BAIRD'S BEAKED WHALES CAUGHT ON THE COAST OF JAPAN IN RECENT 10 YEARS

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ABSTRACT

It seems there has been no sign of decrease on the stock of Baird's beaked whale on the coast of Japan in recent years. This may be the result of reduction in number of catcher boats. The length distribution of the whales caught recently shows a good balance. That is, nearly 80% of the whales were sexually matured. A migrating population of this species appears at Boso Peninsula in May, reaches Hokkaido some time between July and August and comes back again to Kinkazan off shore in the fall and then leaves Japan. They are likely to prefer waters deeper than 1,000 m. On the Sanriku coast, the whales eat deepwater fish, but on the coast of Hokkaido, they eat nearly exclusively squid.

It can be presumed that the whales caught in the Abashiri area in May through June should be *Hyperoodon ampullatus*.

INTRODUCTION

There are few countries in which the whaling industry catches Baird's beaked whales as a harvest and utilize fresh or dried meat for human consumption, and oil extracted from blubber, bones and viscera are used as well as sperm whale oil.

Biological study has been done on Baird's beaked whales caught in the period of 1948–1952 by Omura *et al.* (1955). Present study was done on the whales caught in the period of 1960–1969. However, data were fewer in the early half period and considerable number in the latter half. Because of this unbalance, our consideration was done mainly on the data in the latter five years 1965–1969.

CATCH RECORDS AND ITS ANALYSIS

About 25 years ago, the smaller species whaling industry in Japan made much profit from harvests of minke, pilot and beaked whales. And number of catcher-boats gradually increased ; in the mean time, number of catch per boat become less and less. So the whalers competed each other by extra equipment which often was a 50 tons boat with 50 mm caliber guns. The result was a folly, they need extra catch to pay for such expences. It was not enough for them to catch only those previously permitted species from certain amount of populations migrating to the coast of Japan. They began to poach banned whales such as the sperm

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TABLE 1. NUMBER OF CATCHER-BOATS AND NUMBER OF BAIRD'S BEAKED WHALES CAUGHT IN JAPANESE WATERS IN 1948–1969

Years	Number of catcher-boats	Number of whales caught	Number of whales per catchers
1948	—	76	—
1949	—	95	—
1950	80	197	2.5
1951	68	242	3.6
1952	65	382	5.9
1953	58	270	4.7
1954	54	230	4.3
1955	47	258	5.5
1956	54	297	5.5
1957	46	186	4.0
1958	35	229	6.5
1959	32	186	5.8
1960	25	147	5.9
1961	23	133	5.8
1962	20	145	7.3
1963	19	160	8.4
1964	18	189	10.5
1965	16	172	10.8
1966	16	171	10.7
1967	15	107	7.1
1968	8	117	14.6
1969	7	134	19.1

TABLE 2. NUMBER OF BAIRD'S BEAKED WHALES CAUGHT IN JAPANESE WATERS IN 1965–1969.

Years	Sex	Areas I	II	III	IV	Total	Sex ratio
1965	Male	41	37	11	13	102	59.3
	Female	27	23	8	12	70	40.7
	Total	68	60	19	25	172	
1966	Male	62	33	6	5	106	62.0
	Female	23	21	11	10	65	38.0
	Total	85	54	17	15	171	
1967	Male	35	17	6	6	64	59.8
	Female	23	10	8	2	43	40.2
	Total	58	27	14	8	107	
1968	Male	36	15	5	1	57	48.7
	Female	44	12	4	0	60	51.3
	Total	80	27	9	1	117	
1969	Male	44	22	2	3	71	53.0
	Female	47	10	2	4	63	47.0
	Total	91	32	4	7	134	
Total	Male	218	124	30	28	400	57.1
	Female	164	76	33	28	301	42.9
	Total	382	200	63	56	701	
Sex ratio	Male	57.0	62.0	47.6	50.0	57.1	
	Female	42.9	38.0	52.4	50.0	42.9	

and the sei whales by those well equipped boats. The fact became a serious problem for the Fisheries Agency of the Government. To stop that devastating catch, the Agency recomended whalers to change their whaling objectives from the smaller whales to the larger ones. As a measure, they gave a certain quota equally to a group of ten 50 tons boats and a single 500 tons boat. In those days larger species whaling promised considerable interest, many whalers converted to the larger species whaling. The small boat, therefore, reduced in number and the catch per small boat was recovered accordingly.

