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Shark Bottom Longline Observer Program: Catch and Bycatch 2005-2009

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Abstract

Data gathered from observation of the bottom longline fishery in the southern U.S. Atlantic Ocean and Gulf of Mexico from 2005 through 2009 are reported. Number caught, disposition, and percentages of the large and small coastal complex for sandbar sharks, blacknose sharks, and dusky sharks are reported by year, area, and target when available.

Introduction

Observations of the shark-directed bottom longline fishery in the Atlantic Ocean and Gulf of Mexico have been conducted since 1994 (e.g. Hale and Carlson, 2007, Hale et al., 2007, Morgan et al. 2009, Hale et al., 2009, Hale et al. 2010). Currently 217 U.S. fishers are permitted to target sharks (excluding dogfish) in the Atlantic Ocean and Gulf of Mexico, and an additional 279 fishers are permitted to land sharks incidentally. Amendments to the Consolidated Atlantic Highly Migratory Species Fishery Management Plan based on updated stock assessments have eliminated the major directed shark fishery in the U.S. Atlantic (NMFS, 2007). The amendments implemented

a shark research fishery, which allows NMFS to select a limited number of commercial shark vessels on an annual basis to collect life history data and catch data for future stock assessments. Specifically, only commercial shark fishers participating in the research fishery are allowed to land sandbar sharks, *Carcharhinus plumbeus*, and must carry an observer on 100% of all trips (compared to a coverage level of 4-6% outside the research fishery). Outside the research fishery, fishers are permitted to land 33 non-sandbar large coastal sharks (blacktip shark, *Carcharhinus limbatus*, bull shark, *Carcharhinus leucas*, lemon shark, *Negaprion brevirostris*, nurse shark, *Ginglymostoma cirratum*, silky shark, *Carcharhinus falciformis*, spinner shark, *Carcharhinus brevipinna*, tiger shark, *Galeocerdo cuvier*, great hammerhead shark, *Sphyrna mokarran*, scalloped hammerhead shark, *Sphyrna lewini*, and smooth hammerhead shark, *Sphyrna zygaena*). Herein, we report on catch and bycatch of sandbar sharks, dusky sharks, and blacknose sharks in the bottom longline fishery for the 2005 – 2009 fishing seasons, including coverage of the sandbar shark research fishery.

Methods

Vessels were selected from three fishing regions: northern Atlantic Ocean, southern Atlantic Ocean, and Gulf of Mexico. The northern Atlantic Ocean was defined from Virginia through Maine, the southern Atlantic Ocean was from the east coast of Florida through North Carolina and the Caribbean, and the Gulf of Mexico was defined from Texas through the west coast of Florida including the Florida Keys (NMFS, 2005). In October 2008, NMFS announced its request for applications for the shark research fishery from commercial shark fishers with a directed or incidental permit for 2009. Commercial shark fishers submitted applications to the Highly Migratory Species (HMS)

Management Division. The HMS Management Division provided a list of qualified applicants to the Panama City Laboratory and based on the temporal and spatial needs of the research objectives, the availability of qualified applicants, and the available quota, seven qualified applicants were selected for observer coverage. These vessels carried observers on 100% of trips. Outside the research fishery, vessels targeting shark and possessing current valid directed shark fishing permits were randomly selected for coverage with a target coverage level of 4-6%. Because of the overlap with vessels targeting reef fish and shark within the same trip and vessels possessing directed shark permits (Hale and Carlson, 2007), starting in 2006 observers also boarded trips regardless of the indicated target species. Thus, observers worked bottom longline trips that targeted grouper, snapper, and tilefish, as well as sharks.

Selection letters requiring observer coverage were issued to the permit holder via U.S. Certified mail approximately one month prior to the upcoming fishing season. Once the permitholder receives the selection letter, he or she is required to make contact with the observer coordinator and indicate intent to fish during the upcoming fishing season. If the permit holder intended to fish, the observer coordinator deployed an observer to the port of departure. Vessels were required to pass a Coast Guard Vessel Safety Examination as well as a safety evaluation by the observer prior to coverage. While onboard the vessel, the observer completes three data forms: Longline Gear Log, Longline Haul Log, and Individual Animal Log. The Longline Gear Log is used to record gear characteristics. The Longline Haul Log is used to record the information on set and haulback, as well as environmental information. The Individual Animal Log records all

species caught, condition of the catch (e.g. alive, dead, damaged, or unknown), and the final disposition of the catch (e.g. kept, released, discarded dead etc.).

