

Historical catch amount of blue shark caught by the Japanese coastal fisheries

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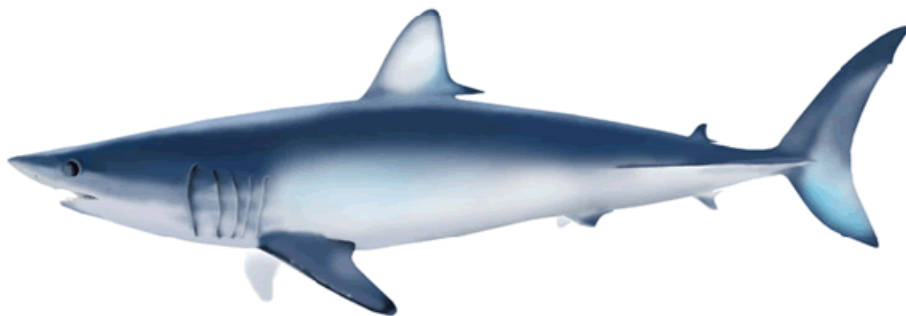
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Abstract

This document provided the estimation of historical catch of blue shark by coastal fisheries since 1951. The most of Japanese shark catch data were reported by species aggregated form as "Sharks", thus the ratio of the catch of blue shark among those of sharks by fishing gear were calculated using available species specific landing data, and used to estimate the catch of blue shark. The estimated catches for the coastal longline were varied between 200 and 1800 tons, while the catches for other longline were between 70 and 750 tons. The estimated catches for the other fisheries were substantially smaller than longline catches, and were below 60 tons. Although the catch was tentatively estimated in this document, the detailed species compositions of catch of sharks for coastal fisheries were still limited. This indicates the necessity of further investigations, and also should be considered at the conduction of stock assessment.

Introduction

Blue shark historically have been caught by several coastal fisheries; Japanese coastal longline, other longline, squid drift net, drift net, bait fishing, trap net, and others-primarily harpoon. The catch amount was compiled by Japanese year books since 1951, however the most of Japanese shark catch data were reported by species aggregated form as "Sharks". This document estimated and provided Japanese historical catch data of blue shark caught by the coastal fisheries, except drift net, because the ISC Shark Working Group has decided to conduct the stock assessment of this stock.

Materials and Methods

Four types of data were used for the estimation of historical Japanese catch amount of blue shark by coastal fisheries. Historical Japanese catch amount in metric ton by several coastal gears was obtained from Japanese year books, which have been compiled by Japan Fishery Agency since 1951. Although the catch amount by fishing gear by main shark species: blue shark, spiny dogfish, salmon shark, and other sharks, were available from 1951 and 1967, they have totalized into one category of "sharks" afterwards. The estimated historical catch of spiny dogfish by gear obtained by the statistics of prefecture were also used (Yano pers. comm.). The catch amount by gear by species collected at several major fishing ports by the Research Project on Japanese bluefin tuna (RJB) since 2005 were also used for the analysis. Besides, the log book of Japanese coastal longliners (defined as the longliners less than 20 tons) since 1994 were also used.

Because spiny dogfish occupies the major part of the "non-pelagic sharks", we assumed the difference between the species aggregated shark catch by Japanese year book and estimated annual catch of spiny dogfish was the catch of "pelagic sharks". The calculated catch of "pelagic sharks" was multiplied by the

ratio of the catch of blue shark among pelagic sharks to obtain only catch of blue shark. The ratio was estimated by each fishery: the coastal longline, other longline, bait fishing, trap net, and others-primarily harpoon.

For the coastal and other longline, the ratios of the catch of blue shark among pelagic sharks in the period between 1994 and 2010 were calculated from the log book of Japanese coastal longliners, because the RJB data did not include enough information of these fisheries. The log book contains the catch data of blue shark, shortfin mako, salmon shark, and other sharks. For the ratio before 1993, the average ratio between 1994 and 1996 were applied to estimate the catch of blue shark.

For the other fisheries, the ratios between 1968 and 1979 were assumed to be equal to the average ratio between 1965 and 1967 by the year books. The dividing year 1979 was tentatively arbitrary chosen. For the ratio after 1980, the average ratio obtained from the RJB data between 2005 and 2010 were applied. However the RJB data did not contain the information for bait fishing, the same ratio before 1979 were applied to the ratio after 1980 for this fishery.

Results and Discussion

The catches of totalized sharks since 1968 were summarized in Figure 1. The catch of sharks from the year books were 3500 tons on average, and mainly consisted of coastal and other longline. The estimated catch of spiny dogfish were mostly less than 800 tons, and mainly consisted of other longline (Yano pers. comm.).

Figure 2 shows the ratio of the catch of blue shark among the pelagic sharks by year and by gear. The ratios for the coastal and other longline in the recent 5 years were high values, and showed that the catch of sharks consisted mainly of blue shark by this fishery. The ratio between 1994 and 2004 varied from 0.1 to 0.5, and the 3 year average ratio applied before 1993 were about 0.3. For the other fisheries, the ratios in the 1960s and 1970s were small (less than 0.05). The ratio for the net fishing since 1980 was 0.1, and 0.55 was for trap net.

