THE SHARK TAGGER

winter 1977

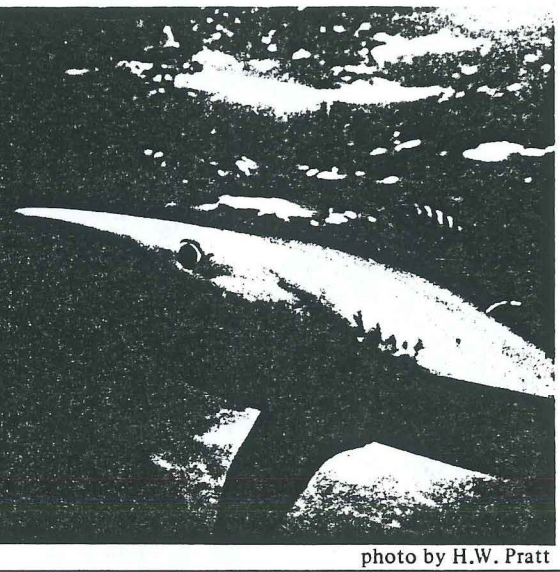

photo by H.W. Pratt

1977, A RECORD YEAR

In 1977, 3,679 sharks of 29 species were tagged and released under the NMFS cooperative shark tagging program. During the same period, 136 tags were recovered from 15 species of sharks and a broadbill swordfish. Compared to 1976 these results represent an increase of nearly 1,500 releases (59%) and 61 recaptures (82.4%). The recovery rate of 3.7% in 1977 was also slightly higher than in previous years. The maximum time at liberty came from a sandbar shark that was recaptured 12 years after it was tagged. The longest distance traveled by a tagged shark was 1,400 miles by a blue shark at liberty for six months. The maximum distance recorded for any species in 1977 was 1,900 miles by a swordfish. Of the 136 tag returns, 98 (72%) were recovered by U.S. sport fishermen, 19 (14%) from U.S. commercial fishermen, and 19 (14%) from other sources. Included in the "other" category were five recaptures from sharks tagged and recovered off the Spanish coast in the Mediterranean; one recapture by NMFS biologists; and 13 recaptures by foreign fishermen in the Western Atlantic. The latter included fishermen for Japan (5), Taiwan (1), Korea (2), Canada (2), Cuba (1), British West Indies (1) and Mexico (1). With respect to the overall tagging effort, cooperative taggers accounted for 89.7% of all fish tagged. Narragansett biologists accounted for the remaining 10.3% during research cruises. Without question, the tagging program depends on volunteer fishermen. The vast majority of taggers are sport fishermen, but we also acknowledge assistance from commercial fishermen and other biologists who have been most helpful. We are indeed grateful to all of you.

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BAY SHORE LONG ISLAND TAGGING EXPERIMENT

For 15 years the annual Bay Shore Mako Tournament has offered our project a unique opportunity to study sharks. During this tournament 150 boats fish in the area south of Fire Island Inlet, NY, for two days during the last weekend in June. From its inception, provisions have been made to help biologists gather detailed information and examine catches on the dock. As a result we have been able to monitor the abundance and species composition of sharks off Long Island during the spring and to correlate changes in annual abundance with changes in water temperatures. The tournament also provides an opportunity to study population structure, food and reproductive habits and other elements of shark biology. Although 10 species of sharks have been represented in tournament catches, the blue shark is by far the most common.

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Newsletter of the
Cooperative Shark Tagging Program
U.S. Department of Commerce
National Oceanic and Atmospheric Administration
National Marine Fisheries Service
Northeast Fisheries Center
Narragansett, Rhode Island 02882

