

CATCHES OF PELAGIC SHARKS FROM THE NORTHWESTERN ATLANTIC, GULF OF MEXICO, AND CARIBBEAN

Enric Cortés¹

SUMMARY

United States commercial landings, recreational catches, and commercial dead discard estimates of pelagic sharks were compiled from several sources. Commercial landings were obtained from southeast regional general canvass data, northeast regional canvass data (dealer weighout sheets), and quota monitoring data of permitted shark dealer reports in the United States southeastern region. Recreational harvest estimates were obtained from three recreational surveys. Dead discards of pelagic sharks in the United States longline fleet targeting tunas and tuna-like species, which have been reported to ICCAT previously, were estimated based on mandatory logbook and observer records from this fishery.

RÉSUMÉ

Les débarquements commerciaux, les prises récréationnelles et les estimations des rejets morts commerciaux des requins pélagiques réalisés par les Etats-Unis ont été compilés à partir de plusieurs sources. Les débarquements commerciaux ont été obtenus des données générales régionales recueillies dans le Sud-Est, des données régionales recueillies dans le Nord-Est (feuilles de poids au débarquement consignées par les mareyeurs), ainsi que des données de suivi des quotas consignées dans les rapports des mareyeurs de requins autorisés dans la région du Sud-Est des Etats-Unis. Les estimations des prises récréationnelles ont été obtenues de trois prospections récréationnelles. A partir des livres de bord obligatoires et des registres des observateurs de cette pêcherie, on a estimé les rejets morts de requins pélagiques de la flottille palangrière nord-américaine ciblant les thonidés et les espèces apparentées, qui avaient auparavant été déclarés à l'ICCAT.

RESUMEN

Se recopilaron de diversas fuentes datos sobre desembarques comerciales, capturas de la pesquería de recreo y estimaciones de descartes de peces muertos de la pesquería comercial. Los desembarques comerciales se obtuvieron a partir de los datos generales regionales sondeados del Sudeste, los datos regionales sondeados del Nordeste (hojas de venta al peso) y datos de seguimiento de cuota de los informes de los comerciantes de tiburones autorizados en la región sur-oriental de Estados Unidos. Las estimaciones de las capturas de recreo se obtuvieron de tres encuestas en estas pesquerías. Se estimaron los descartes de tiburones pelágicos de la flota palangrera estadounidense que se dirige a los túnidos y especies afines, que habían sido previamente comunicados a ICCAT, a partir los cuadernos de pesca obligatorios y los registros de los observadores de esta pesquería.

KEYWORDS

Catch, commercial fishing, longlining, discards, pelagic shark fisheries, sport fishing, By-catch, catch statistics, logbooks

¹National Marine Fisheries Service, Southeast Fisheries Science Center, Panama City Laboratory, 3500 Delwood Beach Road, Panama City, Florida 32408, U.S.A.; E-mail: Enric.Cortes@noaa.gov

1. Introduction

1.1 United States management history

The pelagic shark complex initially identified in the 1993 United States Federal Fisheries Management Plan (NMFS 1993) included ten species: shortfin mako (*Isurus oxyrinchus*), longfin mako (*Isurus paucus*), porbeagle (*Lamna nasus*), thresher (*Alopias vulpinus*), bigeye thresher (*Alopias superciliosus*), blue (*Prionace glauca*), oceanic whitetip (*Carcharhinus longimanus*), sevengill (*Heptranchias perlo*), sixgill (*Hexanchus griseus*), and bigeye sixgill (*Hexanchus vitulus*). The 1993 FMP classified the status of pelagic sharks as unknown because no stock assessment had been conducted for this complex. The Maximum Sustainable Yield (MSY) for pelagic sharks was set at 1,560 mt dressed weight (dw), which was the 1986-1991 commercial landings average for this group. In 1997, as a result of indications that the abundance of Atlantic sharks had declined, commercial quotas for large coastal, small coastal, and pelagic sharks were reduced. The quota for pelagic sharks was set at 580 mt. The 1999 United States FMP for Atlantic Tunas, Swordfish, and Sharks (NMFS 1999) proposed the following measures affecting pelagic sharks: 1) a reduction in the recreational bag limit to 1 Atlantic shark per vessel per trip, with a minimum size of 137 cm fork length for all sharks, 2) an increase in the annual commercial quota for pelagic sharks to 853 mt dw, apportioned between porbeagle (92 mt), blue sharks (273 mt dw), and other pelagic sharks (488 mt dw), with the pelagic shark quota being reduced by any overharvest in the blue shark quota, and 3) making the bigeye sixgill, sixgill, sevengill, bigeye thresher, and longfin mako sharks prohibited species that cannot be retained. Regulations on prohibited species went into effect in 2000, whereas those on pelagic shark quotas were enacted in 2001.

