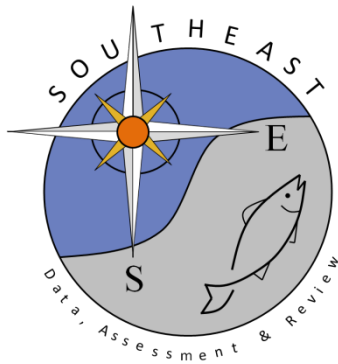


Tag and recapture data for Atlantic sharpnose, *Rhizoprionodon terraenovae*, and bonnethead, *Sphyrna tiburo*, sharks caught in the northern Gulf of Mexico from 1998-2011

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Tag and recapture data for Atlantic sharpnose, *Rhizoprionodon terraenovae*, and bonnethead, *Sphyrna tiburo*, sharks caught in the northern Gulf of Mexico from 1998-2011

Jill M. Hendon¹, Eric R. Hoffmayer², and Glenn R. Parsons³

Routine, monthly (March to October), fishery-independent shark resource sampling has been conducted in Mississippi, Alabama, and Louisiana coastal waters by The University of Southern Mississippi and the University of Mississippi since 1998. Sampling methods have included gillnet, bottom longline (152 m and 1.8 km), and hook-and-line gear. All sharks in good condition were externally tagged with either a dart (7 or 18 cm) or roto tag and were released. The dart tags were imbedded in the dorsal musculature at the base of the first dorsal fin, and the roto tags were punched through the cartilage of the first dorsal fin. From 1998 to 2011, approximately 6,500 sharks have been tagged on these resource surveys. A total of 3,753 Atlantic sharpnose sharks were tagged and 20 of these were recaptured (0.5%), whereas 160 bonnethead sharks were tagged and two of these were recaptured (1.3%). No Atlantic sharpnose or bonnethead shark traveled from the Gulf of Mexico to the Atlantic Ocean or vice versa.

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INTRODUCTION

Fishery-independent inshore surveys of coastal shark populations have been conducted by the University of Southern Mississippi and the University of Mississippi since 1998. From 1998 to 2000, an inshore gillnet survey was conducted in the nearshore waters of Mississippi and Alabama. In 2004 The University of Southern Mississippi reinitiated the gillnet survey, and complemented this work with the addition of inshore bottom longline (152 m) gear. Then in 2008, the Southeast Area Monitor and Assessment Program (SEAMAP) funded a bottom longline (1.8 km) survey in coastal state and federal waters of Mississippi (through 2011) and Louisiana (through 2010). One common objective of all these projects was shark tagging. As a result, the Mississippi Coastal Shark Tagging Program was established and its primary goal was to gain information on the movement patterns, growth rates, and stock structure of shark species within the waters of the northern Gulf of Mexico

METHODOLOGY

Mississippi Nearshore Gillnet Survey (1998-2011)

Sampling was conducted with a 152.4 x 3 m gillnet consisting of five 30.5 meter panels of 4.5, 5.1, 5.7, 6.4, and 7.0 cm square mesh. The net was typically fished between the hours of 0800 and 2000. Depending upon the rate of capture and the environmental conditions prevalent, the net was checked every 0.5 to 1.0 hour. Each time the net was checked, the time of day over which those sharks were captured was recorded. For additional details see SEDAR34-WP-09.

Mississippi Inshore Bottom Longline Survey (2004-2011)

Sampling was conducted with a 152.4 m bottom longline that consisted of 50 1.0 m gangions (2.0 mm monofilament) outfitted with #12/0 circle hooks, and baited with menhaden (*Brevoortia patronus*). The longline was typically fished between the hours of 0800 and 2000, and was allowed to soak for one hour prior to retrieval. For additional details see SEDAR34-WP-10.

SEAMAP Mississippi/Louisiana Bottom Longline Survey (2008-2011)

The sampling protocol and equipment follows the procedures established by the NOAA Fisheries Mississippi Laboratories bottom longline survey (Grace and Henwood 1997). The longline gear consisted of a 1.8 km (426 kg test) monofilament mainline and 100, 3.7 m gangions (332 kg test monofilament) outfitted with #15/0 circle hooks and baited with Atlantic mackerel, (*Scomber scombrus*). The longline fished for one hour from the time of last high-flier deployment to the time of first high-flier retrieval. For additional details see SEDAR34-WP-11.