On shark research fishery trips, observers were required to randomly sample sandbar sharks for biological samples for updates to life history studies, which was a research recommendation from the last large coastal shark stock assessment (SEDAR 11). Observers were also required to obtain trip weighout forms which were compared to shark dealer reports by quota monitoring managers to manage the sandbar shark quota within the research fishery.

Results

From 2005 to 2009, 879 sets were observed in the Gulf of Mexico and southern Atlantic Ocean, with 41.1 % of sets catching sandbar sharks, 32.3% of sets catching blacknose sharks, and 8.2% of sets catching dusky sharks (Figure 1). A total of 27,423 sharks have been recorded caught, with small coastal sharks making up 20.5% of the shark catch (Figure 2) and large coastal sharks making up 73.4% of the shark catch (Figure 3).

Catch disposition for sandbar, dusky, and blacknose shark was divided up as percent of the catch kept for landing (including the percent of the catch kept for bait), percent of the catch released alive (including tagged animals), percent of the catch discarded dead, and percent of the catch lost (before it was boarded) or with unknown disposition (the observer was unable to record a disposition for the catch) (Tables 1- 16).

Acknowledgements

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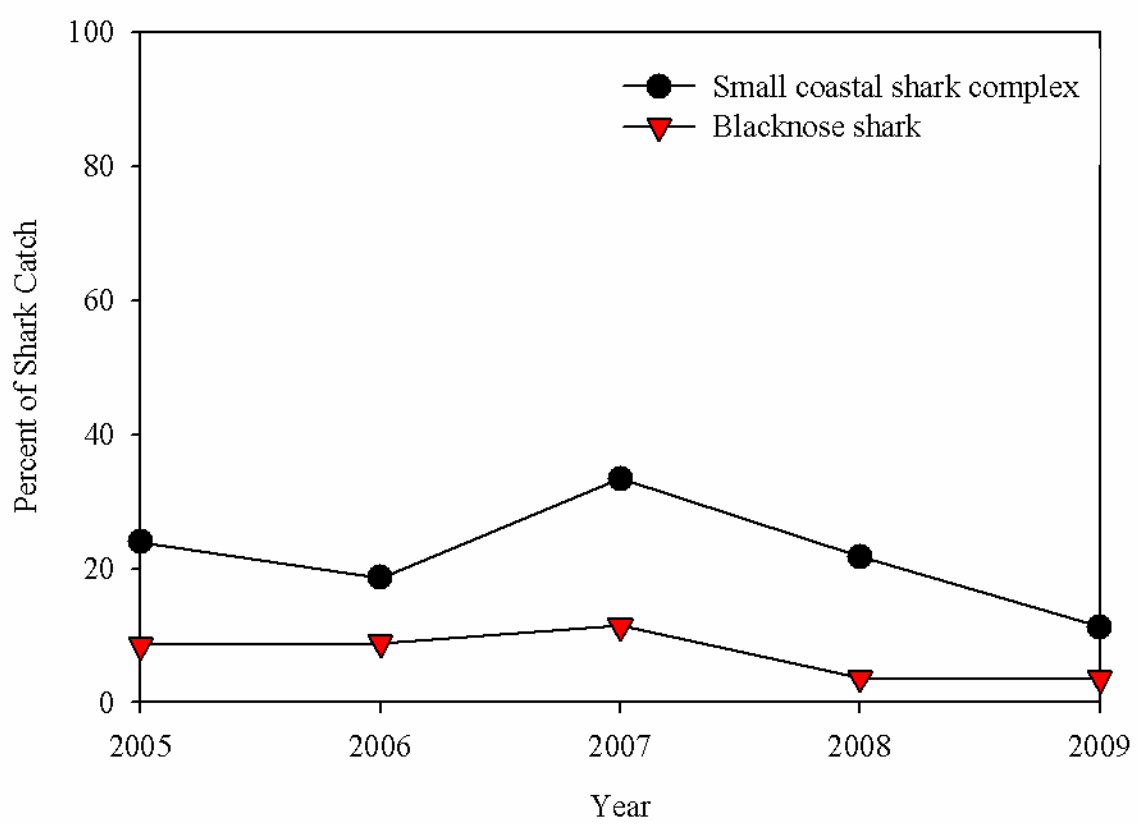

Figure 1. Percent catch of blacknose sharks and all small coastal sharks as a proportion of the total shark catch for 2005 – 2009.