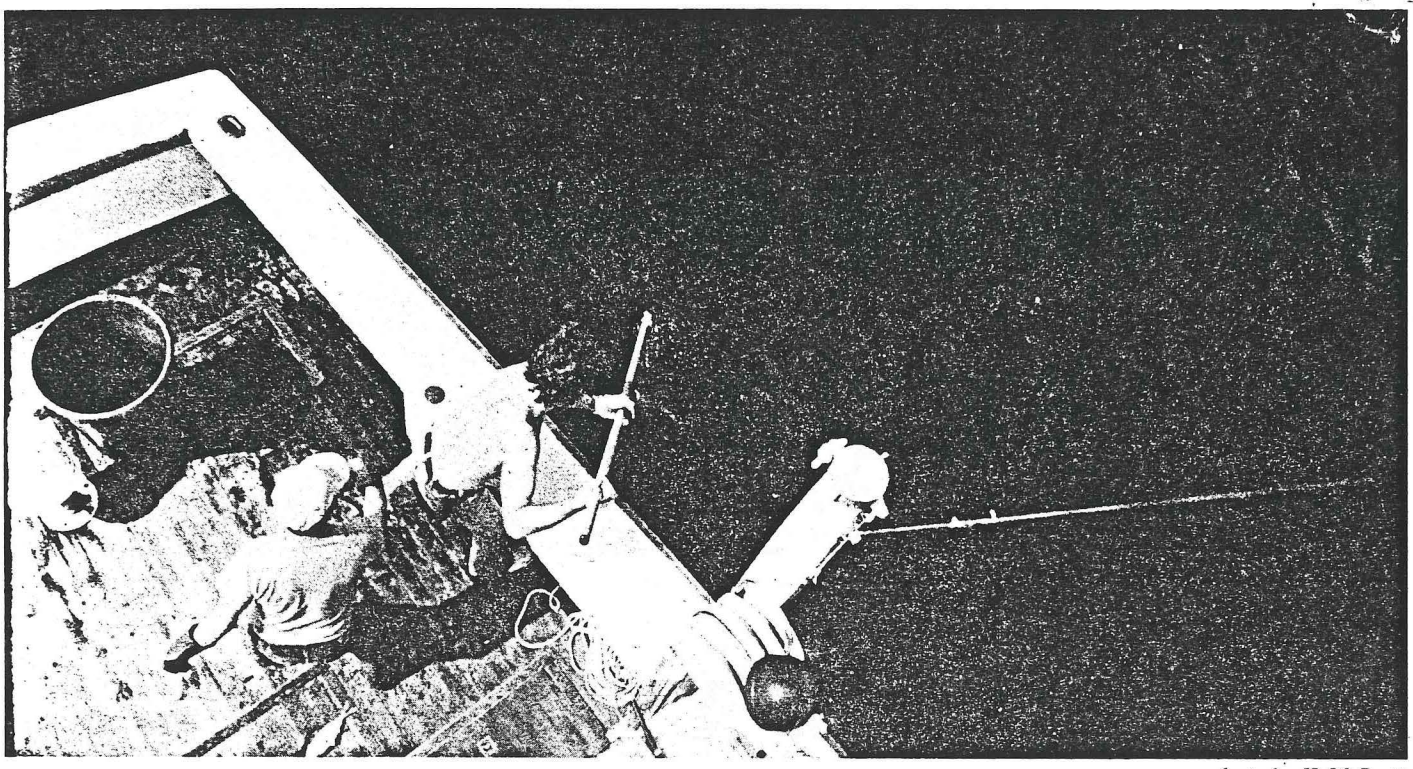

photo by H. W. Pratt

Blue Sharks (95 recaptures)

Blue shark recaptures represented 70% of all tags returned in 1977. This is in part due to the blue shark being the most abundant species of game shark off Long Island, where shark angling is a popular sport for large numbers of fishermen. Moreover, the abundance of blue sharks was higher than usual off Long Island in 1977; more fishermen became involved in the tagging program; and good weather conditions prevailed during May and June. In mid-June 157 blue sharks were tagged from the research vessel, *Geronimo*, in an area 20-30 miles south of Fire Island Inlet, NY. In late June 302 blues were tagged in the same general area during the annual Bay Shore Mako Tournament. Overall through the efforts of sports-fishermen, nearly 1,000 blue sharks were tagged off New Jersey and New York last June. Subsequent recaptures showed movements to Southern New England, Georges Bank and the offings of Nova Scotia during the summer, and return movements as far south as Cape Hatteras in late fall.

Future recaptures from the June tagging will be particularly interesting since, for the first time, many of those tagged were females. We know very little about the migrations of the females except that the juveniles are common on the Continental Shelf in the early spring. Males predominate later in summer and fall. Adult females (over 7' long) seldom come inshore and very likely spend their lives beyond the Gulf Stream. In the next few years recaptures of females tagged last year should provide additional information on habits of the adult females. An interesting aspect of the *Geronimo* tagging (June 16-20) was that although 13 fish (8%) were recaptured, none were taken during the Bay Shore Tournament five days later when 150 boats fished the same area and caught 628 blue sharks. Tournament fishermen often ask how long fish stay on the fishing grounds. In this case the evidence suggests that the sharks tagged five days earlier had moved further east along the coast and had been replaced by new arrivals from offshore.

