HUMAN ACTIVITIES DISTURBING NATURAL MIGRATION ROUTES OF WHALES*

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ABSTRACT

Trying to prove human activities which disturbed natural migration routes of whales, two populations of whales were investigated.

In Tokyo Bay area, annual catch numbers of the Baird's beaked whale (*Berardius bairdii*) in Boso whaling ground are between 50–300. Although the whales have shown no sign of average body length decrease, (Nishiwaki and Oguro 1971), apparent decrease of whales caught inspite of increasing Catch Per Unit Effort makes us no other way, accept the fact that the maritime transportation disturbed the migration routes of whales of this stock.

Same is true in the northern coast of Kyushyu. Reason of catch decrine in the present investigation can not be considered as damage to the minke whale (*Balaenoptera acutorostrata*) stock caused by whaling. Catch Per Unit Effort is, as a whole, in an up surging, but the number of whales caught is decreasing without average body length decrease.

Great number of vessels are coming into and going out of the both areas and the number is still increasing. Not only those whales, but also various species of marine mammals may be troubled by the busy traffic. The result of this investigation would be a warning to the countless activities by men, which disturb or expel wild animals from their natural inhabiting ground and migration routes everywhere in our environment.

INTRODUCTION

Handreds of years ago, when human population was moderate and people did not try to catch whales, many species of big whales which by nature favored to breed in temperate or warmer waters, may have entered into lagoons and inlets of Japan. Evidences of half fossilized whale skeletons have been found at many places along the coast of the Inland Sea, in the western Kyushyu Island and even on the coast of Tokyo Bay. At present, however, there are very few sighting reports of big

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whales in those areas.

In 1969, a stray calf of the bowhead whale came into Osaka Bay and was accidentally caught by local fishermen (Nishiwaki and Kasuya 1970). The incident was a proof of the natural preference of this species which had favored the temperate waters of the Inland Sea.

At Scammon's Lagoon, Baja California, gray whales had come abundantly to breed in former days. However, when the rumour of this phenomenon spread among people, not only scientists but also a large number of general people gathered to see the whales. Disturbed by the sightseers, it was reported, that the number of whales coming to the lagoon had apparently decreased. The incident was one of disturbances, not by whaling activities, but by another human action affected the whales.

Trying to prove human activities which disturbed natural migration routes of whales, we investigated the two populations of whales, the Baird's beaked whale (*Berardius bairdii*) in Boso whaling ground and the minke whale (*Balaenoptera acutorostrata*) in Yobiko whaling ground, both of which did not receive a serious damage by whaling, but affected by the increasing number of ships and boats coming in and out or passing near by the whaling grounds (there are very few whale population which have received no harm from whaling).

INFLUENCES OF VESSELS OVER THE BAIRD'S BEAKED WHALES IN BOSO WHALING GROUND

Baird's beaked whale catch has been operated from land stations in certain limited areas of Japan. One of such whaling grounds is Boso ground in Chiba Pref. The ground is only 20 miles distant from the mouth of Tokyo Bay. Coast of Tokyo Bay is dotted with commercial, naval and fisheries' ports. As shown in Fig. 1, there

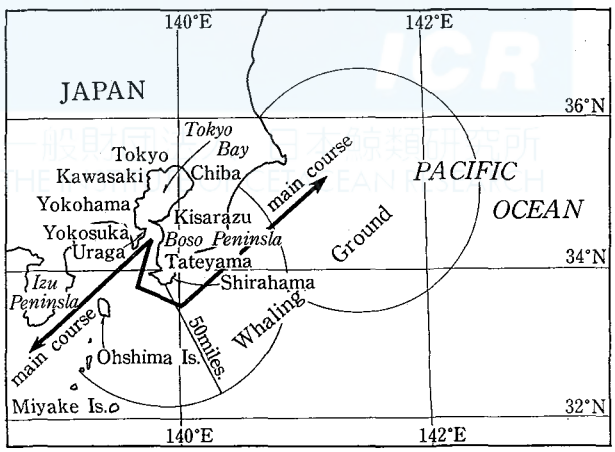

Fig. 1. Boso whaling ground and the main course of vessels in and out of Tokyo Bay.