Sharks included in the United States pelagic shark management unit are generally trans-oceanic species that are harvested or caught as bycatch in the North Atlantic Ocean by fishers from several nations. Although it has long been recognized that assessment of these pelagic shark resources requires a multinational approach, the first assessment of two pelagic shark species (shortfin mako and blue shark) did not take place until 2004 and was done under the auspices of ICCAT. That assessment (ICCAT 2005) included a review of the biology of these two species, a description of the fisheries that catch them, analyses of the state of the stocks and outlook as well as of the effect of current regulations, and recommendations for statistics and research. Although the assessment was considered very preliminary owing to the limitations both on quantity and quality of information available, the main conclusions were that both North and South Atlantic blue shark stock biomass was likely to be above MSY, whereas the North Atlantic stock of shortfin mako could be below biomass at MSY, with the magnitude of decline for the South Atlantic shortfin mako stock estimated to be less than in the North Atlantic.

Estimates of catches will thus be required to conduct updated stock assessments of these two species as well as new stock assessments for other pelagic sharks. In this document, estimates of United States commercial landings, recreational catches, and bycatch of pelagic sharks were compiled from a variety of sources for the period 1981-2005. Catch data are presented for pelagic sharks as a group and for blue shark, shortfin mako, thresher shark, longfin mako, oceanic whitetip shark, porbeagle, and bigeye thresher separately.

2. Materials and methods

United States commercial landings for 1982-2005 were based on weighout sheets from the landed catch of U.S. longline fishermen holding permits to land and sell shark and swordfish caught in the Atlantic Ocean (Cramer 1997, Cramer et al. 2000, Cramer, unpublished data). These landings were reported as metric tons whole weight and in numbers. Whole weight was transformed to dressed weight by applying a conversion factor of 1.96. Landings for 1995-2005 were also available from the southeast regional general canvass data and the Southeast Fisheries Science Center (SEFSC) quota monitoring data, based on southeastern region permitted shark dealer reports. Average weights were calculated based on weights reported in the dealer weighout sheets, and were available for 1986-2005. If no weights were available or the sample size was very low ($n < 5$) for any given year, the geometric mean for all remaining years (with $n \geq 5$) was applied to that year. Landings in numbers for 1995-2005 were obtained by dividing landings in lb dw by the average weight in lb dw for that year.

Recreational harvest estimates were obtained from the United States Marine Recreational Fishery Statistics Program (MRFSS), the National Marine Fisheries Service (NMFS) Headboat Survey operated by the SEFSC Beaufort Laboratory, and the Texas Parks and Wildlife Department Recreational Fishing Survey (TXPWD). Combined, these surveys cover the recreational fisheries operating from Maine to Texas, from 1981 to 2005 (data for 2005 were not available yet). Almost the totality of recreational catches came from the MRFSS survey. Catches are typically reported as numbers and yield estimates were obtained by multiplying catch in numbers by

average weights calculated from lengths through published length-weight relationships. A conversion factor of 2.0 was used to transform whole weights into dressed weights. If an average length was not available or the sample size was very low ($n < 5$) for any given year, the mean for all remaining years (with $n \geq 5$) was applied to that year.

Dead discards of pelagic sharks in fisheries targeting tuna and tuna-like species were compiled based on mandatory logbooks from longline and other vessels (Large Pelagic Logbook) and observer reports from these fisheries (SEFSC Pelagic Longline Observer Program) as reported in Cramer (1997, 2000), Cramer and Adams (1998), Cramer *et al.* (1998), Cramer *et al.* (2000), and Cramer (unpublished data). The majority of vessels (90%) use longline gear (Cramer 1997). Discards are typically recorded in numbers and weight (mt ww), and were further expressed as dw by using a conversion factor of 1.96. Dead discard estimates were available starting in 1987.

3. Results and discussion

Commercial landings of pelagic sharks steadily increased from the early 1980s and peaked in 2004 (**Table 1; Figure 1a**) according to weighout sheets, and quota monitoring and general canvass program data. Mean average weights for pelagic sharks during 1986-2005, estimated from the weighout sheets, ranged from 58 to 88 lb dw (**Table 1**). Recreational landings in numbers estimated from the MRFSS survey during 1981-2004 fluctuated from a minimum of about 3,800 fish in 2001 to a maximum of 93,000 fish in 1985 (**Table 1; Figure 1a**). Pelagic longline dead discards also fluctuated between 1987 and 2005, with a minimum of about 2,600 fish in 2004 and a maximum of about 30,500 fish in 1993. Total catches in numbers ranged from about 12,500 fish in 1981 (no commercial landings or discard estimates were available for that year) to about 95,000 fish in 1985, as a result of the peak in recreational landings that year.

Blue shark commercial landings were negligible (**Table 2; Figure 1b**). Recreational landings in numbers ranged from 0 fish in several years to over 20,000 fish in 1987. Pelagic longline discards reached 29,000 fish in 1993, but otherwise oscillated between a minimum of about 1,500 fish in the latest year of data (2005) to a maximum of about 19,000 fish in 1996 (**Table 2**). In general, there was a decreasing trend in dead discards of blue sharks. The trends in recreational landings and dead discards were very similar from 1992 to 1997 (**Figure 1b**). Total catches ranged from 0 fish in 1982 (a year in which no commercial or recreational landings were reported) to about 43,500 fish in 1993, the year in which dead discard estimates peaked (**Table 2; Figure 1b**).

