Update of Japanese annual catches of pelagic sharks between 1964 and 1993 by changing the species composition.

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Abstract

Japanese catch data of three pelagic sharks (blue shark, shortfin mako, and porbeagle) and the other sharks between 1964 and 1993 in the IOTC area was updated by using the FAO capture statistics and species composition of the main pelagic sharks calculated from current Japanese observer data. The update was conducted because the IOTC secretariat used unproved species composition of pelagic sharks to estimate Japanese catch data between 1964 and 1993 as the IOTC capture statistics. Japan requests that the IOTC secretariat replace the Japanese annual catches of three pelagic sharks in this period estimated by the IOTC secretariat with the catch data updated in this paper, as the official IOTC capture statistics. Also, the updated catch data of three pelagic sharks can be used in the stock assessments.

Key words

Japanese annual catch; pelagic sharks; the IOTC capture statistics; blue shark; shortfin mako; porbeagle.

Introduction

Japanese annual catches of three pelagic sharks, blue shark (*Prionace glauca*), shortfin mako (*Isurus oxyrinchus*), and porbeagle (*Lamna nasus*) in the IOTC area are currently available at the IOTC website (https://iotc.org/data/datasets) (**Table A1**). At the meeting of 16th working party on ecosystem and bycatch (IOTC, 2020), it was revealed that the Japanese annual catches of the three pelagic sharks between 1964 and 1993 were estimated by the IOTC secretariat based on the FAO capture statistics of sharks (sharks, rays, and skates, etc.) (http://www.fao.org/fishery/geoinfo/en) (**Table A2**) and the species composition of sharks. Since there was no rational evidence of the species composition that the IOTC secretariat used, Japan requested not to use the Japanese catch data for conducting the stock assessment of three pelagic sharks until Japan makes confirmation (IOTC, 2020).

The objectives of this working document paper are to estimate the Japanese annual catches

of the main pelagic sharks (blue shark, shortfin mako, and porbeagle) caught in the IOTC area between 1964 and 1993.

Material and Method

To estimate Japanese annual catches of the main pelagic, Japan used two data sources, the FAO capture statistics and Japanese observer data.

The FAO capture statistics in the IOTC area could be separated into two sub-areas as the western side and eastern side (80 °E based) (http://www.fao.org/figis/geoserver/factsheets/rfbs.html) and there is no information about the species of sharks (**Table A2**). To divide the total shark catches into species-specific catches, Japan followed the procedure as follows; (1) Species-specific catches of the pelagic sharks came from the Japanese observer data was divided into sub-areas, and estimated species compositions of main pelagic sharks (blue shark, shortfin mako, porbeagle, and other sharks) in each sub-area; (2) Japanese annual catches of main pelagic sharks in the subareas were estimated using the FAO capture databases by multiplying the species composition of the main pelagic sharks.

For the total catch of sharks between 1994 and 2020, the FAO capture statistics and the IOTC capture statistics were compared to validate the appropriateness of the total catches of pelagic sharks in the FAO capture statistics prior to 1994. Unlike the Japanese annual total catches until 1993, those after 1993 in the IOTC capture statistics were estimated by Japan based on Japanese logbook data including species-specific catch of the pelagic sharks (Matsumoto *et al*., 2013).

Results and discussions

The original species composition of the IOTC capture statistics prior to 1994 was 0.53, 0.07, and 0.40 for blue shark, shortfin mako, and porbeagle (**Table A1**). Meanwhile, the species composition of main pelagic sharks calculated from Japanese observer data indicated that the blue shark, shortfin mako, porbeagle, and other sharks accounted for approximately 0.75, 0.04, 0.11, and 0.10, respectively (**Table 1**). The species composition of main pelagic sharks resulted from Japanese observer data is reasonable from the perspective of the productivity and relative biomass of each species (i.e., higher productivity and abundance of blue sharks than those of the other sharks).

The result of estimation of species-specific annual catches based on the species composition come from the observer data was shown in **table 2**.

In addition, with regard to the Japanese annual total catches of pelagic sharks after 1993, the total catches of the FAO capture statistics (http://www.fao.org/fishery/geoinfo/en) (**Table A2**) were smaller than those of the IOTC capture statistics (Matsumoto *et al*., 2013) (**Table A1**) in each year. The result suggests that the annual total catch for pelagic sharks of the FAO capture statistics prior to 1994 has a possibility to be underestimated.

Conclusions

Japan would like to request that IOTC secretariat should replace the Japanese annual catches of three pelagic sharks (blue shark, shortfin mako, and porbeagle) between 1964 to 1993 with the catch data updated in this paper, as the official IOTC capture statistics. Also, the updated catch data of three pelagic sharks can be used in the stock assessments.

References

IOTC, 2020. Report of the 16th working party on ecosystems and bycatch. Accessed by https://iotc.org/meetings/16th-working-party-ecosystems-and-bycatch-wpeb16.

Matsumoto *et al*. 2013. Japan National Report to the Scientific Committee of the Indian Ocean Tuna Commission, 2013. IOTC-2013-SC16_NR12.

Tables

Table 1. Species composition of main pelagic sharks calculated using the Japanese observer data in the IOTC area from 1994 to 2020. The IOTC area was separated into two subareas (i.e., eastern and western subareas) at 80 °E based on the FAO capture statistics.