TABLE 1. ANNUAL NUMBER OF VESSELS ENTERED THE PORTS

Year	Tokyo Bay Area				Northern coast of Kyushyu			
	Tokyo	Yokohama	Yokosuka	Chiba	Dokai Area	Kokura	Moji	Shimonoseki
1948	11941	—	—	—	41756	15330	17738	5199
1949	11301	5870	3521	—	37132	14108	34839	11478
1950	13797	12507	1768	—	58467	12849	33884	90886
1951	13913	14723	3228	—	47441	30427	13156	113332
1952	12625	16262	3806	—	42926	29211	40612	90239
1953	13957	21093	6220	—	49788	28211	47807	96694
1954	15038	20009	7182	—	72641	28192	44655	100046
1955	15116	17118	8337	—	10391	18858	43447	56812
1956	12066	22953	8101	3744	72450	29398	27857	42382
1957	20649	26737	9156	6306	75743	27165	27564	47460
1958	22813	28384	10063	4155	63310	27394	43600	80323
1959	27360	30573	12408	6708	65657	29265	42820	77185
1960	31776	37120	14690	9479	70136	28117	45100	78151
1961	32767	45121	16085	11198	71648	28354	77778	75664
1962	31358	45644	16206	9942	69944	29952	66141	77257
1963	33936	50649	16114	18513	67224	28792	65720	77317
1964	45886	60078	16223	31237	76418	30013	62430	75909
1965	53381	71087	19136	32241	76544	26424	55807	74237
1966	57356	76039	24719	33500	68172	23450	65530	72665
1967	64502	88238	27880	39480	64064	25034	84363	71059
1968	68894	99691	26404	35336	58037	25994	62448	73913
1969	70158	106721	24556	60065				65317
1970	78816	108427	27549	73713				64124
1971	76586	104742	28243	72098				65993
1972	79763	101537	28632	77347				71576
1973	81689	102946	26225	87185				69319
1974	72222	93987	27673	80827				66845

are Tokyo, Kawasaki, Yokohama, Yokosuka, Chiba, Kisarazu, Uraga and Kurihama Ports. Various ships and boats which are coming into those ports, must enter the mouth of Tokyo Bay. A list of a great number of vessels of over 5 tons is shown by the year in Table 1. Moreover, all boats which once enter into the Bay, must inevitably go out. So, the number of boats must be considered as twice as much to become an amazingly big number. Although it was difficult to get data from every port of Tokyo Bay area, general circumstances of maritime transportation around the Bay might be understood with this table. Actual number of the boats was, of course, much more than the indicated number. In the year when 100 whales were caught, the number of boats coming into Tokyo Bay was about 250,000. That is, one boat per minute was passing through the mouth of the Bay.

In Fig. 2, annual number of vessels entered into Tokyo Bay is compared with that of Baird's beaked whales caught at Boso whaling ground since 1948 till 1974. These numbers are averages of every three years. This method makes the curves smoother and the curves show the tendencies more clearly.

As it is also indicated in Fig. 2, CPUE (Catch Per Unit Effort) has been increasing in the years. The reason of the remarkable increase of CPUE between

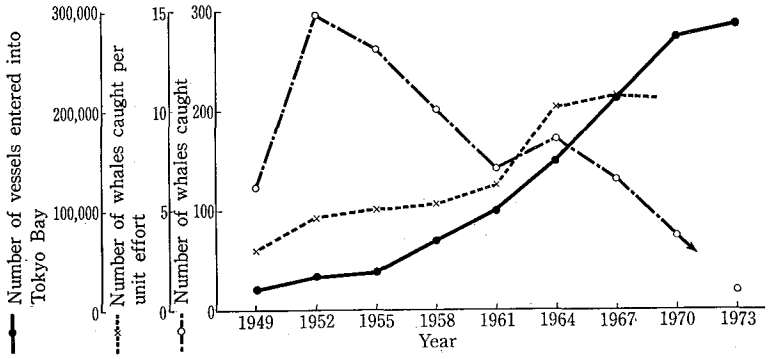

Fig. 2. Annual number of vessels entered into Tokyo Bay compared with that of Baird's beaked whales caught from Boso whaling ground.

1961 and 1964 was that, small tonnaged (15–20 tons) catchers were abolished and bigger (30–50 tons) catchers were taken up for operation. Accordingly, number of catchers decreased, instead, capability per boat increased. Nevertheless, the population seems to have shown no sign of receiving damages during the 25 years, although biological examination on those whales caught has not been done every years. Annual catch numbers are between 50–300. The numbers are rather small, but the whales have shown no sign of average body length decrease (Nishiwaki and Oguro 1971). Considered the increasing CPUE and apparent decrease of whales caught without population damage, we have no other way, accept this phenomenon as a fact that the maritime transportations have disturbed the migration routes of the Baird's beaked whale.

MINKE WHALES IN YOBIKO WHALING GROUND AND MARITIME TRAFFIC ON THE NORTHERN COAST OF KYUSHYU

In the northern part of Kyushyu Island, local people have had a habit of eating whale meat since more than four hundred years ago. Among the species of whales coming near to the coast, minke whales are relatively fearless and even coming into set net to be an easy harvest for fishermen. The meat of minke whale was a very important protein resources at the time of devastation just after World War II: minke whale meat was a necessary food in northern Kyushyu and consumed abundantly. Whaling on minke whale is usually done by small boats of 15–20 tons with 35–50 mm harpoon guns. The whaling ground is naturally limited within 30 miles from the shore (Fig. 3).