As shown in Tables 1 and 2, the number of Baird's beaked whales caught was 30–40 thirty to forty years ago, and as many as 250–300 about twenty years ago, the peak of which was 382 in 1952. Then, unpleasant tendencies began to appear in the CPUE (catch per unit effort) by the influence of thoughtless catch. Number

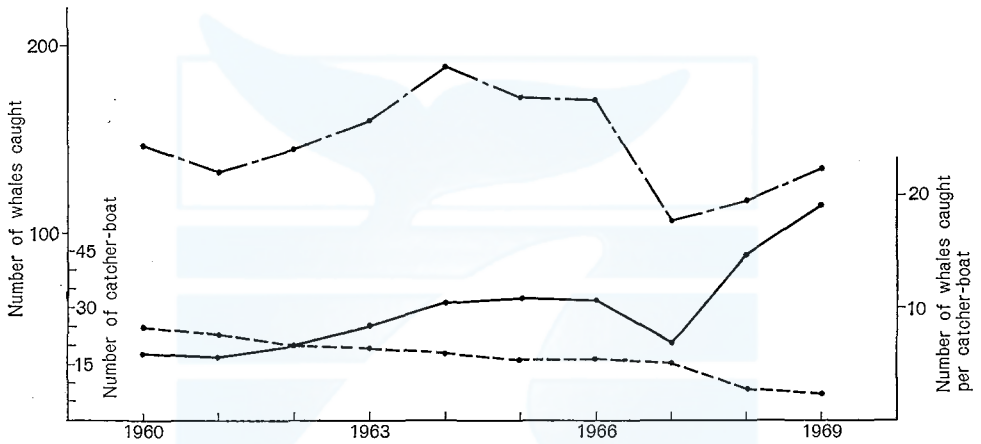

Fig. 1. Number of Baird's beaked whales caught and number of catcher-boats in Japanese waters according to the years.

of total catch also began to decrease. However, some recovery appeared in recent 10 years as 130–170. Analyzing these recent statistics, it may safe to say that the stock is somehow stabilized than ever. In Fig. 1, although the number of total catch in each year is vary, there is no tendency of decrease. And the number of catch per boat (CPUE) is still increasing as a result of the reduction.

There are two land stations in Area I, four in Area II and one in Areas III and IV respectively.

Distribution of positions of catch is shown in Fig. 2. To analyze conditions of the stock, the coastal waters was divided into some area as Omura *et al.* formerly did (1955). On the other hand, there is no catch in the coast of the Sea of Japan. It may because of that the smaller species whaling boat owners have given up the area.

In Area I whaling operation was done by the whalers from the stations in Boso Peninsula (Bosyu). Operation period of that area is appeared to be longest