The reported and estimated catches (in metric tons) of blue shark by coastal fisheries were shown in Table 1, Figure 3. Using the ratio shown in Figure 2, the blue shark catches by coastal fisheries were estimated in the period between 1968 and 2010. The catch record in the year books for the coastal longline started in 1969. The catches before 2004 were varied between 200 and 900 tons, and the average catch was about 600 tons. The catches since 2005 were larger than previous years because of the high ratio (Figure 2), and its average was about 1500 tons.

The catches for other longline before 1968 in the year books were fluctuated between 70 and 750 tons. The estimated catches before 2004 were varied between 100 and 450 tons, and its average was about 300 tons. The catches since 2005 were also larger than those before 2004, and the average catch was about 650

tons.

The estimated catches for the other fisheries were substantially smaller than longline catches. Most of the catches by bait fishing and trap net were below 20 tons, while the catch by others-primarily harpoon was below 60 tons.

In this document, the catch of blue shark by coastal fisheries were tentatively estimated. Because the detailed species compositions of catch of sharks for coastal fisheries were still limited and simple catch ratios of blue shark were used for the estimation of most of the fishery, thus it was suggested that further investigations would be needed for the stock assessment.

Table 1. The reported (1951- 1968) and estimated (1968-2010) catches (in metric tons) of blue shark by coastal fisheries, 1951- 2010. Dash (“-”) indicates data not available. Zero (“0”) indicates a catch of less than 1 metric ton.

	Coastal longline	Other longline	Bait fishing	Trap net	Other
1951	-	585	11	0	41
1952	-	765	8	0	53
1953	-	109	4	0	30
1954	-	94	0	4	49
1955	-	86	49	4	23
1956	-	158	11	0	19
1957	-	188	0	0	38
1958	-	291	3	3	62
1959	-	357	2	3	14
1960	-	118	1	0	37
1961	-	160	1	2	25
1962	-	69	1	0	35
1963	-	100	0	2	37
1964	-	201	0	0	1
1965	-	574	1	0	3
1966	-	234	4	0	5
1967	-	515	17	1	1
1968	-	644	9	0	3
1969	609	256	9	0	2
1970	520	303	8	0	1
1971	532	226	6	0	4
1972	578	366	7	1	3
1973	667	216	3	0	0
1974	684	353	7	0	1
1975	384	357	7	0	0
1976	759	450	3	0	1
1977	673	298	4	0	1
1978	904	257	9	0	1
1979	822	330	6	0	0
1980	650	324	4	20	15
1981	649	344	4	5	11
1982	497	274	8	17	25
1983	217	272	5	11	44
1984	678	295	29	5	36
1985	732	300	5	8	29
1986	614	328	6	9	19
1987	668	292	9	13	8
1988	614	239	7	9	22
1989	541	225	5	12	38
1990	533	270	4	7	28
1991	487	310	10	10	27
1992	499	349	14	9	15
1993	526	270	4	12	10
1994	767	419	4	9	34
1995	502	381	4	7	19
1996	387	221	4	7	33
1997	238	117	6	9	14
1998	518	204	4	7	9
1999	300	111	2	7	12
2000	798	364	1	7	19
2001	433	148	2	8	17
2002	598	217	1	7	13
2003	667	272	2	7	9
2004	543	201	3	7	9
2005	1681	578	2	7	14
2006	1382	472	2	5	5
2007	1885	752	2	5	36
2008	1469	757	1	8	23
2009	1270	657	1	6	15
2010	958	731	1	7	16