Fortunately, the record of the body length of minke whales caught in this area since 1948 has been kept to date, and was very important reference to our investigation. It was very difficult to grasp a number of vessels coming in and out of all the ports in Northern Kyushyu. As main transportations of this area, number of vessels coming into Dokai district (Yahata, Wakamatsu and Tobata), Kokura, Moji and Shimonoseki Ports, were investigated. Fig. 4 shows a relation between

Fig. 3. Yobiko whaling ground and ports of Northern Kyushyu on the coast of Korean Strait.

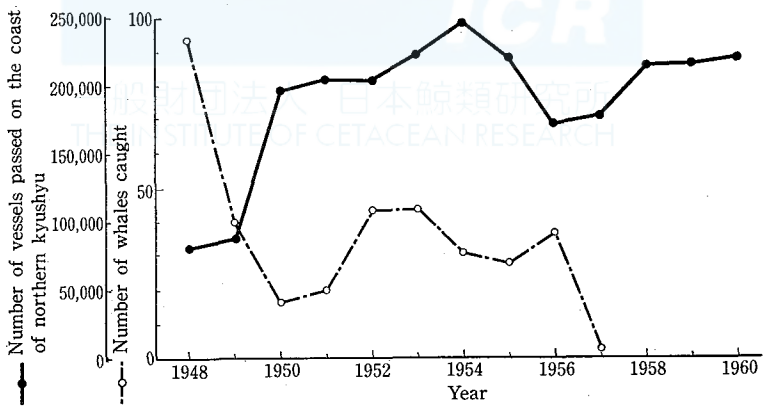

Fig. 4. Relation between the incresing number of vessels and that of the decreasing whales caught in Yobiko whaling ground since 1948 till 1957.

the increasing number of vessels and the decreasing number of minke whales caught in Yobiko whaling ground. Similar number to that in Tokyo Bay, 250,000 vessels came to those ports in the most prosperous years. In Fig. 4, actual numbers of whales caught are used, not averages of every three years. So, the curves are not so smooth as those in Fig. 2, but the tendency of traffic and catch number might be recognized.

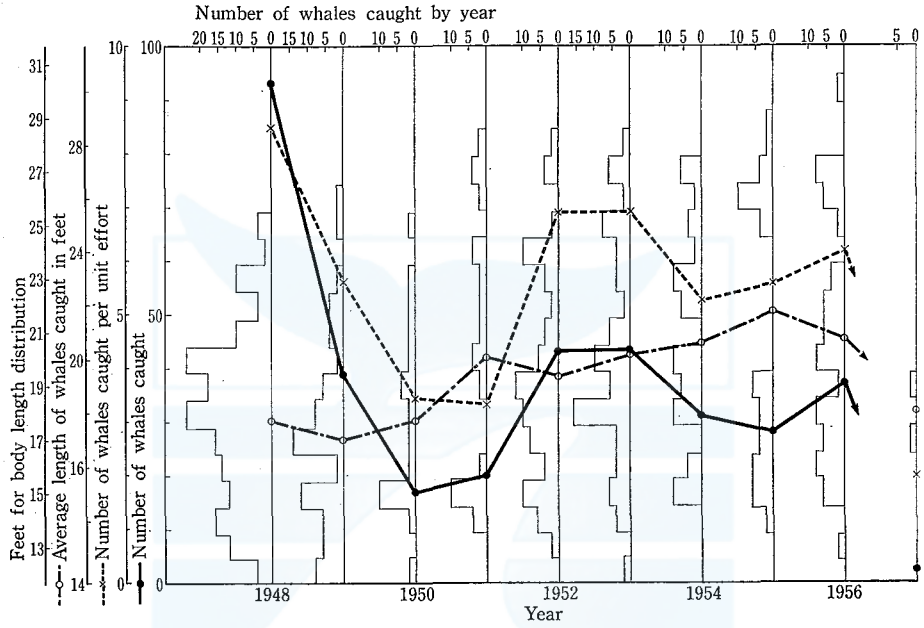

Fig. 5. Annual number of whales caught, its body length distribution and average body length with CPUE in Yobiko landstation during the period 1948–1957.