Hook and Line

In addition to the survey work described above, sharks were also caught opportunistically using hook-and-line gear (1998-2011). Typical gear included 100 lb steel leader and 5/0 J style hooks.

Tagging

Two basic tag types were applied to the sharks: 1) dart tags (plastic-tipped 7 cm or stainless steel-tipped 18 cm long; ©Hallprint Pty Ltd.), placed within the dorsal musculature at the base of the first dorsal fin, and 2) roto tags (swivel tag, 3.8 x 1.0 cm, ©Premier1Supplies), punched through the cartilage of the first dorsal fin. Prior to 2004, all sharks were tagged with the 7 cm plastic-tipped dart tags. From 2004-2011, immature (<70 cm STL) Atlantic sharpnose and bonnethead sharks, were tagged with the 7 cm plastic-tipped dart tag, whereas the mature sharks (>71 cm STL) were typically tagged with the roto tags. Neither species were tagged with the stainless steel tipped dart tags. Each tag had a unique identifier number as well as a phone number for contact upon recapture.

Upon initial capture sharks were identified to species, measured in centimeters (PCL, FL, and STL), weighed (kg), and a sex and stage (YOY, juvenile, and adult) were identified. If the shark was deemed in good condition, it was tagged prior to release. The date, tag number, and capture location (latitude and longitude) were recorded.

Upon recapture the same information was collected from each shark. If a recreational or commercial fisher captured the tagged shark, then all possible information was requested. The recapture information was then compared to the initial tagging information to discern movement and growth changes for each shark.

Summary information provided in this document includes tagging date and location, recapture date and location, time at liberty (d), and distance traveled (km). The time at liberty is the number of days between the initial tagging and recapture event. The distance traveled is calculated as the straight-line distance over water between the tagging location and the recapture location, and was measured in kilometers (km).

RESULTS

From 1998 to 2011, over 6,500 sharks were tagged. Of this number, 3,753 were Atlantic sharpnose sharks (256 young of the year, 938 juvenile, and 2,561 adult), 3,243 of which were male (86.4%), 484 of which were female (12.9%), and 26 were unknown (0.7%). Bonnethead sharks only comprised 160 of the total tagged number (1 young of the year, 29 juvenile, and 130

adult). Of those, 113 were male (70.6%), 43 were female (26.9%), and four were unknown (2.5%).

Since initiating tagging, we have had 52 recaptured sharks reported. Of the 3,753 Atlantic sharpnose sharks tagged, 20 have been recaptured yielding a recapture rate of 0.5%; while of the 160 tagged bonnethead sharks two have been recaptured resulting in a 1.3% recapture rate.

For Atlantic sharpnose sharks the time at liberty ranged from 1 to 598 days while the distance traveled ranged from 0 to 204 km (Table 1). Details of these recaptures revealed that Atlantic sharpnose shark movements were mainly longitudinal and covered a relatively short distance. The majority of the sharks were recaptured within the Mississippi Sound, and only three moved beyond the tagging region: shark 1201 moved to the Chandeleur Sound Louisiana, shark 0854 moved to the East Mississippi Delta off Louisiana (0854), and shark 0090 moved to Pensacola Bay.

For bonnethead sharks the time at liberty ranged from 14 to 331 days while the distance traveled ranged from 16.2 to 37 km (Table 2). Details of these recaptures revealed that the recaptured bonnethead sharks were caught in the same region in which they were tagged.

No Atlantic sharpnose or bonnethead shark traveled from the Gulf of Mexico to the Atlantic Ocean or vice versa.

REFERENCES

- Grace, M.A. and T. Henwood. 1997. Assessment of the distribution and abundance of coastal sharks in the U.S. Gulf of Mexico and Eastern Seaboard, 1995 and 1996. *Mar. Fish Rev.* 59: 23–32.
- Hoffmayer, E.R., J.M. Hendon, G.R. Parsons, and A.G. Pollack. 2013. Standardized catch rates of Atlantic sharpnose (*Rhizoprionodon terraenovae*) and bonnethead (*Sphyrna tiburo*) sharks collected during a gillnet survey in Mississippi coastal waters, 1998-2011. SEDAR34-WP-09. SEDAR, North Charleston, SC. 23 pp.
- Hoffmayer, E.R., J.M. Hendon, and A.G. Pollack. 2013. Standardized catch rates of Atlantic sharpnose sharks (*Rhizoprionodon terraenovae*) collected during a bottom longline survey in Mississippi coastal waters, 2004-2011. SEDAR34-WP-10. SEDAR, North Charleston, SC. 17 pp.
- Hoffmayer, E., A. Pollack, J. Hendon, M. Drymon, and M. Grace. 2013. Standardized catch rates of Atlantic sharpnose sharks (*Rhizoprionodon terraenovae*) collected during bottom longline surveys in Mississippi, Louisiana, Alabama, and Texas coastal waters, 2004-2011. SEDAR34-WP-11. SEDAR, North Charleston, SC. 19 pp.

