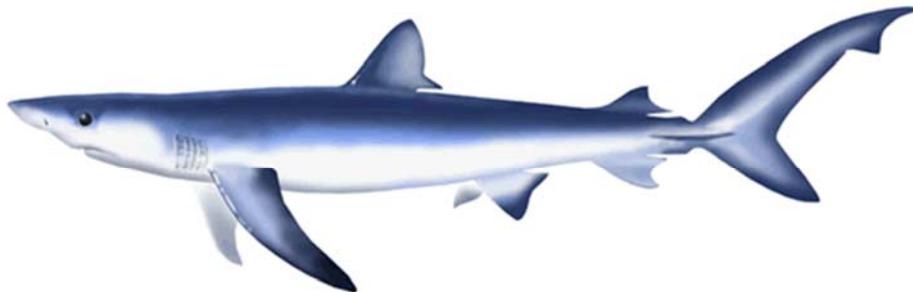


Blue shark catches estimations for the Mexican Pacific (1976-2014)

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Abstract

This document presents estimates for the blue shark catches landed at ports or fishing camps in the coasts of five Mexican states, located in the Pacific, for the period of 1975 to 2014. From 1975 to 2011 the estimates are the same as reported by Sosa-Nishizaki, (2013). Mexican shark catch statistics by species were not available until 2006, so past blue shark catches have to be estimated. For the period of 1975 to 2006 estimations assume that blue shark has been represented in total catches with different proportions through time. And the values of the proportions were obtained from published papers in the scientific literature or by using more detailed local statistics. In Mexico, blue sharks are caught mainly by the artisanal and middle size long-line fisheries, which target pelagic sharks or swordfish. Catches that were landed in the past by the former large size vessel long-line fisheries and the drift gill net fisheries were taken into consideration to construct the historical series. For the period of 2006-2014 we used official statistics that report specifically blue shark catches. Historically, blue shark was not an important species in past catches; however, catches have increase from levels of less than 500 t in the 1970s to around 1,000 in the 1990s, and to around 4,000 t in the second half of the 2000s, reaching the highest catch reported in 2014 (5,500 t). Estimates indicate that blue sharks are caught mainly in the western coast of the Peninsula of Baja California, and recent years off of the Revillagigedo Islands.

Introduction

Pelagic sharks have been targeted within the exclusive economic zone off Mexico's Pacific Coast by the artisanal fishery, the pelagic long-line fishery, and the former drift gillnet fishery (Holts et al. 1998; Sosa-Nishizaki et al. 2008). In the catch compositions of these fisheries, blue shark has become an important species, and even more, has become a target species off the west coast of the Baja California peninsula and waters off the Revillagigedo Islands (Corro-Espinosa, 2016).

Until recently, shark landings in Mexico were not reported by species, but were divided into two groups based on the length. Sharks larger than 150 cm total length (TL) were reported as "Tiburón", while shark less than 150 cm TL were reported as "Cazón". Since 2006, reports with the species composition of the landings started to be published (http://www.conapesca.gob.mx/wb/cona/informacion_estadistica_por_especie_y_entidad) by the official Mexican fisheries agency, the National Commission for Fisheries and Aquaculture (CONAPESCA, based in its name in Spanish). For the early years (2006-2011) landings categorized as "Species not specified" were still listed, showing possible misreporting. However, the level of classification into species has shown an improvement during time, especially in the case of blue shark from 2011 to 2014.

The objective of this document is to update the Mexican blue shark landings based on Sosa-Nishizaki report (2013), in order to cover the period 1976-2014.

Material and Methods

Catch data

Blue shark is mainly landed at the Baja California, Baja California Sur, Sinaloa, Nayarit and Colima. We extended the Sosa-Nishizaki (2013) catch series up to 2014 using the available blue shark statistics reported by CONAPESCA in its web page

(http://www.conapesca.gob.mx/wb/cona/informacion_estadistica_por_especie_y_entidad). The states of Oaxaca and Guerrero have very few reports, with catches less than 0.2 t, so they were not here included.

Results and Discussion

Catch data

Blue shark catch estimations are shown in Table 1 (see Sosa-Nishizaki 2013 for details in estimation procedures). Catches show a constant increasing tendency since 1990, from a level of 1,130 t to 4,469 t in 2010, and reaching a peak in 2014 with 5,502 t. Baja California seems to be the most important landing place for the species, followed by Baja California Sur, however in 2014, Sinaloa became the second most important landing state for blue shark. This general increment is related with the expansion of the fishing grounds from the longline fishery based in Mazatlan, Sinaloa, that fish off Revillagigedo Islands.