Shortfin mako commercial landings never exceeded 7,000 fish according to weighout sheets, and quota monitoring and general canvass program data (**Table 3; Figure 1c**). Most of the landings were attributable to the recreational fishery, whose landings in numbers peaked in 1985 (as for blue shark) to about 80,000 fish, and ranged from less than 1,500 fish to over 31,000 fish in the remaining years. Pelagic longline discards of shortfin makos were negligible. Total catches ranged from less than 4,000 fish in 1999 to almost 82,000 fish in 1985, when recreational catches peaked (**Table 3; Figure 1c**).

Total catches of thresher sharks peaked at about 5,300 fish in 1984 and 1999 (**Table 4**). A maximum of about 1,800 fish were estimated to have been landed by the commercial fishery in 1997, whereas recreational landings peaked at about 5,250 fish in 1984. The maximum estimate of dead discards from the pelagic longline fishery was about 700 fish in 1989, and no dead discards were reported for 1998-2005.

Total catches of longfin makos in any given year were under 450 fish. Very few longfin makos were landed by the commercial fishery, there were no reported landings from recreational fisheries, and only some fish were reported discarded dead from 1992 to 1995 (**Table 5**). Very few oceanic whitetip sharks were landed by the commercial fishery, except for a peak of about 1,250 fish in 1983, but otherwise total catches never exceeded 450 fish (**Table 6**). Total reported catches of porbeagle, and especially bigeye thresher, were also very low (**Tables 7 and 8**).

References

- CRAMER, J. 1997. Estimates of the numbers and metric tons of sharks discarded dead by pelagic longline vessels. Col. Vol. Sci. Pap. ICCAT; 46(4): 436-445.
- CRAMER, J. 2000. Pelagic longline bycatch. Col. Vol. Sci. Pap. ICCAT; 51(6): 1895-1929.

CRAMER, J. Pelagic longline bycatch (unpublished data).

CRAMER, J., and H. M. Adams. 1998. Pelagic longline bycatch. SFD Contribution SFD-97/98-06. NMFS-Southeast Fisheries Science Center, Sustainable Fisheries Division, 75 Virginia Beach Drive, Miami, FL 33149, USA.

CRAMER, J., A. Bertolino and G. P. Scott. 1998. Estimates of recent shark bycatch by U.S. vessels fishing for Atlantic tuna and tuna-like species. Col. Vol. Sci. Pap. ICCAT; 48(3): 117-128.

CRAMER, J., A. Bertolino and H. Adams. 2000. Shark bycatch from the U. S. longline fleet, 1982 through 1992. Col. Vol. Sci. Pap. ICCAT; 51(6): 1830-1840.

ICCAT 2005. Report of the 2004 Inter-sessional meeting of the ICCAT sub-committee on by-catches: shark stock assessment. Col. Vol. Sci. Pap. ICCAT; 58(3): 799-890.

NMFS (National Marine Fisheries Service). 1993. Fishery management plan for sharks of the Atlantic Ocean. U.S. Dept. of Commerce, Washington, D.C. National Oceanic and Atmospheric Administration. Silver Spring, MD, 167 pp.

NMFS (National Marine Fisheries Service). 1999. Final fishery management plan for Atlantic tunas, swordfish, and sharks. Vol. 1. U.S. Dept. of Commerce, Washington, D.C. National Oceanic and Atmospheric Administration. Silver Spring, MD, 321 pp.

Table 1. Estimates of commercial and recreational landings and dead discards for **pelagic sharks** in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