Table 1. Data for recaptured Atlantic sharpnose sharks, *Rhizoprionodon terraenovae*, as documented by the Mississippi Coastal Shark Tagging Program from 1998 to 2011.

Identifier	Tag Type	Sex	Date Tagged	Latitude	Longitude	Date Recaptured	Latitude	Longitude	Time at Liberty (days)	Distance Traveled (km)	Recapture Source
140	Dart	M	5/26/1998	30.246	-89.144	7/5/1998	30.242	-89.082	40	7.0	Recreational
146	Dart	M	5/26/1998	30.246	-89.144	6/5/1999	30.253	-88.858	375	29.0	Recreational
403	Dart	M	5/21/1999	30.261	-88.733	7/21/1999	30.204	-88.520	61	26.5	Recreational
548	Dart	F	4/28/2000	30.274	-88.711	5/21/2000	30.260	-88.775	23	12.4	Recreational
572	Dart	M	4/28/2000	30.274	-88.711	5/21/2000	30.295	-88.602	23	7.4	Recreational
835	Dart	M	6/27/2000	30.269	-88.585	7/7/2000	30.308	-88.447	10	16.1	Recreational
1157	Dart	M	9/16/2000	30.283	-89.112	6/26/2001	30.266	-89.021	283	10.6	Recreational
1189	Dart	M	9/15/2000	30.280	-88.722	5/20/2001	30.250	-88.884	247	15.4	Recreational
1201	Dart	M	9/18/2000	30.255	-88.235	5/5/2001	30.047	-88.871	229	81.5	Recreational
R0090	Roto	M	6/21/2004	30.271	-88.729	8/15/2004	30.445	-87.025	55	204	Recreational
SH0083	Dart	M	6/21/04	30.271	-88.729	5/30/05	30.202	-89.000	342	29.6	Recreational
SH0136	Dart	M	8/17/2004	30.368	-88.960	6/29/2005	30.257	-88.900	14	13.0	Recreational
SH0153	Dart	M	10/26/2004	30.259	-88.701	6/15/2006	30.234	-89.104	598	45.7	Recreational
SH0213	Dart	M	5/26/2005	30.225	-88.434	6/15/2005	30.248	-88.296	14	15.7	Recreational
R0645	Roto	M	9/27/2006	30.271	-88.738	6/1/2007	30.258	-88.908	247	24.8	Recreational
R0854	Roto	M	6/12/2007	30.247	-88.774	7/1/2007	29.283	-88.783	18	126.3	Recreational
SH1992	Dart	M	4/22/2009	30.022	-88.974	7/14/2009	30.256	-89.066	83	33.3	Recreational
MS2742	Roto	M	9/15/2010	30.296	-88.610	9/29/2010	30.292	-88.596	14	1.4	MS Resource Survey
R1453	Roto	M	5/4/2010	30.293	-88.595	5/4/2011	30.175	-88.150	365	46.3	Commercial
SH2544	Dart	F	9/24/2010	30.249	-88.772	9/25/2010	30.249	-88.772	1	0	Recreational

Table 2. Data for recaptured bonnethead sharks, *Sphyrna tiburo*, as documented by the Mississippi Coastal Shark Tagging Program from 1998 to 2011.

Identifier	Tag Type	Sex	Date Tagged	Latitude	Longitude	Date Recaptured	Latitude	Longitude	Time at Liberty (days)	Distance Traveled (km)	Recapture Source
SH0298	Dart	F	5/7/2005	30.273	-88.747	5/21/2005	30.255	-89.036	14	37	Recreational
R0426	Roto	M	5/3/2010	30.2623	-89.131	3/30/2011	30.202	-88.999	331	16.2	Commercial