We would like to discuss at this point whether that decline of catch in Yobiko was caused by whaling damage on the minke whale stock. Fig. 5 shows the annual size distribution, average body length and number of whales caught with CPUE since 1948 till 1957. The data of whales caught were exclusively body length without physiological records such as maturity or pregnancy. The number of whales caught were rather small in most years, especially in 1957. Very little can be presumed only from size distribution of each year. However, if the size distribution of all whales caught during the ten years period is observed collectively, whales can be divided into groups. Each peaks of size distribution appears at the body lengths 15, 18–20 and 23–24 feet respectively. These peaks are considered to be groups of yearings, the one to two years old and the older than three years. At that time, minke whale whaling in Japan was not restricted by regulations. So, females and calves were caught together. But in later years of the period, number of yearings became smaller: disturbed frequently by increasing maritime transportations, mothers with calves must have detoured the coast of

northern Kyushyu.

Record in 1947 is unknown. In 1948, 93 individuals were caught. Then Korean War broke out in 1950. Number of vessels coming to Northern Kyushyu in 1950 was triple times as much as the number in 1949. The least catch in 1950 was not because exclusively of disturbing maritime traffic, but also of various industrial reasons, including munitional boom. In other words, wages from such industries became more profittable than those from whaling, so whalers switched to other employments in those years. Conditions were similar in 1951 and 1952. In 1953, the war stopped and the munitional boom gradually ceased. However, number of vessels showed little decrease. Whalers of the ground saw unstable status of their whaling desperately and wanted to move to some other district. One catcher boat moved to Ushizu, Ishikawa Pref. in 1950 and caught five minke whales (average body length of them was 20 feet), then other two followed in 1951 and caught 25 individuals (average body length of them was 23.3 feet). In 1956, one whaling boat of Yobiko made an expedition to southern islands of Kyushyu as far as Naze, Amami-Oshima and caught 19 individuals (average body length of them was 25.0 feet). Finally whalers of Yobiko whaling ground gave up the entire ground and all except one moved to the far northern district, Wakasa Bay, Fukui Pref. And though remained one worked, caught only two individuals in the following year. Then Yobiko whaling was ceased at all.

TABLE 2. ANNUAL NUMBER OF CATCHER-BOATS, WHALES CAUGHT WITH AVERAGE BODY LENGTH AND CPUE IN YOBIKO WHALING GROUND

Year	1948	1949	1950	1951	1952	1953	1954	1955	1956	1957
Number of catchers	10	7	5	5	6	6	6	5	6	1
Number of whales caught	93	39	17	20	43	43	31	28	37	2
Average body length in feet	17.8	17.0	17.7	20.0	19.3	20.1	20.5	21.7	20.7	18.0
CPUE	8.5	5.6	3.4	4.0	7.2	7.2	5.2	5.6	6.2	2.0

Again, reason of the catch decline can not be considered as damages caused by whaling to the whale stock. As it can be understood from Fig. 5, though CPUE has been flactuated by the years, as a whole, it was in an up surging, but average body length of the population showed no sign of decrease, or even showed increase. We would like to introduce here a letter from Mr. S. L. Bowen addressed to the senior auther written on 18th April, 1972. He was then an army soldier dispatched to Korea. He had had interest in the gray whale and its status and conditions. He told Nishiwaki that in 1970, total number of whales caught from the whaling ground adjacent to Ulsan was 740, among them, 715 were minke whales. It may be safe to presume that the stock of minke whales there was identical population to the Yobiko stock. Distance between the two grounds is little more than 100 miles. If the number which Mr. Bowen indicated, is right, cause of Yobiko whaling decline (they caught, at most, 100 a year since 1948 till 1957) was not by damages on the minke whale stock by whaling activities. At present, minke whale whaling can not be operated in the Yobiko whaling ground, eastern

channel of the Korean Strait, but is still prosperous in the Ulsan whaling ground, the western channel of the Korean Strait. Considered the experience in Yobiko whaling ground, one can hardly deny influences of maritime traffic to the minke whales. As great number of vessels which belonged or connected to the Northern Kyushyu Industrial Zone, in which Moji, Tobata, Yahata, Karatsu, Sasebo and Nagasaki, biggest ports of Japan, are included, are coming in and going out and the number is still increasing, various other species of marine mammals may be troubled similarly by the busy traffic.

CONCLUSION

Naturally, there might have been other additional factors of influences which affected the whale populations to some extent. But, at least, result of the present investigation shows apparent disturbances by ships and boats to the migration routes of Baird's beaked whales in Boso whaling ground and minke whales in Yobiko whaling ground.

The result of this investigation would be a warning to the countless activities by men, which disturb or expel wild animals from natural inhabiting grounds and migration routes everywhere in our environment. As well as aerial and land transportations, maritime traffic is another environmental problem. Damages by whaling has been so controvercial in recent years, but those by maritime traffic tends to be overlooked. From the view point of ecosystem, maritime influences to animals are not small, but little countermeasures to those have been taken up till now.

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