With respect to long distance movements, a blue shark tagged off New England and recaptured off Havana, Cuba, showed the farthest distance traveled. This is the second blue shark recovery from Cuba and strengthens the hypothesis that at least a part of the blue shark population migrates from New England to the offings of South America, then through the Caribbean into the Gulf of Mexico, and back northward through the Florida Straits. As we mentioned in previous Newsletters, this is only a part of a complex migratory pattern for the blue shark that includes trans-Atlantic movements of more than 3,000 miles. We would appreciate hearing from you about the occurrence of blue sharks off the Southeast Atlantic coast and in the Gulf of Mexico.

Recaptures from the Eastern Atlantic show that Gordon Bland, who has been tagging in the Mediterranean for several years, had five returns in 1977. All were taken within 200 miles after less than six months at liberty. Capt. Bland now has had 29 sharks recovered after up to 19 months at liberty and distances of nearly 800 miles, to the coast of Italy. His recaptures show easterly movements, and since none have been taken outside the Mediterranean the relationship between the Atlantic and Mediterranean populations remains unsettled. An intensified tagging effort in the Atlantic approaches to the Straits of Gibraltar would provide meaningful information on this question. Hopefully we will hear from more fishermen who wish to tag in that area.

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Sandbar Sharks (8 recaptures)

Recaptures from tagged sandbar sharks provided additional information on their migrations between the mid-Atlantic states and Florida. Previous recaptures have shown that the east coast range of the sandbar shark extends from Cape Cod to the north coast of Cuba. The most interesting recapture in 1977 came from a juvenile male tagged in Virginia by Chuck Stillwell on June 23, 1965, that was recaptured on June 22, 1977, in the Gulf of Mexico off Panama City, Florida. The shark was at liberty for 12 years, which is a new record for any species tagged under our program. It is also the maximum distance recorded for a sandbar shark and is the first to demonstrate movements from the Atlantic into the Gulf of Mexico. At tagging the shark measured 43" in total length but at recapture, only an uncertain size estimate of 60-70 lbs was obtained. If we assume the shark weighed 70 lbs at recapture, then it grew about two feet in 12 years (2" per year) and at 67" was just approaching maturity. Based on some earlier recaptures, this is not an unreasonable estimate. However, precise information would have been invaluable.

If you hear about a tagged shark being caught, *please try to obtain the tag and as many recapture details as possible*.

Mako Sharks (6 recaptures)

Mako sharks were recaptured after nearly a year at liberty and movements of over 1,200 miles. The long distance recovery is not included in the tables and summary figures because it was received from a Taiwanese longliner as the Newsletter was being readied for mailing. That particular mako was tagged near Lydonia Canyon on Georges Bank by Steve Connett on August 1, 1977. It was recaptured 3½ months later (November 11, 1977) in the mid-Atlantic approximately 500 miles west of the Azores. This is the second farthest distance traveled by a tagged mako and is the first to suggest that the species may make trans-Atlantic migrations. Another recovery came from a mako that was tagged off Cape Hatteras, NC, and recaptured five months later on Georges Bank. An interesting coincidence surrounding that recovery was that it was taken in the same area by the same fisherman who ten days earlier had recaptured a swordfish that had been tagged in the Gulf of Mexico.

Knowledge of the life history of the mako, including its migrations, is largely incomplete. However, tag recoveries from the Western Atlantic show some similarities to those from blue sharks (and swordfish). Makos tagged off New England have been recaptured off Cape Hatteras, Bermuda, and in the Caribbean off South America.

