centres
- 14 Dorsal fin, vertical height
- 15 Dorsal fin, length of base
- 17 Flipper, tip to anterior end of lower border
- 19 Flipper, greatest width
- 21 Skull, greatest width
- 22 Skull length, condyle to tip of premaxilla
- 24 Length of lower jaw
- 25 Tip of premaxilla to postglenoid process of squamosal
- 26 Distance between both postglenoid process of squamosal
- 27 Length of rostrum
- 28 Width of rostrum at the base

TABLE 24. THE WEST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, MALE, 1953

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
509	Aug. 24	1690 55	315 **18.6**	335 **19.8**	700 **41.4**	85 **5.0**	430 **25.4**	475 **28.1**	770 **45.5**	760 **44.9**	115 **6.8**	40 **2.4**	115 **6.8**	235 **13.9**	55 **3.3**	190 **11.2**	440 **26.0**	445 **26.3**	430 **25.4**	170 **10.0**	310 **18.3**	140 **8.3**
464	Aug. 8	1695 56	305 **18.0**	350 **20.7**	695 **41.0**	70 **4.1**	400 **23.6**	450 **26.6**	800 **47.2**	790 **46.6**	120 **7.1**	40 **2.4**	100 **5.9**	210 **12.4**	55 **3.2**	195 **11.5**	430 **25.4**	430 **25.4**	435 **25.7**	175 **10.3**	325 **19.2**	125 **7.4**
338	July 8	1720 56	340 **19.8**	375 **21.8**	680 **39.5**	75 **4.4**	415 **24.1**	500 **29.1**	800 **46.5**	830 **48.2**	140 **8.1**	34 **2.0**	105 **6.1**	195 **11.3**	50 **2.9**	185 **10.7**	425 **24.7**	425 **24.7**	425 **24.7**	175 **10.2**	315 **18.3**	125 **7.3**
571	Sept. 4	1755 58	320 **18.2**	365 **20.8**	720 **41.0**	80 **4.6**	370 **21.1**	495 **28.2**	815 **46.5**	815 **46.5**	125 **7.1**	35 **2.0**	80 **4.7**	210 **12.0**	50 **2.9**	195 **11.1**	455 **25.9**	440 **25.1**	455 **25.9**	175 **10.0**	320 **18.2**	120 **6.8**
526	Aug. 27	1760 58	350 **19.9**	370 **21.0**	725 **41.2**	85 **4.8**	360 **20.4**	460 **26.1**	875 **49.7**	875 **49.7**	120 **6.8**	40 **2.3**	80 **4.5**	200 **11.4**	50 **2.8**	185 **10.5**	455 **25.8**	450 **25.6**	450 **25.6**	170 **9.7**	310 **17.6**	125 **7.1**
251	June 25	1770 58	330 **18.6**	380 **21.5**	745 **42.1**	90 **5.1**	415 **23.4**	510 **28.8**	800 **45.2**	800 **45.2**	140 **7.9**	46 **2.6**	95 **5.4**	215 **12.1**	55 **3.1**	215 **12.1**	455 **25.7**	465 **26.3**	455 **25.7**	175 **9.9**	310 **17.5**	148 **8.4**
353	July 10	1770 58	395 **22.3**	430 **24.3**	790 **44.6**	80 **4.5**	405 **22.9**	450 **25.4**	730 **41.2**	720 **40.7**	60 **3.4**	36 **2.0**	110 **6.2**	230 **13.0**	60 **3.4**	215 **12.1**	465 **26.3**	510 **28.8**	495 **28.0**	190 **10.7**	365 **20.6**	130 **7.3**
637	Sept. 16	1770 58	345 **19.5**	390 **22.0**	755 **42.7**	80 **4.5**	370 **20.9**	480 **27.1**	820 **46.3**	770 **43.5**	150 **8.5**	37 **2.1**	80 **4.5**	210 **11.9**	53 **3.0**	210 **11.9**	470 **26.6**	460 **26.0**	470 **26.6**	165 **9.3**	330 **18.6**	130 **7.3**
407	July 26	1775 58	365 **20.5**	400 **22.5**	785 **44.2**	95 **5.3**	435 **24.5**	485 **27.3**	770 **43.4**	770 **43.4**	125 **7.0**	41 **2.3**	65 **3.7**	240 **13.5**	51 **2.9**	200 **11.3**	485 **27.3**	485 **27.3**	485 **27.3**	180 **10.1**	320 **18.0**	130 **7.3**
574	Sept. 4	1775 58	325 **18.3**	350 **19.7**	740 **41.7**	75 **4.2**	390 **2.20**	475 **26.7**	775 **43.6**	775 **43.6**	125 **7.0**	35 **2.0**	100 **5.6**	205 **11.5**	51 **2.9**	175 **9.9**	420 **23.6**	425 **23.9**	425 **23.9**	165 **9.3**	290 **16.3**	110 **6.2**
257	June 26	1780 58	335 **18.8**	360 **20.2**	740 **41.6**	85 **4.8**	410 **23.0**	510 **28.7**	810 **45.5**	865 **48.6**	110 **6.2**	38 **2.1**	100 **5.6**	220 **12.4**	55 **3.1**	220 **12.4**	490 **27.5**	460 **25.9**	490 **27.5**	180 **10.1**	330 **18.5**	140 **7.9**
304	July 3	1780 58	310 **17.4**	345 **19.4**	720 **40.5**	90 **5.1**	399 **22.4**	530 **29.8**	820 **46.1**	820 **46.1**	110 **6.2**	40 **2.2**	95 **5.3**	210 **11.8**	50 **2.8**	190 **10.7**	490 **27.5**	435 **24.4**	490 **27.5**	170 **9.6**	300 **16.9**	130 **7.3**
426	July 28	1790 59	350 **19.6**	385 **21.5**	720 **40.2**	85 **4.8**	400 **22.4**	510 **28.5**	810 **45.3**	790 **44.2**	50 **3.8**	41 **2.3**	90 **5.0**	220 **12.3**	55 **3.1**	200 **11.2**	465 **26.0**	465 **26.0**	470 **26.3**	170 **9.5**	330 **18.4**	125 **7.0**
344	July 9	1800 59	340 **18.9**	390 **21.7**	770 **42.8**	85 **4.7**	400 **22.2**	500 **27.8**	830 **46.1**	830 **46.1**	130 **7.2**	46 **2.6**	90 **5.0**	215 **12.0**	55 **3.1**	210 **11.7**	445 **24.7**	460 **25.6**	450 **25.0**	185 **10.3**	320 **17.8**	140 **7.8**
576	Sept. 5	1800 59	350 **19.5**	380 **21.1**	700 **38.9**	80 **4.4**	440 **24.5**	525 **29.2**	800 **44.5**	770 **42.8**	105 **5.8**	36 **2.0**	90 **5.0**	215 **12.0**	53 **2.9**	205 **11.4**	460 **25.6**	455 **25.3**	465 **25.9**	180 **10.0**	335 **18.6**	130 **7.2**
466	Aug. 9	1815 60	385 **21.2**	410 **22.6**	755 **41.6**	95 **5.2**	405 **22.3**	490 **27.0**	820 **45.2**	820 **45.2**	130 **7.2**	55 **3.0**	90 **5.0**	215 **11.8**	55 **3.0**	210 **11.6**	510 **28.1**	510 **28.1**	505 **27.8**	195 **10.7**	355 **19.6**	135 **7.4**

629	Sept. 15	1815 60	350 **19.3**	385 **21.2**	680 **37.5**	75 **4.1**	420 **23.1**	500 **27.6**	825 **45.5**	825 **45.5**	125 **6.9**	33 **1.8**	75 **4.1**	215 **11.8**	54 **3.0**	215 **11.8**	450 **24.8**	455 **25.1**	460 **25.3**	175 **9.6**	320 **17.6**	125 **6.9**
584	Sept. 5	1820 60	405 **22.2**	430 **23.6**	755 **41.4**	85 **4.7**	445 **24.4**	505 **27.7**	805 **44.2**	775 **42.5**	115 **6.3**	39 **2.1**	70 **3.8**	215 **11.8**	55 **3.0**	210 **11.5**	460 **25.3**	465 **25.5**	470 **25.8**	180 **9.9**	345 **18.9**	130 **7.1**
690	Sept. 27	1820 60	355 **19.5**	395 **21.7**	770 **42.3**	90 **4.9**	410 **22.5**	480 **26.4**	810 **44.5**	790 **43.4**	145 **8.0**	47 **2.6**	90 **4.9**	215 **11.8**	56 **3.1**	235 **12.9**	480 **26.4**	480 **26.4**	475 **26.1**	175 **9.6**	335 **18.4**	125 **6.9**
380	July 15	1830 60	365 **19.9**	400 **21.8**	805 **44.0**	85 **4.6**	390 **21.3**	520 **28.4**	860 **47.0**	880 **48.0**	90 **4.9**	48 **2.6**	110 **6.0**	225 **12.3**	50 **2.7**	215 **11.7**	480 **26.2**	480 **26.2**	485 **26.5**	180 **9.8**	335 **18.3**	135 **7.4**
467	Aug. 9	1830 60	385 **21.0**	420 **22.9**	780 **42.6**	95 **5.2**	405 **22.1**	480 **26.2**	805 **44.0**	795 **43.4**	135 **7.4**	43 **2.3**	95 **5.2**	215 **11.7**	60 **3.3**	215 **11.7**	485 **26.5**	485 **26.5**	495 **27.0**	195 **10.6**	365 **19.9**	135 **7.4**
644	Sept. 18	1830 60	375 **20.5**	415 **22.7**	780 **42.6**	85 **4.6**	415 **22.7**	490 **26.8**	810 **44.2**	810 **44.2**	130 **7.1**	40 **2.2**	95 **5.2**	210 **11.5**	54 **2.9**	215 **11.7**	490 **26.8**	495 **27.0**	500 **27.3**	175 **9.6**	365 **19.9**	135 **7.4**
3	May 21	1830 60	385 **21.0**	370 **20.2**	770 **42.0**	85 **4.6**	440 **24.0**	570 **31.1**	820 **44.8**	800 **43.7**	80 **4.4**	40 **2.2**	70 **3.8**	250 **13.7**	60 **3.3**	220 **12.0**	490 **26.8**	430 **23.5**	— —	— —	— —	— —
638	Sept. 16	1835 60	355 **19.3**	385 **21.0**	755 **41.1**	85 **4.6**	415 **22.6**	515 **28.1**	825 **45.0**	820 **44.7**	130 **7.1**	44 **2.4**	100 **5.5**	215 **11.7**	58 **3.2**	200 **10.9**	470 **25.6**	455 **24.8**	470 **25.6**	170 **9.3**	340 **18.5**	120 **6.5**
415	July 27	1840 60	365 **19.8**	400 **21.7**	785 **42.6**	85 **4.6**	405 **22.0**	515 **28.0**	855 **46.2**	845 **45.9**	115 **6.2**	35 **1.9**	65 **3.5**	235 **12.8**	65 **3.5**	205 **11.1**	485 **26.3**	485 **26.3**	475 **25.8**	185 **10.0**	340 **18.3**	120 **6.5**
451	Aug. 3	1840 60	385 **20.9**	430 **23.3**	805 **43.7**	90 **4.9**	405 **22.0**	485 **26.3**	810 **44.0**	805 **43.7**	110 **6.0**	48 **2.6**	85 **4.6**	205 **11.1**	60 **3.3**	210 **11.4**	520 **28.2**	505 **27.4**	515 **28.0**	190 **10.3**	365 **19.8**	130 **7.1**
567	Aug. 31	1840 60	370 **20.1**	405 **22.0**	760 **41.3**	90 **4.9**	400 **21.7**	490 **26.6**	790 **42.9**	790 **42.9**	120 **6.5**	40 **2.2**	110 **6.0**	220 **11.9**	55 **3.0**	210 **11.4**	490 **26.6**	500 **27.2**	490 **26.6**	195 **10.6**	345 **18.3**	140 **7.6**
532	Aug. 28	1845 61	360 **19.5**	405 **22.0**	725 **39.3**	95 **5.1**	420 **22.8**	500 **27.1**	810 **43.9**	810 **43.9**	125 **6.8**	— —	100 **5.4**	215 **11.7**	55 **3.0**	205 **11.1**	485 **26.3**	465 **25.2**	495 **26.8**	175 **9.5**	350 **19.0**	130 **7.0**
533	Aug. 28	1845 61	375 **20.3**	405 **22.0**	785 **42.5**	95 **5.1**	390 **21.1**	490 **26.6**	800 **43.4**	795 **43.1**	115 **6.2**	30 **1.6**	85 **4.6**	215 **11.7**	55 **3.0**	220 **11.9**	480 **26.0**	485 **26.3**	480 **26.0**	185 **10.0**	365 **19.8**	135 **7.3**
134	June 10	1850 61	390 **21.1**	375 **20.3**	800 **43.3**	85 **4.6**	400 **21.6**	540 **29.2**	830 **44.9**	— —	80 **4.3**	45 **2.4**	90 **4.9**	240 **13.0**	60 **3.2**	— —	— —	— —	— —	— —	— —	— —
272	June 29	1860 61	375 **20.2**	420 **22.6**	710 **38.2**	95 **5.1**	430 **23.1**	550 **29.6**	850 **45.7**	850 **45.7**	40 **2.2**	35 **1.9**	150 **8.1**	225 **12.1**	55 **3.0**	230 **12.4**	510 **27.4**	525 **28.2**	510 **27.4**	195 **10.5**	340 **18.3**	150 **8.1**
525	Aug. 27	1860 61	355 **19.1**	375 **20.2**	795 **42.8**	80 **4.3**	390 **21.0**	515 **27.7**	845 **45.5**	845 **45.5**	140 **7.5**	45 **2.4**	95 **5.1**	215 **11.6**	55 **3.0**	215 **11.6**	455 **24.5**	450 **24.2**	455 **24.5**	185 **10.6**	310 **16.7**	140 **7.5**
609	Sept. 9	1875 62	385 **20.5**	425 **22.7**	770 **41.0**	85 **4.5**	430 **22.9**	515 **27.4**	810 **43.2**	790 **42.1**	115 **6.1**	43 **2.3**	90 **4.8**	245 **13.1**	58 **3.1**	230 **12.3**	500 **26.7**	505 **26.9**	505 **26.9**	180 **9.6**	365 **19.5**	145 **7.7**
354	July 10	1885 62	390 **20.7**	410 **21.8**	785 **41.7**	95 **5.0**	420 **22.3**	540 **28.7**	830 **44.1**	825 **43.8**	60 **3.2**	30 **1.6**	120 **6.4**	225 **11.9**	55 **2.9**	210 **11.2**	495 **26.3**	490 **26.0**	495 **26.3**	190 **10.1**	345 **18.3**	135 **7.2**

TABLE 24. THE WEST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, MALE, 1953 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
640	Sept. 16	1885 62	360 19.1	385 20.4	755 40.1	105 5.6	440 23.4	495 26.3	865 45.9	865 45.9	140 7.4	— —	110 5.8	225 11.9	57 3.0	200 10.6	470 25.0	440 23.4	480 25.5	185 9.8	345 18.3	130 6.9
259	June 27	1890 62	370 19.6	400 21.2	805 42.6	85 4.5	415 22.0	520 27.5	870 46.0	830 43.9	120 6.3	23 1.2	95 5.0	240 12.7	60 3.2	210 11.1	475 25.1	480 25.4	470 24.9	185 9.8	340 18.0	140 7.4
670	Sept. 25	1890 62	360 19.0	395 20.9	760 40.2	90 4.8	430 22.7	505 26.7	825 43.6	810 42.8	135 7.1	36 1.9	90 4.8	230 12.2	53 2.8	220 11.6	490 25.9	475 25.1	490 25.9	185 9.8	340 18.0	135 7.1
5	May 21	1890 62	350 18.5	400 21.2	— —	— —	490 25.9	550 29.1	690 36.5	810 42.8	— —	45 2.4	70 3.7	210 11.1	60 3.2	220 11.6	460 24.3	460 24.3	— —	— —	— —	— —
318	July 6	1900 62	370 19.5	405 21.3	740 38.9	85 4.5	435 22.9	520 27.4	850 44.7	850 44.7	130 6.8	39 2.1	105 5.5	200 10.5	55 2.9	205 10.8	485 25.5	490 25.8	490 25.8	180 9.5	345 18.1	135 7.1
529	Aug. 28	1905 63	390 20.5	420 22.1	685 36.0	90 4.7	405 21.3	530 27.8	850 44.6	840 44.1	115 6.0	40 2.1	110 5.8	230 12.1	60 3.2	230 12.1	505 26.5	485 25.5	510 26.8	190 10.0	360 18.9	145 7.6
527	Aug. 27	1915 63	355 18.5	390 20.4	790 41.2	95 5.0	425 22.2	525 27.4	980 51.2	980 51.2	135 7.0	40 2.1	100 5.2	215 11.2	55 2.9	200 10.4	465 24.3	465 24.3	470 24.5	185 9.7	325 17.0	125 6.5
500	Aug. 23	1925 63	380 19.7	415 21.5	935 48.5	100 5.2	440 22.8	560 29.1	885 45.9	855 44.4	130 6.7	50 2.6	110 5.7	245 12.7	55 2.9	220 11.4	505 26.2	515 26.7	515 26.7	180 9.3	365 18.9	145 7.5
316	July 6	1930 63	370 19.2	410 21.2	830 43.0	85 4.4	430 22.3	500 25.9	820 42.5	800 41.4	120 6.2	44 2.3	130 6.7	240 12.4	60 3.1	210 10.9	495 25.6	495 25.6	500 25.9	180 9.3	340 17.6	135 7.0
583	Sept. 5	1930 63	360 18.6	410 21.2	885 45.8	85 4.4	440 22.8	520 26.9	865 44.8	865 44.8	145 7.5	30 1.6	90 4.7	195 10.1	51 2.6	215 11.1	505 26.2	485 25.1	500 25.9	195 10.1	360 18.6	135 7.0
313	July 5	1940 64	400 20.6	405 20.9	810 41.7	90 4.6	430 22.1	530 27.3	850 43.8	830 42.7	140 7.2	48 2.5	110 5.7	225 11.6	55 2.8	210 10.8	485 25.0	485 25.0	485 25.0	180 9.3	330 17.0	130 6.7
636	Sept. 15	1960 64	375 19.1	395 20.1	835 42.6	90 4.6	430 21.9	525 26.8	850 43.4	850 43.4	120 6.1	46 2.3	90 4.6	230 11.7	59 3.0	230 11.7	475 24.2	460 23.5	480 24.5	185 9.4	340 17.3	130 6.6
639	Sept. 16	1960 64	405 20.7	450 23.0	830 42.3	90 4.6	430 21.9	495 25.2	795 40.5	780 39.8	165 8.4	43 2.2	70 3.6	220 11.2	61 3.1	215 11.0	545 27.8	530 27.0	540 27.5	190 9.7	390 19.9	150 7.7
260	June 27	1980 65	325 16.4	425 21.5	855 43.2	90 4.5	445 22.5	550 27.8	870 43.9	850 42.9	150 7.6	45 2.3	95 4.8	235 11.9	60 3.0	220 11.1	505 25.5	520 26.3	505 25.5	185 9.3	355 17.9	145 7.3
29	May 25	1995 65	370 18.5	400 20.0	780 39.1	90 4.5	440 22.0	560 28.1	750 37.6	— —	130 6.5	45 2.3	110 5.5	— —	— —	240 12.0	510 25.6	490 24.5	— —	— —	— —	— —

TABLE 25. THE WEST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, FEMALE, 1953

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
352	July 10	1710 56	350 20.5	380 22.2	830 48.6	115 6.7	385 22.5	460 26.9	740 43.3	755 44.2	50 2.9	46 2.7	130 7.6	210 12.3	55 3.2	200 11.7	485 28.4	455 26.6	480 28.1	175 10.2	325 19.0	130 7.6
225	June 8	1780 58	385 21.6	395 22.2	755 42.4	85 4.8	430 24.2	525 29.5	820 46.1	820 46.1	55 3.1	39 2.2	110 6.2	235 12.9	50 2.8	200 11.2	460 25.9	470 26.4	470 26.4	180 10.1	330 18.5	130 7.3
364	July 12	1790 59	350 19.6	365 20.4	830 46.4	95 5.3	300 16.8	575 32.1	805 45.0	800 44.7	75 4.2	52 2.9	60 3.4	215 12.0	50 2.8	190 10.6	450 25.2	445 24.9	450 25.2	170 9.5	335 18.7	135 7.5
477	Aug. 17	1810 59	355 19.6	395 21.8	785 43.3	85 4.7	420 23.2	525 29.0	820 45.3	835 46.1	75 4.1	42 2.3	125 6.9	210 11.6	55 3.0	200 11.0	485 26.8	465 25.7	480 26.5	170 9.4	345 19.0	130 7.2
572	Sept. 4	1810 59	360 19.9	398 22.0	740 40.8	85 4.7	385 21.3	505 27.9	800 44.2	775 42.8	30 1.7	38 2.1	90 5.0	210 11.6	53 2.9	195 10.8	480 26.5	475 26.2	480 26.5	185 10.2	350 19.3	135 7.5
579	Sept. 5	1810 59	350 19.3	370 20.4	705 38.9	85 4.7	420 23.2	525 29.0	835 46.1	835 46.1	60 3.3	40 2.2	80 4.4	200 11.0	47 2.6	200 11.0	450 24.8	445 24.6	455 25.1	170 9.4	330 18.2	130 7.2
646	Sept. 18	1835 60	365 19.9	415 22.6	760 41.4	90 4.9	415 22.3	495 27.0	830 45.2	830 45.2	45 2.5	46 2.5	85 4.6	225 12.3	54 2.9	200 10.9	470 25.6	455 24.8	470 25.6	185 10.1	330 18.0	130 7.1
425	July 28	1845 61	365 19.8	410 22.2	780 42.3	90 4.9	430 23.3	525 28.5	825 44.7	845 45.8	50 2.7	43 2.3	80 4.3	235 12.7	55 3.0	210 11.4	500 27.1	500 27.1	505 27.4	185 10.0	345 18.7	120 6.5
298	July 2	1850 61	395 21.4	430 23.3	790 42.7	80 4.3	415 22.5	500 27.1	800 43.3	800 43.3	60 3.2	52 2.8	120 6.5	230 12.4	60 3.2	215 11.6	515 27.9	510 27.6	510 27.6	195 10.5	335 18.1	135 7.3
383	July 19	1850 61	385 20.8	410 22.2	800 43.3	85 4.6	410 22.2	500 27.1	800 43.3	810 43.8	40 2.2	46 2.5	115 6.2	225 12.2	50 2.7	215 11.6	495 26.8	495 26.8	495 26.8	185 10.0	360 19.5	140 7.6
420	July 28	1855 61	345 18.6	365 19.7	700 37.7	80 4.3	450 24.3	540 29.1	980 52,8	1015 54.7	50 2.7	38 2.0	110 5.9	200 10.8	52 2.8	225 12.1	425 22.9	455 24.5	440 23.7	185 10.0	320 17.2	140 7.5
339	July 8	1860 61	360 19.4	425 22.9	770 41.4	95 5.1	410 22.1	520 28.0	850 45.7	840 45.2	60 3.2	38 2.0	110 5.9	230 12.4	55 3.0	210 11.3	515 27.7	510 27.4	515 27.7	185 10.0	360 19.4	135 7.3
282	June 29	1865 61	385 20.6	410 22.0	760 40.7	80 4.3	435 23.3	515 27.6	845 45.3	800 42.9	45 2.4	44 2.4	125 6.7	210 11.3	55 2.9	220 11.8	490 26.3	485 26.0	440 23.6	185 9.9	345 18.5	140 7.5
283	June 30	1865 61	355 19.0	380 20.4	770 41.3	90 4.8	445 23.9	540 28.9	800 42.9	770 41.3	60 3.2	39 2.1	120 6.4	215 11.5	55 2.9	200 10.7	475 25.5	470 25.2	470 25.2	175 9.4	335 18.0	135 7.2
577	Sept. 5	1865 61	355 19.0	395 21.2	735 39.4	80 4.3	410 22.0	505 27.1	820 44.0	800 42.9	45 2.4	46 2.5	85 4.6	190 10.2	54 2.9	215 11.5	480 25.7	475 25.5	495 26.5	185 9.9	340 18.2	140 7.5
521	Aug. 25	1870 61	385 20.6	415 22.2	820 43.9	90 4.8	420 22.5	505 27.0	835 44.7	825 44.1	65 3.5	40 2.1	115 6.1	220 11.8	55 2.9	225 12.0	500 26.8	495 26.5	510 27.3	195 10.4	370 19.8	140 7.5