In order to test the quality of these estimations, Sosa-Nishizaki (2013) used the catches reported by CONAPESCA for the period of 2007 to 2011, and compared with the estimated catches for the same period, using the empirical proportion assumed to estimate the catches for the periods between 2000-2006. In average, the difference between estimated catches with those reported were less than $\pm 10\%$ for all the states except in Baja California. And these results confirm the decision for the states of Baja California Sur, Sinaloa, Nayarit and Colima to use of reported blue shark data by CONAPESCA's web page, and are suggested to be use in the assessment. In the case of Baja California, Sosa-Nishizaki (2013) found that an overestimation was constantly seen when comparing estimated data with reported data. However, estimated catches were based on local information and observations done in port by observers, and were more reliable. However, for the period of 2012 and 2014, the catches reported in the CONAPESCA's web page became consistent with the observed at field, so we used the reported statistics in the web. We conclude that for following years, the update of this blues shark catch series should be based on the reported blue shark catches reported in the web page.

References

- Corro-Espinosa, D. 2016. Sinaloa. In: Castillo-Géniz, L. and Tovar-Ávila, J. (eds.). Tiburones mexicanos de importancia pesquera en la CITES. INAPESCA, Mexico City. Pp 39-43.
- Holts, D. B., A. Julian, O. Sosa-Nishizaki, N. Bartoo. 1998. Pelagic shark fisheries along the west coast of the United States and Baja California, Mexico. *Fish. Res.* 39:115-125.
- Sosa-Nishizaki, O., J.F. Márquez-Farias, and C.J. Villavicencio-Garayzar. 2008. Pelagic shark fisheries along the west coast of Mexico. In: Merry D. Camhi, Ellen K. Pikitch and Elizabeth A. Babcock (eds.). *Sharks of the open oceans*. Blackwell Publishing Ltd., Oxford. 275-282 pp.
- Sosa-Nishizaki, O. 2013. Unofficial blue shark catches estimations for the Mexican Pacific (1976-2011). ISC/13/SHARKWG-2/INFO-01. 11 pp.
(http://isc.fra.go.jp/pdf/SHARK/ISC13_SHARK_2/Info1-Unofficial%20Mexican%20BS%20report%20to%20ISC%20SHARKWG.pdf)

Table 1. Mexican blue shark landings estimations in tones (live weight) for the main states with blue shark landings. BC= Baja California state, BCS= Baja California Sur, SIN= Sinaloa, NAY= Nayarit, and COL= Colima

Year	BC	BCS	SIN	NAY	COL	TOTAL
1976	25	291	28	7	22	374
1977	14	315	28	9	19	386
1978	14	467	31	25	25	561
1979	17	194	41	64	23	338
1980	32	193	7	61	44	336
1981	44	87	24	66	35	256
1982	71	139	23	43	29	306
1983	63	143	18	27	42	293
1984	41	105	20	18	79	263
1985	15	140	16	17	40	227
1986	31	203	13	28	131	407
1987	54	244	16	14	23	351
1988	63	402	12	12	20	509
1989	34	157	12	22	55	280
1990	212	450	17	22	429	1,130
1991	149	404	16	22	424	1,016
1992	276	668	15	19	659	1,636
1993	938	770	141	15	676	2,540
1994	827	486	74	17	352	1,758
1995	572	778	48	19	682	2,100
1996	825	813	96	16	1,367	3,117
1997	925	651	120	11	1,241	2,948
1998	1,241	546	82	19	1,247	3,134
1999	792	1,082	149	21	218	2,261
2000	1,404	908	193	48	166	2,719
2001	1,612	665	116	33	162	2,587
2002	1,552	566	170	28	207	2,524
2003	1,445	438	242	23	158	2,307
2004	2,265	611	694	37	175	3,781
2005	1,420	670	455	21	155	2,721
2006	1,474	622	551	17	102	2,765
2007	1,774	776	554	13	207	3,324
2008	2,088	1,171	812	57	227	4,355
2009	2,438	949	779	48	209	4,423
2010	2,206	1,523	540	93	107	4,469
2011	1,810	1,228	477	47	157	3,719
2012	2,078	1,242	501	36	251	4,108
2013	2,474	996	365	378	282	4,494
2014	2,333	921	1,719	145	383	5,502