Year	Commercial					Recreational			Discards			Total	
	mt (ww) ¹	mt (dw) ²	lb (dw) ³	av. weight ⁴	number ⁵	number ⁶	av. weight ⁷	lb (dw)	number	mt (ww)	lb (dw) ⁸	number	lb (dw)
1981						12,603	50.035	630,591				12,603	630,591
1982	45.41	23.17	51,077		1,354	20,015	50.996	1,020,685				21,369	1,071,762
1983	51.89	26.48	58,367		1,627	21,968	117.64	2,584,316				23,595	2,642,683
1984	49.12	25.06	55,250		1,538	23,295	67.489	1,572,156				24,833	1,627,406
1985	57.99	29.59	65,227		1,969	92,998	38.224	3,554,756				94,967	3,619,982
1986	68.50	34.95	77,049	66.850	2,385	42,572	65.631	2,794,043				44,957	2,871,091
1987	87.46	44.62	98,375	69.171	2,786	37,153	39.002	1,449,041	13,092	560.64	630,606	53,031	2,178,022
1988	129.48	66.06	145,639	68.958	3,915	32,993	41.271	1,361,654	13,655	468.74	527,237	50,563	2,034,530
1989	141.36	72.12	159,001	57.574	4,937	18,255	73.228	1,336,777	13,480	538.21	605,376	36,672	2,101,155
1990	102.74	52.42	115,566	67.221	3,274	11,630	41.246	479,691	13,955	795.97	895,300	28,859	1,490,557
1991	114.32	58.33	128,587	76.681	3,290	10,070	62.061	624,954	17,232	813.21	914,695	30,592	1,668,236
1992	139.81	71.33	157,258	73.737	4,111	16,304	39.219	639,427	8,939	298.31	335,538	29,354	1,132,222
1993	387.30	197.60	435,638	81.631	5,278	29,861	50.988	1,522,553	30,545	1191.52	1,340,217	65,684	3,298,407
1994	513.46	261.97	577,535	82.713	6,688	5,638	68.28	384,963	13,410	637.71	717,294	25,736	1,679,791
1995	393.93	200.98	720,219	75.676	9,517	32,673	47.629	1,556,182	10,864	710.27	798,909	53,054	3,075,310
1996	402.03	205.12	760,364	81.934	9,280	18,534	33.697	624,540	22,153	949.22	1,067,682	49,967	2,452,586
1997	381.08	194.43	739,486	85.937	8,605	8,743	54.834	479,414	7,754	250.42	281,671	25,102	1,500,571
1998	267.07	136.26	624,483	83.184	7,507	11,762	35.977	423,161	6,002	280.09	315,044	25,271	1,362,688
1999	113.10	57.70	376,471	88.388	4,259	11,122	48.304	537,237	3,464	117.63	132,310	18,845	1,046,018
2000	191.15	97.53	407,647	69.280	5,884	13,353	16.749	223,649	7,495	216.13	243,102	26,732	874,399
2001	193.58	98.77	411,574	62.978	6,535	3,777	83.938	317,034	6,158	155.75	175,187	16,470	903,795
2002	174.06	88.81	533,247	60.717	8,782	4,673	87.152	407,261	5,335	92.73	104,302	18,790	1,044,811
2003	158.08	80.65	643,883	58.673	10,974	4,298	35.88	154,212	4,341	71.93	80,907	19,613	879,002
2004	205.15	104.67	810,526	66.435	12,200	5,072	55.796	282,997	2,597	63.92	71,897	19,869	1,165,420
2005	194.87	99.42	421,115	65.746	6,405	5,072	31.204	158,267	2,861	194.00	218,210	14,338	797,592

¹ In whole weight from weighout data sheets; ² Whole weight to dressed weight conversion ratio is 1.96; ³ 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; ⁴ In pounds dressed weight from weighout data sheets; ⁵ 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); ⁶ Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; ⁷ In pounds dressed weight; ⁸ Whole weight to dressed weight conversion ratio is 1.96.

Table 2. Estimates of commercial and recreational landings and dead discards for **blue sharks** in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

Year	Commercial					Recreational			Discards			Total	
	mt (ww) ¹	mt (dw) ²	lb (dw) ³	av. weight ⁴	number ⁵	number ⁶	av. weight ⁷	lb (dw)	number	mt (ww)	lb (dw) ⁸	number	lb (dw)
1981						4,925	45.435	223,765				4,925	223,765
1982	0.00	0.00	0		0	0	45.435	0				0	0
1983	0.00	0.00	0		0	14,593	45.435	663,027				14,593	663,027
1984	0.00	0.00	0		0	2,579	45.435	117,176				2,579	117,176
1985	0.00	0.00	0		0	11,621	33.003	383,528				11,621	383,528
1986	0.40	0.20	450	148.500	6	18,898	66.182	1,250,707				18,904	1,251,157
1987	0.00	0.00	0	100.318	0	20,683	47.545	983,373	12,506	526.20	591,868	33,189	1,575,241
1988	0.10	0.05	112	100.318	4	12,235	32.620	399,106	12,934	421.16	473,719	25,173	872,937
1989	0.00	0.00	0	100.318	0	7,419	41.011	304,261	12,525	480.00	539,902	19,944	844,163
1990	0.25	0.13	286	100.318	6	1,745	56.134	97,954	13,141	741.33	833,845	14,892	932,084
1991	0.00	0.00	0	100.318	0	6,643	52.120	346,233	16,562	772.32	868,702	23,205	1,214,936
1992	0.47	0.24	529	67.769	14	5,853	41.191	241,091	7,043	184.39	207,401	12,910	449,021
1993	7.88	4.02	8,860	75.188	85	14,114	53.567	756,045	29,329	1136.33	1,278,139	43,528	2,043,044
1994	7.82	3.99	8,796	79.960	105	507	45.435	23,035	11,986	572.24	643,653	12,598	675,485
1995	3.61	1.84	7,162	66.557	108	464	45.435	21,082	9,725	618.15	695,293	10,297	723,536
1996	5.40	2.76	24,005	70.819	339	9,150	34.070	311,741	18,996	710.69	799,381	28,485	1,135,127
1997	1.42	0.72	2,491	52.933	47	4,236	55.740	236,115	6,614	184.61	207,643	10,897	446,249
1998	2.87	1.46	3,925	40.873	96	6,085	45.435	276,469	5,295	195.25	219,616	11,476	500,011
1999	0.16	0.08	1,048	6.725	156	5,218	45.435	237,078	2,772	98.96	111,310	8,146	349,435
2000	0.61	0.31	4,124	62.634	66	7,010	45.435	318,496	6,298	137.19	154,311	13,374	476,931
2001	3.09	1.58	3,548	40.579	87	950	45.435	43,163	5,219	105.87	119,082	6,256	165,793
2002	0.20	0.10	228	56.500	4	0	45.435	0	4,335	67.87	76,340	4,339	76,568
2003	1.43	0.73	7,933	67.083	118	376	45.435	17,083	3,362	54.79	61,628	3,856	86,644
2004	6.96	3.55	7,834	47.994	163	0	45.435	0	2,697	63.92	71,897	2,860	79,731
2005	1.78	0.91	2,006	62.406	32		45.435	0	1,487	75.84	85,301	1,519	87,307