TABLE 25. THE WEST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, FEMALE, 1953 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
326	July 7	1890 62	335 17.7	405 21.4	790 41.8	95 5.0	435 23.0	520 27.5	830 43.9	810 42.8	30 1.6	38 2.0	105 5.6	225 11.9	60 3.2	205 10.8	485 25.7	485 25.7	490 25.9	180 9.5	365 19.3	140 7.4
33	May 26	1890 62	370 19.6	400 21.2	800 42.3	90 4.8	450 23.8	540 28.6	760 40.2	745 39.4	50 2.6	40 2.1	90 4.8	— —	— —	— —	— —	— —	— —	— —	— —	— —
689	Sept. 27	1895 62	365 19.3	400 21.1	745 39.3	85 4.5	435 23.0	520 27.5	830 43.8	845 44.6	40 2.1	38 2.0	100 5.3	215 11.4	52 2.7	205 10.8	465 24.6	465 24.6	470 24.8	170 9.0	335 17.7	130 6.9
361	July 11	1910 63	375 19.7	410 21.5	810 42.4	85 4.5	400 21.0	500 26.2	820 43.0	820 43.0	40 2.1	49 2.6	110 5.8	240 12.6	55 2.9	205 10.7	510 26.7	485 25.4	505 26.5	185 9.7	360 18.9	135 7.1
388	July 20	1915 63	385 20.1	415 21.7	805 42.0	90 4.7	435 22.7	480 25.1	850 44.4	830 43.3	50 2.6	40 2.1	90 4.7	235 12.3	55 2.9	230 12.0	490 25.6	505 26.4	500 26.1	200 10.4	360 18.8	145 7.6
536	Aug. 28	1915 63	390 20.4	420 21.9	815 42.5	85 4.4	430 22.4	545 28.4	875 45.7	865 45.2	60 3.1	46 2.4	120 6.3	235 12.3	60 3.1	225 11.7	510 26.6	495 25.8	520 27.1	185 9.7	375 19.6	140 7.3
266	June 27	1920 63	395 20.6	415 21.6	780 40.6	70 3.6	445 23.2	570 29.7	850 44.3	850 44.3	50 2.6	40 2.1	60 3.1	210 10.9	60 3.1	215 11.2	505 26.3	500 26.1	510 26.6	195 10.2	350 18.2	150 7.8
368	July 12	1920 63	395 20.6	435 22.7	785 40.9	90 4.7	430 22.4	520 27.1	890 46.4	880 45.8	50 2.6	38 2.0	150 7.8	205 10.7	55 2.9	210 10.9	505 26.3	510 26.6	515 26.8	195 10.2	250 18.2	138 7.2
454	Aug. 3	1920 63	390 20.3	430 22.4	875 45.6	90 4.7	410 21.4	535 27.9	870 45.3	860 44.8	55 2.9	45 2.3	130 6.8	210 10.9	55 2.9	210 10.9	510 26.6	510 26.6	510 26.6	195 10.2	365 19.0	135 7.0
568	Aug. 31	1930 63	390 20.2	430 22.3	800 41.4	85 4.4	410 21.2	515 26.7	855 44.3	835 43.3	50 2.6	38 2.0	100 5.2	215 11.1	55 2.8	215 11.1	505 26.2	500 25.9	520 26.9	190 9.8	360 18.6	145 7.5
672	Sept. 25	1930 63	355 18.4	395 20.5	785 40.7	90 4.7	445 23.1	535 27.7	850 44.0	840 43.5	55 2.8	38 2.0	90 4.7	215 11.1	53 2.7	200 10.4	485 25.1	475 24.6	485 25.1	165 8.5	355 18.4	125 6.5
671	Sept. 25	1935 64	390 20.2	430 22.2	850 43.9	90 4.7	415 21.5	555 28.7	885 45.8	865 44.7	55 2.8	50 2.6	95 4.9	215 11.1	55 2.8	230 11.9	515 26.6	520 26.9	520 26.9	185 9.6	380 19.6	145 7.5
524	Aug. 27	1940 64	400 20.6	445 22.9	— —	90 4.6	410 21.1	475 24.5	800 41.2	750 38.6	60 3.1	35 1.8	100 5.2	230 11.8	60 3.1	235 12.1	525 27.0	525 27.0	530 27.3	195 10.0	360 185	155 8.0
585	Sept. 5	1940 64	420 21.6	460 23.7	820 42.2	90 4.6	445 22.9	535 27.6	875 45.1	865 44.5	70 3.6	38 2.0	90 4.6	230 11.8	54 2.8	215 11.1	510 26.3	500 25.8	505 26.0	185 9.5	370 19.1	145 7.5
311	July 5	1950 64	345 17.7	400 20.5	745 38.2	85 4.4	420 21.5	515 26.4	880 45.1	850 43.6	75 3.8	43 2.2	120 6.2	215 11.0	50 2.6	210 10.8	496 25.4	485 24.9	495 25.4	180 9.2	330 16.9	130 6.7
692	Sept. 27	1950 64	375 19.2	410 21.0	795 40.8	95 4.9	390 20.0	565 29.0	880 45.1	860 44.1	45 2.3	48 2.5	85 4.4	200 10.3	54 2.8	235 12.1	480 24.6	495 25.4	495 25.4	165 8.5	355 18.2	130 6.7

269	June 28	1955 64	385 **19.7**	425 **21.8**	750 **38.4**	95 **4.9**	410 **21.0**	520 **26.6**	885 **45.3**	870 **44.5**	60 **3.1**	41 **2.1**	110 **5.6**	260 **13.3**	60 **3.1**	220 **11.3**	490 **25.1**	480 **24.6**	490 **25.1**	185 **9.5**	350 **17.9**	140 **7.2**
603	Sept. 8	1965 64	450 **22.9**	475 **24.2**	850 **43.3**	90 **4.6**	435 **22.1**	540 **27.5**	865 **44.0**	855 **43.5**	55 **2.8**	44 **2.2**	100 **5.1**	230 **11.7**	59 **3.0**	220 **11.2**	525 **26.7**	515 **26.2**	530 **27.0**	190 **9.7**	370 **18.8**	145 **7.4**
530	Aug. 28	1965 65	390 **19.9**	430 **21.9**	745 **37.9**	90 **4.6**	410 **20.9**	525 **26.7**	880 **44.8**	880 **44.8**	55 **2.8**	50 **2.5**	110 **5.6**	235 **12.0**	60 **3.1**	210 **10.7**	515 **26.2**	520 **26.5**	515 **26.2**	190 **9.7**	385 **19.6**	135 **6.9**
632	Sept. 15	1965 65	410 **20.9**	455 **23.2**	745 **37.9**	100 **5.1**	530 **27.0**	590 **30.0**	850 **43.3**	800 **40.7**	50 **2.5**	57 **2.9**	100 **5.1**	235 **12.0**	59 **3.0**	230 **11.7**	530 **27.0**	525 **26.7**	525 **26.7**	195 **9.9**	390 **19.9**	155 **7.9**
315	July 6	1970 65	385 **19.6**	430 **21.8**	830 **42.2**	85 **4.3**	440 **22.4**	550 **27.9**	920 **46.7**	920 **46.7**	40 **2.0**	44 **2.2**	115 **5.8**	235 **11.9**	60 **3.0**	210 **10.7**	510 **25.9**	510 **25.9**	515 **26.2**	190 **9.7**	350 **17.8**	140 **7.1**
624	Sept. 13	1970 65	385 **19.6**	420 **21.3**	805 **40.9**	90 **4.6**	460 **23.4**	565 **28.7**	895 **45.5**	870 **44.2**	45 **2.3**	44 **2.2**	90 **4.6**	230 **11.7**	55 **2.8**	220 **11.2**	500 **25.4**	500 **25.4**	500 **25.4**	195 **9.9**	375 **19.1**	140 **7.1**
136	June 11	1970 65	390 **19.8**	430 **21.8**	850 **43.2**	100 **5.1**	495 **25.1**	540 **27.4**	860 **43.7**	— —	60 **3.0**	— —	95 **4.8**	— —	45 **2.3**	210 **10.7**	525 **26.7**	500 **25.4**	— —	195 **9.9**	— —	— —
337	July 8	1980 65	415 **21.0**	430 **21.7**	810 **40.9**	95 **4.8**	420 **21.2**	550 **27.8**	910 **46.0**	895 **45.2**	50 **2.5**	40 **2.0**	100 **5.1**	240 **12.1**	60 **3.0**	220 **11.1**	495 **25.0**	510 **25.8**	515 **26.0**	185 **9.3**	360 **18.2**	135 **6.8**
455	Aug. 3	1985 65	370 **18.6**	400 **20.2**	815 **41.1**	100 **5.0**	440 **22.2**	530 **26.7**	865 **43.6**	915 **46.1**	60 **3.0**	48 **2.4**	100 **5.0**	245 **12.3**	60 **3.0**	220 **11.1**	515 **26.0**	510 **25.7**	515 **26.0**	190 **9.6**	375 **18.9**	145 **7.3**
539	Aug. 29	1985 65	380 **19.2**	405 **21.4**	815 **41.1**	90 **4.5**	370 **18.6**	525 **26.5**	885 **44.6**	885 **44.6**	65 **3.3**	45 **2.3**	115 **5.8**	215 **10.8**	55 **2.8**	215 **10.8**	485 **24.4**	475 **23.9**	475 **23.9**	195 **9.8**	355 **17.9**	135 **6.8**
655	Sept. 25	1985 65	395 **19.9**	430 **21.7**	885 **44.6**	90 **4.5**	450 **22.7**	580 **29.2**	890 **44.9**	880 **44.4**	45 **2.3**	46 **2.3**	100 **5.0**	240 **12.1**	61 **3.1**	215 **10.8**	520 **26.2**	505 **25.5**	515 **26.0**	170 **8.6**	380 **19.2**	130 **6.6**
21	May 24	1985 65	380 **19.2**	410 **20.7**	840 **42.3**	90 **4.5**	470 **23.7**	555 **28.0**	605 **30.5**	875 **44.1**	— —	40 **2.0**	90 **4.5**	250 **12.6**	55 **2.8**	210 **10.6**	480 **24.2**	470 **23.7**	— —	— —	— —	— —
634	Sept. 15	1995 66	380 **19.0**	415 **20.8**	845 **423**	100 **5.0**	375 **18.8**	535 **26.8**	870 **43.6**	865 **43.3**	45 **2.3**	43 **2.2**	100 **5.0**	245 **12.3**	59 **3.0**	225 **11.3**	510 **25.6**	500 **25.1**	510 **25.6**	190 **9.5**	360 **18.0**	140 **7.0**
20	May 24	2010 66	390 **19.4**	410 **20.4**	840 **41.8**	90 **4.5**	500 **24.9**	580 **28.9**	930 **46.3**	1030 **51.3**	60 **3.0**	40 **2.0**	90 **4.5**	240 **12.0**	55 **2.7**	210 **10.5**	480 **23.9**	490 **24.4**	— —	— —	— —	— —
258	June 27	2015 66	400 **19.8**	440 **21.8**	880 **43.6**	60 **3.0**	435 **21.6**	520 **25.8**	870 **43.2**	870 **43.2**	60 **3.0**	48 **2.4**	85 **4.2**	240 **11.9**	65 **3.2**	230 **11.4**	525 **26.0**	515 **25.5**	525 **26.0**	190 **9.4**	370 **18.4**	150 **7.4**
625	Sept. 13	2015 66	405 **20.1**	435 **21.6**	805 **39.9**	90 **4.5**	490 **24.3**	540 **26.8**	870 **43.2**	850 **42.2**	50 **2.5**	43 **2.1**	110 **5.5**	235 **11.7**	58 **2.9**	210 **10.4**	510 **25.3**	515 **25.5**	505 **25.0**	190 **9.4**	365 **18.1**	140 **6.9**
2	May 20	2015 66	420 **20.8**	450 **22.3**	— —	100 **5.0**	500 **24.8**	570 **28.3**	930 **46.1**	— —	70 **3.5**	— —	90 **4.5**	— —	— —	235 **11.7**	550 **27.3**	540 **26.8**	— —	— —	— —	— —
144	June 12	2015 66	370 **18.4**	400 **19.8**	820 **40.7**	100 **5.0**	480 **23.8**	565 **28.0**	940 **46.6**	950 **47.1**	65 **3.2**	— —	— —	225 **11.2**	50 **2.5**	220 **10.9**	— —	490 **25.0**	— —	200 **9.9**	— —	170 **8.4**

TABLE 25. THE WEST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, FEMALE, 1953 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
324	July 7	2020 66	380 **18.8**	410 **20.3**	920 **45.5**	90 **4.5**	480 **23.8**	610 **30.2**	940 **46.5**	940 **46.5**	40 **2.0**	58 **2.9**	140 **6.9**	230 **11.4**	55 **2.7**	210 **10.4**	500 **24.8**	495 **24.5**	500 **24.8**	195 **9.7**	360 **17.8**	140 **6.9**
366	July 12	2030 67	415 **20.5**	445 **21.9**	840 **41.4**	100 **4.9**	450 **22.2**	550 **27.1**	900 **44.4**	880 **43.4**	50 **2.5**	38 **1.9**	140 **6.9**	230 **11.3**	55 **2.7**	205 **10.1**	545 **26.9**	540 **26.6**	545 **26.9**	185 **9.1**	390 **19.2**	135 **6.7**
88	June 3	2030 67	330 **16.3**	410 **20.2**	825 **40.7**	90 **4.4**	510 **25.1**	560 **27.6**	890 **43.9**	880 **43.4**	50 **2.5**	— —	110 **5.4**	210 **10.4**	— —	— —	— —	— —	— —	— —	— —	— —
374	July 13	2040 67	415 **20.3**	455 **22.3**	760 **37.2**	100 **4.9**	480 **23.5**	530 **26.0**	880 **43.1**	870 **42.6**	70 **3.4**	38 **1.9**	155 **5.6**	190 **9.3**	60 **2.9**	220 **10.8**	550 **27.0**	535 **26.2**	550 **27.0**	180 **8.8**	400 **19.6**	130 **6.4**
688	Sept. 27	2040 67	420 **20.6**	465 **22.8**	845 **41.4**	100 **4.9**	445 **21.8**	575 **28.2**	910 **44.6**	905 **44.3**	50 **2.5**	58 **2.8**	110 **5.4**	255 **12.5**	60 **2.9**	235 **11.5**	540 **26.5**	540 **26.5**	545 **26.7**	200 **9.8**	385 **18.9**	145 **7.1**
633	Sept. 15	2070 68	440 **21.3**	475 **22.9**	720 **34.8**	100 **4.8**	445 **21.5**	555 **26.8**	870 **42.0**	870 **42.0**	45 **2.2**	39 **1.9**	95 **4.6**	210 **10.1**	54 **2.6**	230 **11.1**	560 **27.0**	550 **26.6**	560 **27.0**	180 **8.7**	410 **19.8**	145 **7.0**
63	June 1	2100 69	430 **20.5**	460 **21.9**	— —	100 **4.8**	470 **22.4**	540 **25.7**	930 **44.3**	960 **45.7**	50 **2.4**	45 **2.1**	100 **4.8**	— —	— —	— —	— —	— —	— —	— —	— —	— —
384	July 18	2120 70	410 **19.4**	450 **21.2**	860 **40.8**	100 **4.7**	525 **24.8**	590 **27.8**	950 **44.8**	1005 **49.6**	80 **3.4**	29 **1.4**	110 **5.2**	250 **11.8**	60 **2.8**	245 **11.6**	535 **25.3**	535 **25.3**	535 **25.3**	195 **9.2**	380 **17.9**	160 **7.6**

All measurements in 1953 were carried out on the deck of Baikal maru.

TABLE 26. THE WEST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, MALE, 1954～1956

1) B: Baikal-maru, 2) Ky: Kyokuyo-maru, 3) K: Kinjo-maru

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
B[1]	61	June 3 1954	1890 62	400 **21.2**	440 **23.3**	840 **44.4**	420 **22.2**	520 **27.5**	815 **43.1**	815 **43.1**	130 **6.9**	49 **2.6**	70 **3.7**	232 **12.3**	61 **3.2**	230 **12.2**	525 **27.8**	520 **27.5**	520 **27.5**	185 **9.8**	355 **18.8**	140 **7.4**
B	59	June 2 1954	1898 62	355 **18.7**	400 **21.1**	770 **40.6**	440 **23.2**	525 **27.7**	850 **44.8**	880 **46.4**	125 **6.6**	50 **2.6**	70 **3.7**	207 **10.9**	49 **2.6**	215 **11.3**	475 **25.0**	460 **24.3**	475 **25.0**	178 **9.4**	335 **17.7**	135 **7.1**
B	95	June 8 1954	2084 68	375 **18.0**	430 **20.6**	840 **40.3**	450 **21.6**	590 **28.3**	920 **44.2**	920 **44.2**	150 **7.2**	55 **2.6**	80 **3.8**	227 **10.9**	60 **2.9**	235 **11.3**	505 **24.2**	480 **23.0**	505 **24.2**	195 **9.4**	356 **17.1**	140 **6.7**
Ky[2]	40	June 12 1956	1855 61	345 **18.6**	375 **20.2**	790 **42.6**	420 **22.6**	520 **28.0**	830 **44.7**	810 **43.7**	120 **6.5**	35 **1.9**	80 **4.3**	— —	52 **2.8**	208 **11.2**	470 **25.3**	455 **24.5**	468 **25.2**	195 **10.5**	— —	123 **6.6**

Ky	286	June 26	1715	300	350	—	390	485	805	795	145	44	95	—	47	185	400	395	400	160	275	110
		1956	56	**17.5**	**20.4**	—	**22.7**	**28.3**	**46.9**	**46.4**	**8.5**	**2.6**	**5.5**	—	**2.7**	**10.8**	**23.3**	**23.0**	**23.3**	**9.3**	**16.0**	**6.4**
Ky	1247	Aug. 18	1780	330	350	700	405	490	810	790	120	42	85	—	55	205	445	460	445	175	320	130
		1956	58	**18.5**	**19.7**	**39.3**	**22.8**	**27.5**	**45.5**	**44.4**	**6.7**	**2.4**	**4.8**	—	**3.1**	**11.5**	**25.0**	**25.8**	**25.0**	**9.8**	**18.0**	**7.3**
Ky	1272	Aug. 19	1855	360	385	775	390	490	820	800	125	38	90	—	53	190	485	495	490	175	320	120
		1956	61	**19.4**	**20.7**	**41.8**	**21.0**	**26.4**	**44.2**	**43.1**	**6.7**	**2.0**	**4.9**	—	**2.9**	**10.2**	**26.1**	**26.7**	**26·4**	**9.4**	**17.3**	**6.5**
Ky	1320	Aug. 21	1835	330	360	745	415	515	860	835	120	41	85	—	52	200	460	465	460	180	310	130
		1956	60	**18.0**	**19.6**	**40.6**	**22.6**	**28.1**	**46.9**	**45.5**	**6.5**	**2.2**	**4.6**	—	**2.8**	**10.9**	**25.1**	**25.3**	**25.1**	**9.8**	**16.9**	**7.1**
Ky	1370	Aug. 23	1805	365	395	770	395	480	790	790	120	—	—	—	50	220	485	480	490	175	340	130
		1956	59	**20.2**	**21.9**	**42.7**	**21.9**	**26.6**	**43.8**	**43.8**	**6.6**	—	—	—	**2.8**	**12.2**	**26.9**	**26.6**	**27.1**	**9.7**	**18.9**	**7.2**

TABLE 27. THE WEST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, FEMALE, 1954~1956

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
K[3]	26	May 20	1700	—	340	700	420	490	780	760	45	40	80	200	50	185	420	390	400	150	280	101
		1954	56	—	**20.0**	**41.2**	**24.7**	**28.8**	**45.9**	**44.7**	**2.6**	**2.4**	**4.7**	**11.8**	**2.9**	**10.9**	**24.7**	**22.9**	**23.5**	**8.8**	**16.5**	**6.5**
B	60	June 3	1790	320	365	710	420	520	820	840	50	48	65	190	46	209	465	455	460	154	300	132
		1954	59	**17.9**	**20.4**	**39.7**	**23.5**	**29.1**	**45.8**	**47.0**	**2.8**	**2.7**	**3.6**	**10.6**	**2.6**	**11.7**	**26.0**	**25.4**	**25.7**	**8.6**	**16.8**	**7.4**
B	34	May 31	1860	385	422	805	410	510	810	810	40	40	70	210	55	204	502	495	505	170	365	140
		1954	61	**20.7**	**20.7**	**43.3**	**22.0**	**27.4**	**43.5**	**43.5**	**2.2**	**2.2**	**3.8**	**11.3**	**3.0**	**11.0**	**27.0**	**26.6**	**27.2**	**9.1**	**19.6**	**7.5**
B	114	June 9	1862	—	—	—	—	—	—	—	—	—	—	—	—	217	505	—	500	161	360	128
		1954	61	—	—	—	—	—	—	—	—	—	—	—	—	**11.7**	**27.1**	—	**26.9**	**8.6**	**19.3**	**6.9**
K	7	May 18	2000	360	410	840	460	585	920	950	55	40	110	240	55	215	485	480	490	205	340	150
		1954	66	**18.0**	**20.5**	**42.0**	**23.0**	**29.3**	**46.0**	**48.5**	**2.8**	**2.0**	**5.5**	**12.0**	**2.8**	**10.3**	**24.3**	**24.0**	**24.5**	**10.3**	**17.0**	**7.5**
Ky	42	June 12	1740	310	325	660	425	510	800	790	45	45	99	—	53	195	425	425	430	165	—	120
		1956	57	**17.8**	**18.7**	**37.9**	**24.4**	**29.3**	**46.0**	**45.4**	**2.6**	**2.6**	**5.7**	—	**3.0**	**11.2**	**24.4**	**24.4**	**24.7**	**9.5**	—	**6.6**
Ky	53	June 13	1985	385	410	815	465	550	890	870	55	43	80	—	—	—	—	—	—	—	—	—
		1956	65	**19.4**	**20.7**	**41.1**	**23.4**	**27.7**	**44.8**	**43.8**	**2.8**	**2.2**	**4.0**	—	—	—	—	—	—	—	—	—
Ky	232	June 23	2000	370	410	805	460	540	875	830	55	40	105	—	58	210	505	495	510	200	360	145
		1956	66	**18.5**	**20.5**	**40.3**	**23.0**	**27.0**	**43.8**	**41.5**	**2.8**	**2.0**	**5.3**	—	**2.9**	**10.5**	**25.3**	**24.6**	**25.5**	**10.0**	**18.0**	**7.3**
Ky	250	June 23	1680	235	255	600	380	480	810	800	45	—	95	—	52	205	315	325	345	170	210	120
		1956	55	**14.0**	**15.2**	**35.7**	**22.6**	**28.6**	**48.2**	**47.6**	**2.7**	—	**5.7**	—	**3.1**	**12.2**	**18.7**	**19.3**	**20.5**	**10.1**	**12.5**	**7.1**
Ky	288	June 29	2000	400	450	—	455	560	880	870	55	47	90	—	—	215	520	525	515	200	355	130
		1956	66	**20.0**	**22.5**	—	**22.8**	**28.0**	**44.0**	**43.5**	**2.8**	**2.4**	**4.5**	—	—	**10.8**	**26.0**	**26.3**	**25.8**	**10.0**	**17.8**	**6.5**

TABLE 27. THE WEST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, FEMALE, 1954~1956 (cont.)