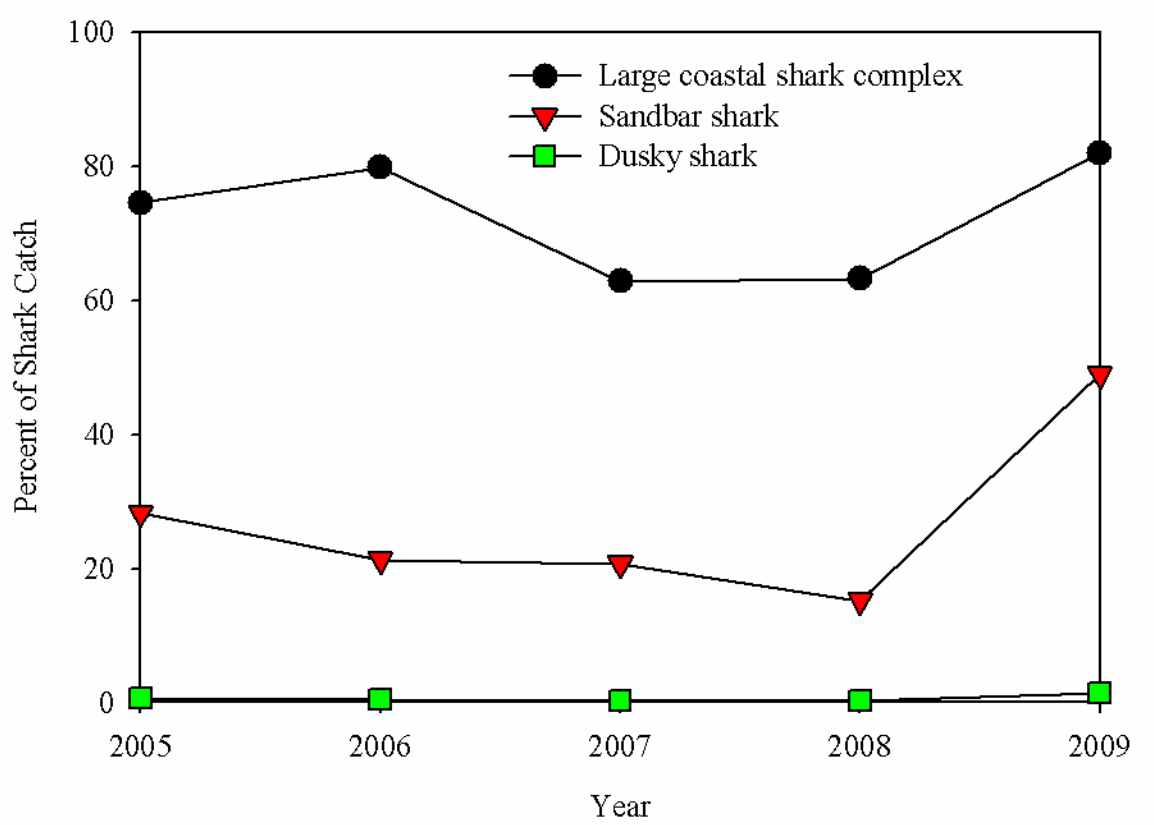

Figure 2. Percent catch of sandbar and dusky sharks and all large coastal sharks as a proportion of the total shark catch for 2005 - 2009.