¹ In whole weight from weighout data sheets; ² Whole weight to dressed weight conversion ratio is 1.96; ³ 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; ⁴ In pounds dressed weight from weighout data sheets, value for 1987-1991 is the geometric mean of values for 1986 and 1992; ⁵ 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); ⁶ Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; ⁷ In pounds dressed weight; ⁸ Whole weight to dressed weight conversion ratio is 1.96.

Table 3. Estimates of commercial and recreational landings and dead discards for **shortfin makos** in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

Year	Commercial					Recreational			Discards			Total	
	mt (ww) ¹	mt (dw) ²	lb (dw) ³	av. weight ⁴	number ⁵	number ⁶	av. weight ⁷	lb (dw)	number	mt (ww)	lb (dw) ⁸	number	lb (dw)
1981						7,678	56.395	433,001				7,678	433,001
1982	42.12	21.49	47,376		1,298	13,522	50.996	689,568				14,820	736,944
1983	6.78	3.46	7,626		225	7,375	51.597	380,529				7,600	388,155
1984	42.46	21.66	47,759		1,436	15,474	67.531	1,044,975				16,910	1,092,734
1985	53.24	27.16	59,884		1,877	79,912	41.487	3,315,309				81,789	3,375,193
1986	64.76	33.04	72,842	64.936	2,318	20,792	70.107	1,457,665				23,110	1,530,507
1987	77.84	39.71	87,554	65.771	2,592	14,809	35.069	519,337	217	8.72	9,808	17,618	616,699
1988	101.37	51.72	114,021	63.095	3,398	19,998	44.693	893,771	127	5.08	5,714	23,523	1,013,505
1989	124.56	63.55	140,105	55.771	4,608	8,367	90.117	754,009	249	9.01	10,134	13,224	904,248
1990	91.77	46.82	103,223	63.843	3,081	8,509	35.483	301,925	259	10.31	11,593	11,849	416,741
1991	104.87	53.51	117,957	75.502	3,085	3,422	69.020	236,186	245	11.16	12,553	6,752	366,697
1992	125.97	64.27	141,691	71.833	3,782	8,382	33.589	281,543	771	38.41	43,203	12,935	466,437
1993	281.09	143.41	316,164	77.355	4,044	15,034	49.883	749,941	562	24.03	27,029	19,640	1,093,134
1994	324.66	165.64	365,177	76.717	4,623	4,496	79.296	356,515	558	21.45	24,127	9,677	745,818
1995	288.83	147.36	460,767	71.209	6,471	31,212	51.227	1,598,897	446	28.44	31,989	38,129	2,091,653
1996	238.05	121.46	427,020	83.239	5,130	8,618	30.265	260,824	0	0.00	0	13,748	687,844
1997	245.46	125.23	446,305	84.574	5,277	3,025	60.839	184,038	0	0.00	0	8,302	630,343
1998	199.76	101.92	401,491	82.327	4,877	5,633	29.590	166,680	0	0.00	0	10,510	568,171
1999	90.05	45.94	217,867	87.763	2,482	1,383	51.597	71,359	0	0.00	0	3,865	289,226
2000	166.74	85.07	286,764	66.185	4,333	5,813	51.597	299,934	0	0.00	0	10,146	586,698
2001	182.02	92.87	347,844	63.154	5,508	2,871	83.938	240,986	0	0.00	0	8,379	588,830
2002	165.59	84.48	314,736	61.024	5,158	3,206	87.152	279,409	0	0.00	0	8,364	594,145
2003	140.80	71.84	285,222	57.733	4,940	3,957	51.597	204,170	0	0.00	0	8,897	489,392
2004	188.31	96.07	392,628	66.006	5,948	5,144	55.796	287,015	0	0.00	0	11,092	679,643
2005	186.03	94.91	375,814	65.615	5,728	5,144	31.204	160,513	0	0.00	0	10,872	536,327

¹ In whole weight from weighout data sheets; ² Whole weight to dressed weight conversion ratio is 1.96; ³ 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; ⁴ In pounds dressed weight from weighout data sheets; ⁵ 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); ⁶ Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; ⁷ In pounds dressed weight; ⁸ Whole weight to dressed weight conversion ratio is 1.96.