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
Ky	312	July 1 1956	1950 64	350 17.9	390 20.0	810 41.5	435 22.3	480 24.6	810 41.5	— —	50 2.6	20 1.0	80 4.1	— —	52 2.7	205 10.5	490 25.1	— —	490 25.1	170 8.7	340 17.4	125 6.4
Ky	1211	Aug. 14 1956	1945 64	375 19.3	415 21.3	815 41.9	445 22.9	565 29.0	870 44.7	850 43.7	30 1.5	49 2.5	100 5.1	— —	56 2.9	210 10.8	485 24.9	495 25.4	485 24.9	180 9.3	335 17.2	130 6.7
Ky	1297	Aug. 20 1956	2025 67	380 18.8	400 19.8	835 41.2	470 23.2	590 29.1	950 46.9	920 45.4	40 2.0	42 2.1	— —	— —	56 2.8	230 11.4	525 25.9	510 25.2	520 25.7	210 10.4	360 17.8	145 7.2
Ky	1348	Aug. 22 1956	1995 65	385 19.3	415 20.8	815 40.9	460 23.1	555 27.8	910 45.6	880 44.1	60 3.0	52 2.6	100 5.0	— —	56 2.8	220 11.0	525 26.3	530 26.6	530 26.6	190 9.5	365 18.3	130 6.5
Ky	1393	Aug. 24 1956	1985 65	395 19.9	415 20.9	855 43.1	450 22.7	550 27.7	870 43.8	870 43.8	60 3.0	40 2.0	90 4.5	— —	55 2.8	235 11.8	535 27.0	535 27.0	530 26.7	190 9.6	350 17.6	135 6.8

TABLE 28. THE SOUTH EAST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, MALE, 1954~1956

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
K	603	July 10 1954	1660 55	290 17.5	325 19.6	680 40.9	405 24.4	475 28.6	785 47.3	735 44.2	155 9.3	46 2.8	120 7.2	175 10.5	48 2.9	— —	— —	— —	— —	— —	— —	— —
K	473	July 1 1954	1850 61	340 18.4	370 20.0	780 42.2	450 24.3	510 27.6	840 45.4	840 45.4	120 6.5	45 2.4	75 4.1	215 11.6	50 2.7	210 11.4	470 25.4	470 25.4	455 24.6	180 9.7	340 18.4	140 7.6
K	686	July 17 1954	2020 66	395 19.6	410 20.3	830 41.1	470 23.3	580 28.7	920 45.5	895 44.3	145 7.2	60 3.0	140 6.9	240 11.9	60 3.0	210 10.4	510 25.2	495 24.5	500 24.8	170 8.4	370 18.3	135 6.7
Ky	341	July 4 1956	1620 53	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	46 2.8	170 10.5	405 25.0	400 24.7	405 25.0	155 9.6	285 17.6	105 6.5

TABLE 29. THE SOUTH EAST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, FEMALE, 1954~1956

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
K	672	July 15 1954	1800 59	295 16.4	350 19.5	730 40.6	450 25.0	500 27.8	790 43.9	772 42.9	45 2.5	40 2.2	85 4.7	220 12.2	50 2.8	190 10.6	440 24.5	440 24.5	435 24.2	145 8.1	315 17.5	120 6.7

K	145	June 8 1954	1860 61	305 **16.4**	330 **17.8**	720 **38.7**	460 **24.7**	500 **26.9**	830 **44.7**	830 **44.7**	30 **1.6**	40 **2.2**	85 **4.6**	195 **10.5**	50 **2.7**	190 **1.02**	425 **22.9**	410 **22.1**	420 **22.6**	180 **9.7**	300 **16.1**	115 **6.2**
K	56	May 31 1954	2005 66	370 **18.5**	400 **20.0**	830 **41.4**	440 **22.0**	540 **26.9**	870 **43.4**	840 **41.9**	60 **3.0**	45 **2.2**	90 **4.5**	240 **12.0**	60 **3.0**	205 **10.2**	510 **25.4**	520 **25.9**	515 **25.7**	180 **9.0**	345 **17.2**	145 **7.2**
K	32	May 22 1954	2045 67	395 **19.3**	440 **21.5**	875 **42.8**	440 **21.5**	570 **27.9**	890 **43.5**	920 **45.0**	45 **2.2**	35 **1.7**	80 **3.9**	250 **12.2**	60 **2.9**	— —	— —	515 **25.2**	— —	— —	— —	— —
K	69	June 2 1954	2070 68	370 **17.9**	410 **19.8**	860 **41.5**	500 **24.2**	590 **28.5**	930 **44.9**	960 **46.3**	60 **2.9**	40 **1.9**	70 **3.4**	255 **12.3**	60 **2.9**	210 **10.1**	505 **24.4**	500 **24.2**	515 **24.9**	200 **9.6**	360 **17.4**	150 **7.2**
K	687	July 17 1954	2105 69	365 **17.3**	385 **18.2**	835 **39.7**	490 **23.3**	585 **27.8**	845 **40.1**	950 **45.1**	— —	47 **2.2**	110 **5.2**	240 **11.4**	61 **2.9**	235 **11.2**	525 **24.9**	520 **24.7**	520 **24.7**	200 **9.5**	350 **16.6**	145 **6.9**
Ky	366	July 6 1956	1920 63	310 **16.1**	370 **19.3**	810 **42.2**	450 **23.4**	565 **29.4**	910 **47.4**	890 **46.4**	45 **2.3**	32 **1.7**	90 **4.7**	— —	56 **2.9**	275 **14.3**	480 **25.0**	480 **25.0**	490 **25.5**	220 **11.5**	335 **17.4**	140 **7.3**
Ky	1528	Sept. 4 1956	1845 61	365 **19.8**	390 **21.1**	765 **41.5**	430 **23.3**	480 **26.0**	810 **43.9**	790 **42.8**	50 **2.7**	47 **2.5**	85 **4.6**	— —	51 **2.8**	200 **10.8**	500 **27.1**	495 **26.8**	495 **26.8**	185 **10.0**	335 **18.2**	120 **6.5**

TABLE 30. THE NORTH EAST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, MALE, 1954~1956

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
K	751	July 20 1954	1740 57	320 **18.4**	340 **19.6**	720 **41.4**	420 **24.2**	495 **28.5**	780 **44.9**	770 **44.3**	125 **7.2**	45 **2.6**	100 **5.8**	209 **12.0**	53 **3.0**	170 **9.8**	420 **24.2**	420 **24.2**	420 **24.2**	— —	285 **16.4**	120 **6.9**
B	985	Sept. 16 1954	1740 57	330 **19.0**	370 **21.3**	700 **40.3**	440 **25.3**	530 **30.5**	840 **48.3**	860 **49.5**	100 **5.8**	45 **2.6**	90 **5.2**	219 **12.6**	43 **2.5**	195 **11.2**	410 **23.6**	400 **23.0**	413 **23.7**	176 **10.1**	275 **15.8**	125 **7.2**
B	861	Sept. 5 1954	1760 58	— —	370 **21.0**	755 **42.9**	390 **22.2**	490 **27.8**	690 **39.2**	690 **39.2**	100 **5.7**	41 **2.3**	80 **4.5**	207 **11.8**	49 **2.8**	196 **11.1**	435 **24.7**	428 **24.3**	440 **25.0**	155 **8.8**	310 **17.6**	122 **6.9**
K	743	July 19 1954	1775 58	315 **17.7**	330 **18.6**	690 **38.8**	415 **23.3**	525 **29.6**	850 **47.9**	820 **46.2**	115 **6.5**	36 **2.0**	110 **6.2**	210 **11.8**	49 **2.8**	190 **10.7**	425 **23.9**	420 **23.6**	420 **23.6**	180 **10.1**	300 **16.9**	105 **5.9**
K	896	Aug. 1 1954	1780 59	330 **18.5**	350 **19.7**	670 **37.7**	410 **23.0**	490 **27.5**	800 **45.0**	790 **44.4**	120 **6.7**	— —	100 **5.6**	205 **11.5**	54 **3.0**	190 **10.7**	435 **24.4**	430 **24.2**	440 **24.7**	175 **9.8**	305 **17.1**	120 **6.7**
B	848	Sept. 3 1954	1792 59	315 **17.6**	345 **19.3**	695 **38.8**	430 **24.0**	520 **29.0**	860 **48.0**	860 **48.0**	135 **7.5**	45 **2.5**	90 **5.0**	— —	52 **2.9**	206 **11.5**	426 **23.8**	420 **23.4**	420 **23.4**	171 **9.5**	290 **16.2**	136 **7.6**
B	865	Sept. 5 1954	1800 59	350 **19.5**	380 **21.1**	750 **41.7**	400 **22.2**	490 **27.2**	690 **38.4**	720 **40.0**	120 **6.7**	48 **2.7**	80 **4.4**	207 **11.5**	54 **3.0**	210 **11.7**	450 **25.0**	460 **25.6**	455 **25.3**	172 **9.6**	320 **17.8**	137 **7.6**
B	1037	Sept. 19 1954	1800 59	355 **19.7**	380 **21.1**	780 **43.4**	410 **22.8**	500 **27.8**	830 **46.1**	830 **46.1**	140 **7.8**	37 **2.1**	90 **5.0**	220 **12.2**	53 **3.0**	205 **11.4**	475 **26.4**	475 **26.4**	480 **26.7**	175 **9.7**	340 **18.9**	127 **7.1**

TABLE 30. THE NORTH EAST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, MALE, 1954~1956 (cont.)

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
K	895	Aug. 1 1954	1840 60	360 **19.5**	390 **21.2**	750 **40.7**	430 **23.3**	520 **28.2**	840 **45.6**	830 **45.1**	130 **7.1**	45 **2.4**	80 **4.3**	205 **11.1**	52 **2.8**	210 **11.4**	— —	440 **23.9**	455 **24.7**	160 **8.7**	320 **17.4**	140 **7.6**
K	933	Aug. 3 1954	1840 60	320 **17.4**	350 **19.0**	750 **40.7**	435 **23.6**	535 **29.1**	865 **47.0**	850 **46.2**	130 **7.1**	42 **2.3**	85 **4.6**	220 **11.9**	54 **2.9**	215 **11.7**	445 **23.9**	— —	435 **23.6**	150 **8.1**	310 **16.8**	135 **7.3**
B	901	Sept. 9 1954	1848 61	340 **18.4**	370 **20.0**	750 **40.6**	410 **22.2**	500 **27.1**	810 **43.8**	830 **44.9**	130 **7.0**	43 **2.3**	100 **5.4**	220 **11.9**	55 **3.0**	210 **11.4**	450 **24.3**	445 **24.1**	450 **24.3**	170 **9.2**	315 **17.0**	123 **6.7**
K	954	Aug. 4 1954	1850 61	330 **17.9**	345 **18.7**	740 **40.0**	430 **23.3**	515 **27.9**	855 **46.3**	830 **44.9**	120 **6.5**	— —	85 **4.6**	208 **11.3**	54 **2.9**	225 **12.2**	450 **24.3**	454 **24.6**	450 **24.3**	165 **8.9**	318 **17.2**	125 **6.8**
K	908	Aug. 2 1954	1860 61	320 **17.2**	330 **17.8**	750 **40.4**	430 **23.1**	550 **29.6**	870 **46.8**	860 **46.3**	150 **8.1**	50 **2.7**	80 **4.3**	225 **12.1**	54 **2.9**	205 **11.0**	425 **22.9**	430 **23.1**	425 **22.9**	180 **9.7**	290 **15.6**	135 **7.3**
B	1042	Sept. 19 1954	1860 61	340 **18.3**	380 **20.4**	790 **42.4**	420 **22.6**	540 **29.0**	850 **45.6**	870 **46.8**	130 **7.0**	41 **2.2**	100 **5.4**	225 **12.1**	58 **3.1**	210 **11.3**	460 **24.7**	440 **23.6**	460 **24.7**	175 **9.4**	320 **17.2**	132 **7.1**
B	806	Aug. 30 1954	1861 61	340 **18.3**	360 **19.3**	750 **40.3**	390 **20.9**	500 **26.9**	810 **43.5**	790 **42.4**	115 **6.2**	42 **2.3**	110 **5.9**	204 **11.0**	53 **2.8**	225 **12.1**	455 **24.4**	455 **24.4**	460 **24.7**	180 **9.7**	325 **17.5**	120 **6.4**
B	840	Sept. 3 1954	1861 61	340 **18.3**	360 **19.3**	730 **39.2**	440 **23.6**	540 **29.0**	880 **47.3**	900 **48.3**	130 **7.0**	41 **2.2**	80 **4.3**	220 **11.8**	52 **2.8**	202 **10.8**	455 **24.4**	440 **23.6**	455 **24.4**	175 **9.4**	325 **17.5**	125 **6.7**
B	807	Aug. 30 1954	1865 61	320 **17.2**	360 **19.3**	710 **38.1**	395 **21.2**	500 **26.8**	810 **43.4**	780 **41.8**	125 **6.7**	38 **2.0**	100 **5.4**	205 **11.0**	50 **2.7**	205 **11.0**	435 **23.3**	435 **23.3**	445 **23.9**	165 **8.8**	315 **16.9**	125 **6.7**
K	953	Aug. 4 1954	1975 65	345 **17.5**	390 **19.7**	805 **40.7**	465 **23.5**	540 **27.3**	890 **45.0**	875 **44.3**	150 **7.6**	41 **2.1**	95 **4.8**	225 **11.4**	57 **2.9**	220 **11.1**	475 **24.0**	498 **25.2**	465 **23.5**	183 **9.3**	345 **17.5**	130 **6.6**
Ky	712	July 12 1955	1915 63	— —	430 **22.5**	880 **46.0**	400 **20.9**	500 **26.1**	820 **42.8**	800 **41.8**	110 **5.7**	34 **1.8**	80 **4.2**	— —	— —	— —	— —	— —	— —	— —	— —	140 **7.3**
Ky	1072	July 29 1955	1790 59	330 **18.4**	370 **20.7**	750 **41.9**	420 **23.5**	540 **30.2**	820 **45.8**	800 **44.7**	130 **7.3**	50 **2.8**	100 **5.6**	205 **11.5**	55 **3.1**	210 **11.7**	450 **25.1**	— —	445 **24.9**	162 **9.1**	310 **17.3**	123 **6.9**
Ky	1074	July 29 1955	1876 62	365 **19.5**	400 **21.3**	820 **43.7**	440 **23.5**	530 **28.3**	830 **44.2**	820 **43.7**	130 **6.9**	41 **2.2**	100 **5.3**	225 **12.0**	53 **2.8**	220 **11.7**	500 **26.7**	— —	495 **26.4**	174 **9.3**	350 **18.7**	132 **7.0**
Ky	1099	July 30 1955	1670 55	310 **18.6**	335 **20.1**	640 **38.3**	400 **24.0**	500 **29.9**	790 **47.3**	760 **45.5**	120 **7.2**	42 **2.5**	100 **6.0**	195 **11.7**	48 **2.9**	185 **11.1**	410 **24.6**	— —	405 **24.3**	140 **8.4**	290 **17.4**	112 **6.7**
Ky	1101	July 30 1955	1760 58	340 **19.3**	360 **20.5**	730 **41.5**	400 **22.7**	480 **27.3**	810 **46.0**	800 **45.5**	120 **6.8**	42 **2.4**	80 **4.5**	200 **11.4**	50 **2.8**	215 **12.2**	445 **25.3**	— —	450 **25.6**	160 **9.1**	315 **17.9**	125 **7.1**
Ky	1115	July 31 1955	1820 60	285 **15.7**	365 **20.1**	765 **42.0**	400 **22.0**	510 **28.0**	830 **45.6**	810 **44.5**	130 **7.1**	41 **2.3**	110 **6.0**	210 **11.5**	49 **2.7**	205 **11.3**	445 **24.5**	— —	450 **24.7**	175 **9.6**	306 **16.8**	123 **6.8**

Ky	1117	July 31 1955	1760 58	295 **16.8**	345 **19.6**	750 **42.0**	400 **22.7**	510 **29.0**	750 **42.6**	730 **41.5**	160 **9.1**	— —	— —	200 **11.4**	48 **2.7**	195 **11.1**	415 **23.6**	— —	410 **23.3**	160 **9.1**	290 **16.5**	120 **6.8**
Ky	1147	Aug. 1 1955	1800 59	— —	385 **21.4**	772 **42.9**	410 **22.8**	510 **28.3**	810 **45.0**	790 **43.9**	180 **10.0**	39 **2.1**	90 **5.0**	216 **12.0**	56 **3.1**	210 **11.7**	460 **25.6**	— —	455 **25.3**	170 **9.4**	310 **17.2**	123 **6.8**
Ky	1172	Aug. 2 1955	1920 63	380 **19.8**	410 **21.4**	830 **43.2**	460 **24.0**	570 **29.7**	895 **46.6**	860 **44.8**	180 **9.4**	57 **3.0**	110 **5.7**	230 **12.0**	60 **3.1**	220 **11.5**	500 **26.0**	— —	490 **25.5**	180 **9.4**	365 **19.0**	130 **6.8**
Ky	386	July 7 1956	1870 61	355 **19.0**	395 **21.1**	— —	440 **23.5**	525 **28.1**	850 **45.5**	835 **44.7**	115 **6.1**	44 **2.4**	90 **4.8**	— —	54 **2.9**	215 **11.5**	485 **25.9**	470 **25.1**	490 **26.2**	185 **9.9**	350 **18.7**	140 **7.5**
Ky	419	July 8 1956	1800 59	355 **19.7**	370 **20.6**	— —	395 **21.9**	485 **26.9**	780 **43.3**	765 **42.5**	115 **6.4**	43 **2.4**	100 **5.6**	— —	56 **3.1**	210 **11.7**	470 **26.1**	460 **25.6**	475 **26.4**	185 **10.3**	330 **18.3**	130 **7.2**
Ky	511	July 11 1956	1850 61	340 **18.4**	360 **19.5**	730 **39.5**	415 **22.4**	510 **27.6**	815 **44.1**	790 **42.7**	140 **7.6**	48 **2.6**	100 **5.4**	— —	55 **3.0**	185 **10.0**	450 **24.3**	450 **24.3**	450 **24.3**	175 **9.5**	305 **16.5**	135 **7.3**
Ky	572	July 13 1956	1860 61	355 **19.1**	390 **21.0**	790 **42.5**	415 **22.3**	530 **28.5**	805 **43.3**	770 **41.4**	115 **6.2**	41 **2.2**	100 **5.4**	— —	52 **2.8**	200 **10.8**	480 **25.8**	480 **25.8**	480 **25.8**	190 **10.2**	330 **17.7**	135 **7.3**
Ky	891	July 25 1956	1895 62	325 **17.2**	360 **19.0**	740 **39.1**	445 **23.5**	565 **29.8**	885 **46.7**	860 **45.4**	155 **8.2**	40 **2.1**	80 **4.2**	— —	55 **2.9**	195 **10.3**	450 **23.7**	440 **23.2**	455 **24.0**	175 **9.2**	290 **15.3**	125 **6.6**
Ky	912	July 26 1956	1805 59	325 **18.0**	345 **19.1**	695 **38.5**	410 **22.7**	500 **27.7**	840 **46.5**	790 **43.8**	115 **6.4**	— —	— —	— —	52 **2.9**	205 **11.4**	455 **25.2**	465 **25.8**	460 **25.5**	180 **10.0**	320 **17.7**	130 **7.2**
Ky	986	July 29 1956	1760 58	320 **18.2**	345 **19.6**	710 **40.3**	380 **21.6**	500 **28.4**	800 **45.5**	780 **44.3**	130 **7.4**	— —	— —	— —	53 **3.0**	190 **10.8**	435 **24.7**	435 **24.7**	440 **25.0**	175 **9.9**	295 **16.8**	120 **6.8**
Ky	1073	Aug. 1 1956	1780 58	315 **17.7**	335 **18.8**	705 **39.6**	395- **22.2**	525 **29.5**	840 **47.2**	825 **46.3**	120 **6.7**	— —	— —	— —	51 **2.9**	200 **11.2**	425 **23.9**	420 **23.6**	430 **24.2**	170 **9.6**	295 **16.6**	120 **6.7**

TABLE 31. THE NORTH EAST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, FEMALE, 1954~1956

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
B	691	Aug. 21 1954	1670 55	295 **17.7**	322 **19.3**	610 **36.5**	— —	480 **28.8**	770 **46.1**	780 **46.7**	50 **3.0**	37 **2.2**	— —	214 **12.8**	44 **2.6**	195 **11.7**	410 **24.6**	408 **24.4**	410 **24.6**	157 **9.4**	284 **17.0**	121 **7.2**
K	726	July 19 1954	1770 58	315 **17.8**	345 **19.5**	680 **38.4**	440 **24.9**	545 **30.8**	790 **44.6**	815 **46.0**	45 **2.5**	38 **2.1**	70 **4.0**	190 **10.7**	50 **2.8**	195 **11.0**	430 **24.3**	425 **24.0**	430 **24.3**	165 **9.3**	305 **17.2**	125 **7.1**
B	1028	Aug. 18 1954	1780 58	325 **18.3**	347 **19.5**	730 **41.0**	450 **25.3**	540 **30.3**	780 **43.8**	800 **45.0**	30 **1.7**	45 **2.5**	90 **5.1**	212 **11.9**	50 **2.8**	200 **11.2**	420 **23.6**	415 **23.3**	425 **23.9**	165 **9.3**	290 **16.3**	130 **7.3**
B	1035	Aug. 18 1954	1795 59	350 **19.5**	380 **21.2**	745 **41.5**	470 **26.2**	530 **29.5**	810 **45.1**	810 **45.1**	70 **3.9**	43 **2.4**	80 **4.5**	212 **11.8**	51 **2.8**	210 **11.7**	454 **25.3**	450 **25.1**	457 **25.5**	165 **9.2**	310 **17.3**	125 **7.0**

TABLE 31. THE NORTH EAST SIDE WATERS OF ALEUTIAN ISLANDS IN THE NORTHERN PACIFIC, FEMACE, 1954~1956 (cont.)