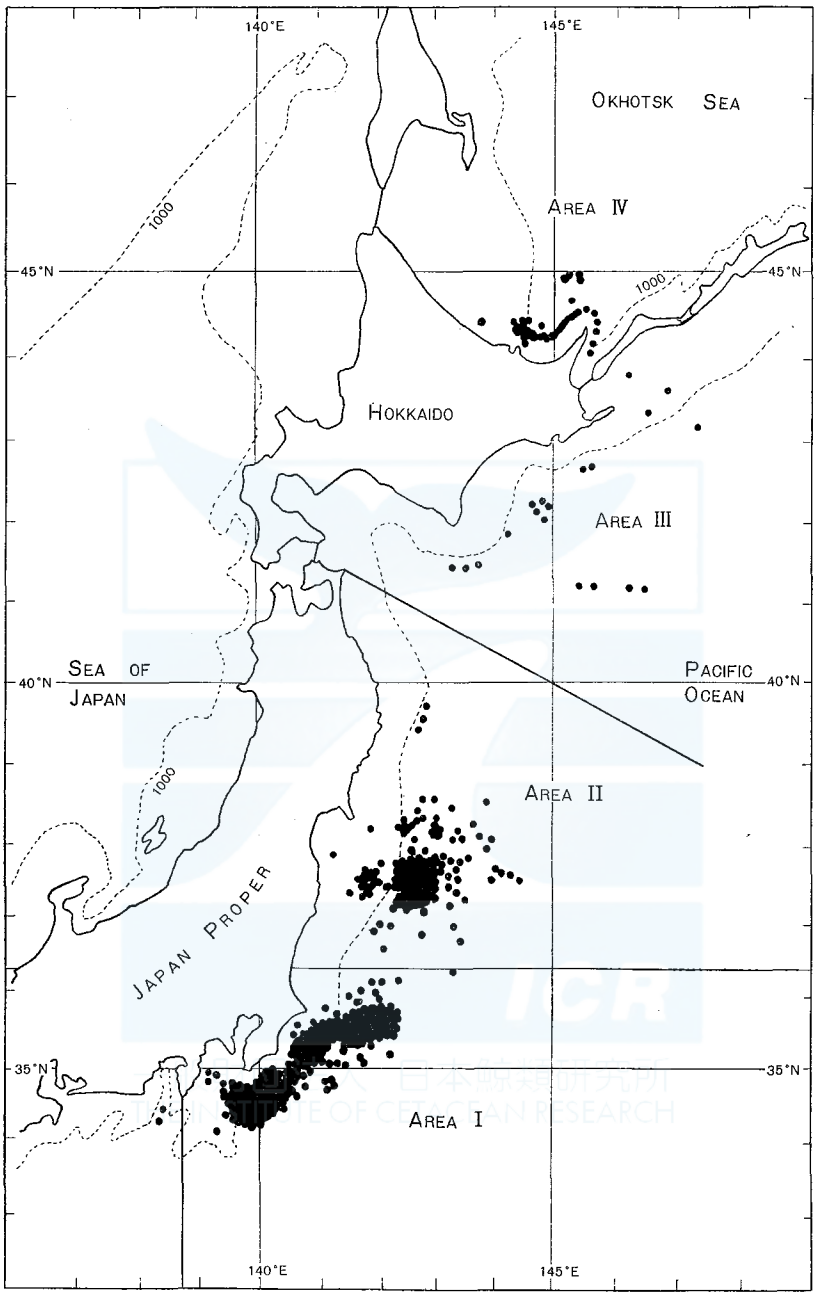

Fig. 2. Positions of Baird's beaked whales caught in Japanese waters in 1965–1969.

of all others, which is from May to Dec. Area II was of the whalers from the stations in Oshika Peninsula, Miyagi Pref. Although no catch is seen at Nemuro station in Area III by Omura *et al,* there are some catch records in recent years on the coast of Nemuro in the present map. The waters of Hokkaido is divided into two, the Pacific coast as Area III and the Okhotsk coast as Area IV, by the line between Kunashiri and Etolov Island. As shown in Table 3 and Fig. 3, catch appeared in Area I and II in May first. Male is superior in total number as about 57%.

TABLE 3. MONTHLY CATCH OF BAIRD'S BEAKED WHALES IN JAPANESE WATERS BY THE AREA, IN 1965–1969.

Months	Sex	Areas I	II	III	IV	Total
May	Male	3	0	—	—	3
	Female	2	2	—	—	4
	Total	5	2	—	—	7
June	Male	32	4	—	0	36
	Female	20	0	—	1	21
	Total	52	4	—	1	57
July	Male	46	5	—	0	51
	Female	55	0	—	1	56
	Total	101	5	—	1	107
August	Male	65	37	3	2	107
	Female	49	13	2	0	64
	Total	114	50	5	2	171
September	Male	34	33	16	8	91
	Female	20	30	22	7	79
	Total	54	63	38	15	170
October	Male	23	20	9	14	66
	Female	11	11	7	14	43
	Total	34	31	16	28	109
November	Male	12	21	2	4	39
	Female	7	13	2	5	27
	Total	19	34	4	9	66
December	Male	3	5	—	—	8
	Female	0	6	—	—	6
	Total	3	11	—	—	14
Total	Male	218	124	30	28	400
	Female	164	76	33	28	301
	Total	382	200	63	56	701

Females seem to migrate to those areas earier than males do, number of males incleases after July.