Table 4. Estimates of commercial and recreational landings and dead discards for **common thresher** sharks in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

Year	Commercial					Recreational			Discards			Total	
	mt (ww) ¹	mt (dw) ²	lb (dw) ³	av. weight ⁴	number ⁵	number ⁶	av. weight ⁷	lb (dw)	number	mt (ww)	lb (dw) ⁸	number	lb (dw)
1981						0		0				0	0
1982	3.15	1.61	3,543		53	0		0				53	3,543
1983	9.37	4.78	10,541		146	0		0				146	10,541
1984	6.44	3.29	7,244		95	5,242		0				5,337	7,244
1985	4.05	2.07	4,555		83	607		0				690	4,555
1986	2.94	1.50	3,307	138.615	51	2,805		0				2,856	3,307
1987	8.30	4.23	9,336	112.629	160	1,656		0	369	25.72	28,930	2,185	38,266
1988	26.40	13.47	29,695	125.871	494	122		0	594	42.50	47,804	1,210	77,498
1989	14.25	7.27	16,028	117.930	274	2,448		0	706	49.20	55,340	3,428	71,368
1990	8.95	4.57	10,067	145.966	150	1,368		0	555	44.33	49,862	2,073	59,929
1991	6.31	3.22	7,097	119.897	121	0		0	425	29.73	33,440	546	40,538
1992	10.42	5.32	11,720	109.647	238	2,069		0	471	39.40	44,317	2,778	56,037
1993	36.83	18.79	41,431	123.143	341	0		0	13	0.92	1,035	354	42,466
1994	62.94	32.11	70,796	119.714	546	577		0	38	2.72	3,059	1,161	73,856
1995	60.23	30.73	154,329	99.577	1,550	771		0	0	0.00	0	2,321	154,329
1996	61.76	31.51	140,195	107.650	1,302	759		0	633	66.37	74,657	2,694	214,852
1997	67.29	34.33	201,753	113.837	1,772	1,472		0	353	39.09	43,966	3,597	245,719
1998	44.07	22.48	128,870	103.060	1,250	36		0	0	0.00	0	1,286	128,870
1999	19.24	9.82	96,266	113.433	849	4,512		0	0	0.00	0	5,361	96,266
2000	21.13	10.78	92,850	120.635	770	529		0	0	0.00	0	1,299	92,850
2001	4.61	2.35	56,893	129.475	439	0		0	0	0.00	0	439	56,893
2002	5.41	2.76	53,077	95.188	558	1,467		0	0	0.00	0	2,025	53,077
2003	13.26	6.77	46,502	99.433	468	0		0	0	0.00	0	468	46,502
2004	7.73	3.94	50,030	164.057	305	0		0	0	0.00	0	305	50,030
2005	7.06	3.60	28,428	147.019	193	0		0	0	0.00	0	193	28,428

¹ In whole weight from weighout data sheets; ² Whole weight to dressed weight conversion ratio is 1.96; ³ 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; ⁴ In pounds dressed weight from weighout data sheets; ⁵ 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); ⁶ Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; ⁷ In pounds dressed weight; ⁸ Whole weight to dressed weight conversion ratio is 1.96.

Table 5. Estimates of commercial and recreational landings and dead discards for **longfin makos** in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

Year	Commercial					Recreational			Discards		Total		
	mt (ww) ¹	mt (dw) ²	lb (dw) ³	av. weight ⁴	number ⁵	number ⁶	av. weight ⁷	lb (dw)	number	mt (ww)	lb (dw) ⁸	number	lb (dw)
1981								0				0	0
1982	0.11	0.06	124		2			0			0	2	124
1983	0.00	0.00	0		0			0			0	0	0
1984	0.13	0.07	146		5			0			0	5	146
1985	0.55	0.28	619		7			0			0	7	619
1986	0.12	0.06	135	134.939	2	0		0			0	2	135
1987	0.63	0.32	709	103.286	11	0		0	0	0.00	0	11	709
1988	1.41	0.72	1,586	191.462	15	0		0	0	0.00	0	15	1,586
1989	1.00	0.51	1,125	192.889	9	0		0	0	0.00	0	9	1,125
1990	0.65	0.33	731	143.857	11	0		0	0	0.00	0	11	731
1991	0.59	0.30	664	123.143	10	0		0	0	0.00	0	10	664
1992	1.27	0.65	1,428	154.600	19	0		0	419	26.44	29,740	438	31,168
1993	3.09	1.57	3,470	145.158	24	0		0	69	4.69	5,275	93	8,745
1994	8.31	4.24	9,343	144.413	51	0		0	200	10.90	12,260	251	21,603
1995	2.24	1.14	5,659	98.900	57	0		0	184	14.41	16,208	241	21,867
1996	3.04	1.55	11,037	139.905	79	0		0	0	0.00	0	79	11,037
1997	2.02	1.03	7,867	98.857	80	0		0	0	0.00	0	80	7,867
1998	1.96	1.00	4,971	123.444	40	0		0	0	0.00	0	40	4,971
1999	0.97	0.49	3,540	133.000	27	0		0	0	0.00	0	27	3,540
2000	0.06	0.03	6,560	134.939	49	0		0	0	0.00	0	49	6,560
2001	0.13	0.07	9,453	134.939	70	0		0	0	0.00	0	70	9,453
2002	0.00	0.00	3,008	134.939	22	0		0	0	0.00	0	22	3,008
2003	0.00	0.00	1,831	134.939	14	0		0	0	0.00	0	14	1,831
2004	0.00	0.00	1,827	134.939	14	0		0	0	0.00	0	14	1,827
2005	0.00	0.00	403	134.939	3	0		0	0	0.00	0	3	403