Factory ship	Serial no.	Date caught	1	3	5	6	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
B	838	Sept. 2 1954	1825 60	331 **18.1**	350 **19.1**	740 **40.5**	460 **25.2**	580 **31.7**	860 **47.0**	820 **44.9**	50 **2.7**	40 **2.2**	85 **4.6**	231 **12.6**	51 **2.8**	218 **11.9**	425 **23.2**	410 **22.4**	425 **23.2**	185 **10.1**	292 **16.0**	127 **6.9**
B	951	Sept. 13 1954	1850 61	370 **20.0**	390 **21.1**	790 **42.7**	430 **23.2**	530 **28.7**	840 **45.4**	840 **45.4**	60 **3.2**	31 **1.7**	90 **4.9**	226 **12.2**	55 **3.0**	220 **11.9**	500 **27.1**	485 **26.2**	500 **27.1**	185 **10.0**	360 **19.5**	130 **7.0**
K	574	July 20 1954	1815 62	320 **17.6**	345 **19.0**	720 **39.7**	405 **22.3**	525 **28.9**	835 **46.0**	835 **46.0**	50 **2.8**	30 **1.7**	90 **5.0**	200 **11.0**	55 **3.0**	200 **11.0**	430 **23.7**	445 **24.5**	420 **23.1**	160 **8.8**	305 **16.8**	125 **6.9**
B	837	Sept. 2 1954	1886 62	— —	410 **21.7**	800 **42.4**	460 **24.4**	560 **29.7**	890 **47.2**	920 **48.8**	30 **1.6**	— —	110 **5.8**	240 **12.7**	51 **2.7**	210 **11.1**	480 **25.4**	490 **26.0**	480 **25.4**	175 **9.3**	360 **19.1**	135 **7.2**
B	1057	Sept. 21 1954	1890 62	375 **19.8**	410 **21.7**	820 **43.4**	430 **22.7**	500 **26.5**	870 **46.0**	890 **47.1**	70 **3.7**	50 **2.7**	100 **5.3**	205 **10.8**	53 **2.8**	220 **11.6**	500 **26.5**	495 **26.2**	505 **26.7**	185 **9.8**	365 **19.3**	135 **7.1**
K	934	Aug. 3 1954	1910 63	350 **18.3**	380 **19.9**	770 **40.3**	450 **23.5**	580 **30.3**	900 **47.1**	870 **45.5**	90 **4.7**	51 **2.7**	100 **5.2**	230 **12.0**	52 **2.7**	225 **11.8**	465 **24.3**	470 **24.6**	460 **24.1**	170 **8.9**	335 **17.5**	140 **7.3**
B	1073	Sept. 22 1954	1930 63	350 **18.1**	380 **19.7**	790 **40.9**	500 **25.9**	610 **31.6**	940 **48.7**	940 **48.7**	70 **3.6**	49 **2.5**	100 **5.1**	210 **10.9**	52 **2.7**	220 **11.4**	480 **24.9**	480 **24.9**	485 **25.1**	175 **9.1**	345 **17.9**	135 **7.0**
K	909	Aug. 2 1954	1940 64	340 **17.5**	360 **18.5**	770 **39.7**	455 **23.4**	570 **29.4**	900 **46.4**	910 **46.9**	50 **2.6**	45 **2.3**	95 **4.9**	225 **11.6**	52 **2.7**	205 **10.6**	460 **23.7**	450 **23.2**	460 **23.7**	170 **8.8**	315 **16.2**	125 **6.4**
B	1054	Sept. 20 1954	1950 64	360 **18.5**	400 **20.5**	810 **41.6**	440 **22.6**	520 **26.7**	860 **44.1**	840 **43.1**	60 **3.1**	46 **2.4**	120 **6.1**	214 **11.0**	49 **2.5**	210 **10.8**	495 **25.4**	485 **24.9**	495 **25.4**	175 **9.0**	355 **18.2**	135 **6.9**
K	903	Aug. 1 1954	1955 64	365 **18.7**	395 **20.2**	805 **41.2**	460 **23.6**	570 **29.2**	910 **46.6**	980 **50.2**	55 **2.8**	— —	110 **5.6**	220 **11.3**	55 **2.8**	210 **10.8**	490 **25.1**	490 **25.1**	480 **24.6**	185 **9.5**	340 **17.4**	140 **7.2**
B	866	Sept. 5 1954	1962 64	360 **18.4**	390 **19.9**	850 **43.4**	— —	570 **29.1**	880 **44.9**	910 **46.4**	60 **3.1**	48 **2.4**	110 **5.6**	235 **12.0**	53 **2.7**	210 **10.7**	475 **24.2**	475 **24.2**	480 **24.5**	175 **8.9**	340 **17.3**	127 **6.5**
B	890	Sept. 8 1954	1980 65	380 **19.2**	405 **20.5**	830 **41.9**	450 **22.7**	550 **27.8**	900 **45.5**	880 **44.4**	50 **2.5**	44 **2.2**	90 **4.5**	250 **12.6**	54 **2.7**	227 **11.5**	490 **24.7**	490 **24.7**	500 **25.3**	177 **8.9**	345 **17.4**	135 **6.8**
B	1043	Sept. 19 1954	2010 66	385 **19.2**	425 **21.2**	850 **42.3**	510 **25.4**	580 **28.9**	900 **44.8**	900 **44.8**	50 **2.5**	49 **2.4**	120 **6.0**	— —	— —	230 **11.5**	500 **24.9**	495 **24.7**	500 **24.9**	190 **9.5**	360 **17.9**	139 **6.9**
B	1058	Sept. 21 1954	2015 66	390 **19.3**	430 **21.3**	850 **42.2**	470 **23.3**	580 **28.8**	900 **44.6**	870 **43.2**	50 **2.5**	51 **2.5**	120 **6.0**	220 **10.9**	52 **2.6**	235 **11.7**	510 **25.3**	515 **25.5**	515 **25.5**	195 **9.7**	370 **18.4**	136 **6.7**
K	750	July 20 1954	2020 66	370 **18.3**	385 **19.1**	810 **40.1**	490 **24.3**	575 **28.5**	900 **44.6**	870 **43.1**	56 **2.8**	48 **2.4**	77 **3.8**	250 **12.4**	56 **2.8**	225 **11.1**	500 **24.8**	490 **24.3**	480 **23.8**	180 **8.9**	350 **17.3**	130 **6.4**
K	955	Aug. 4 1954	2020 66	370 **18.3**	390 **19.3**	— —	480 **23.8**	585 **29.0**	930 **46.0**	930 **46.0**	65 **3.2**	45 **2.2**	120 **5.9**	235 **11.6**	53 **2.6**	215 **10.6**	470 **23.3**	490 **24.3**	485 **24.0**	175 **8.7**	350 **17.3**	125 **6.2**

K	952	Aug. 4 1954	2030 67	370 **18.2**	410 **20.2**	850 **41.9**	475 **23.4**	560 **27.6**	910 **44.9**	900 **44.4**	55 **2.7**	50 **2.5**	105 **5.2**	223 **11.0**	56 **2.8**	225 **11.1**	505 **24.9**	490 **24.2**	485 **23.9**	160 **7.9**	355 **17.5**	132 **6.5**
B	1056	Sept. 21 1954	2030 67	395 **19.5**	437 **21.5**	840 **41.4**	510 **25.1**	580 **28.6**	920 **45.4**	960 **47.3**	60 **3.0**	48 **2.4**	90 **4.4**	220 **10.8**	57 **2.8**	210 **10.4**	530 **26.1**	515 **25.4**	525 **25.9**	180 **8.9**	390 **19.2**	143 **7.0**
B	857	Sept. 4 1954	2074 68	410 **19.8**	440 **21.2**	910 **43.9**	460 **22.2**	580 **28.0**	910 **43.9**	890 **42.9**	50 **2.4**	53 **2.6**	100 **4.8**	240 **11.6**	64 **3.1**	242 **11.7**	535 **25.8**	500 **24.1**	535 **25.8**	188 **9.1**	378 **18.2**	148 **7.1**
B	954	Sept. 14 1954	2160 71	430 **20.7**	460 **22.2**	910 **43.8**	510 **24.6**	620 **29.9**	1010 **48.7**	970 **46.8**	60 **2.9**	57 **2.7**	120 **5.8**	250 **12.1**	57 **2.7**	245 **11.8**	570 **27.4**	570 **27.4**	575 **27.7**	200 **9.6**	410 **19.8**	152 **7.3**
Ky	772	July 16 1955	1770 58	345 **19.5**	370 **20.9**	740 **41.8**	410 **23.2**	510 **28.8**	820 **46.3**	800 **45.2**	70 **4.0**	51 **2.9**	80 **4.5**	— —	— —	— —	— —	— —	— —	— —	— —	— —
Ky	1071	July 29 1955	1970 65	380 **19.3**	410 **20.8**	820 **41.6**	460 **23.3**	580 **29.4**	910 **46.2**	900 **45.7**	50 **2.5**	52 **2.6**	110 **5.6**	235 **11.9**	56 **2.8**	— —	— —	— —	— —	— —	— —	— —
Ky	1073	July 29 1955	1845 61	— —	395 **21.4**	765 **41.5**	450 **24.4**	540 **29.3**	790 **42.8**	770 **41.7**	40 **2.2**	42 **2.3**	100 **5.4**	215 **11.7**	52 **2.8**	220 **11.9**	485 **26.3**	— —	480 **26.0**	170 **9.2**	340 **18.4**	140 **7.6**

TABLE 32. NORTHERN PART OF EAST CHINA SEA, MALE, 1955

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
16	Aug. 4	1524	230	284	518	55	375	434	716	671	—	—	—	—	—
		50	**15.1**	**18.6**	**34.0**	**3.6**	**24.0**	**28.5**	**47.0**	**44.0**	—	—	—	—	—
30	Aug. 8	1555	289	324	—	68	—	—	—	—	—	30	76	175	45
		51	**18.6**	**20.8**	—	**4.4**	—	—	—	—	—	**1.9**	**4.9**	**11.3**	**2.9**
34	Aug. 9	1555	284	312	591	71	365	441	716	703	106	30	78	190	43
		51	**18.3**	**20.1**	**38.0**	**4.6**	**23.5**	**28.4**	**46.0**	**45.2**	**6.8**	**1.9**	**5.0**	**12.2**	**2.8**
45	Aug. 15	1585	291	327	640	71	406	487	762	742	126	27	86	192	43
		52	**18.4**	**20.6**	**40.4**	**4.5**	**25.6**	**30.7**	**48.1**	**46.8**	**7.9**	**1.7**	**5.4**	**12.1**	**2.7**
49	Aug. 15	1585	261	291	627	65	365	426	747	793	134	38	91	190	48
		52	**16.5**	**18.4**	**39.6**	**4.1**	**23.0**	**26.9**	**47.1**	**50.0**	**8.5**	**2.4**	**5.7**	**12.0**	**3.0**
59	Aug. 18	1524	258	291	554	68	—	431	744	718	116	30	71	172	40
		50	**16.9**	**19.1**	**36.4**	**4.5**	—	**28.3**	**48.8**	**47.1**	**7.6**	**2.0**	**4.7**	**11.3**	**2.6**
61	Aug. 19	1524	266	291	569	68	378	449	752	723	119	27	96	185	45
		50	**17.5**	**19.1**	**37.3**	**4.5**	**24.8**	**29.5**	**49.3**	**47.4**	**7.8**	**1.8**	**6.3**	**12.1**	**3.0**
77	Aug. 23	1524	248	286	564	68	375	449	732	713	114	38	96	185	43
		50	**16.3**	**18.8**	**37.0**	**4.5**	**24.6**	**29.5**	**48.0**	**46.8**	**7.5**	**2.5**	**6.3**	**12.1**	**2.8**
85	Aug. 25	1524	241	291	610	65	380	457	732	698	106	48	109	190	48
		50	**15.8**	**19.1**	**40.0**	**4.3**	**24.9**	**30.0**	**48.0**	**45.8**	**7.0**	**3.1**	**7.2**	**12.5**	**3.1**
141	Sept. 12	1555	269	304	640	73	350	441	696	676	157	27	83	195	45
		51	**17.3**	**19.5**	**41.2**	**4.7**	**22.5**	**28.4**	**44.8**	**43.5**	**10.1**	**1.7**	**5.3**	**12.5**	**2.9**
152	Sept. 14	1585	286	294	627	73	—	464	808	833	121	27	78	197	48
		52	**18.0**	**18.5**	**39.6**	**4.6**	—	**29.3**	**51.0**	**52.6**	**7.6**	**1.7**	**4.9**	**12.4**	**3.0**
164	Sept. 16	1524	243	261	732	63	350	426	793	—	—	—	—	—	—
		50	**15.9**	**17.1**	**48.0**	**4.1**	**23.0**	**28.0**	**52.0**	—	—	—	—	—	—
185	Sept. 21	1555	253	289	640	68	357	467	772	762	129	35	116	182	45
		51	**16.3**	**15.6**	**41.2**	**4.4**	**23.0**	**30.0**	**49.6**	**49.0**	**8.3**	**2.3**	**7.5**	**11.7**	**2.9**
226	Oct. 15	1585	304	350	640	76	355	457	—	—	129	30	91	205	45
		52	**19.2**	**22.1**	**40.4**	**4.8**	**22.4**	**28.8**	—	—	**8.1**	**1.9**	**5.7**	**12.9**	**2.8**
17	Aug. 4	1646	187	312	554	68	416	510	813	762	137	—	—	172	45
		54	**11.4**	**19.0**	**33.7**	**4.1**	**25.3**	**31.0**	**49.4**	**46.3**	**8.3**	—	—	**10.4**	**2.7**
19	Aug. 4	1646	284	317	610	73	441	510	810	762	147	38	114	195	45
		54	**17.3**	**19.3**	**37.1**	**4.4**	**26.8**	**31.0**	**49.2**	**46.3**	**8.9**	**2.3**	**6.9**	**11.8**	**2.7**
21	Aug. 5	1646	291	347	—	78	—	—	—	—	—	38	71	210	45
		54	**17.7**	**21.1**	—	**4.7**	—	—	—	—	—	**2.3**	**4.3**	**12.8**	**2.7**
26	Aug. 7	1676	289	322	671	83	426	487	777	706	180	—	93	195	45
		55	**17.2**	**19.2**	**40.0**	**5.0**	**25.4**	**29.1**	**46.4**	**42.1**	**10.7**	—	**5.5**	**11.6**	**2.7**
37	Aug. 10	1646	286	314	625	81	380	457	808	772	131	30	86	195	45
		54	**17.4**	**19.1**	**38.0**	**4.9**	**23.1**	**27.8**	**49.1**	**46.9**	**8.0**	**1.8**	**5.2**	**11.8**	**2.7**
62	Aug. 19	1615	291	322	620	81	352	474	808	747	124	—	98	195	48
		53	**18.0**	**19.9**	**38.4**	**5.0**	**21.8**	**29.4**	**50.0**	**46.3**	**7.7**	—	**6.1**	**12.1**	**3.0**
90	Aug. 26	1646	289	317	640	71	393	505	752	698	119	43	103	210	48
		54	**17.6**	**19.3**	**38.9**	**4.3**	**23.9**	**30.7**	**45.7**	**42.4**	**7.2**	**2.6**	**6.3**	**12.8**	**2.9**
99	Aug. 30	1676	332	370	—	78	—	—	—	—	—	—	91	203	50
		55	**19.8**	**22.1**	—	**4.7**	—	—	—	—	—	—	**5.4**	**12.1**	**3.0**
100	Aug. 30	1615	279	317	—	76	368	467	777	754	124	30	88	197	45
		53	**17.3**	**19.6**	—	**4.7**	**22.8**	**28.9**	**48.1**	**46.7**	**7.7**	**1.9**	**5.4**	**12.2**	**2.8**
103	Sept. 1	1646	299	337	640	78	385	469	779	749	119	38	101	200	48
		54	**18.2**	**20.5**	**38.9**	**4.7**	**23.4**	**28.5**	**47.3**	**45.5**	**7.2**	**2.3**	**6.1**	**12.2**	**2.9**
111	Sept. 4	1676	294	337	640	81	396	487	823	808	134	40	109	180	45
		55	**17.5**	**20.1**	**38.2**	**4.8**	**23.6**	**29.1**	**49.1**	**48.2**	**8.0**	**2.4**	**6.5**	**10.7**	**2.7**

TABLE 32. NORTHERN PART OF EAST CHINA SEA, MALE, 1955 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
120	Sept. 7	1676	274	309	610	73	—	487	793	769	126	27	86	190	48
		55	16.3	18.4	36.4	4.4	—	29.1	47.3	45.9	7.5	1.6	5.1	11.3	2.9
133	Sept. 10	1676	195	335	640	76	365	500	805	772	131	—	—	182	45
		55	11.6	20.0	38.2	4.5	21.8	29.8	48.0	46.1	7.8	—	—	10.9	2.7
140	Sept. 12	1676	299	335	640	78	413	444	762	744	121	30	78	200	45
		55	17.8	20.0	38.2	4.7	24.6	26.5	45.5	44.4	7.2	1.8	4.7	11.9	2.7
143	Sept. 12	1646	304	345	615	76	380	492	818	795	142	40	103	233	50
		54	18.5	21.0	37.4	4.6	23.1	29.9	49.7	48.3	8.6	2.4	6.3	14.2	3.1
154	Sept. 14	1676	330	355	671	58	383	492	803	787	114	43	109	197	55
		55	19.7	21.2	40.0	3.5	22.9	29.4	47.9	47.0	6.8	2.6	6.5	11.8	3.3
156	Sept. 15	1615	261	291	610	68	378	411	762	744	—	38	116	182	50
		53	16.2	18.0	37.8	4.2	23.4	25.4	47.2	46.1	—	2.4	7.2	11.3	3.1
157	Sept. 15	1646	253	309	660	76	352	469	772	754	121	35	116	208	50
		54	15.4	18.8	40.1	4.6	21.4	28.5	47.0	45.8	7.4	2.1	7.0	12.6	3.1
160	Sept. 16	1676	314	319	683	76	380	482	813	808	142	35	109	197	50
		55	18.7	19.0	40.8	4.5	22.7	28.8	48.5	48.2	8.5	2.1	6.5	11.8	3.0
182	Sept. 20	1676	289	319	640	71	388	523	805	774	137	40	126	187	45
		55	17.2	19.0	38.2	4.2	23.2	31.2	48.0	46.2	8.2	2.4	7.5	11.2	2.7
184	Sept. 21	1646	289	324	635	78	375	505	808	798	126	38	129	208	50
		54	17.6	19.7	38.6	4.7	22.8	30.7	49.1	48.5	7.7	2.3	7.8	12.6	3.1
191	Sept. 22	1676	314	340	640	78	396	487	803	—	—	32	98	205	50
		55	18.7	20.3	38.2	4.7	23.6	29.1	47.9	—	—	1.9	5.8	12.2	3.0
193	Sept. 22	1646	335	365	671	—	396	457	762	737	—	43	126	182	45
		54	20.4	22.2	40.8	—	24.1	27.8	46.3	44.8	—	2.6	7.7	11.1	2.7
197	Sept. 24	1646	297	322	655	76	388	457	767	744	114	38	101	182	45
		54	18.0	19.6	39.8	4.6	23.6	27.8	46.6	45.2	6.9	2.3	6.1	11.1	2.7
203	Sept. 26	1676	297	324	—	—	—	—	—	—	—	—	—	197	50
		55	17.7	19.3	—	—	—	—	—	—	—	—	—	11.8	3.0
207	Oct. 1	1676	309	335	640	73	388	502	810	779	139	40	121	218	48
		55	18.4	20.0	38.2	4.4	23.1	30.0	48.3	46.5	8.3	2.4	7.2	13.0	2.9
218	Oct. 5	1676	317	322	627	—	335	462	779	739	137	38	116	208	48
		55	18.9	19.2	37.4	—	20.0	27.6	46.5	44.1	8.2	2.3	6.9	12.4	2.9
44	Aug. 14	1797	340	380	732	88	426	487	838	815	137	35	103	200	48
		59	18.9	21.1	40.7	4.9	23.7	27.1	46.6	45.3	7.6	1.9	5.7	11.1	2.7
57	Aug. 17	1768	319	357	718	86	396	502	853	853	137	43	111	220	48
		58	18.0	20.2	40.6	4.9	22.4	28.4	48.2	48.2	7.7	2.4	6.3	12.4	2.7
63	Aug. 19	1737	304	352	686	81	416	500	823	805	119	38	88	210	48
		57	17.5	20.3	39.5	4.7	23.9	28.8	47.4	46.3	6.9	2.2	5.1	12.1	2.8
64	Aug. 20	1737	307	340	688	83	406	518	810	777	114	40	98	205	50
		57	17.7	19.6	39.6	4.8	23.4	29.8	46.6	44.7	6.6	2.3	5.6	11.8	2.9
65	Aug. 20	1707	307	370	660	78	408	505	803	777	131	38	98	218	50
		56	18.0	21.7	38.7	4.6	23.9	29.6	47.0	45.5	7.7	2.2	5.7	12.8	2.9
71	Aug. 21	1768	322	352	701	81	441	518	838	838	139	38	111	213	50
		58	18.2	19.9	39.6	4.6	24.9	29.3	47.4	47.4	7.9	2.1	6.3	12.0	2.8
74	Aug. 23	1707	304	337	640	76	418	487	823	805	114	40	106	203	50
		56	17.8	19.7	37.5	4.5	24.5	28.5	48.2	47.2	6.7	2.3	6.2	11.9	2.9
76	Aug. 23	1707	304	340	671	81	408	487	823	803	114	35	91	205	50
		56	17.8	19.9	39.3	4.7	23.9	28.5	48.2	47.0	6.7	2.1	5.3	12.0	2.9
81	Aug. 21	1407	327	370	701	78	396	469	896	878	134	35	96	208	50
		56	19.2	21.7	41.1	4.6	23.2	27.5	52.5	51.4	7.8	2.1	5.6	12.2	2.9