Distance between the positions of catch and the land stations is shown in Table 4: 50% of catch are within 1–30 miles. This may partly because of that whaling boats are so small that they have to be towing whales to a station within a day. Even the most distant catches Area about 120 miles from a land station and the distant catches are scarce. The distance of most abundant catches are 1–30 miles in Area IV, 91–120 miles in Area III, 61–90 miles in Area II and 1–30

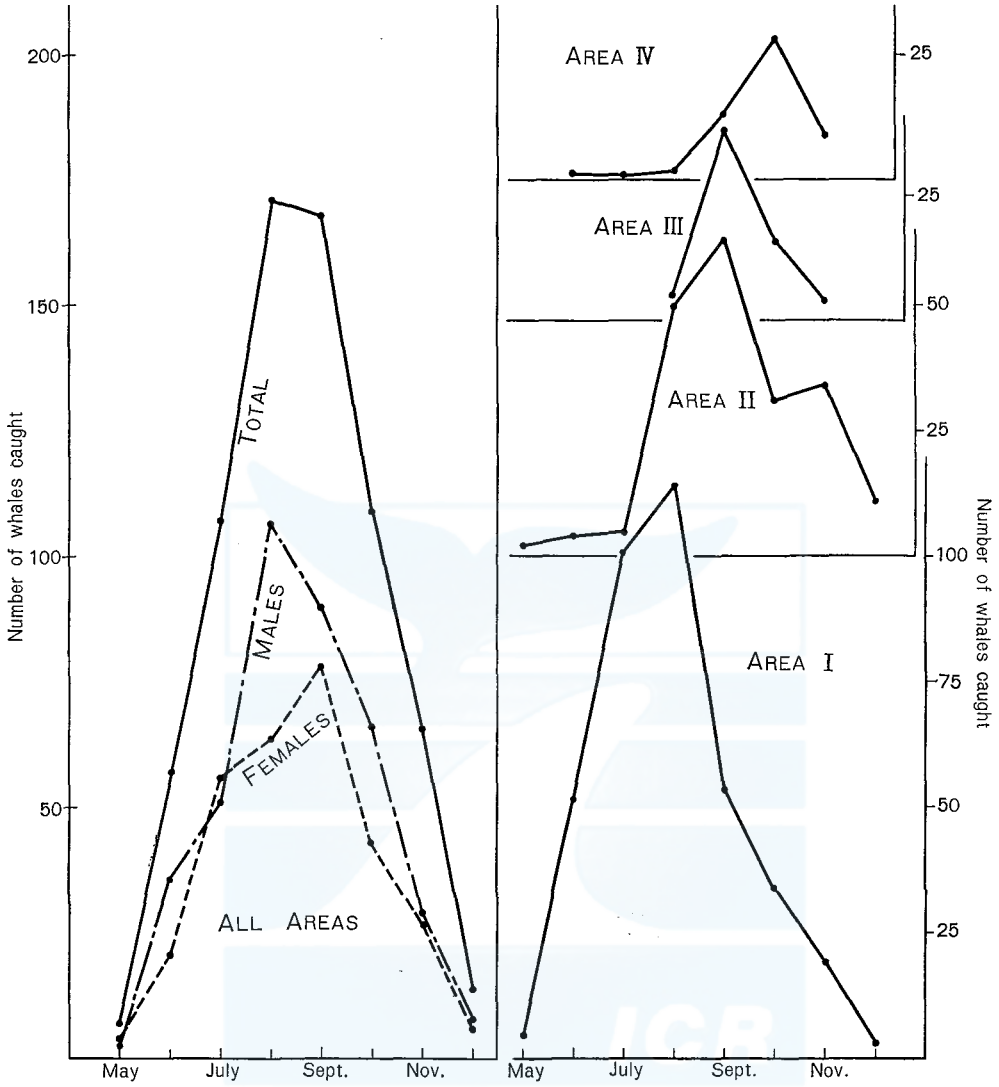

Fig. 3. Number of Baird's beaked whales caught by the area and months in 1965–1969.

TABLE 4. DISTANCE BETWEEN LAND STATIONS AND THE POSITIONS OF BAIRD'S BEAKED WHALES CAUGHT IN JAPANESE WATERS IN 1965–1969.

Distance in miles	Areas I	II	III	IV	Total	Percentage
1–30	295	10	5	42	352	50.2%
31–60	81	62	5	2	154	22.0
61–90	2	107	—	—	109	15.5
91–120	—	15	44	—	59	8.4
120<	—	6	—	—	6	0.9
unknown	4	—	5	12	21	3.0
Total	382	200	63	56	701	

miles in Area I. If the distance of abandant catch and the water depth of the positions are put into a map together as in Fig. 2, positions of catch are abandant in the waters deeper than 1,000 m. On the Abashiri and Boso coasts where the 1,000 m depth contour line is close to the shore, positions of catch are appeared to be near to the shore. Whereas on the Kushiro and Kinkazan coasts where the contour line is far from the shore, the positions of catch are at distance.