¹ In whole weight from weighout data sheets; ² Whole weight to dressed weight conversion ratio is 1.96; ³ 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; ⁴ In pounds dressed weight from weighout data sheets; ⁵ 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); ⁶ Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; ⁷ In pounds dressed weight; ⁸ Whole weight to dressed weight conversion ratio is 1.96.

Table 6. Estimates of commercial and recreational landings and dead discards for **oceanic whitetip sharks** in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

Year	Commercial					Recreational			Discards		Total		
	mt (ww) ¹	mt (dw) ²	lb (dw) ³	av. weight ⁴	number ⁵	number ⁶	av. weight ⁷	lb (dw)	number	mt (ww)	lb (dw) ⁸	number	lb (dw)
1981						0		0				0	0
1982	0.00	0.00	0		0	0		0				0	0
1983	35.62	18.17	40,065		1,248	0		0				1,248	40,065
1984	0.00	0.00	0		0	0		0				0	0
1985	0.02	0.01	22		1	0		0				1	22
1986	0.16	0.08	180	69.600	5	77		0				82	180
1987	0.00	0.00	0	43.020	0	0		0	0	0.00	0	0	0
1988	0.00	0.00	0	43.020	0	0		0	0	0.00	0	0	0
1989	0.30	0.15	337	43.020	7	20		0	0	0.00	0	27	337
1990	0.10	0.05	112	43.020	2	0		0	0	0.00	0	2	112
1991	0.11	0.06	124	43.020	4	5		0	0	0.00	0	9	124
1992	0.91	0.46	1,024	67.786	30	0		0	206	7.53	8,470	236	9,493
1993	7.83	3.99	8,803	62.297	141	0		0	305	3.50	3,937	446	12,740
1994	3.28	1.67	3,691	54.925	68	0		0	366	4.38	4,927	434	8,617
1995	3.40	1.73	4,596	65.308	70	2		0	197	6.47	7,277	269	11,873
1996	7.77	3.96	9,937	56.893	175	0		0	0	0.00	0	175	9,937
1997	7.94	4.05	11,693	39.986	292	0		0	0	0.00	0	292	11,693
1998	5.89	3.01	28,685	36.429	787	0		0	0	0.00	0	787	28,685
1999	1.06	0.54	2,671	29.175	92	0		0	0	0.00	0	92	2,671
2000	1.55	0.79	2,399	33.423	72	0		0	0	0.00	0	72	2,399
2001	2.56	1.31	3,810	43.606	87	0		0	0	0.00	0	87	3,810
2002	1.92	0.98	3,731	27.744	134	0		0	0	0.00	0	134	3,731
2003	2.53	1.29	5,403	26.147	207	0		0	0	0.00	0	207	5,403
2004	1.54	0.79	2,824	38.167	74	0		0	3	0.07	79	77	2,903
2005	3.04	1.55	4,053	31.100	130	0		0	0	0.00	0	130	4,053

¹ In whole weight from weighout data sheets; ² Whole weight to dressed weight conversion ratio is 1.96; ³ 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; ⁴ In pounds dressed weight from weighout data sheets; ⁵ 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); ⁶ Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; ⁷ In pounds dressed weight; ⁸ Whole weight to dressed weight conversion ratio is 1.96.

Table 7. Estimates of commercial and recreational landings and dead discards for **porbeagle sharks** in the U.S. Atlantic, Gulf of Mexico, and Caribbean.