TABLE 32. NORTHERN PART OF EAST CHINA SEA, MALE, 1955 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
82	Aug. 24	1798 **59**	307 **17.1**	340 **18.9**	701 **39.0**	81 **4.5**	413 **23.0**	533 **29.6**	853 **47.4**	825 **45.9**	142 **7.9**	35 **1.9**	98 **5.5**	218 **12.1**	53 **2.9**
86	Aug. 25	1768 **58**	337 **19.1**	375 **21.2**	732 **41.4**	81 **4.6**	431 **24.4**	487 **27.5**	823 **46.5**	787 **44.5**	137 **7.7**	38 **2.1**	101 **5.7**	218 **12.3**	53 **3.0**
87	Aug. 25	1737 **57**	307 **17.7**	340 **19.6**	681 **39.2**	78 **4.5**	— —	482 **27.7**	798 **45.9**	830 **47.8**	144 **8.3**	35 **2.0**	91 **5.2**	213 **12.3**	48 **2.8**
88	Aug. 26	1798 **59**	314 **17.5**	355 **19.7**	671 **37.3**	83 **4.6**	408 **22.7**	507 **28.2**	868 **48.3**	850 **47.3**	139 **7.7**	38 **2.1**	114 **6.3**	210 **11.7**	50 **2.8**
91	Aug. 26	1707 **56**	314 **18.4**	352 **20.6**	— —	78 **4.6**	385 **22.6**	502 **29.4**	810 **47.5**	772 **45.2**	109 **6.4**	38 **2.2**	131 **7.7**	208 **12.2**	50 **2.9**
95	Aug. 30	1798 **59**	322 **17.9**	365 **20.3**	732 **40.7**	86 **4.8**	444 **24.7**	543 **30.2**	853 **47.4**	828 **46.1**	126 **7.0**	38 **2.1**	101 **5.6**	215 **12.0**	50 **2.8**
101	Aug. 31	1737 **57**	309 **17.8**	355 **20.4**	620 **35.7**	78 **4.5**	408 **23.5**	533 **30.7**	843 **48.5**	828 **47.7**	131 **7.5**	35 **2.0**	91 **5.1**	190 **10.7**	48 **2.7**
107	Sept. 3	1707 **56**	307 **18.0**	347 **20.3**	671 **39.3**	81 **4.7**	406 **23.8**	482 **28.2**	808 **47.3**	808 **47.3**	124 **7.3**	35 **2.1**	83 **4.9**	182 **10.7**	48 **2.8**
112	Sept. 4	1798 **59**	314 **17.5**	352 **19.6**	732 **40.7**	86 **4.8**	444 **24.7**	549 **30.5**	899 **50.0**	865 **48.1**	139 **7.7**	38 **2.1**	131 **7.3**	230 **12.8**	50 **2.8**
114	Sept. 5	1798 **59**	314 **17.5**	347 **19.3**	686 **38.2**	83 **4.6**	426 **23.7**	518 **28.8**	884 **49.2**	838 **46.6**	152 **8.5**	32 **1.8**	103 **5.7**	218 **12.1**	53 **2.9**
117	Sept. 6	1798 **59**	322 **17.9**	360 **20.0**	701 **39.0**	83 **4.6**	408 **22.7**	518 **28.8**	853 **47.4**	873 **48.6**	124 **6.9**	35 **1.9**	101 **5.6**	218 **12.1**	50 **2.8**
118	Sept. 7	1798 **59**	324 **18.0**	360 **20.0**	732 **40.7**	81 **4.5**	426 **23.7**	487 **27.1**	823 **45.8**	815 **45.3**	162 **9.0**	43 **2.4**	111 **6.2**	208 **11.6**	53 **2.9**
121	Sept. 8	1737 **57**	304 **17.5**	335 **19.3**	610 **35.1**	81 **4.7**	— —	549 **31.6**	884 **50.9**	— —	— —	43 **2.4**	103 **5.9**	185 **10.7**	48 **2.8**
123	Sept. 8	1737 **57**	335 **19.3**	365 **21.0**	732 **42.1**	81 **4.7**	396 **22.8**	487 **28.0**	— —	— —	147 **8.5**	38 **2.2**	103 **5.9**	213 **12.3**	50 **2.9**
124	Sept. 8	1768 **58**	304 **17.2**	335 **18.9**	— —	78 **4.4**	335 **18.9**	549 **31.1**	853 **48.2**	808 **45.7**	83 **4.7**	— —	134 **7.6**	230 **13.0**	45 **2.5**
131	Sept. 10	1798 **59**	342 **19.0**	373 **20.7**	762 **42.4**	81 **4.5**	383 **21.3**	505 **28.1**	833 **46.3**	823 **45.8**	167 **9.3**	45 **2.5**	121 **6.7**	213 **11.8**	53 **2.9**
136	Sept. 11	1768 **58**	335 **18.9**	373 **21.1**	732 **41.4**	81 **4.6**	416 **23.5**	495 **28.0**	833 **47.1**	823 **46.5**	182 **10.3**	35 **2.0**	114 **6.4**	215 **12.2**	50 **2.8**
139	Sept. 12	1737 **57**	332 **19.1**	380 **21.9**	671 **38.6**	81 **4.7**	350 **20.1**	507 **29.2**	868 **50.5**	853 **49.1**	— —	43 **2.5**	103 **5.9**	205 **11.8**	50 **2.9**
144	Sept. 12	1768 **58**	284 **16.1**	330 **18.7**	665 **37.6**	83 **4.7**	411 **23.2**	514 **29.1**	850 **48.1**	838 **47.4**	126 **7.1**	— —	— —	220 **12.2**	48 **2.7**
146	Sept. 13	1798 **59**	309 **17.2**	370 **20.6**	701 **39.0**	78 **4.3**	401 **22.3**	487 **27.1**	853 **47.4**	838 **46.6**	152 **8.5**	43 **2.4**	103 **5.7**	218 **12.1**	48 **2.7**
147	Sept. 13	1707 **56**	317 **18.6**	350 **20.5**	676 **39.6**	83 **4.9**	385 **22.6**	492 **28.8**	823 **48.2**	800 **46.9**	164 **9.6**	40 **2.3**	129 **7.6**	200 **11.7**	48 **2.8**
161	Sept. 16	1707 **56**	304 **17.8**	340 **19.9**	640 **37.5**	76 **4.5**	— —	581 **34.0**	— —	843 **49.4**	139 **8.1**	35 **2.1**	116 **6.8**	220 **12.9**	53 **3.1**
166	Sept. 17	1798 **59**	309 **17.2**	340 **18.9**	688 **38.3**	78 **4.3**	436 **24.2**	535 **29.8**	853 **47.4**	835 **46.4**	152 **8.5**	— —	— —	213 **11.8**	53 **2.9**
171	Sept. 18	1707 **56**	319 **18.7**	350 **20.5**	701 **41.1**	78 **4.6**	396 **23.2**	— —	798 **46.7**	767 **44.9**	147 **8.6**	35 **2.1**	116 **6.8**	208 **12.2**	48 **2.8**
173	Sept. 19	1768 **58**	350 **19.8**	378 **21.4**	732 **41.4**	86 **4.9**	396 **22.4**	487 **27.5**	865 **48.9**	845 **47.8**	109 **6.2**	40 **2.3**	111 **6.3**	210 **11.9**	50 **2.8**

TABLE 32. NORTHERN PART OF EAST CHINA SEA, MALE, 1955 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
174	Sept. 19	1798	335	368	747	83	403	505	833	823	116	38	131	225	50
		59	**18.6**	**20.5**	**41.5**	**4.9**	**22.4**	**28.1**	**46.3**	**45.8**	**6.5**	**2.1**	**7.3**	**12.5**	**2.8**
175	Sept. 19	1737	284	289	657	78	352	492	—	—	129	45	129	213	53
		57	**16.4**	**16.6**	**37.8**	**4.5**	**20.3**	**28.3**	—	—	**7.4**	**2.6**	**7.4**	**12.3**	**3.1**
177	Sept. 19	1768	309	345	732	83	380	497	742	711	159	40	126	192	53
		58	**17.5**	**19.5**	**41.4**	**4.7**	**21.5**	**28.1**	**42.0**	**40.2**	**9.0**	**2.3**	**7.1**	**10.9**	**3.0**
178	Sept. 20	1737	324	357	691	76	418	502	843	810	157	40	142	243	53
		57	**18.7**	**20.6**	**39.8**	**4.4**	**24.1**	**28.9**	**48.5**	**46.6**	**9.0**	**2.3**	**8.2**	**14.0**	**3.1**
179	Sept. 20	1798	350	388	732	78	424	502	803	789	144	45	129	223	50
		59	**19.5**	**21.6**	**40.7**	**4.3**	**23.6**	**27.9**	**44.7**	**43.9**	**8.0**	**2.5**	**7.2**	**12.4**	**2.8**
186	Sept. 21	1798	309	355	732	81	426	490	868	858	152	43	129	220	55
		59	**17.2**	**19.7**	**40.7**	**4.5**	**23.7**	**27.3**	**48.3**	**47.7**	**8.5**	**2.4**	**7.2**	**12.2**	**3.1**
200	Sept. 25	1768	309	355	701	78	391	540	848	823	139	30	91	223	53
		58	**17.5**	**20.1**	**39.6**	**4.4**	**22.1**	**30.5**	**48.0**	**46.5**	**7.9**	**1.7**	**5.1**	**12.6**	**3.0**
206	Sept. 27	1737	317	352	640	81	418	—	—	—	—	35	116	197	50
		57	**18.3**	**20.3**	**36.8**	**4.7**	**24.1**	—	—	—	—	**2.0**	**6.7**	**11.3**	**2.9**
214	Oct. 5	1737	327	352	683	—	396	502	793	762	134	43	116	215	50
		57	**18.8**	**20.3**	**39.3**	—	**22.8**	**28.9**	**45.7**	**43.9**	**7.7**	**2.5**	**6.7**	**12.4**	**2.9**
18	Aug. 4	1829	401	444	744	93	439	518	793	739	147	50	96	203	50
		60	**22.0**	**24.3**	**40.7**	**5.1**	**24.0**	**28.3**	**43.4**	**40.4**	**8.0**	**2.7**	**5.2**	**11.1**	**2.7**
27	Aug. 7	1890	335	380	701	88	426	505	884	818	152	40	98	210	53
		62	**17.7**	**20.1**	**37.1**	**4.7**	**22.5**	**26.7**	**46.8**	**43.3**	**8.0**	**2.1**	**5.2**	**11.1**	**2.8**
39	Aug. 11	1829	312	350	732	78	411	502	853	833	139	43	96	215	53
		60	**17.1**	**19.1**	**40.0**	**4.3**	**22.5**	**27.4**	**46.6**	**45.5**	**7.6**	**2.4**	**5.2**	**11.8**	**2.9**
42	Aug. 14	1829	327	357	732	81	441	549	884	865	152	38	96	233	55
		60	**17.9**	**19.5**	**40.0**	**4.4**	**24.1**	**30.0**	**48.3**	**47.3**	**8.3**	**2.1**	**5.2**	**12.7**	**3.0**
53	Aug. 17	1829	319	357	732	86	426	487	853	798	111	43	103	215	50
		60	**17.4**	**19.5**	**40.0**	**4.7**	**23.3**	**26.6**	**46.6**	**43.6**	**6.1**	**2.4**	**5.6**	**11.8**	**2.7**
83	Aug. 24	1890	340	375	732	88	469	549	904	875	142	38	114	220	53
		62	**18.0**	**19.8**	**38.7**	**4.7**	**24.8**	**29.0**	**47.8**	**46.3**	**7.5**	**2.0**	**6.0**	**11.6**	**2.8**
94	Aug. 27	1829	327	357	701	88	413	502	865	860	164	32	101	192	50
		60	**17.9**	**19.5**	**38.3**	**4.8**	**22.6**	**27.4**	**47.3**	**47.0**	**9.0**	**1.7**	**5.5**	**10.5**	**2.7**
110	Sept. 4	1859	335	378	711	86	426	566	914	873	154	45	119	218	53
		61	**18.0**	**20.3**	**38.2**	**4.6**	**22.9**	**30.4**	**49.2**	**47.0**	**8.3**	**2.4**	**6.4**	**11.7**	**2.9**
130	Sept. 10	1829	304	365	701	86	406	528	863	853	170	45	93	230	55
		60	**16.6**	**19.9**	**38.3**	**4.7**	**22.2**	**28.9**	**47.2**	**46.6**	**9.3**	**2.5**	**5.1**	**12.6**	**3.0**
134	Sept. 10	1829	350	380	752	81	411	502	853	838	129	48	164	215	50
		60	**19.1**	**20.8**	**41.1**	**4.4**	**22.5**	**27.4**	**46.6**	**45.8**	**7.1**	**2.6**	**9.0**	**11.8**	**2.7**
135	Sept. 10	1859	345	383	749	91	469	549	870	853	167	45	129	215	53
		61	**18.6**	**20.6**	**40.3**	**4.9**	**25.2**	**29.5**	**46.8**	**45.9**	**9.0**	**2.4**	**6.9**	**11.6**	**2.9**
142	Sept. 12	1829	347	396	732	81	421	518	853	840	137	32	109	228	50
		60	**19.0**	**21.7**	**40.0**	**4.4**	**23.0**	**28.3**	**46.6**	**45.9**	**7.5**	**1.7**	**6.0**	**12.5**	**2.7**
148	Sept. 13	1859	352	396	777	78	385	591	823	815	137	35	114	223	53
		61	**18.9**	**21.3**	**41.8**	**4.2**	**20.7**	**31.8**	**44.3**	**43.8**	**7.4**	**1.9**	**6.1**	**12.0**	**2.9**
158	Sept. 15	1829	352	383	721	83	401	492	840	823	177	43	121	197	53
		60	**19.2**	**20.9**	**39.4**	**4.5**	**21.9**	**26.9**	**45.9**	**50.5**	**9.7**	**2.4**	**6.6**	**10.8**	**2.9**
159	Sept. 16	1829	340	375	686	86	350	538	914	886	121	40	129	210	53
		60	**18.6**	**20.5**	**37.5**	**4.7**	**19.4**	**29.4**	**50.0**	**53.9**	**6.6**	**2.2**	**7.1**	**11.5**	**2.9**
162	Sept. 16	1829	330	357	732	81	426	535	868	865	180	35	119	208	50
		60	**18.0**	**19.5**	**40.0**	**4.4**	**23.3**	**29.3**	**47.5**	**52.8**	**9.8**	**1.9**	**6.5**	**11.4**	**2.7**

TABLE 32. NORTHERN PART OF EAST CHINA SEA, MALE, 1955 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
172	Sept. 18	1859	380	401	793	76	373	472	762	—	126	40	103	236	50
		61	**20.4**	**21.6**	**42.7**	**4.1**	**20.1**	**25.4**	**41.0**	—	**6.8**	**2.2**	**5.5**	**12.7**	**2.7**
194	Sept. 23	1829	335	375	749	81	406	549	853	835	121	35	119	236	53
		60	**18.3**	**20.5**	**41.0**	**4.4**	**22.2**	**30.0**	**46.6**	**51.1**	**6.6**	**1.9**	**6.5**	**12.9**	**2.9**
195	Sept. 23	1890	350	380	718	78	426	543	896	926	121	43	134	218	50
		62	**18.5**	**20.1**	**38.0**	**4.1**	**22.5**	**28.7**	**47.4**	**49.0**	**6.4**	**2.3**	**7.1**	**11.5**	**2.6**
201	Sept. 25	1829	352	373	—	83	431	556	914	894	152	38	109	205	50
		60	**19.2**	**20.4**	—	**4.5**	**23.6**	**30.4**	**50.0**	**54.3**	**8.3**	**2.1**	**6.0**	**11.2**	**2.7**
211	Oct. 5	1829	340	370	723	71	393	518	800	777	162	45	131	225	55
		60	**18.6**	**20.2**	**39.5**	**3.8**	**21.5**	**28.3**	**49.2**	**47.9**	**8.9**	**2.5**	**7.2**	**12.3**	**3.0**
217	Oct. 5	1829	335	380	688	78	380	518	868	853	157	43	121	203	50
		60	**18.3**	**20.8**	**37.6**	**4.3**	**20.8**	**28.3**	**52.9**	**52.1**	**8.6**	**2.4**	**6.6**	**11.1**	**2.7**
40	Aug. 11	1951	349	383	774	91	441	549	929	904	142	32	101	208	50
		64	**17.9**	**19.6**	**39.7**	**4.7**	**22.6**	**28.1**	**47.6**	**46.3**	**7.3**	**1.6**	**5.2**	**10.7**	**2.6**
68	Aug. 21	1951	352	398	777	86	457	549	906	860	139	43	111	228	—
		64	**18.0**	**20.4**	**39.8**	**4.4**	**23.4**	**28.1**	**46.4**	**44.1**	**7.1**	**2.2**	**5.7**	**11.7**	—
150	Sept. 14	1920	355	396	787	83	431	518	793	772	159	38	126	238	53
		63	**18.5**	**20.6**	**41.0**	**4.3**	**22.4**	**27.0**	**41.3**	**40.2**	**8.3**	**2.0**	**6.6**	**12.4**	**2.8**
155	Sept. 15	1920	365	401	779	83	421	533	945	860	162	40	116	236	50
		63	**19.0**	**20.9**	**40.6**	**4.3**	**21.9**	**27.8**	**49.2**	**44.8**	**8.4**	**2.1**	**6.0**	**12.3**	**2.6**

TABLE 33. NORTHERN PART OF EAST CHINA SEA, FEMALE, 1955

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
126	Sept. 8	1524	274	304	—	63	365	457	732	732	43	32	91	162	43
		50	**18.0**	**19.9**	—	**4.1**	**24.0**	**30.0**	**48.0**	**48.0**	**2.8**	**2.1**	**6.0**	**10.6**	**2.8**
145	Sept. 13	1555	243	289	645	73	380	441	747	737	91	35	101	203	48
		51	**15.6**	**18.6**	**41.5**	**4.7**	**24.4**	**28.4**	**48.0**	**47.4**	**5.7**	**2.3**	**6.5**	**13.1**	**3.1**
188	Sept. 22	1555	264	297	599	73	383	472	793	749	45	43	137	192	43
		51	**17.0**	**19.1**	**38.5**	**4.7**	**24.6**	**30.4**	**51.0**	**48.2**	**2.9**	**2.8**	**8.8**	**12.3**	**2.8**
213	Oct. 5	1585	253	284	579	65	403	472	793	764	48	30	81	159	43
		52	**16.0**	**17.9**	**36.5**	**4.1**	**25.4**	**29.8**	**50.0**	**48.2**	**3.0**	**1.9**	**5.1**	**10.0**	**2.7**
224	Oct. 14	1524	289	319	591	63	383	487	747	732	58	38	116	170	40
		50	**19.0**	**20.9**	**38.8**	**4.1**	**25.1**	**32.0**	**49.0**	**48.0**	**3.8**	**2.5**	**7.6**	**11.1**	**2.6**
15	Aug. 4	1524	255	286	645	55	340	549	691	660	45	—	—	—	—
		50	**16.7**	**18.8**	**42.3**	**3.6**	**22.3**	**36.0**	**45.3**	**43.3**	**3.0**	—	—	—	—
22	Aug. 5	1555	243	299	945	68	380	408	762	747	45	38	81	200	45
		51	**15.6**	**19.2**	**59.6**	**4.5**	**24.4**	**26.2**	**49.0**	**48.0**	**2.9**	**2.4**	**5.2**	**12.9**	**2.9**
32	Aug. 8	1524	251	1281	640	68	396	464	719	716	43	35	83	182	43
		50	**16.5**	**8.4**	**42.0**	**4.5**	**26.0**	**30.4**	**47.2**	**47.0**	**2.8**	**2.3**	**5.4**	**11.9**	**2.8**
43	Aug. 14	1615	274	307	640	78	365	457	762	737	55	32	91	197	45
		53	**17.0**	**19.0**	**39.6**	**4.8**	**22.6**	**28.3**	**47.2**	**45.6**	**3.4**	**2.0**	**5.6**	**12.2**	**2.8**
79	Aug. 24	1676	322	355	686	81	413	487	823	818	53	35	96	220	50
		55	**19.2**	**21.2**	**40.9**	**4.8**	**24.6**	**29.1**	**49.1**	**48.8**	**3.2**	**2.1**	**5.7**	**13.1**	**3.0**
109	Sept. 4	1646	307	378	686	71	352	467	747	721	53	30	91	205	48
		54	**18.7**	**23.0**	**41.7**	**4.3**	**21.4**	**28.4**	**45.4**	**43.8**	**3.2**	**1.8**	**5.5**	**12.5**	**2.9**