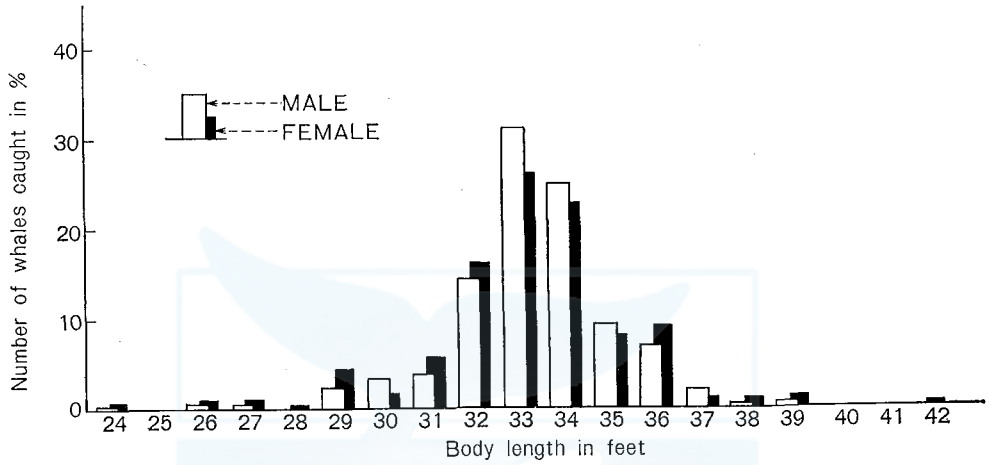

Fig. 4. Size distribution of Baird's beaked whales caught in Japanese waters in 1965–1969.

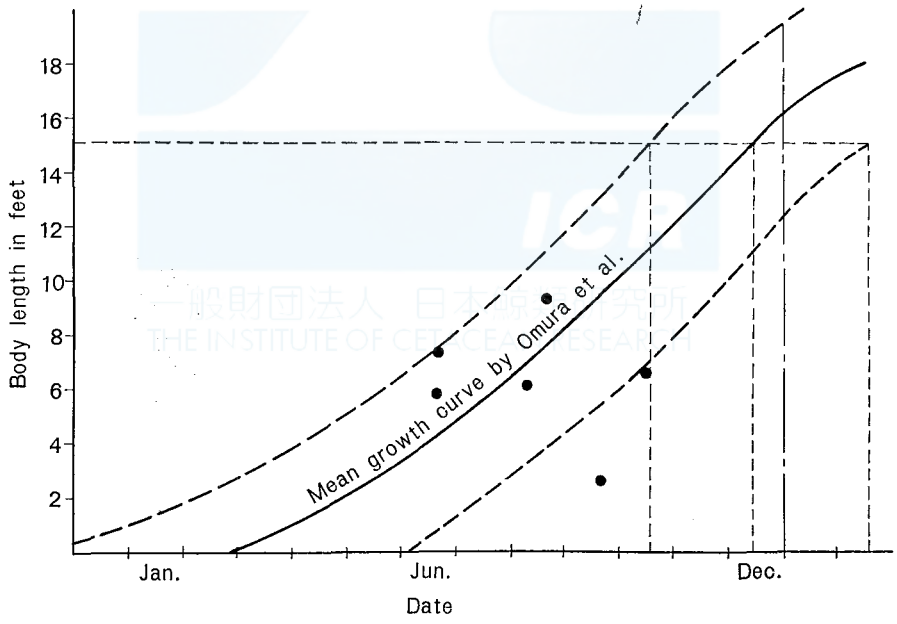

Fig. 5. Recorded foetuses of Baird's beaked whals by the date in 1965–1969.