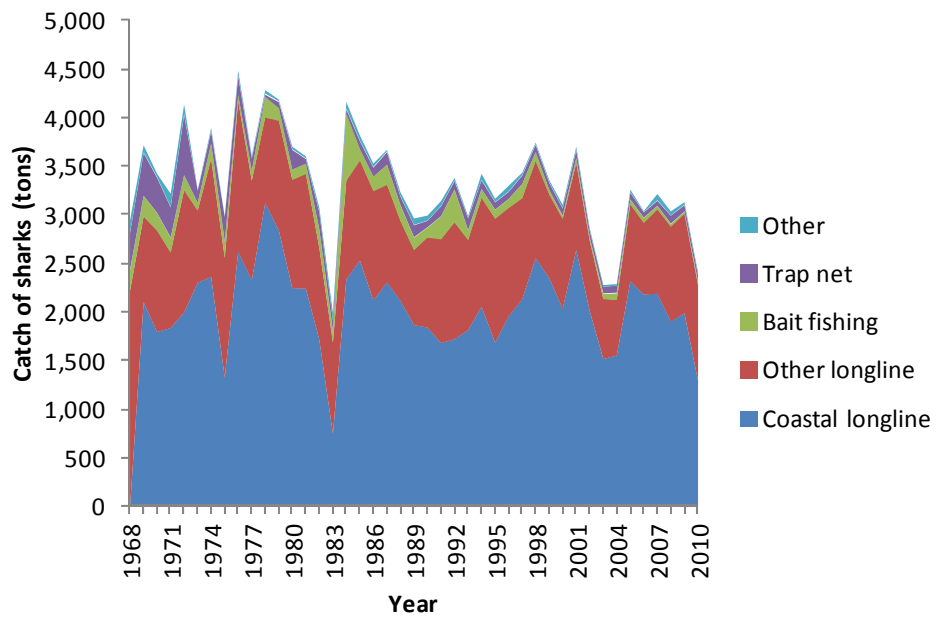


Figure 1. The catch (tons) of sharks in the year books by gear for the period between 1968 and 2010.

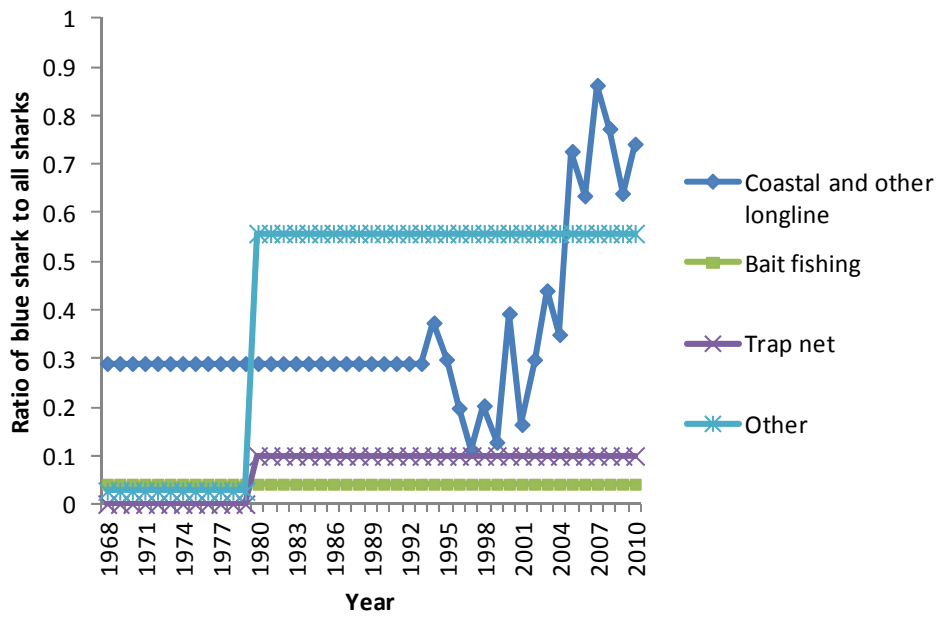


Figure 2. The annual ratios of the catch of blue shark to those of all sharks by gear.

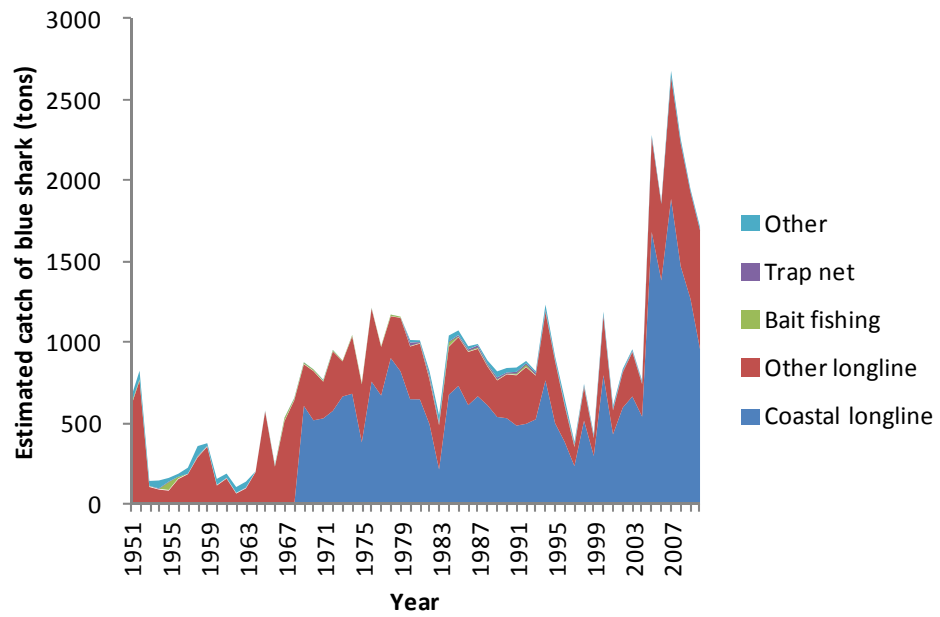


Figure 3. The estimated catches (in metric tons) of blue shark by coastal fisheries, 1951- 2010.