TABLE 33. NORTHERN PART OF EAST CHINA SEA, FEMALE, 1955 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
129	Sept. 8	1646	304	365	—	73	365	396	793	793	50	38	109	215	45
		54	**18.5**	**22.2**	—	**4.4**	**22.2**	**24.1**	**48.2**	**48.2**	**3.0**	**2.3**	**6.6**	**13.1**	**2.7**
149	Sept. 14	1676	317	345	688	78	391	487	774	747	53	35	93	210	50
		55	**18.9**	**20.6**	**41.1**	**4.7**	**23.3**	**29.1**	**46.2**	**44.6**	**3.2**	**2.1**	**5.5**	**12.5**	**3.0**
176	Sept. 19	1676	309	350	591	65	360	500	830	825	45	27	111	210	50
		55	**18.4**	**20.9**	**35.3**	**3.9**	**21.5**	**29.8**	**49.5**	**49.2**	**2.7**	**1.6**	**6.6**	**12.5**	**3.0**
33	Aug. 8	1737	327	360	640	88	411	502	762	793	58	35	103	157	48
		57	**18.8**	**20.7**	**36.8**	**5.1**	**23.7**	**28.9**	**43.9**	**45.7**	**3.3**	**2.0**	**5.9**	**9.0**	**2.8**
41	Aug. 13	1798	322	355	701	83	426	535	884	808	48	40	103	223	50
		59	**17.9**	**19.7**	**39.0**	**4.6**	**23.7**	**29.8**	**49.2**	**44.9**	**2.7**	**2.2**	**5.7**	**12.4**	**2.8**
48	Aug. 15	1707	314	340	671	81	426	502	815	795	68	35	93	220	48
		56	**18.4**	**19.9**	**39.3**	**4.7**	**25.0**	**29.4**	**47.7**	**46.4**	**4.0**	**2.1**	**5.4**	**12.9**	**2.8**
50	Aug. 16	1737	297	347	640	78	411	477	840	818	63	43	119	197	48
		57	**17.1**	**20.0**	**36.8**	**4.5**	**23.7**	**27.5**	**48.4**	**47.1**	**3.6**	**2.5**	**6.9**	**11.3**	**2.8**
60	Aug. 18	1737	304	340	671	86	426	533	853	825	55	43	98	205	48
		57	**17.5**	**19.6**	**38.6**	**5.0**	**24.5**	**30.7**	**49.1**	**47.5**	**3.2**	**2.5**	**5.6**	**11.8**	**2.8**
69	Aug. 21	1737	345	375	701	78	413	502	823	769	60	32	86	218	53
		57	**19.9**	**21.6**	**40.4**	**4.5**	**23.8**	**28.9**	**47.4**	**44.3**	**3.5**	**1.8**	**5.0**	**12.6**	**3.1**
78	Aug. 23	1798	324	355	701	83	444	530	853	818	53	43	119	223	53
		59	**18.0**	**19.7**	**39.0**	**4.6**	**24.5**	**29.5**	**47.4**	**45.5**	**2.9**	**2.4**	**6.6**	**12.4**	**2.9**
80	Aug. 24	1798	322	360	701	78	426	502	823	789	35	43	109	208	50
		59	**17.9**	**20.0**	**39.0**	**4.3**	**23.7**	**27.9**	**45.7**	**43.9**	**1.9**	**2.4**	**6.1**	**11.6**	**2.8**
84	Aug. 24	1798	297	347	718	78	462	559	884	865	53	35	96	230	50
		59	**16.5**	**19.3**	**39.9**	**4.3**	**25.7**	**31.0**	**49.1**	**48.1**	**2.9**	**1.9**	**5.3**	**12.8**	**2.8**
108	Sept. 3	1707	314	352	671	73	416	487	838	838	48	48	96	190	50
		56	**18.4**	**20.6**	**39.3**	**4.3**	**24.4**	**28.5**	**49.1**	**49.1**	**2.8**	**2.8**	**5.6**	**11.1**	**2.9**
116	Sept. 5	1737	307	337	610	83	411	505	840	803	48	32	103	225	53
		57	**17.7**	**19.4**	**35.1**	**4.8**	**23.7**	**29.1**	**48.4**	**46.2**	**2.8**	**1.8**	**5.9**	**13.0**	**3.1**
119	Sept. 7	1798	342	378	732	83	424	518	853	830	50	32	111	200	53
		59	**19.0**	**21.0**	**40.7**	**4.6**	**23.6**	**28.8**	**47.5**	**46.2**	**2.8**	**1.8**	**6.2**	**11.1**	**2.9**
122	Sept. 8	1737	274	365	671	81	426	487	853	830	48	43	116	220	53
		57	**15.8**	**21.0**	**38.6**	**4.7**	**24.5**	**28.0**	**49.1**	**47.8**	**2.8**	**2.5**	**6.7**	**12.7**	**3.1**
165	Sept. 17	1798	345	391	716	81	411	524	838	810	58	35	116	208	53
		59	**19.2**	**21.7**	**39.8**	**4.5**	**22.9**	**29.1**	**46.6**	**45.0**	**3.2**	**1.9**	**6.5**	**11.6**	**2.9**
170	Sept. 18	1798	340	380	739	65	426	523	848	828	65	53	147	223	50
		59	**18.9**	**21.1**	**41.1**	**3.6**	**23.7**	**29.1**	**47.1**	**46.1**	**3.6**	**2.9**	**8.2**	**12.4**	**2.8**
180	Sept. 20	1768	340	378	723	76	436	500	843	838	40	40	101	213	53
		58	**19.2**	**21.4**	**40.9**	**4.3**	**24.7**	**28.3**	**47.7**	**47.4**	**2.3**	**2.3**	**5.7**	**12.0**	**3.0**
183	Sept. 21	1798	322	365	752	78	436	530	863	833	55	38	103	238	53
		59	**17.9**	**20.3**	**41.8**	**4.3**	**24.2**	**29.5**	**48.0**	**46.3**	**3.1**	**2.1**	**5.7**	**13.2**	**2.9**
187	Sept. 21	1707	314	345	696	73	375	492	823	813	45	38	147	208	50
		56	**18.4**	**20.2**	**40.8**	**4.3**	**22.0**	**28.8**	**48.2**	**47.9**	**2.6**	**2.2**	**8.4**	**12.1**	**2.9**
198	Sept. 24	1798	345	378	721	81	426	549	853	—	—	38	126	228	53
		59	**19.2**	**21.0**	**40.1**	**4.5**	**23.7**	**30.5**	**47.4**	—	—	**2.1**	**7.0**	**12.7**	**2.9**
202	Sept. 26	1798	314	365	742	76	396	535	853	835	60	38	131	213	48
		59	**17.5**	**20.3**	**41.3**	**4.2**	**22.0**	**29.8**	**47.4**	**46.4**	**3.3**	**2.1**	**7.3**	**11.8**	**2.7**
204	Sept. 26	1707	307	335	671	73	396	518	853	830	55	35	103	200	50
		56	**18.0**	**19.6**	**39.3**	**4.3**	**23.2**	**30.3**	**50.0**	**48.6**	**3.2**	**2.1**	**6.0**	**11.7**	**2.9**
209	Oct. 1	1707	304	340	671	73	396	497	813	838	63	35	103	195	45
		56	**17.8**	**19.9**	**39.3**	**4.3**	**23.2**	**29.1**	**47.6**	**49.1**	**3.7**	**2.1**	**6.0**	**11.4**	**2.6**

TABLE 33. NORTHERN PART OF EAST CHINA SEA, FEMALE, 1955 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
210	Oct. 2	1798	335	370	749	86	416	518	845	830	60	43	116	205	53
		59	**18.6**	**20.6**	**41.7**	**4.8**	**23.1**	**28.8**	**47.0**	**46.2**	**3.3**	**2.4**	**6.5**	**11.4**	**2.9**
212	Oct. 5	1737	304	345	713	83	424	518	850	833	73	—	—	200	48
		57	**17.5**	**19.9**	**41.0**	**4.8**	**24.4**	**29.8**	**48.9**	**48.0**	**4.2**	—	—	**11.5**	**2.8**
23	Aug. 5	1859	352	378	777	86	413	518	838	798	55	32	106	210	53
		61	**18.1**	**19.5**	**40.9**	**4.6**	**22.2**	**27.9**	**45.1**	**42.9**	**3.0**	**1.7**	**5.7**	**11.3**	**2.9**
24	Aug. 6	1890	337	370	671	91	446	564	884	865	65	38	96	213	48
		62	**17.9**	**19.6**	**35.6**	**4.8**	**23.6**	**29.8**	**46.8**	**45.8**	**3.4**	**2.0**	**5.1**	**11.3**	**2.5**
25	Aug. 6	18.90	355	388	739	93	439	556	868	818	45	32	98	236	53
		62	**18.8**	**20.5**	**39.1**	**4.9**	**23.2**	**29.4**	**45.9**	**43.3**	**2.4**	**1.7**	**5.2**	**12.5**	**2.8**
28	Aug. 7	18.29	347	365	732	86	441	549	884	833	55	35	96	218	48
		60	**19.0**	**20.0**	**40.0**	**4.7**	**24.1**	**30.0**	**48.3**	**45.6**	**3.0**	**1.9**	**5.2**	**11.9**	**2.6**
35	Aug. 9	18.90	304	332	701	81	457	579	914	889	60	32	91	230	53
		62	**16.1**	**17.6**	**37.1**	**4.3**	**24.2**	**30.6**	**48.4**	**47.0**	**3.2**	**1.7**	**4.8**	**12.2**	**2.8**
51	Aug. 16	18.59	355	388	701	83	457	535	838	805	60	38	119	241	48
		61	**19.1**	**20.9**	**37.7**	**4.5**	**24.6**	**28.8**	**45.1**	**43.3**	**3.2**	**2.0**	**6.4**	**13.0**	**2.6**
54	Aug. 17	18.59	340	383	762	88	418	533	884	823	50	38	98	225	53
		61	**18.3**	**20.6**	**41.0**	**4.7**	**22.5**	**28.7**	**47.6**	**44.3**	**2.7**	**2.0**	**5.3**	**12.1**	**2.9**
73	Aug. 23	18.90	327	360	732	86	457	549	884	884	40	40	109	213	48
		62	**17.3**	**19.0**	**38.7**	**4.6**	**24.2**	**29.0**	**46.8**	**46.8**	**2.1**	**2.1**	**5.8**	**11.3**	**2.5**
89	Aug. 26	18.29	322	355	732	83	457	533	865	840	50	38	109	215	53
		60	**17.6**	**19.4**	**40.0**	**4.5**	**25.0**	**29.1**	**47.3**	**45.9**	**2.7**	**2.1**	**6.0**	**11.8**	**2.9**
92	Aug. 26	18.90	345	378	793	88	472	559	899	894	60	45	116	230	58
		62	**18.3**	**20.0**	**42.0**	**4.7**	**25.0**	**29.6**	**47.6**	**47.3**	**3.2**	**2.4**	**6.1**	**12.2**	**3.1**
96	Aug. 30	18.90	350	391	762	83	487	579	899	899	50	40	106	220	53
		62	**18.5**	**20.7**	**40.3**	**4.4**	**25.8**	**30.6**	**47.6**	**47.6**	**2.6**	**2.1**	**5.6**	**11.6**	**2.8**
97	Aug. 30	18.90	363	401	732	86	457	549	884	855	58	40	106	215	50
		62	**19.2**	**21.2**	**38.7**	**4.6**	**24.2**	**29.0**	**46.8**	**45.2**	**3.1**	**2.1**	**5.6**	**11.4**	**2.6**
102	Aug. 31	18.29	345	380	718	91	424	518	884	848	65	32	93	208	53
		60	**18.9**	**20.8**	**39.3**	**5.0**	**23.2**	**28.3**	**48.3**	**46.4**	**3.6**	**1.7**	**5.1**	**11.4**	**2.9**
105	Sept. 2	18.29	355	393	681	81	451	535	870	863	60	38	116	197	48
		60	**19.4**	**21.5**	**37.2**	**4.4**	**24.7**	**29.3**	**47.6**	**47.2**	**3.3**	**2.1**	**6.3**	**10.8**	**2.6**
106	Sept. 2	18.29	332	370	671	86	467	533	870	843	60	35	116	195	48
		60	**18.2**	**20.2**	**36.7**	**4.7**	**25.5**	**29.1**	**47.6**	**46.1**	**3.3**	**1.9**	**6.3**	**10.7**	**2.6**
115	Sept. 5	18.29	324	378	732	81	439	518	884	801	58	45	109	218	50
		60	**17.7**	**20.7**	**40.0**	**4.4**	**24.0**	**28.3**	**48.3**	**43.8**	**3.2**	**2.5**	**6.0**	**11.9**	**2.7**
132	Sept. 10	18.59	294	365	747	81	406	485	884	860	30	35	91	228	53
		61	**15.8**	**19.6**	**40.2**	**4.4**	**2.18**	**26.1**	**47.6**	**46.3**	**1.6**	**1.9**	**4.9**	**12.3**	**2.9**
137	Sept. 11	18.29	347	434	747	78	436	518	860	835	81	40	142	228	53
		60	**19.0**	**23.7**	**40.8**	**4.3**	**23.8**	**28.3**	**47.0**	**45.7**	**4.4**	**2.2**	**7.8**	**12.5**	**2.9**
138	Sept. 11	18.90	322	365	767	81	436	549	884	855	68	43	121	215	53
		62	**17.0**	**19.3**	**40.6**	**4.3**	**23.1**	**29.0**	**46.8**	**45.2**	**3.6**	**2.3**	**6.4**	**11.4**	**2.8**
153	Sept. 14	18.59	340	378	686	83	513	426	863	823	78	40	98	233	55
		61	**18.3**	**20.3**	**36.9**	**4.5**	**27.6**	**22.9**	**46.4**	**44.3**	**4.2**	**2.2**	**5.3**	**12.5**	**3.0**
163	Sept. 16	18.29	335	365	657	78	446	518	838	840	68	32	103	215	48
		60	**18.3**	**20.0**	**35.9**	**4.3**	**24.4**	**28.3**	**45.8**	**45.9**	**3.7**	**1.7**	**5.6**	**12.5**	**2.6**
168	Sept. 17	18.59	350	378	732	88	408	561	840	815	50	45	142	243	53
		61	**18.8**	**20.3**	**39.4**	**4.7**	**21.9**	**30.2**	**45.2**	**43.8**	**2.7**	**2.4**	**7.6**	**13.1**	**2.9**
190	Sept. 22	18.90	365	411	774	93	393	502	853	810	58	38	170	218	53
		62	**19.3**	**21.7**	**41.0**	**4.9**	**20.8**	**26.6**	**45.1**	**42.9**	**3.1**	**2.0**	**9.0**	**11.5**	**2.8**

TABLE 33. NORTHERN PART OF EAST CHINA SEA, FEMALE, 1955 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
192	Sept. 22	18.29	340	365	671	76	441	549	884	868	45	45	114	195	45
		60	**18.6**	**20.0**	**36.7**	**4.2**	**24.1**	**30.0**	**48.3**	**47.5**	**2.5**	**2.5**	**6.2**	**10.7**	**2.5**
199	Sept. 24	18.59	355	385	732	78	408	533	868	865	50	30	106	205	50
		61	**19.1**	**20.7**	**39.4**	**4.2**	**21.9**	**28.7**	**46.7**	**46.5**	**2.7**	**1.6**	**5.7**	**11.0**	**2.7**
205	Sept. 27	18.90	345	391	732	83	457	540	843	830	71	43	109	208	53
		62	**18.3**	**20.7**	**38.7**	**4.4**	**24.2**	**28.6**	**44.6**	**43.9**	**3.8**	**2.3**	**5.8**	**11.0**	**2.8**
208	Oct. 1	18.59	335	365	732	91	416	530	884	853	71	38	91	220	53
		61	**18.0**	**19.6**	**39.4**	**4.9**	**22.4**	**28.5**	**47.6**	**45.9**	**3.8**	**2.0**	**4.9**	**11.9**	**2.9**
215	Oct. 5	1859	327	340	779	86	411	549	880	853	68	48	116	213	48
		61	**17.6**	**18.3**	**41.9**	**4.6**	**22.1**	**29.5**	**47.3**	**45.9**	**3.7**	**2.6**	**6.2**	**11.5**	**2.6**
216	Oct. 5	1829	335	365	732	86	375	502	899	909	55	38	109	218	53
		60	**18.3**	**20.0**	**40.0**	**4.7**	**20.5**	**27.4**	**49.2**	**49.7**	**3.0**	**2.1**	**6.0**	**11.9**	**2.9**
223	Oct. 13	1890	357	396	652	78	436	502	957	934	83	50	126	228	55
		62	**18.9**	**21.0**	**34.5**	**4.1**	**23.1**	**26.6**	**50.6**	**49.4**	**4.4**	**2.6**	**6.7**	**12.1**	**2.9**
225	Oct. 15	1859	352	383	716	78	416	564	1051	1011	65	35	73	213	53
		61	**18.9**	**20.6**	**38.5**	**4.2**	**22.4**	**30.3**	**56.5**	**54.4**	**3.5**	**1.9**	**3.9**	**11.5**	**2.9**
31	Aug. 8	1920	324	378	732	93	441	518	884	800	73	35	91	236	56
		63	**16.9**	**19.7**	**38.1**	**4.8**	**23.0**	**27.0**	**46.0**	**41.7**	**3.8**	**1.8**	**4.7**	**12.3**	**2.8**
38	Aug. 11	1920	335	396	777	88	482	549	929	873	71	43	96	220	58
		63	**17.4**	**20.6**	**40.5**	**4.6**	**25.1**	**28.6**	**48.4**	**45.5**	**3.7**	**2.2**	**5.0**	**11.5**	**2.0**
75	Aug. 23	1951	380	418	808	91	457	579	914	873	48	43	116	241	55
		64	**19.5**	**21.4**	**41.4**	**4.7**	**23.4**	**29.7**	**46.8**	**44.7**	**2.5**	**2.2**	**5.9**	**12.4**	**2.8**
46	Aug. 15	1951	383	416	779	91	457	533	899	863	58	40	129	220	53
		64	**19.6**	**21.3**	**39.9**	**4.7**	**23.4**	**27.3**	**46.1**	**44.2**	**3.0**	**2.1**	**6.6**	**11.3**	**2.7**
56	Aug. 17	1951	365	396	793	—	457	579	914	914	—	50	129	228	53
		64	**18.7**	**20.3**	**40.6**	—	**23.4**	**29.7**	**46.8**	**46.8**	—	**2.6**	**6.6**	**11.7**	**2.7**
67	Aug. 21	1981	365	406	793	91	477	579	919	825	45	40	111	215	58
		65	**18.4**	**20.5**	**40.0**	**4.6**	**24.1**	**29.2**	**46.4**	**41.6**	**2.3**	**2.0**	**5.6**	**10.9**	**2.9**
98	Aug. 30	1981	393	408	810	91	469	561	904	894	53	43	116	218	50
		65	**19.7**	**20.6**	**40.7**	**4.6**	**23.7**	**28.3**	**45.6**	**45.1**	**2.7**	**2.2**	**5.9**	**11.0**	**2.5**
104	Sept. 1	1920	345	380	747	81	482	596	980	960	58	35	88	228	55
		63	**18.0**	**19.8**	**38.9**	**4.2**	**25.1**	**31.0**	**51.0**	**50.0**	**3.0**	**1.8**	**4.6**	**11.9**	**2.9**
127	Sept. 8	1951	365	396	732	88	487	579	975	909	—	38	175	228	60
		64	**18.7**	**20.3**	**37.5**	**4.5**	**25.0**	**29.7**	**50.0**	**46.6**	—	**1.9**	**9.0**	**11.7**	**3.1**
128	Sept. 8	1920	365	396	762	88	487	610	945	926	53	32	91	236	50
		63	**19.0**	**20.6**	**39.2**	**4.6**	**25.4**	**31.8**	**49.2**	**48.2**	**2.8**	**1.7**	**4.7**	**12.3**	**2.6**
151	Sept. 14	1920	347	396	767	88	472	512	957	941	65	43	152	253	60
		63	**18.1**	**20.6**	**39.9**	**4.6**	**24.6**	**26.7**	**49.8**	**49.0**	**3.4**	**2.2**	**7.9**	**13.2**	**3.1**
167	Sept. 17	1951	378	408	774	91	462	492	914	914	71	43	114	218	53
		64	**19.4**	**20.9**	**39.7**	**4.7**	**23.7**	**25.2**	**46.8**	**46.8**	**3.6**	**2.2**	**5.8**	**11.2**	**2.7**
169	Sept. 17	1951	352	365	681	81	441	564	955	934	73	40	114	230	50
		64	**18.0**	**18.7**	**34.9**	**4.2**	**22.6**	**28.9**	**48.9**	**47.9**	**3.7**	**2.1**	**5.8**	**11.8**	**2.6**
181	Sept. 20	1981	357	413	823	86	416	523	894	823	88	35	137	258	50
		65	**18.0**	**20.8**	**41.5**	**4.3**	**21.0**	**26.4**	**45.1**	**41.5**	**4.4**	**1.8**	**6.9**	**13.0**	**2.5**
189	Sept. 22	1920	357	408	793	88	396	528	868	838	60	35	114	223	50
		63	**18.6**	**21.2**	**41.3**	**4.6**	**20.6**	**27.5**	**45.2**	**43.6**	**3.1**	**1.8**	**5.9**	**11.6**	**2.6**
196	Sept. 24	1920	388	418	793	91	457	579	960	926	45	32	131	243	50
		63	**20.2**	**21.8**	**41.3**	**4.7**	**23.8**	**30.2**	**50.0**	**48.2**	**2.3**	**1.7**	**6.8**	**12.7**	**2.6**
227	Oct. 17	1920	350	375	701	83	441	549	914	914	103	38	121	233	53
		63	**18.2**	**19.5**	**36.5**	**4.3**	**23.0**	**28.6**	**47.6**	**47.6**	**5.4**	**2.0**	**6.3**	**13.1**	**2.8**

TABLE 33. NORTHERN PART OF EAST CHINA SEA, FEMALE, 1955 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19
66	Aug. 20	2012 **66**	396 **19.7**	439 **21.8**	823 **40.9**	88 **4.4**	457 **22.7**	549 **27.3**	945 **47.0**	919 **45.7**	63 **3.1**	40 **2.0**	103 **5.1**	243 **12.0**	58 **2.9**
70	Aug. 21	2012 **66**	388 **19.3**	431 **21.4**	823 **40.9**	96 **4.8**	451 **22.4**	549 **27.3**	929 **46.2**	896 **44.5**	53 **2.6**	38 **1.9**	126 **6.3**	238 **11.8**	55 **2.7**
72	Aug. 21	2042 **67**	385 **18.9**	431 **21.1**	853 **41.8**	101 **4.9**	487 **23.8**	540 **26.4**	945 **46.3**	906 **44.4**	58 **2.8**	50 **2.4**	131 **6.4**	264 **12.9**	58 **2.8**
220	Oct. 9	2103 **69**	426 **20.3**	464 **22.1**	838 **39.8**	103 **4.9**	457 **21.7**	596 **28.3**	992 **47.2**	967 **46.0**	76 **3.6**	45 **2.1**	137 **6.4**	238 **11.3**	63 **3.0**

TABLE 34. NORTHERN PART OF EAST CHINA SEA, MALE, 1956

1) Taiyo Gyogyo Co. 2) Nippon Suisan Co.