DISTRIBUTION OF BODY LENGTH

Distribution of body length of the whales caught is shown in Fig. 4. The smallest length of both sexes are appeared to be equal as 24 feet and the largest length of those are 39 feet in male and 42 feet in female. Many individuals are seen within the range of 33–34 feet. Roughly, larger lengths are of females. According to Omura *et al.*, the Baird's beaked whale attains sexual maturity at the length within 32–33 feet by males and 33–34 feet by females. Considered on this condition, it can be said that 80% of males and 70% of females among all the whales caught are matured.

RECORD OF FOETUSES

Records of foetuses found in the present study are shown in Fig. 5. Six in the season from June to Oct.: in Area I, two in June, two in Aug., one in Sept. and in Area IV, one in Oct. As the records are so scarce, that they are shown in the additional points on the growth curve drawn by Omura *et al* (1955).

FOOD

701 stomachs were examined; 55% of all, namely 383 stomachs contained food remains and 30% are empty ones. 15% are the stomachs without description because abdomens of whales are cut open immediately after catch to prevent them

TABLE 5. STOMACH CONTENTS OF BAIRD'S BEAKED WHALES CAUGHT IN JAPANESE WATERS IN 1965–1969.

kinds of stomach contents	number of whales	percentage
deep-sea fish	156	40.7
squid	111	28.9
mackerel	15	3.9
sardine	5	1.3
flat fish	1	—
pollack	1	—
saury	1	—
unidentified	93	24.2

from decomposition, so, the contents are washed away. There were various kinds of food remained in the stomachs as shown in Fig. 5. Most are deep-water fish and squid. There are 24% of unidentified species of food because they have already been digested.

Distribution of food by area is shown in Fig. 6. Squid is found mostly in Areas IV and III, squid and deep water fish are in Area II and deep-water fish is in the waters south of Area III. Occurrence of squid and deep-water fish is shown in Table 6 by month. Squid is frequent in Area IV from Aug. to Nov., also in Area III from Aug. to Nov. Naturally, in Areas III and IV, fishing season of squid

begins in July. The whales which had squid in their stomach and caught in Area II, are supposed to have been migrating from north. In Area II, there are records of mackerel and sardine as well as squid and deep-water fish. Whales

