

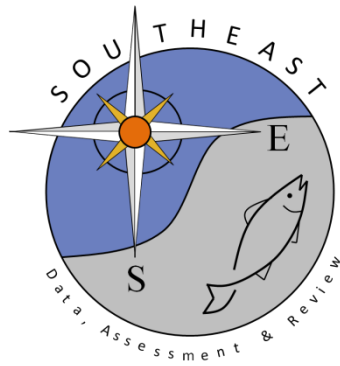
Dead discards of blacktip sharks in the Gulf of Mexico shark bottom longline fishery

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Introduction

Currently 208 U.S. fishers are permitted to target sharks (excluding dogfish) in the Atlantic Ocean and Gulf of Mexico, and an additional 253 fishers are permitted to land sharks incidentally. Amendments to the Consolidated Atlantic Highly Migratory Species Fishery Management Plan based on stock assessments have eliminated the major directed shark fishery in the U.S. Atlantic (NMFS 2007). These 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. Since 2008, only commercial shark fishers participating in the shark research fishery are allowed to land sandbar sharks, *Carcharhinus plumbeus*, and must carry an observer on 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 (including 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*, and scalloped hammerhead shark, *Sphyrna lewini*).

Bottom longline landings and fishing effort of commercial vessels operating in the Gulf of Mexico are reported to the National Marine Fisheries Service (NMFS) through the Coastal Fisheries Logbook Program (CFLP, conducted by the NMFS Southeast Fisheries Science Center). The program collects landings and effort data by fishing trip from vessels that are federally permitted to fish in a number of fisheries managed by the National Marine Fisheries Service and Gulf of Mexico Fishery Management Councils. The coastal logbook program began in 1990 with the objective of a complete census of coastal fisheries permitted vessel activity, with the exception of Florida, where a 20% sample of vessels was selected to report. Beginning in 1993, reporting in Florida was increased to include all vessels permitted for Federally managed coastal fisheries.

Commercial shark longline vessels operating in the Gulf of Mexico are also required to carry fishery observers to monitor catch and bycatch. The spatial distribution of fishery observer coverage is provided in Figure 1. Fishery observers are trained in fishery and biological data collection, biological sampling, and teleost and elasmobranch species identification. Observers are required to record and measure all species captured, their disposition (e.g. kept, discarded dead, used for bait, etc.) and effort (e.g. number of hooks, gear characteristics, set and haul times).

Methods

Observer reported blacktip shark discard rates from 2006-2010, along with self reported commercial fishing effort data, were used to calculate blacktip shark discards from the shark bottom longline fishery in the Gulf of Mexico. Fishing effort data were available from the coastal logbook program for the years 1993-2010. Beginning in 1993 all commercial vessels with Federal fishing permits (other than those for swordfish, tunas, and shrimp) were required to report landings and effort to the coastal logbook program. The time series was truncated at 2010 because all reports from fishing trips made in 2011 had not been received and entered into the coastal logbook data base prior to the SEDAR 29 data workshop.

Available coastal logbook data were filtered to include only bottom longline data and to remove records missing effort information (number of sets, number of hooks per set). Data reported from individual trips with fishing effort in both the South Atlantic and Gulf of Mexico were excluded from the analyses because fishing effort cannot be reliably apportioned within single trips. Coastal logbook data were additionally filtered to remove likely erroneous records; for example, data from trips that reported fishing more than 24 sets per 24 hours. Those data that exceeded the 99.5 percentile of the data for any variable used to calculate effort (number of sets, number of hooks) were also excluded. Such outliers in the data set usually resulted from data entry errors. After data filtering, effort data from only those trips that targeted sharks (defined as trips with reported landings of 2/3 shark by weight) were included in the analysis. Effort was defined as hooks fished because hook hours fished could not be reliably calculated from the coastal logbook data.

Total discards were calculated as the product of observer reported yearly mean dead discard rates and the yearly total shark targeted fishing effort (bottom longline hooks fished) reported to the coastal logbook program. Discard rate by hook fished was not available prior to 2006. To calculate discards for the years 1993-2005 the mean dead discard rate across the years 2006-10, weighted by sample size, was used. Yearly total dead discards prior to 2006 were calculated as the product of the weighted mean dead discard rate and the year-specific shark targeted effort.

Results and Discussion

Calculated Gulf of Mexico blacktip shark discards (in numbers of fish) from the commercial bottom longline fishery are provided in Table 1. Also included are dead

discard rates, number of observed trips (discard rate sample sizes), discard rate CVs, number of trips reporting effort, and total effort (hooks fished).

Table 1. Yearly calculated discards of blacktip sharks from Gulf of Mexico bottom longline commercial fishing vessels. Discards are reported as number of fish. “Trips (discards)” is the number of trips with observer reported discards. “Trips (total effort)” is the number of shark targeted trips reporting effort to the coastal logbook program.

Year	Trips (discards)	Trips (total effort)	Discard Rate	Discard Rate CV	Total Effort	Calculated Dead Discards
1993		134	134		774,515	3,382
1994		243	243		1,164,170	5,083
1995		424	424		2,124,450	9,276
1996		729	729		2,511,345	10,965
1997		350	350		1,080,150	4,716
1998		331	331		1,189,496	5,194
1999		384	384		1,170,304	5,110
2000		337	337		973,290	4,250
2001		428	428		935,767	4,086
2002		496	496		1,088,609	4,753
2003		547	547		1,074,047	4,689
2004		434	434		789,230	3,446
2005		464	464		1,009,610	4,408
2006	28	576	576	2.244	1,193,336	11,282
2007	23	149	149	2.616	288,210	366
2008	31	136	136	1.994	160,520	371
2009	52	80	80	3.280	65,225	190
2010	64	54	54	2.973	15,380	84

Figure 1. Distribution of observed fishing effort in the Gulf of Mexico for the directed shark bottom longline fishery 1994-2010.