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
1) 89	Aug. 15	1554 **51**	280 **18.0**	315 **20.3**	585 **37.6**	70 **4.5**	353 **22.7**	480 **30.9**	740 **47.6**	750 **48.3**	112 **7.2**	46 **3.0**	115 **7.4**	130 **8.4**	41 **2.6**	180 **11.6**	390 **25.1**	— —	385 **24.8**	140 **9.0**	270 **17.4**	108 **6.9**
130	Sept. 11	1585 **52**	— —	306 **19.3**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	183 **11.5**	385 **24.3**	— —	382 **24.1**	147 **9.3**	268 **16.9**	115 **7.3**
N2) 25	Aug. 7	1590 **52**	— —	325 **20.4**	630 **39.6**	77 **4.8**	340 **21.4**	450 **28.3**	760 **47.8**	770 **48.4**	110 **6.9**	— —	— —	207 **13.1**	50 **3.1**	193 **12.1**	385 **24.2**	420 **26.4**	392 **24.7**	164 **10.3**	— —	— —
N 31	Aug. 10	1515 **50**	— —	285 **18.8**	590 **38.9**	65 **4.3**	350 **23.1**	425 **28.1**	865 **57.1**	830 **54.8**	105 **6.9**	38 **2.5**	105 **6.9**	188 **12.4**	47 **3.1**	160 **10.6**	340 **22.4**	330 **21.8**	340 **22.4**	135 **8.9**	235 **15.5**	100 **6.6**
N 35	Aug. 11	1550 **51**	— —	315 **20.3**	580 **37.4**	73 **4.7**	370 **23.9**	450 **29.0**	750 **48.4**	710 **45.8**	110 **7.1**	36 **2.3**	110 **7.1**	195 **12.6**	45 **2.9**	180 **11.6**	375 **24.2**	375 **24.2**	370 **23.9**	150 **9.7**	260 **16.8**	110 **7.1**
62	Aug. 10	1646 **54**	250 **15.2**	285 **17.3**	605 **36.8**	75 **4.6**	369 **22.4**	490 **29.8**	817 **49.6**	788 **47.9**	130 **7.9**	37 **2.2**	124 **7.5**	152 **9.2**	50 **3.0**	210 **12.8**	390 **23.7**	387 **23.5**	395 **24.0**	160 **9.7**	260 **15.8**	118 **7.2**
67	Aug. 11	1615 **53**	265 **16.4**	285 **17.6**	575 **35.6**	75 **4.6**	377 **23.3**	490 **30.3**	780 **48.3**	780 **48.3**	117 **7.2**	37 **2.3**	133 **8.2**	138 **8.5**	41 **2.5**	170 **10.5**	372 **23.0**	— —	360 **22.3**	130 **8.0**	240 **14.9**	108 **6.7**
68	Aug. 11	1615 **53**	290 **18.0**	322 **19.9**	685 **42.4**	76 **4.7**	350 **21.7**	480 **29.7**	770 **47.7**	782 **48.4**	140 **8.7**	32 **2.0**	100 **6.2**	147 **9.1**	45 **2.8**	194 **12.0**	425 **26.3**	— —	410 **25.4**	142 **8.8**	290 **18.0**	110 **6.8**
74	Aug. 13	1646 **54**	280 **17.0**	320 **19.4**	666 **40.5**	72 **4.4**	340 **20.7**	405 **24.6**	755 **45.9**	722 **43.9**	109 **6.6**	38 **2.3**	109 **6.6**	144 **8.7**	43 **2.6**	160 **9.7**	412 **25.0**	— —	390 **23.7**	135 **8.2**	— —	— —
78	Aug. 13	1676 **55**	298 **17.8**	322 **19.2**	627 **37.4**	81 **4.8**	380 **22.7**	470 **28.0**	756 **45.1**	730 **43.6**	157 **9.4**	35 **2.1**	106 **6.3**	148 **8.8**	47 **2.8**	197 **11.8**	426 **25.4**	— —	418 **24.9**	148 **8.8**	270 **16.1**	115 **6.9**
81	Aug. 14	1615 **53**	300 **18.6**	325 **20.1**	630 **39.0**	82 **5.1**	352 **21.8**	468 **29.0**	788 **48.8**	745 **46.1**	118 **7.3**	37 **2.3**	116 **7.2**	138 **8.5**	50 **3.1**	192 **11.9**	409 **25.3**	— —	398 **24.6**	192 **11.9**	300 **18.6**	118 **7.3**
82	Aug. 14	1646 **54**	285 **17.3**	323 **19.6**	607 **36.9**	77 **4.7**	374 **22.7**	500 **30.4**	794 **48.2**	764 **46.4**	144 **8.7**	45 **2.7**	113 **6.9**	157 **9.5**	52 **3.2**	205 **12.5**	405 **24.6**	— —	395 **24.0**	156 **9.5**	278 **16.9**	125 **7.6**
90	Aug. 18	1615 **53**	265 **16.4**	304 **18.8**	605 **37.5**	72 **4.5**	380 **23.5**	490 **30.3**	791 **49.0**	760 **47.1**	133 **8.2**	35 **2.2**	112 **6.9**	145 **9.0**	48 **3.0**	175 **10.8**	395 **24.5**	— —	390 **24.1**	137 **8.5**	265 **16.4**	115 **7.1**
99	Aug. 21	1646 **54**	300 **18.2**	330 **20.0**	670 **40.7**	80 **4.9**	378 **23.0**	450 **27.3**	767 **46.6**	743 **45.1**	116 **7.0**	35 **2.1**	103 **6.3**	136 **8.3**	47 **2.9**	170 **10.3**	402 **24.4**	— —	392 **23.8**	145 **8.8**	275 **16.7**	118 **7.2**
102	Aug. 22	1646 **54**	310 **18.8**	347 **21.1**	607 **36.9**	78 **4.7**	368 **22.4**	470 **28.6**	819 **49.8**	840 **51.0**	146 **8.9**	33 **2.0**	120 **7.3**	150 **9.1**	52 **3.2**	194 **11.8**	445 **27.0**	— —	430 **26.1**	150 **9.1**	280 **17.0**	122 **7.4**

TABLE 34. NORTHERN PART OF EAST CHINA SEA, MALE, 1956 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
106	Aug. 25	1615 **53**	289 **17.9**	312 **19.3**	615 **38.1**	73 **4.5**	350 **21.7**	510 **31.6**	775 **48.0**	790 **48.9**	135 **8.4**	43 **2.7**	116 **7.2**	150 **9.3**	50 **3.1**	180 **11.1**	397 **24.6**	— —	386 **23.9**	130 **8.0**	254 **15.8**	105 **6.5**
131	Sept. 2	1676 **55**	— —	300 **17.9**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	175 **10.4**	390 **23.3**	— —	386 **23.0**	145 **8.7**	260 **15.5**	110 **6.6**
134	Sept. 3	1676 **55**	— —	315 **18.8**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	210 **12.5**	390 **23.2**	— —	385 **23.0**	170 **10.1**	260 **15.5**	— —
136	Sept. 6	1646 **54**	— —	325 **19.7**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	180 **10.9**	398 **24.2**	— —	390 **23.7**	140 **8.5**	260 **15.8**	113 **6.9**
N 20	Aug. 4	1655 **55**	— —	345 **20.8**	730 **44.1**	84 **5.1**	390 **23.6**	480 **29.0**	780 **47.1**	750 **45.3**	130 **7.9**	40 **2.4**	88 **5.3**	201 **12.1**	49 **3.0**	190 **11.5**	420 **25.4**	415 **25.1**	420 **25.4**	165 **10.0**	295 **17.9**	120 **7.3**
N 22	Aug. 6	1670 **55**	— —	394 **23.6**	660 **39.5**	64 **3.8**	— —	470 **28.1**	780 **46.7**	760 **45.5**	130 **7.8**	— —	— —	220 **13.2**	52 **3.1**	205 **12.3**	445 **26.6**	465 **27.8**	440 **26.3**	175 **10.5**	310 **18.6**	120 **7.2**
33	July 30	1798 **59**	310 **17.2**	390 **21.7**	738 **41.0**	88 **4.9**	380 **21.1**	515 **28.6**	830 **46.2**	— —	140 **7.8**	34 **1.9**	89 **4.9**	163 **9.1**	52 **2.9**	— —	— —	430 **23.9**	— —	— —	— —	— —
44	Aug. 5	1737 **57**	320 **18.4**	342 **19.7**	717 **41.3**	76 **4.4**	375 **21.6**	485 **27.9**	851 **49.0**	825 **47.5**	134 **7.7**	42 **2.4**	100 **5.8**	157 **9.0**	53 **3.1**	180 **10.4**	445 **25.6**	430 **24.8**	450 **25.9**	155 **8.9**	280 **16.1**	125 **7.2**
46	Aug. 6	1737 **57**	315 **18.1**	370 **21.3**	697 **40.1**	84 **4.8**	380 **21.9**	517 **29.8**	— —	— —	143 **8.2**	37 **2.1**	123 **7.1**	173 **10.0**	51 **2.9**	218 **12.6**	458 **26.4**	425 **24.5**	462 **26.6**	160 **9.2**	300 **17.3**	125 **7.2**
52	Aug. 7	1798 **59**	360 **20.0**	405 **22.5**	767 **42.7**	91 **5.1**	397 **22.1**	460 **25.6**	789 **43.9**	760 **42.3**	128 **7.1**	42 **2.3**	119 **6.6**	155 **8.6**	52 **2.9**	205 **11.4**	475 **26.4**	445 **24.7**	480 **26.7**	160 **8.9**	320 **17.8**	130 **7.2**
55	Aug. 8	1737 **57**	305 **17.6**	330 **19.0**	664 **38.2**	81 **4.7**	382 **22.0**	475 **27.3**	851 **49.0**	825 **47.5**	163 **9.4**	33 **1.9**	118 **6.8**	161 **9.3**	46 **2.6**	200 **11.5**	423 **24.4**	415 **23.9**	428 **24.6**	160 **9.2**	295 **17.0**	122 **7.0**
59	Aug. 9	1737 **57**	340 **19.6**	357 **20.6**	674 **38.8**	85 **4.9**	382 **22.0**	506 **29.1**	850 **48.9**	821 **47.3**	140 **8.1**	43 **2.5**	114 **6.6**	154 **8.9**	49 **2.8**	205 **11.8**	445 **25.6**	416 **24.0**	450 **26.0**	157 **9.0**	310 **17.9**	124 **7.1**
60	Aug. 9	1707 **56**	330 **19.0**	350 **20.5**	649 **38.0**	76 **4.5**	370 **21.7**	515 **30.2**	830 **48.6**	795 **46.6**	147 **8.6**	34 **2.0**	119 **7.0**	156 **9.1**	46 **2.7**	197 **11.5**	425 **24.9**	404 **23.7**	430 **25.2**	146 **8.6**	286 **16.8**	118 **6.9**
63	Aug. 10	1768 **58**	318 **18.0**	348 **19.7**	749 **42.4**	85 **4.8**	410 **23.2**	495 **28.0**	861 **48.7**	840 **47.5**	142 **8.0**	38 **2.1**	108 **6.1**	177 **10.0**	53 **3.0**	210 **11.9**	460 **26.0**	433 **24.5**	437 **24.7**	150 **8.5**	322 **18.2**	125 **7.1**
69	Aug. 11	1798 **59**	330 **18.4**	352 **19.6**	742 **41.3**	84 **4.7**	410 **22.8**	527 **29.3**	866 **48.2**	842 **46.8**	139 **7.7**	46 **2.6**	124 **6.9**	165 **9.2**	57 **3.2**	205 **11.4**	455 **25.3**	— —	445 **24.7**	160 **8.9**	296 **16.5**	125 **7.0**
73	Aug. 13	1798 **59**	320 **17.8**	355 **19.7**	733 **40.8**	83 **4.6**	400 **22.0**	490 **27.3**	810 **45.0**	— —	157 **8.7**	46 **2.6**	142 **7.9**	186 **10.3**	54 **3.0**	214 **11.9**	462 **25.7**	— —	455 **25.3**	165 **9.2**	296 **16.5**	129 **7.2**

79	Aug. 14	1798 **59**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	174 **9.7**	51 **2.8**	207 **11.5**	465 **25.9**	— —	445 **24.7**	165 **9.2**	325 **18.1**	29 **7.2**
85	Aug. 15	1798 **59**	318 **17.7**	355 **19.7**	737 **41.0**	87 **4.8**	406 **22.6**	506 **28.1**	845 **47.0**	822 **45.7**	155 **8.4**	34 **1.9**	119 **6.6**	154 **8.6**	52 **2.9**	220 **12.2**	446 **24.8**	— —	428 **23.8**	165 **9.2**	308 **17.1**	128 **7.1**
86	Aug. 15	1798 **59**	330 **18.4**	380 **21.1**	737 **41.0**	85 **4.7**	380 **21.1**	524 **29.1**	910 **50.6**	870 **48.4**	194 **10.8**	43 **2.4**	116 **6.5**	163 **9.1**	51 **2.8**	213 **11.8**	472 **26.3**	— —	460 **25.6**	165 **9.2**	325 **18.1**	127 **7.1**
87	Aug. 15	1737 **57**	305 **17.6**	340 **19.6**	— —	73 **4.2**	— —	— —	— —	— —	— —	— —	— —	156 **9.0**	52 **3.0**	— —	— —	— —	— —	— —	— —	— —
94	Aug. 19	1737 **57**	320 **18.4**	350 **20.1**	677 **39.0**	76 **4.4**	388 **22.3**	495 **28.5**	843 **48.5**	820 **47.2**	141 **.8.1**	34 **2.0**	108 **6.2**	155 **8.9**	50 **2.9**	200 **11.5**	430 **24.8**	— —	430 **24.8**	148 **8.5**	304 **17.5**	125 **7.2**
98	Aug. 21	1737 **57**	310 **17.8**	350 **20.1**	627 **36.1**	86 **5.0**	390 **22.5**	500 **28.8**	865 **49.8**	840 **48.4**	154 **8.9**	33 **1.9**	100 **5.8**	166 **9.6**	52 **3.0**	205 **11.8**	431 **24.8**	— —	425 **24.5**	157 **9.0**	300 **17.3**	131 **7.5**
101	Aug. 22	1737 **57**	300 **17.3**	337 **19.4**	647 **37.2**	78 **4.5**	358 **20.6**	496 **28.6**	830 **47.8**	848 **48.8**	154 **8.9**	42 **2.4**	120 **6.9**	161 **9.3**	53 **3.1**	200 **11.5**	425 **24.5**	— —	415 **23.9**	163 **9.4**	290 **16.7**	125 **7.2**
105	Aug. 25	1707 **56**	313 **18.3**	338 **19.8**	670 **39.2**	81 **4.7**	400 **23.4**	475 **27.8**	819 **48.0**	800 **46.9**	170 **10.0**	37 **2.2**	103 **6.0**	146 **8.6**	48 **2.8**	210 **12.3**	420 **24.6**	— —	410 **24.0**	160 **9.4**	280 **16.4**	122 **7.1**
114	Aug. 27	1737 **57**	320 **18.4**	360 **20.7**	687 **39.6**	79 **4.5**	390 **22.5**	505 **29.1**	825 **47.5**	820 **47.2**	181 **10.4**	39 **2.2**	105 **6.0**	172 **9.9**	49 **2.8**	190 **10.9**	447 **25.7**	— —	440 **25.3**	150 **8.6**	305 **17.6**	133 **7.7**
117	Aug. 29	1798 **59**	325 **18.1**	368 **20.5**	667 **37.1**	81 **4.5**	351 **19.5**	483 **26.9**	884 **49.2**	852 **47.4**	153 **8.5**	36 **2.0**	96 **5.3**	166 **9.2**	53 **2.9**	200 **11.1**	465 **25.9**	— —	460 **25.6**	160 **8.9**	320 **17.8**	125 **7.0**
126	Sept. 2	1798 **59**	325 **18.1**	375 **20.9**	— —	87 **4.8**	— —	— —	— —	— —	— —	— —	— —	— —	— —	213 **11.8**	455 **25.3**	— —	442 **24.6**	165 **9.2**	285 **15.9**	130 **7.2**
127	Sept. 2	1707 **56**	— —	345 **20.2**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	200 **11.7**	438 **25.7**	— —	440 **25.8**	152 **8.9**	294 **17.2**	125 **7.3**
129	Sept. 2	1798 **59**	— —	373 **20.7**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	210 **11.7**	470 **26.1**	— —	450 **25.0**	157 **8.7**	320 **17.8**	130 **7.2**
132	Sept. 3	1768 **58**	— —	380 **21.5**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	210 **11.9**	470 **26.6**	— —	455 **25.7**	170 **9.6**	330 **18.7**	132 **7.5**
138	Sept. 6	1768 **58**	— —	335 **18.9**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	200 **11.3**	410 **23.2**	— —	410 **23.2**	152 **8.6**	272 **15.4**	118 **6.7**
141	Sept. 7	1798 **59**	— —	360 **20.0**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	200 **11.1**	450 **25.0**	— —	445 **24.7**	167 **9.3**	308 **17.1**	127 **7.1**
N 26	Aug. 7	1770 **58**	— —	385 **21.8**	730 **41.2**	85 **4.8**	400 **22.6**	500 **28.2**	830 **46.9**	790 **44.6**	120 **6.8**	— —	— —	223 **12.6**	52 **2.9**	215 **12.1**	465 **26.3**	460 **22.6**	474 **26.8**	180 **10.2**	— —	— —
N 29	Aug. 9	1740 **57**	— —	370 **21.3**	— —	90 **5.2**	420 **24.1**	520 **29.9**	810 **46.6**	790 **45.4**	135 **7.8**	45 **2.6**	95 **5.5**	— —	58 **3.3**	210 **12.1**	460 **26.4**	450 **25.9**	445 **25.6**	190 **10.9**	295 **17.0**	120 **6.9**

TABLE 34. NORTHERN PART OF EAST CHINA SEA, MALE, 1956 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
N 34	Aug. 11	1715 **56**	— —	365 **21.3**	720 **42.0**	85 **5.0**	390 **22.7**	490 **28.6**	800 **46.6**	775 **45.2**	130 **7.6**	35 **2.0**	115 **6.7**	213 **12.4**	51 **3.0**	205 **12.0**	440 **25.7**	430 **25.1**	445 **25.9**	175 **10.2**	— —	— —
N 36	Aug. 11	1710 **56**	310 **18.1**	345 **20.2**	690 **40.4**	85 **5.0**	410 **24.0**	520 **30.4**	860 **50.3**	795 **46.5**	140 **8.9**	39 **2.3**	105 **6.1**	205 **12.0**	51 **3.0**	185 **10.8**	425 **24.9**	425 **24.9**	420 **24.6**	170 **9.9**	290 **17.0**	110 **6.4**
N 59	Sept. 1	1710 **56**	— —	360 **21.1**	660 **38.6**	88 **5.1**	410 **24.0**	495 **28.9**	795 **46.5**	725 **42.4**	115 **6.7**	50 **2.9**	120 **7.0**	205 **12.0**	51 **3.0**	210 **12.3**	445 **26.0**	435 **25.4**	454 **26.6**	185 **10.8**	315 **18.4**	125 **7.3**
N 62	Sept. 5	1720 **57**	— —	345 **20.1**	640 **37.2**	73 **4.2**	430 **25.0**	500 **29.1**	900 **52.3**	875 **50.9**	131 **7.6**	31 **1.8**	100 **5.8**	195 **11.3**	45 **2.6**	175 **10.2**	415 **24.1**	405 **23.5**	420 **24.4**	150 **8.7**	280 **16.3**	105 **6.1**
35	July 31	1859 **61**	360 **19.4**	430 **23.1**	735 **39.5**	88 **4.7**	490 **26.4**	500 **26.9**	880 **47.3**	850 **45.7**	150 **8.1**	— —	— —	157 **8.4**	53 **2.9**	— —	— —	— —	— —	— —	— —	— —
38	Aug. 4	1859 **61**	305 **16.4**	375 **20.2**	728 **39.2**	— —	— —	515 **27.7**	910 **49.0**	889 **47.8**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —
41	Aug. 4	1829 **60**	330 **18.0**	375 **20.5**	722 **39.5**	78 **4.3**	455 **24.9**	525 **28.7**	860 **47.0**	830 **45.4**	158 **8.6**	41 **2.2**	109 **6.0**	174 **9.5**	54 **3.0**	— —	— —	— —	— —	— —	— —	— —
42	Aug. 5	1829 **60**	320 **17.5**	365 **20.0**	677 **37.0**	80 **4.4**	410 **22.4**	510 **27.9**	914 **50.0**	890 **48.7**	155 **8.5**	42 **2.3**	112 **6.1**	134 **7.3**	51 **2.8**	— —	— —	— —	— —	— —	— —	— —
53	Aug. 7	1829 **60**	330 **18.0**	365 **20.0**	737 **40.3**	81 **4.4**	430 **23.5**	510 **27.9**	868 **47.5**	835 **45.7**	147 **8.0**	41 **2.2**	122 **6.7**	163 **8.9**	55 **3.0**	— —	— —	— —	— —	— —	— —	— —
57	Aug. 8	1829 **60**	335 **18.3**	335 **19.4**	672 **42.2**	87 **4.8**	420 **23.0**	520 **28.4**	830 **45.4**	850 **46.5**	— —	35 **1.9**	104 **5.7**	178 **9.7**	52 **2.8**	220 **12.0**	460 **25.2**	442 **24.2**	465 **25.4**	160 **8.7**	310 **16.9**	125 **6.8**
75	Aug. 13	1859 **61**	355 **19.1**	375 **20.2**	742 **39.9**	90 **4.8**	410 **22.1**	515 **27.7**	879 **47.3**	850 **45.7**	156 **8.4**	43 **2.3**	117 **6.3**	189 **10.2**	54 **2.9**	— —	— —	— —	— —	— —	— —	— —
84	Aug. 15	1829 **60**	345 **18.9**	376 **20.6**	737 **40.3**	87 **4.8**	373 **20.4**	522 **28.5**	838 **45.8**	802 **43.8**	134 **7.3**	53 **2.9**	134 **7.3**	194 **10.6**	54 **3.0**	215 **11.8**	480 **26.2**	— —	472 **25.8**	170 **9.3**	315 **17.2**	129 **7.1**
104	Aug. 25	1829 **60**	316 **16.9**	340 **18.6**	673 **36.8**	81 **4.4**	448 **24.5**	530 **29.0**	870 **47.6**	890 **48.7**	142 **7.8**	36 **2.0**	118 **6.5**	163 **8.9**	50 **2.7**	205 **11.2**	418 **22.9**	— —	420 **23.0**	152 **8.3**	290 **15.9**	125 **6.8**
133	Sept. 3	1859 **61**	— —	380 **20.4**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	225 **12.1**	475 **25.6**	— —	460 **24.7**	175 **9.4**	330 **17.8**	128 **6.9**
156	Sept. 17	1829 **60**	— —	408 **22.3**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	218 **11.9**	490 **26.8**	— —	485 **26.5**	185 **10.1**	346 **18.9**	140 **7.7**
N 15	July 29	1810 **60**	— —	380 **21.0**	— —	80 **4.4**	— —	— —	— —	— —	— —	25 **1.4**	78 **4.3**	198 **10.9**	55 **3.0**	190 **10.5**	445 **24.6**	440 **24.3**	450 **24.9**	170 **9.4**	320 **17.7**	105 **5.8**

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
N 17	July 31	1830	—	385	—	88	—	—	—	—	—	33	109	208	50	215	480	485	470	185	340	130
		60	—	**21.0**	—	**4.8**	—	—	—	—	—	**1.8**	**6.0**	**11.4**	**2.7**	**11.7**	**26.2**	**26.5**	**25.7**	**10.1**	**18.6**	**7.1**
N 32	Aug. 10	1860	—	405	760	82	420	510	865	880	130	39	120	265	60	210	485	475	485	190	320	135
		61	—	**21.8**	**40.9**	**4.4**	**22.6**	**27.4**	**46.5**	**47.3**	**7.0**	**2.1**	**6.5**	**14.2**	**3.2**	**11.3**	**26.1**	**25.5**	**26.1**	**10.2**	**17.2**	**7.3**
N 53	Aug. 25	1800	—	400	750	—	430	500	810	790	115	38	115	225	51	215	470	460	475	195	320	125
		59	—	**22.2**	**41.7**	—	**23.9**	**27.8**	**45.0**	**43.9**	**6.4**	**2.1**	**6.4**	**12.5**	**2.8**	**12.0**	**26.1**	**25.6**	**26.4**	**10.8**	**17.8**	**6.9**
45	Aug. 6	1920	335	375	607	84	450	525	—	—	—	34	117	181	60	240	500	450	495	168	310	135
		63	**17.4**	**19.5**	**31.6**	**4.4**	**23.4**	**27.3**	—	—	—	**1.8**	**6.1**	**9.4**	**3.1**	**12.5**	**26.0**	**23.4**	**25.8**	**8.7**	**16.1**	**7.0**
113	Aug. 28	1920	350	390	739	91	440	560	932	890	164	48	115	188	54	208	480	—	470	160	325	132
		63	**18.2**	**20.3**	**38.5**	**4.7**	**22.9**	**29.2**	**48.5**	**46.4**	**8.5**	**2.5**	**6.0**	**9.8**	**2.8**	**10.8**	**25.0**	—	**24.5**	**8.3**	**17.0**	**6.9**