Species	Eastern	Western
Blue shark	0.75	0.70
Porbeagle	0.11	0.10
Shortfin mako	0.04	0.01
Other sharks	0.10	0.19

Table 2. Species specific annual catches of main pelagic sharks from 1964 to 1993 estimated from the species composition of the main pelagic sharks after 1993 in the IOTC area.

Year	Blue shark	Porbeagle	Shortfin mako	Other sharks	Total (t)
1964	2,956	435	96	612	4,100
1965	1,808	266	61	364	2,500
1966	1,924	285	53	437	2,700
1967	3,101	456	101	641	4,300
1968	2,151	318	65	467	3,000
1969	2,435	360	72	533	3,400
1970	1,223	180	39	258	1,700
1971	1,298	191	43	268	1,800
1972	1,136	169	30	265	1,600
1973	504	74	16	105	700
1974	852	126	26	185	1,188
1975	751	110	26	147	1,035
1976	277	41	10	52	380
1977	236	34	10	41	321
1978	333	49	11	68	461
1979	503	73	22	80	678
1980	448	65	18	79	610
1981	692	100	31	110	933
1982	390	57	16	67	530
1983	547	80	21	99	747
1984	595	87	22	112	816
1985	924	134	39	156	1,253
1986	788	114	33	134	1,069
1987	591	87	18	129	825
1988	467	68	17	90	643
1989	484	70	20	85	658
1990	267	39	10	51	367
1991	508	74	23	81	685
1992	347	51	10	77	485
1993	320	47	12	61	440

Table A1. Japanese annual catches of three main pelagic sharks in the original IOTC capture statistics. Those until 1993 were estimated from the FAO capture statistics and species composition of main pelagic sharks provided by IOTC secretariat. Those after 1993 were provided by Japan (Matsumoto *et al*., 2013).

Year	Blue shark	Porbeagle	Shortfin mako	Total (tons)
1964	2,173	282	1,645	4,100
1965	1,325	172	1,003	2,500
1966	1,431	186	1,084	2,700
1967	2,279	296	1,726	4,300
1968	1,590	206	1,204	3,000
1969	1,802	234	1,364	3,400
1970	901	117	682	1,700
1971	954	124	722	1,800
1972	848	110	642	1,600
1973	371	48	281	700
1974	630	82	477	1,188
1975	549	71	415	1,035
1976	201	26	152	380
1977	170	22	129	321
1978	244	32	185	461
1979	359	47	272	678
1980	323	42	245	610
1981	494	64	374	933
1982	281	36	213	530
1983	396	51	300	747
1984	432	56	327	816
1985	664	86	503	1,253
1986	567	73	429	1,069
1987	437	57	331	825
1988	341	44	258	643
1989	349	45	264	658
1990	195	25	147	367

Year	Blue shark	Porbeagle	Shortfin mako	Total (t)
1991	363	47	275	685
1992	257	33	195	485
1993	233	30	177	440
1994	414	145	425	984
1995	724	47	328	1,099
1996	736	51	666	1,453
1997	805	62	494	1,361
1998	645	48	283	976
1999	557	37	372	966
2000	530	39	310	879
2001	477	33	246	756
2002	433	25	224	682
2003	355	10	126	491
2004	330	10	297	637
2005	577	20	276	873
2006	398	24	216	638
2007	790	12	162	964
2008	2,240	53	208	2,501
2009	2,657	26	154	2,837
2010	1,531	13	176	1,720
2011	1,409	18	163	1,590
2012	1,558	8	148	1,714
2013	1,102	2	99	1,203
2014	832	2	112	947
2015	974	4	111	1,089
2016	495	4	99	598
2017	592	12	102	706
2018	455	2	102	558
2019	450	2	55	507

Table A2. Japanese annual catches of sharks (sharks, rays, skates, etc.) in the IOTC fishing area from 1964 to 2017 in the FAO capture statistic.

Year	Eastern	Western	Total (t)	Year	Eastern	Western	Total (t)
1964	1,800	2,300	4,100	1991	550	135	685
1965	1,200	1,300	2,500	1992	164	321	485
1966	800	1,900	2,700	1993	244	196	440
1967	1,900	2,400	4,300	1994	185	502	687
1968	1,100	1,900	3,000	1995	554	282	836
1969	1,200	2,200	3,400	1996	437	620	1,057
1970	700	1,000	1,700	1997	436	430	866
1971	800	1,000	1,800	1998	227	442	669
1972	400	1,200	1,600	1999	378	276	654
1973	300	400	700	2000	323	185	508
1974	434	754	1,188	2001	271	158	429
1975	538	497	1,035	2002	419	526	945
1976	227	153	380	2003	141	435	576
1977	218	103	321	2004	70	304	374
1978	210	251	461	2005	85	343	428
1979	546	132	678	2006	90	300	390
1980	410	200	610	2007	147	388	535
1981	750	183	933	2008	706	626	1,332
1982	369	161	530	2009	849	634	1,483
1983	477	270	747	2010	420	379	799
1984	472	344	816	2011	302	311	613
1985	903	350	1,253	2012	435	345	780
1986	769	300	1,069	2013	686	446	1,132
1987	297	528	825	2014	567	344	911
1988	347	296	643	2015	637	451	1,088
1989	446	212	658	2016	441	284	725
1990	201	166	367	2017	321	387	708