Year	Commercial					Recreational			Discards			Total	
	mt (ww) ¹	mt (dw) ²	lb (dw) ³	av. weight ⁴	number ⁵	number ⁶	av. weight ⁷	lb (dw)	number	mt (ww)	lb (dw) ⁸	number	lb (dw)
1981						0		0				0	0
1982	0.03	0.02	34		1	0		0			0	1	34
1983	0.12	0.06	135		8	0		0			0	8	135
1984	0.09	0.05	101		2	0		0			0	2	101
1985	0.13	0.07	146		1	0		0			0	1	146
1986	0.12	0.06	135	83.076	3	0		0			0	3	135
1987	0.69	0.35	776	114.000	23	0		0	0	0.00	0	23	776
1988	0.20	0.10	225	83.076	4	0		0	0	0.00	0	4	225
1989	1.25	0.64	1,406	106.500	39	0		0	0	0.00	0	39	1,406
1990	1.02	0.52	1,147	86.438	24	0		0	0	0.00	0	24	1,147
1991	2.44	1.24	2,745	69.965	70	0		0	0	0.00	0	70	2,745
1992	0.77	0.39	866	51.957	28	0		0	29	2.14	2,407	57	3,273
1993	50.60	25.81	56,909	90.127	643	0		0	0	0.00	0	643	56,909
1994	106.36	54.27	119,635	94.574	1,294	53		0	23	1.23	1,383	1,370	121,018
1995	35.52	18.12	40,312	84.890	475	0		0	0	0.00	0	475	40,312
1996	78.05	39.82	89,136	70.016	1,273	0		0	0	0.00	0	1,273	89,136
1997	55.61	28.37	62,865	81.356	773	0		0	0	0.00	0	773	62,865
1998	12.52	6.39	19,795	114.504	173	0		0	0	0.00	0	173	19,795
1999	1.63	0.83	5,650	94.579	60	0		0	0	0.00	0	60	5,650
2000	1.06	0.54	5,272	153.370	34	0		0	0	0.00	0	34	5,272
2001	1.17	0.60	1,316	59.818	22	0		0	0	0.00	0	22	1,316
2002	0.94	0.48	2,690	39.667	68	0		0	0	0.00	0	68	2,690
2003	0.05	0.03	1,738	83.076	21	0		0	0	0.00	0	21	1,738
2004	0.62	0.32	5,832	83.076	70	0		0	0	0.00	0	70	5,832
2005	0.01	0.01	2,452	83.076	30	0		0	0	0.00	0	30	2,452

¹ In whole weight from weighout data sheets; ² Whole weight to dressed weight conversion ratio is 1.96; ³ 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; ⁴ In pounds dressed weight from weighout data sheets; ⁵ 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); ⁶ Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; ⁷ In pounds dressed weight; ⁸ Whole weight to dressed weight conversion ratio is 1.96.

Table 8. Estimates of commercial and recreational landings and dead discards for **bigeye thresher sharks** in the U.S. Atlantic, Gulf of Mexico, and the Caribbean.

Year	Commercial					Recreational			Discards		Total		
	mt (ww) ¹	mt (dw) ²	lb (dw) ³	av. weight ⁴	number ⁵	number ⁶	av. weight ⁷	lb (dw)	number	mt (ww)	lb (dw) ⁸	number	lb (dw)
1981						0		0				0	0
1982	0.00	0.00	0		0	0		0			0	0	0
1983	0.00	0.00	0		0	0		0			0	0	0
1984	0.00	0.00	0		0	0		0			0	0	0
1985	0.00	0.00	0		0	0		0			0	0	0
1986	0.00	0.00	0		0	0		0			0	0	0
1987	0.00	0.00	0		0	0		0	0	0.00	0	0	0
1988	0.00	0.00	0		0	634		0	0	0.00	0	634	0
1989	0.00	0.00	0		0	0		0	0	0.00	0	0	0
1990	0.00	0.00	0		0	0		0	0	0.00	0	0	0
1991	0.00	0.00	0		0	0		0	0	0.00	0	0	0
1992	0.00	0.00	0	96.618	0	0		0	0	0.00	0	0	0
1993	0.00	0.00	0	102.125	0	0		0	242	20.24	22,766	242	22,766
1994	0.00	0.00	0	152.430	0	0		0	147	18.21	20,483	147	20,483
1995	0.00	0.00	1,497	57.142	26	0		0	274	38.82	43,665	300	45,162
1996	0.00	0.00	8,164	98.570	83	0		0	0	0.00	0	83	8,164
1997	0.00	0.00	5,308	82.433	64	0		0	0	0.00	0	64	5,308
1998	0.00	0.00	1,403	99.256	14	0		0	0	0.00	0	14	1,403
1999	0.00	0.00	18,662	109.557	170	0		0	0	0.00	0	170	18,662
2000	0.00	0.00	4,376	96.618	45	0		0	0	0.00	0	45	4,376
2001	0.00	0.00	330	96.618	3	0		0	0	0.00	0	3	330
2002	0.00	0.00	0	96.618	0	0		0	0	0.00	0	0	0
2003	0.00	0.00	0	96.618	0	0		0	0	0.00	0	0	0
2004	0.00	0.00	719	96.618	7	0		0	0	0.00	0	7	719
2005	0.00	0.00	267	96.618	3	0		0	0	0.00	0	3	267

¹ In whole weight from weighout data sheets; ² Whole weight to dressed weight conversion ratio is 1.96; ³ 1982-1994 data are from weighout data sheets, 1995-2005 data are the sum of the southeast quota monitoring program/southeast general canvass and the northeast general canvass/dealer weighout data; ⁴ In pounds dressed weight from weighout data sheets; ⁵ 1982-1994 data are taken directly from weighout data sheets, 1995-2005 data obtained by dividing values in fourth column (lb dw) by those in fifth column (av. weight); ⁶ Almost all recreational landings are from the MRFSS survey, 2005 data not yet available, 2004 values used; ⁷ In pounds dressed weight; ⁸ Whole weight to dressed weight conversion ratio is 1.96.

Figure 1. Estimated annual catches (in numbers) of pelagic shark species in the northwestern Atlantic, Gulf of Mexico, and Caribbean: (A) pelagic shark species combined; (B) blue shark; and (C) shortfin mako.

