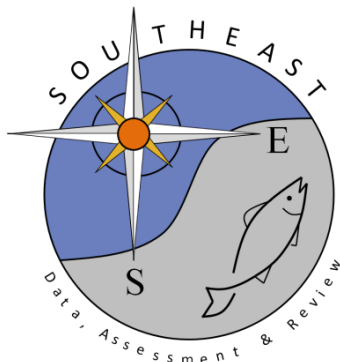


Estimates of Sandbar Shark for the U.S. Atlantic Pelagic Longline fleet for the period 1992-2024

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ESTIMATES OF SANDBAR SHARK FOR THE U.S. ATLANTIC PELAGIC LONGLINE FLEET FOR THE PERIOD 1992-2024

By

Guillermo A. Diaz¹

INTRODUCTION

In preparation to the SEDAR 101, sandbar shark stock assessment, a series of annual estimates of dead discards were prepared using a peer-reviewed methodology (Brown 2001). This methodology has been used by the U.S. to report annual estimates of dead discards and live releases of selected highly migratory species to the International Commission for the Conservation of Atlantic Tunas (ICCAT). It is important to include estimates of dead discards as a stock assessment input to obtain a clear picture of the total mortality affecting the stock.

MATERIAL AND METHODS

The estimation of sandbar shark dead discards for the Atlantic pelagic longline fleet (1992-2024) followed the methodology described by Brown (2001). This methodology is based on fishing effort levels (i.e., number of hooks) reported through the Pelagic Logbook Program (PLP), and scientific observer records of catch rates estimated from data collected by the SEFSC Pelagic Observer Program (POP). The methodology developed by Brown (2001) estimates the number of discarded individuals by applying the Delta-lognormal method as described by Pennington (1983) while considering possible geographical and time of year effects. Catch rate samples were pooled as necessary across strata to achieve a minimum sample size of 30 observations. The method produces number of individuals discarded dead by spatial and temporal strata. Number of individuals were converted into total weight using fork lengths collected by scientific observers and estimating an average weight using the L-W relationship developed by Natason et al. (2003).

RESULTS AND DISCUSSION

From 1992 through 2024, the PLP reported a total of 217,629,371 hooks and showed almost a constant decline in the number of hooks deployed and the number of vessel operating in the fishery from the beginning of the time series (Table 1, Figure 1).

A total of 18,492, 340 hooks (Table 1) and 24,648 longline sets were recorded by POP personnel from May of 1992 to December of 2024. During this period, observers recorded over 812,125 fish (primarily swordfish, tunas, and sharks), in addition to marine mammals, sea turtles, and seabirds interactions. During this period, the POP recorded a total of 2,112 sandbar sharks of which 469 were discarded dead, 1,001 discarded alive, 622 were landed, and 2 were discarded in an unmown condition (Table 2). The number of observed sandbar sharks discarded dead on an annual basis ranged from 0 to

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137 (Table 2). However, the observed number of 137 sharks discarded dead in 2015 is an outlier since the average number of sharks discarded by year (excluding 2015) was 10.4 individuals.

The number of estimated dead discards on an annual basis is presented Table 2. Overall, annual dead discards ranged from 0 in 2002 and 2003 to 748 in 1994 and showed no discernable trend (Figure 2). The average annual dead discards was estimated to be 158.4 individuals.

Table 1: Number of active longline vessels (# Vessels), number of reported hooks by the PLP (Reported Hooks), and number of observed hooks by the POP (Observed Hooks).

YEAR	# Vessels	Reported Hooks	Observed Hooks
1992	340	9,076,717	188,319
1993	435	9,735,806	534,982
1994	501	10,351,805	421,011
1995	489	11,270,539	484,860
1996	367	10,944,660	223,359
1997	352	10,213,780	318,561
1998	288	8,120,273	180,961
1999	226	7,996,685	291,553
2000	206	8,158,390	322,279
2001	185	7,897,037	454,866
2002	149	7,107,958	705,924
2003	123	6,862,091	1,013,676
2004	117	7,345,048	535,167
2005	112	5,973,150	589,787
2006	103	5,522,236	429,715
2007	119	6,312,406	733,170
2008	122	6,273,257	993,169
2009	116	6,772,732	1,206,916
2010	116	5,565,170	781,519
2011	117	5,900,451	609,508
2012	122	7,756,277	736,106
2013	115	7,241,340	1,070,811
2014	110	6,748,965	900,510
2015	103	5,423,566	737,826
2016	84	4,905,240	885,170
2017	88	5,159,788	630,748
2018	75	3,769,453	535,868
2019	67	3,480,145	372,408
2020	69	2,948,170	287,913
2021	63	2,902,538	266,625
2022	65	3,096,366	322,118
2023	70	3,734,302	400,918
2024	61	3,063,030	326,017

Table 2: Number of sandbar sharks discarded dead, discarded alive, and kept as recorded by the POP, and estimated number of dead discards and estimated total weight.