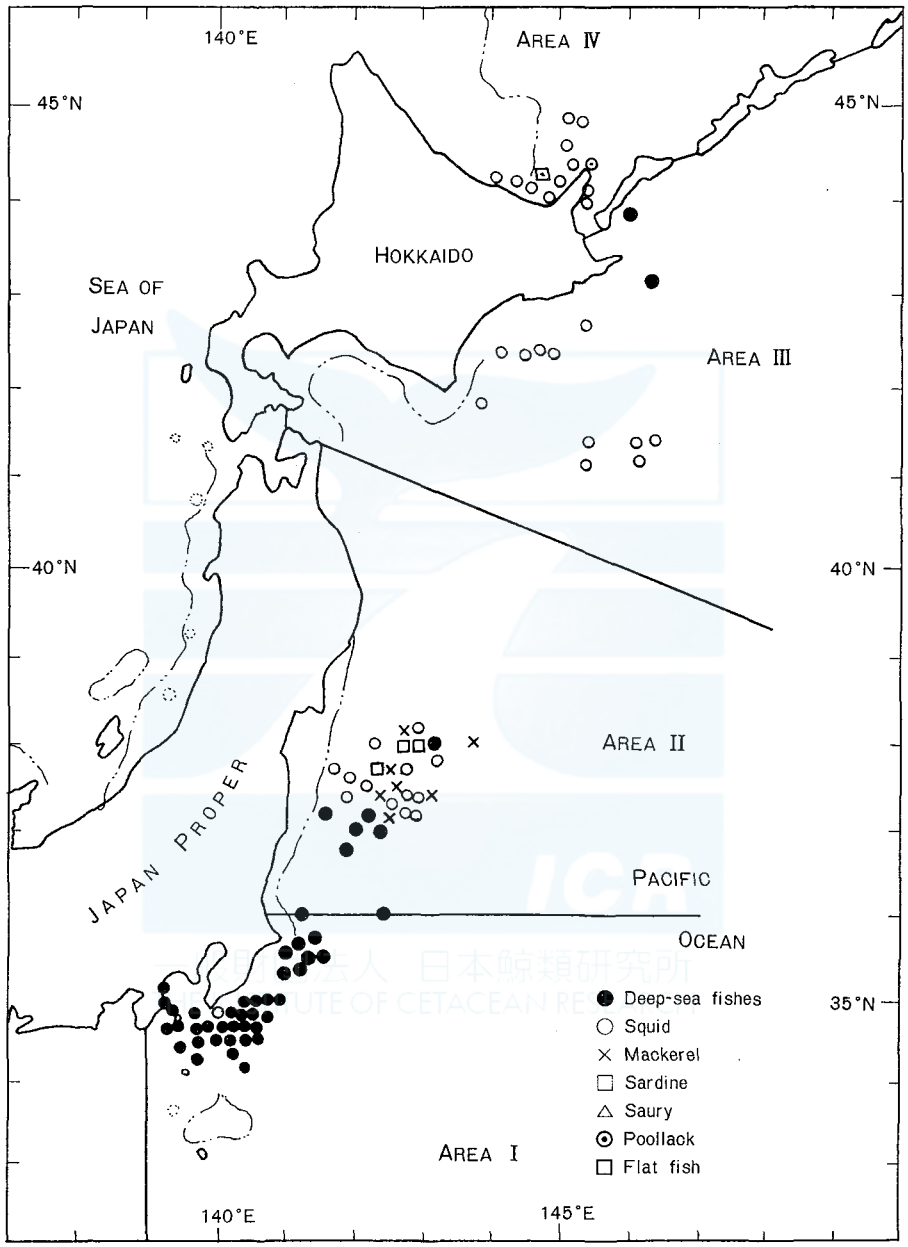

Fig. 6. Position of Baird's beaked whales caught with stomach contents in Japanese waters in 1965–1969.

seem to eat common species of the areas without intentional choice. Species of deep-water fish and its fishing season could not be investigated, however, it seems that it is likely to be abundant at Boso off shore. Records of deep-water fish appear in Area I first and to Areas II and III as time passing by. Whales of the present population seem to migrate north in spring living on deep-water fish and then coming back south doing on squid.

TABLE 6. NUMBER OF STOMACHS OF BAIRD'S BEAKED WHALES CAUGHT IN JAPANESE WATERS WITH CONTENTS OF SQUID OR DEEP-SEA FISH, BY THE AREA AND THE MONTH, IN 1965–1969.

	Areas							
	I		II		III		IV	
Food	squid	deep-sea fish	squid	deep-sea fish	squid	deep-sea fish	squid	deep-sea fish
May		5						
June		14						
July	1	25		2				
August		41	10	3	3	2	2	
September		25	9	3	25	4	12	
October		3						
November		18	1	2	13		24	
December		7		1	4		8	

SUMMARY

1. Whaling of the Baird's beaked whale in recent years indicates an agreeable number of catch from the stock as about 150 whales annually, which is a certain decrease from the number of 250–300 about-twenty years ago. On the other hand, number of whales caught per catcher-boat has increased because of reduction of the boats in number.

2. Length distribution of whales caught shows a good balance: nearly 80% of the whales attained at sexual maturity and the male is superior in number. So that it may safe to say that the stock is well protected.

3. The largest body length investigated was 39 feet of male and was 42 feet of female in the present study.

4. The positions of whales caught are mainly in the waters deeper than 1,000 m. It seems that the whales do not migrate to the shallow waters. In the whaling season, the whales are found at Boso first and migrate to Kushiro through Kinkazan in the season from July to Oct., then they come back to Kinkazan from Aug. to Oct.

5. The whaling commences in Abashiri sometime in May or June, this is simultaneous with that of Boso. Considering the fact, Abashiri population is supposed to be different from that of Boso. Abashiri population is considered to be as *Hyperoodon ampullatus*. Further study is required.

ACKNOWLEDGEMENT

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EXPLANATION OF PLATES

Bird's-eye view of Baird's beaked whales swimming in the waters off Sanriku coast taken by Mr. S. Takashima of the Suisan Koku Co. (Fishery Aviation Co.): Copyright of these photographs is reserved by the company.

PLATE I

	Date	July 26, 1956
	Position	35°–50′N
		141°–20′E

PLATE II

upper figure	Date	July 22, 1970
	Position	38°–45′N
		143°–20′E
lower figure	Date	Sept. 12, 1961
	Position	39°–50′N
		143°–50′E

The others were taken at the same area by and presented in *The Scientific Reports of the Whales Research Institute*, No. 23 (1971) by T. Kasuya.