TABLE 35. NORTHERN PART OF EAST CHINA, SEA, FEMALE, 1956

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
58	Aug. 9	1524	248	278	575	64	340	453	698	713	50	43	114	154	49	205	445	416	450	157	310	124
		50	**16.3**	**18.2**	**37.7**	**4.2**	**22.3**	**29.7**	**45.8**	**46.8**	**3.3**	**2.8**	**7.5**	**10.1**	**3.2**	**13.5**	**29.2**	**27.3**	**29.5**	**10.3**	**20.3**	**8.1**
70	Aug. 10	1585	285	293	585	68	420	505	739	795	72	—	—	142	46	165	380	—	367	135	250	110
		52	**18.0**	**18.5**	**36.9**	**4.3**	**26.5**	**31.9**	**46.6**	**50.2**	**4.5**	—	—	**9.0**	**2.9**	**10.4**	**24.0**	—	**23.2**	**8.5**	**15.8**	**6.9**
89	Aug. 15	1554	280	315	585	70	353	480	740	750	—	46	115	130	41	180	390	—	385	140	270	108
		51	**18.0**	**20.3**	**37.6**	**4.5**	**22.7**	**30.9**	**47.6**	**48.3**	—	**3.0**	**7.4**	**8.4**	**2.6**	**11.6**	**25.1**	—	**24.8**	**9.0**	**17.4**	**6.9**
119	Aug. 30	1524	280	300	640	70	370	440	728	755	63	39	105	135	44	170	386	—	380	140	250	103
		50	**18.4**	**19.7**	**42.0**	**4.6**	**24.3**	**28.9**	**47.8**	**49.5**	**4.1**	**2.6**	**6.9**	**8.9**	**2.9**	**11.2**	**25.3**	—	**24.9**	**9.2**	**16.4**	**6.8**
160	Sept. 19	1554	—	296	—	—	—	—	—	—	—	—	—	—	—	170	373	—	365	135	255	107
		51	—	**19.0**	—	—	—	—	—	—	—	—	—	—	—	**10.9**	**24.0**	—	**23.5**	**8.7**	**16.4**	**6.9**
N 23	Aug. 6	1590	290	325	640	70	385	460	730	705	59	36	90	205	49	165	390	365	380	145	265	105
		52	**18.2**	**20.4**	**40.3**	**4.4**	**24.2**	**28.9**	**45.9**	**44.3**	**3.7**	**2.3**	**5.7**	**12.9**	**3.1**	**10.4**	**24.5**	**23.0**	**23.9**	**9.1**	**16.7**	**6.6**
N 28	Aug. 9	1500	—	305	555	65	—	485	735	720	62	34	—	200	45	165	385	360	380	155	265	115
		50	—	**20.3**	**37.0**	**4.3**	—	**32.3**	**49.0**	**48.0**	**4.1**	**2.3**	—	**13.3**	**3.0**	**11.0**	**25.7**	**24.0**	**25.3**	**10.3**	**17.7**	**7.7**
N 30	Aug. 9	1590	—	310	580	70	370	430	670	650	45	31	75	175	45	170	385	340	380	155	255	100
		52	—	**19.5**	**36.5**	**4.4**	**23.3**	**27.0**	**42.1**	**40.9**	**2.8**	**1.9**	**4.7**	**11.0**	**2.8**	**10.7**	**24.2**	**21.4**	**23.9**	**9.7**	**16.0**	**6.3**
N 64	Sept. 6	1550	—	310	550	76	395	480	740	720	45	39	95	180	45	185	385	380	385	160	265	110
		51	—	**20.0**	**35.5**	**4.9**	**25.5**	**31.0**	**47.7**	**46.5**	**2.9**	**2.5**	**6.1**	**11.6**	**2.9**	**11.9**	**24.8**	**24.5**	**24.8**	**10.3**	**17.1**	**7.1**
N 65	Sept. 6	1505	—	275	620	65	380	460	700	720	40	35	92	170	43	155	340	340	340	155	245	95
		50	—	**18.3**	**41.2**	**4.3**	**25.2**	**30.6**	**46.5**	**47.8**	**2.7**	**2.3**	**6.1**	**11.3**	**2.9**	**10.3**	**22.6**	**22.6**	**22.6**	**10.3**	**16.3**	**6.3**

TABLE 35. NORTHERN PART OF EAST CHINA SEA, FEMALE 1956 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
31	July 30	1676 **55**	— —	— —	637 **38.0**	79 **4.7**	400 **23.9**	500 **29.9**	804 **48.0**	780 **46.5**	69 **4.1**	43 **2.6**	97 **5.8**	130 **7.8**	50 **3.0**	— —	— —	— —	— —	— —	— —	
64	Aug. 10	1676 **55**	293 **17.5**	322 **19.2**	630 **37.6**	73 **4.4**	410 **24.5**	474 **28.3**	780 **46.5**	798 **47.6**	82 **4.9**	40 **2.4**	128 **7.6**	154 **9.2**	52 **3.1**	188 **11.2**	390 **23.3**	— —	380 **22.7**	145 **8.7**	275 **16.4**	134 **8.0**
65	Aug. 10	1676 **55**	334 **19.9**	365 **21.8**	575 **34.3**	77 **4.6**	373 **22.3**	532 **31.7**	828 **49.4**	805 **48.0**	— —	39 **2.3**	107 **6.4**	165 **9.8**	55 **3.3**	210 **12.5**	430 **25.7**	— —	430 **25.7**	160 **9.5**	307 **18.3**	— —
76	Aug. 13	1676 **55**	282 **16.8**	308 **18.4**	625 **37.3**	70 **4.2**	420 **25.1**	518 **30.9**	808 **48.2**	735 **43.9**	66 **3.9**	32 **1.9**	108 **6.4**	147 **8.8**	41 **2.4**	208 **12.4**	410 **24.5**	— —	392 **23.4**	150 **8.9**	262 **15.6**	120 **7.2**
91	Aug. 19	1615 **53**	272 **16.8**	298 **18.5**	575 **35.6**	71 **4.4**	390 **24.1**	502 **31.1**	805 **49.8**	790 **48.9**	50 **3.1**	38 **2.4**	107 **6.6**	130 **8.0**	44 **2.7**	— —	— —	— —	— —	— —	— —	— —
115	Aug. 29	1615 **53**	298 **18.5**	325 **20.1**	645 **39.9**	69 **4.3**	360 **22.3**	498 **30.8**	750 **46.4**	765 **47.4**	52 **3.2**	36 **2.2**	98 **6.1**	150 **9.3**	47 **2.9**	165 **10.2**	410 **25.4**	— —	405 **25.1**	140 **8.7**	290 **18.0**	118 **7.3**
148	Sept. 14	1676 **55**	— —	325 **19.4**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	183 **10.9**	408 **24.3**	— —	401 **23.9**	142 **8.5**	286 **17.1**	112 **6.7**
N 49	Aug. 22	1620 **53**	— —	320 **19.8**	610 **37.7**	79 **4.9**	— —	480 **29.6**	770 **47.5**	750 **46.3**	50 **3.1**	— —	— —	205 **12.7**	50 **3.1**	185 **11.4**	390 **24.1**	390 **24.1**	395 **24.4**	160 **9.9**	275 **17.0**	110 **6.8**
N 66	Sept. 6	1670 **55**	— —	350 **21.0**	665 **39.8**	80 **4.8**	415 **24.9**	520 **31.1**	780 **46.7**	740 **44.3**	40 **2.4**	37 **2.2**	100 **6.0**	195 **11.7**	48 **2.9**	190 **11.4**	430 **25.8**	420 **25.2**	425 **25.5**	170 **10.2**	305 **18.3**	115 **6.9**
32	July 30	1768 **58**	— —	— —	727 **41.1**	— —	355 **20.1**	455 **25.7**	780 **44.1**	— —	52 **2.9**	40 **2.3**	97 **5.5**	157 **8.9**	56 **3.2**	— —	— —	465 **26.3**	— —	— —	— —	— —
34	July 30	1737 **57**	— —	— —	675 **38.9**	— —	425 **24.5**	490 **28.2**	— —	810 **46.6**	73 **4.2**	35 **2.0**	96 **5.5**	136 **7.8**	47 **2.7**	— —	— —	440 **25.3**	— —	— —	— —	— —
43	Aug. 5	1798 **59**	345 **19.2**	365 **20.3**	722 **40.2**	83 **4.6**	403 **22.4**	490 **27.3**	843 **46.9**	802 **44.6**	74 **4.1**	38 **2.1**	143 **8.0**	148 **8.2**	51 **2.8**	— —	450 **25.0**	443 **24.6**	452 **25.1**	— —	295 **16.4**	135 **7.5**
66	Aug. 10	1798 **59**	305 **17.0**	340 **18.9**	715 **39.8**	85 **4.7**	410 **22.8**	524 **29.1**	855 **47.6**	837 **46.6**	55 **3.1**	39 **2.2**	110 **6.1**	173 **9.6**	53 **2.9**	200 **12.2**	415 **23.1**	— —	425 **23.6**	164 **9.1**	275 **15.3**	136 **7.6**
54	Aug. 7	1768 **58**	352 **19.9**	392 **22.2**	722 **40.8**	87 **4.9**	405 **22.9**	495 **28.0**	920 **52.0**	890 **50.3**	72 **4.1**	— —	— —	175 **9.9**	49 **2.8**	215 **12.2**	475 **26.9**	455 **25.7**	480 **27.1**	160 **9.0**	290 **16.4**	131 **7.4**
88	Aug. 15	1798 **59**	327 **18.2**	355 **19.7**	702 **39.0**	78 **4.3**	414 **23.0**	538 **29.9**	876 **48.2**	865 **48.1**	74 **4.1**	31 **1.7**	110 **6.1**	155 **8.6**	46 **2.6**	180 **10.0**	437 **24.3**	— —	430 **23.9**	150 **8.3**	310 **17.2**	122 **6.8**
95	Aug. 20	1768 **58**	300 **17.0**	335 **18.9**	627 **35.5**	83 **4.7**	453 **25.6**	525 **29.7**	830 **46.9**	820 **46.4**	60 **3.4**	36 **2.0**	113 **6.4**	154 **8.7**	51 **2.9**	192 **10.9**	430 **24.3**	— —	412 **23.3**	150 **8.5**	285 **16.1**	115 **6.5**

	109	Aug. 26	1798 **59**	320 **17.8**	360 **20.0**	697 **38.8**	83 **4.6**	432 **24.0**	528 **29.4**	876 **48.7**	870 **48.4**	63 **3.5**	49 **2.7**	94 **5.2**	166 **9.2**	49 **2.7**	209 **11.6**	455 **25.3**	— —	445 **24.7**	152 **8.5**	— —	121 **6.7**
	122	Aug. 31	1798 **59**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	216 **12.0**	470 **26.1**	— —	455 **25.3**	166 **9.2**	322 **17.9**	129 **7.2**
	144	Sept. 11	1707 **56**	— —	350 **20.5**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	192 **11.2**	430 **25.2**	— —	425 **24.9**	155 **9.1**	290 **17.0**	125 **7.3**
	155	Sept. 17	1798 **59**	— —	375 **20.9**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	215 **12.0**	482 **26.8**	— —	478 **26.6**	169 **9.4**	330 **18.4**	130 **7.2**
	157	Sept. 17	1707 **56**	— —	332 **19.4**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	183 **11.7**	418 **24.5**	— —	410 **24.0**	150 **8.8**	283 **16.6**	115 **6.7**
N	27	Aug. 7	1715 **57**	— —	360 **21.0**	590 **34.4**	84 **4.9**	450 **26.2**	540 **31.5**	820 **47.8**	765 **44.6**	50 **2.9**	50 **2.9**	130 **7.6**	210 **12.2**	50 **2.9**	205 **2.0**	440 **25.7**	430 **25.1**	429 **25.0**	166 **9.7**	— —	— —
N	47	Aug. 20	1775 **59**	— —	— —	— —	85 **4.8**	— —	— —	— —	— —	40 **2.3**	— —	— —	205 **11.5**	53 **3.0**	205 **11.5**	470 **26.5**	450 **25.4**	465 **26.2**	180 **10.1**	315 **17.7**	115 **6.5**
N	50	Aug. 22	1710 **56**	— —	355 **20.8**	710 **41.5**	80 **4.7**	410 **24.0**	520 **30.4**	830 **48.5**	845 **49.1**	50 **2.9**	39 **2.3**	105 **6.1**	120 **7.0**	50 **2.9**	185 **10.8**	430 **25.1**	415 **24.3**	435 **25.4**	165 **9.6**	310 **18.1**	120 **7.0**
N	52	Aug. 24	1760 **58**	— —	355 **20.2**	680 **38.6**	82 **4.7**	440 **25.0**	520 **29.5**	840 **47.7**	795 **45.2**	55 **3.1**	35 **2.0**	110 **6.2**	215 **12.2**	53 **3.0**	— —	— —	420 **23.9**	— —	— —	295 **16.8**	130 **7.4**
	37	Aug. 4	1829 **60**	343 **18.8**	370 **20.2**	647 **35.4**	82 **4.5**	420 **23.0**	540 **29.5**	870 **47.6**	809 **44.2**	— —	— —	— —	169 **9.2**	50 **2.7**	— —	— —	— —	— —	— —	— —	— —
	40	Aug. 4	1890 **62**	350 **18.5**	380 **20.1**	— —	91 **4.8**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —
	47	Aug. 6	1829 **60**	350 **19.1**	390 **21.3**	737 **40.3**	85 **4.6**	400 **21.9**	530 **29.0**	835 **45.7**	— —	58 **3.2**	38 **2.1**	106 **5.8**	158 **8.6**	55 **3.0**	— —	— —	— —	— —	— —	— —	— —
	51	Aug. 7	1859 **61**	315 **16.9**	360 **19.4**	718 **38.6**	81 **4.4**	430 **23.1**	530 **28.5**	904 **48.6**	885 **47.6**	68 **3.7**	40 **2.2**	133 **7.2**	156 **8.4**	52 **2.8**	182 **9.8**	450 **24.2**	425 **22.9**	442 **23.8**	160 **8.6**	295 **15.9**	120 **6.5**
	56	Aug. 8	1859 **61**	350 **18.8**	370 **19.9**	693 **37.3**	84 **4.5**	420 **22.6**	530 **28.5**	— —	874 **47.0**	47 **2.5**	45 **2.4**	148 **8.0**	178 **9.6**	54 **2.9**	212 **11.4**	465 **25.0**	460 **24.7**	470 **25.3**	160 **8.6**	335 **18.0**	130 **7.0**
	80	Aug. 14	1829 **60**	332 **18.2**	376 **20.6**	737 **40.3**	83 **4.5**	420 **23.0**	534 **29.2**	900 **49.2**	865 **47.3**	53 **2.9**	36 **2.0**	127 **6.9**	178 **9.7**	51 **2.8**	218 **11.9**	470 **25.7**	— —	463 **25.3**	170 **9.3**	328 **17.9**	136 **7.4**
	97	Aug. 20	1890 **62**	340 **18.0**	380 **20.1**	729 **38.6**	84 **4.4**	430 **22.8**	530 **28.0**	909 **48.1**	880 **46.6**	79 **4.2**	43 **2.3**	117 **6.2**	163 **8.6**	54 **2.9**	— —	— —	— —	— —	— —	— —	— —
	103	Aug. 23	1859 **61**	330 **17.8**	370 **19.9**	698 **37.5**	86 **4.6**	470 **25.3**	540 **29.0**	930 **50.0**	900 **48.4**	77 **4.1**	— —	— —	147 **7.9**	49 **2.6**	200 **10.8**	563 **30.3**	— —	560 **30.1**	150 **8.1**	294 **15.8**	120 **6.5**
	110	Aug. 26	1859 **61**	348 **18.7**	400 **21·5**	748 **40.2**	89 **4.8**	425 **22.9**	565 **30.4**	895 **48.1**	895 **48.1**	— —	38 **2.0**	106 **5.7**	155 **8.3**	49 **2.6**	— —	— —	— —	480 **25.8**	— —	348 **18.7**	135 **7.3**

TABLE 35. NORTHERN PART OF EAST CHINA SEA, FEMALE, 1956 (cont.)

Serial no.	Date caught	1	3	5	6	7	8	10	11	12	13	14	15	17	19	21	22	24	25	26	27	28
112	Aug. 28	1890 **62**	350 **18.5**	390 **20.6**	789 **41.7**	87 **4.6**	430 **22.8**	550 **29.1**	900 **47.6**	880 **44.6**	66 **3.5**	45 **2.4**	105 **5.6**	182 **9.6**	58 **3.1**	230 **11.2**	490 **25.9**	— —	485 **25.7**	180 **9.5**	347 **18.4**	124 **6.6**
121	Aug. 31	1859 **61**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	220 **11.8**	470 **25.3**	— —	470 **25.3**	170 **9.1**	312 **16.8**	— —
124	Aug. 31	1859 **61**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	213 **11.5**	456 **24.5**	— —	455 **24.5**	173 **9.3**	306 **16.5**	123 **6.6**
143	Sept. 7	1829 **60**	— —	360 **19.7**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	190 **10.4**	435 **23.8**	— —	435 **23.8**	143 **7.8**	304 **16.6**	121 **6.6**
150	Sept. 14	1829 **60**	— —	378 **20.7**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	215 **11.8**	475 **26.0**	— —	473 **25.9**	165 **9.0**	322 **17.6**	132 **7.2**
158	Sept. 19	1829 **60**	— —	365 **20.0**	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	— —	186 **10.2**	430 **23.5**	— —	450 **24.6**	150 **8.2**	310 **16.9**	120 **6.6**
N 16	July 29	1830 **60**	— —	390 **21.3**	— —	93 5.1	— —	— —	— —	— —	66 3.6	38 2.1	108 5.9	225 **12.3**	51 2.8	210 **11.5**	470 **25.7**	440 **24.0**	465 **25.4**	175 **9.6**	325 **17.8**	130 **7.1**
N 19	Aug. 4	1800 **59**	— —	360 **20.0**	760 **42.2**	90 5.0	380 **21.1**	450 **25.0**	760 **42.2**	730 **40.6**	65 **3.6**	27 **1.5**	75 4.2	220 **12.2**	52 **2.9**	205 **11.4**	465 **25.8**	430 **23.9**	460 **25.6**	185 **10.3**	330 **18.3**	125 **6.9**
N 21	Aug. 4	1820 **60**	— —	384 **21.0**	700 **38.5**	88 4.8	440 **24.2**	510 **28.0**	850 **46.7**	820 **45.1**	66 **3.6**	38 **2.1**	85 **4.7**	216 **11.9**	49 **2.7**	215 **11.8**	465 **25.5**	455 **25.0**	470 **25.8**	185 **10.2**	325 **17.9**	120 **6.6**
N 24	Aug. 6	1850 **61**	— —	380 **20.5**	760 **41.1**	93 5.0	440 **23.8**	540 **29.2**	850 **45.9**	820 **44.3**	54 **2.9**	35 **1.9**	105 5.7	220 **11.9**	52 2.8	215 **11.6**	470 **25.4**	475 **25.7**	465 **25.1**	180 **9.7**	320 **17.3**	130 **7.0**
N 33	Aug. 10	1880 **62**	— —	400 **21.3**	720 **38.3**	85 4.5	485 **25.8**	550 **29.3**	880 **46.8**	855 **45.5**	55 **2.9**	35 **1.9**	110 **5.9**	230 **12.2**	52 **2.8**	210 **11.2**	485 **25.8**	470 **25.0**	485 **25.8**	175 **9.3**	315 **16.8**	130 **6.9**
39	Aug. 4	1920 **63**	345 **18.0**	393 **20.5**	— —	— —	459 **23.9**	620 **32.3**	915 **47.7**	885 **46.1**	63 **3.3**	49 **2.6**	124 **6.5**	147 **7.7**	51 **2.7**	— —	— —	— —	— —	— —	— —	— —
48	Aug. 6	1951 **64**	370 **19.0**	430 **22.0**	795 **40.7**	94 **4.8**	410 **21.0**	540 **27.7**	860 **44.1**	— —	74 **3.8**	47 **2.4**	135 **6.9**	184 **9.4**	56 **2.9**	— —	— —	— —	— —	— —	— —	— —
61	Aug. 10	1920 **63**	336 **17.5**	361 **18.8**	788 **41.0**	83 **4.3**	423 **22.0**	570 **29.7**	— —	— —	— —	37 **1.9**	116 **6.0**	197 **10.3**	56 **2.9**	195 **10.2**	460 **24.0**	450 **23.4**	465 **24.2**	162 **8.4**	300 **15.6**	120 **6.2**
93	Aug. 19	1951 **64**	368 **18.9**	384 **19.7**	760 **39.0**	94 **4.8**	453 **23.2**	576 **29.5**	935 **47.9**	918 **47.1**	44 **2.3**	36 **1.8**	105 **5.4**	154 **7.9**	60 **3.1**	225 **11.5**	512 **26.2**	— —	500 **25.6**	165 **8.5**	343 **17.6**	136 **7.0**
107	Aug. 26	1981 **65**	350 **17.7**	385 **19.4**	750 **37.9**	85 **4.3**	413 **20.8**	566 **28.6**	925 **46.7**	925 **46.7**	85 **4.3**	38 **1.9**	125 **6.3**	158 **8.0**	56 **2.8**	215 **10.9**	485 **24.5**	— —	476 **24.0**	170 **8.6**	336 **17.0**	132 **6.7**

	111	Aug.	27	1920	375	415	796	89	407	530	880	907	80	47	120	152	55	230	520	—	513	185	368	146
				63	**19.5**	**21.6**	**41.5**	**4.6**	**21.2**	**27.6**	**45.8**	**47.2**	**4.2**	**2.4**	**6.2**	**7.9**	**2.9**	**12.0**	**27.1**	—	**26.7**	**9.6**	**19.2**	**7.6**
	140	Sept.	7	1951	—	393	—	—	—	—	—	—	—	—	—	—	—	210	493	—	490	190	357	137
				64	—	**20.1**	—	—	—	—	—	—	—	—	—	—	—	**10.8**	**25.3**	—	**25.1**	**9.7**	**18.3**	**7.0**
N	57	Sept.	1	1920	—	390	770	90	—	530	880	860	55	—	—	221	53	215	495	460	495	185	335	125
				63	—	**20.3**	**40.1**	**4.7**	—	**27.6**	**45.8**	**44.8**	**2.9**	—	—	**11.5**	**2.8**	**11.2**	**25.8**	**24.0**	**25.8**	**9.6**	**17.4**	**6.5**
N	61	Sept.	3	1950	—	390	800	92	490	570	870	850	65	55	120	235	55	210	475	475	480	190	300	130
				64	—	**20.0**	**41.0**	**4.7**	**25.1**	**29.2**	**44.6**	**43.6**	**3.3**	**2.8**	**6.6**	**12.1**	**2.8**	**10.8**	**24.4**	**24.4**	**24.6**	**9.7**	**15.4**	**6.7**
N	63	Sept.	5	1920	—	400	770	93	450	580	910	880	65	35	115	251	59	—	485	475	485	—	330	—
				63	—	**20.8**	**40.1**	**4.8**	**23.4**	**30.2**	**47.4**	**45.8**	**3.4**	**1.8**	**6.0**	**13.1**	**3.1**	—	**25.3**	**24.7**	**25.3**	—	**17.2**	—
	142	Sept.	7	2073	—	400	—	—	—	—	—	—	—	—	—	—	—	225	510	—	500	170	350	136
				68	—	**19.3**	—	—	—	—	—	—	—	—	—	—	—	**10.9**	**24.6**	—	**24.1**	**8.2**	**16.9**	**6.6**
N	58	Sept.	1	2000	—	420	820	94	455	560	920	899	55	40	115	245	60	240	515	505	520	205	305	130
				66	—	**21.0**	**41.0**	**4.7**	**22.8**	**28.0**	**46.0**	**45.0**	**2.8**	**2.0**	**5.8**	**12.3**	**3.0**	**12.0**	**25.8**	**25.3**	**26.0**	**10.3**	**17.5**	**6.5**