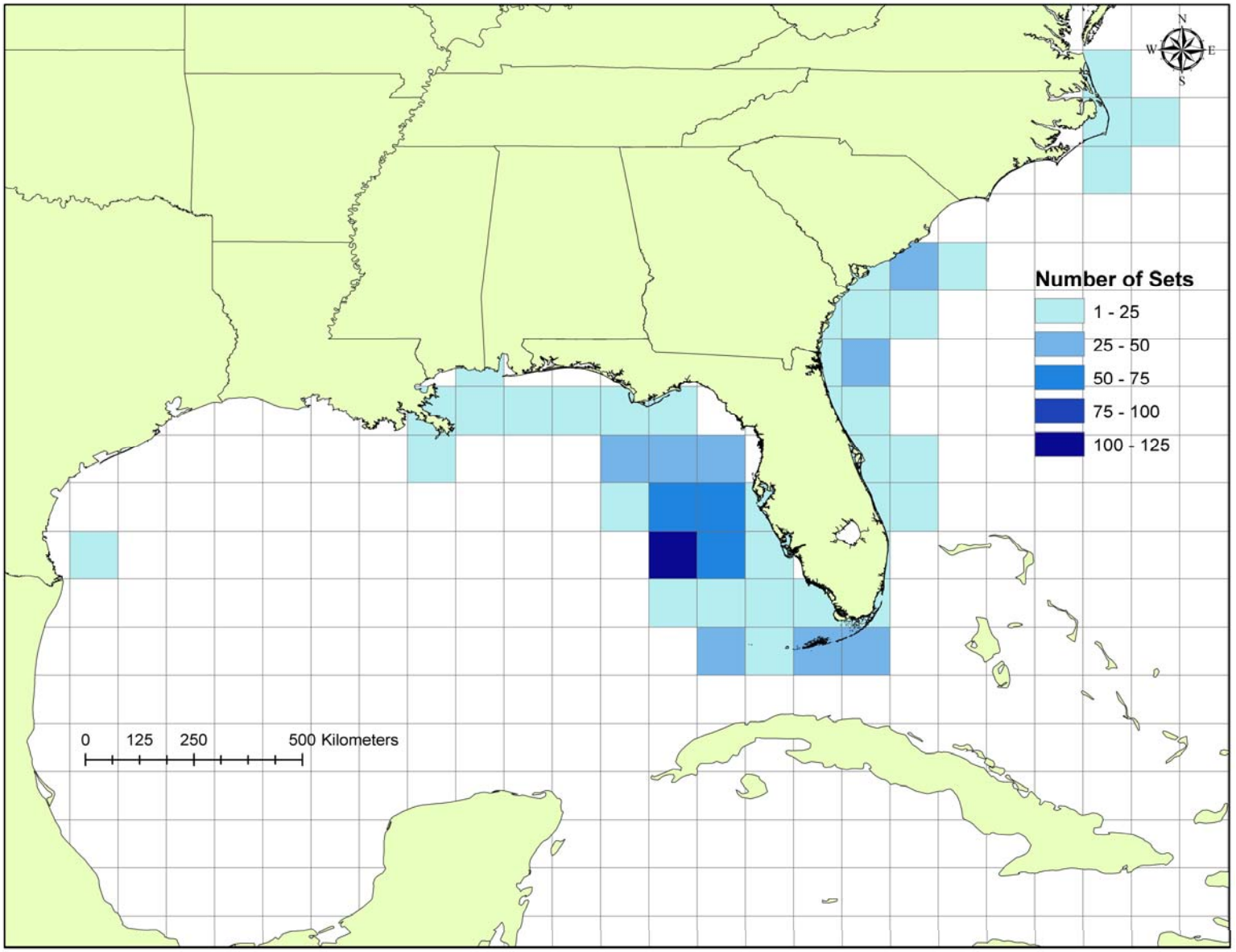

Figure 3. All sets observed from 2005 – 2009.

Table 1. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets in 2005 in the southern Atlantic Ocean.

Common Name	Number Caught	% Complex	% Kept	%Released Alive	% Discarded Dead	%Lost / Unknown
Sandbar shark	846	43.32	98.6	0.0	0.2	1.2
Blacknose shark	63	14.00	90.5	3.2	6.3	0.0
Dusky shark	23		4.3	52.2	43.5	0.0
All LCS	1953					
All SCS	450					
All sharks	2455					

Table 2. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets in 2005 in the Gulf of Mexico.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	218	25.62	98.6	0.0	0.0	1.4
Blacknose shark	259	57.68	78	1.9	19.3	0.8
Dusky shark	2		0.0	0.0	100	0.0
All LCS	851					
All SCS	449					
All sharks	1308					

Table 3. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets in 2006 in the southern Atlantic Ocean.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	753	39.00	99.7	0.0	0.0	0.3
Blacknose shark	13	7.51	84.6	0.0	7.7	7.7
Dusky shark	23		13.0	56.5	30.4	0.0
All LCS	1931					
All SCS	173					
All sharks	2166					

Table 4. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting sharks in 2006 in the Gulf of Mexico.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	427	17.36	97.4	0.0	1.6	0.9
Blacknose shark	364	53.85	79.7	17.9	2.2	0.3
Dusky shark	2		0.0	50.0	50.0	0.0
All LCS	2460					
All SCS	676					
All sharks	3161					