YEAR	OBSERVED			ESTIMATED	
	Discarded Dead	Discarded Alive	Kept	Discarded Dead	Total Weight
1992	8	20	187	211	11,459
1993	30	53	258	284	15,423
1994	16	45	8	748	38,706
1995	6	17	57	335	15,942
1996	1	15	10	50	1,804
1997	3	16	5	119	4,487
1998	1	9	0	55	3,313
1999	4	21	4	159	8,235
2000	5	9	0	162	8,455
2001	2	4	1	72	2,784
2002	0	1	0	0	-
2003	0	1	0	0	-
2004	4	13	31	40	2,411
2005	3	8	0	44	2,377
2006	1	3	49	12	336
2007	9	42	11	185	5,553
2008	7	50	0	46	1,852
2009	38	39	0	136	6,309
2010	8	20	0	93	3,034
2011	16	31	0	156	6,211
2012	7	32	0	71	2,928
2013	14	42	0	98	4,904
2014	5	21	0	25	1,210
2015	137	71	0	404	3,897
2016	47	115	1	388	3,442
2017	30	76	0	422	12,318
2018	13	47	0	141	4,889
2019	4	14	0	44	2,091
2020	5	2	0	156	5,926
2021	14	51	0	270	14,946
2022	8	30	0	24	1,471
2023	18	55	0	244	12,615
2024	5	28	0	32	1,755

Figure 1: Time series of the number of active pelagic longline vessels and number of hook deployed as reported by the PLP.

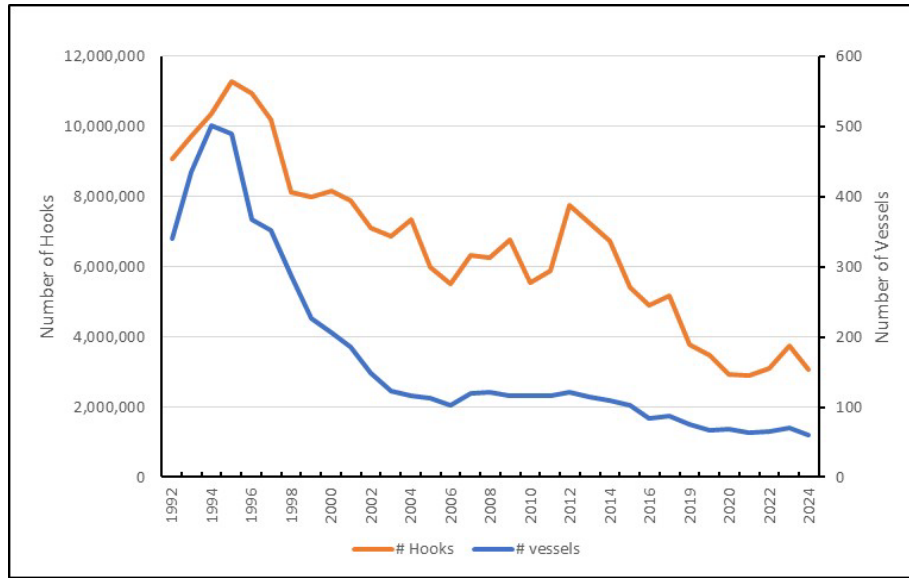
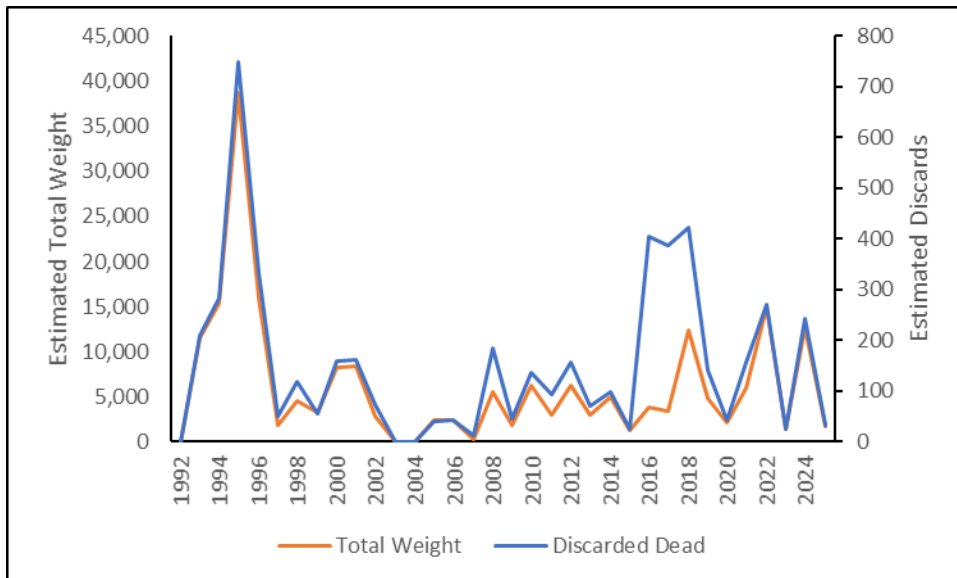


Figure 2: Time series of estimated number of sandbar discarded dead and estimated total weight (kg)



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