Table 5. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting reef fish in 2006 in the Gulf of Mexico.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	2	4.26	100.0	0.0	0.0	0.0
Blacknose shark	120	63.49	0.8	0.8	98.3	0.0
Dusky shark	0		0	0	0	0
All LCS	47					
All SCS	189					
All sharks	237					

Table 6. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting shark in 2007 in the southern Atlantic Ocean.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	827	40.15	98.8	0.1	0.1	1.0
Blacknose shark	148	29.42	98.0	0.0	2.0	0.0
Dusky shark	13		0.0	15.4	84.6	0.0
All LCS	2060					
All SCS	503					
All sharks	2619					

Table 7. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting tilefish in 2007 in the southern Atlantic Ocean.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	0	0.00	0.0	0.0	0.0	0.0
Blacknose shark	0	0.00	0.0	0.0	0.0	0.0
Dusky shark	0		0.0	0.0	0.0	0.0
All LCS	3					
All SCS	0					
All sharks	32					

Table 8. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting reef fish in 2007 in the Gulf of Mexico.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	31	17.71	12.9	77.4	6.5	3.2
Blacknose shark	215	28.03	9.8	77.2	12.6	0.5
Dusky shark	1		0.0	100.0	0.0	0.0
All LCS	175					
All SCS	767					
All sharks	1041					

Table 9. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting shark in 2007 in the Gulf of Mexico.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	160	18.65	98.8	0.0	0.0	1.3
Blacknose shark	199	53.21	74.87	4.52	20.60	0.00
Dusky shark	1		0.0	100.0	0.0	0.0
All LCS	858					
All SCS	374					
All sharks	1235					

Table 10. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting shark in 2008 in the southern Atlantic Ocean.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	383	25.13	85.9	11.7	1.3	1.0
Blacknose shark	4	1.36	100.0	0.0	0.0	0.0
Dusky shark	0		0.00	0.0	0.0	0.0
All LCS	1524					
All SCS	294					
All sharks	1820					

Table 11. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting reef fish in 2008 in the Gulf of Mexico.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	47	37.01	0.0	2.1	0.0	97.9
Blacknose shark	16	4.44	31.3	18.8	0.0	50.0
Dusky shark	0		0.00	0.0	0.0	0.0
All LCS	127					
All SCS	360					
All sharks	1227					

Table 12. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting shark in 2008 in the Gulf of Mexico.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	382	22.06	98.4	1.0	0.3	0.3
Blacknose shark	177	34.57	83.1	1.7	15.3	0.0
Dusky shark	21		0.0	0.0	100.0	0.0
All LCS	1732					
All SCS	512					
All sharks	2306					

Table 13. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting reef fish in 2009 in the Gulf of Mexico.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	1	3.57	0.0	100.0	0.0	0.0
Blacknose shark	195	64.14	0.5	95.9	3.6	0.0
Dusky shark	9		0.0	100.0	0.0	0.0
All LCS	28					
All SCS	304					
All sharks	681					

Table 14. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting large coastal sharks in 2009 in the Gulf of Mexico and southern Atlantic Ocean.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	7	1.79	0.00	14.3	85.7	0.0
Blacknose shark	10	15.63	80.0	10.0	10.0	0.0
Dusky shark	0		0.00	0.0	0.0	0.0
All LCS	392					
All SCS	64					
All sharks	458					

Table 15. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting mixed species (shark and reef fish/tilefish) in 2009 in the Gulf of Mexico and southern Atlantic Ocean.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	203	68.58	98.0	0.0	0.0	2.0
Blacknose shark	1	16.67	100.0	0.0	0.0	0.0
Dusky shark	3		0.0	0.0	100.0	0.0
All LCS	296					
All SCS	6					
All sharks	308					

Table 16. Number caught and disposition of catch (percentage) for sandbar, blacknose, and dusky sharks from observed bottom longline sets targeting sandbar shark in 2009 in the Gulf of Mexico and southern Atlantic Ocean.

Common Name	Number Caught	% Complex	% Kept	% Released Alive	% Discarded Dead	% Lost / Unknown
Sandbar shark	3620	63.56	82.6	11.1	5.8	0.6
Blacknose shark	71	13.95	52.1	2.8	45.1	0.0
Dusky shark	94		0.0	45.7	54.3	0.0
All LCS	5695					
All SCS	509					
All sharks	6371					