Swordfish (1 recapture)

The swordfish return was indeed one of the most exciting recaptures we have ever had. The fish was tagged off the Mississippi Delta in March 1974 by commercial longline fisherman, Philip Ruhle. It was recaptured near Corsair Canyon on

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SUMMARY OF SHARKS AND TELEOSTS TAGGED JAN.-DEC. 1977

SPECIES	TAGGED BY FISHERMEN (SPORT & COMM.)	BIOLOGISTS (NMFS & OTHERS)	TOTALS
SHARKS			
Blue shark	1,429	760	2,189
Sandbar shark	452	7	459
Dusky shark	275	2	277
Mako shark	21	92	113
Scalloped hammerhead	35	1	36
Smooth hammerhead	6	12	18
Great hammerhead	10	1	11
Bonnethead	18	-	18
Hammerhead (unident.)	16	5	21
Blacktip shark (Small Blk. tip)	42	3	45
Spinner shark (Large Blk. tip)	34	-	34
Blacktip (unident.)	95	-	95
Bull shark	22	4	26
Reef shark	-	39	39
Atlantic sharpnose shark	52	-	52
Lemon shark	25	4	29
Nurse shark	14	-	14
Silky shark	31	10	41
Blacknose shark	10	-	10
Tiger shark	41	12	53
Night shark	5	-	5
Oceanic whitetip shark	1	-	1
Sand tiger shark	28	-	28
Thresher shark	3	-	3
Porbeagle shark	1	-	1
Smooth dogfish	22	-	22
Spiny dogfish	2	-	2
Dogfish (unident.)	2	-	2
Finetooth shark	11	-	11
Basking shark	1	-	1
White shark	1	-	1
Bignose shark	-	2	2
Carcharhinid shark (unident.)	14	-	14
Other sharks*	6	-	6
Total Sharks	2,725	954	3,679
TELEOSTS			
Swordfish	40	4	44
Tunas	4	1	5
Billfish	15	-	15
Misc. Teleosts	10	-	10
Total Teleosts	69	5	74
GRAND TOTAL	2,794	959	3,753

*Includes species reported simply as "shark".

TAG RECOVERIES: JANUARY-DECEMBER 1977

SPECIES	GENERAL LOCATIONS: TAGGED	GENERAL LOCATIONS: RECAPTURED	MONTHS/ LIBERTY	DIST. & DIR. TRAVELED	CAPTURE METHOD: TAGGING	CAPTURE METHOD: RECAPT.	TAGGED BY: TAGGER	TAGGED BY: RESIDENCE
Blue shark	NE of Oregon Inlet, NC	ESE Nantucket Is., MA	2.5	470 NE	LL	LL	Biologist	RI
" "	S of Fire Is. Inlet, NY	SE Montauk, NY	<1	102 NE	LL	RR	Biologist	RI
" "	S of Fire Is. Inlet, NY	S of Shinnecock Inlet, NY	<1	49 NE	LL	RR	Biologist	RI
" "	S of Fire Is. Inlet, NY	SE of Block Is., RI	<1	102 NE	LL	RR	Biologist	RI
" "	S of Fire Is. Inlet, NY	S of Watch Hill, RI	1.4	109 NE	LL	RR	Biologist	RI
" "	S of Fire Is. Inlet, NY	S of Pt. Judith, RI	1.9	116 NE	LL	RR	Biologist	RI
" "	E of Chesapeake Bay, VA	SE of Fire Is., NY	7.2	249 NNE	LL	RR	Biologist	RI
" "	NE of Cape Hatteras, NC	SE of Cape May, NJ	2	153 NE	LL	LL	Biologist	RI
" "	S of Fire Is. Inlet, NY	SSE of Fire Is. Inlet, NY	<1	26 NNE	LL	RR	Biologist	RI
" "	S of Fire Is. Inlet, NY	SSW of Montauk, NY	<1	57 NE	LL	RR	Biologist	RI
" "	S of Fire Is. Inlet, NY	SSE of Montauk, NY	<1	90 NE	LL	RR	Biologist	RI
" "	S of Fire Is. Inlet, NY	SE of Block Is., RI	2	97 NE	LL	RR	Biologist	RI
" "	ESE of Cape Lookout, NC	SE of Shinnecock, NY	5	390 NNE	LL	RR	Biologist	RI
" "	SSE of Fire Is. Inlet, NY	SE of Block Is., RI	2.5	93 ENE	LL	RR	Biologist	RI
" "	E of Cape Hatteras, NC	E of Bahama Islands	6	1,402 SE	LL	LL	Biologist	RI
" "	S of Fire Is. Inlet, NY	SE of Moriches Inlet, NY	2.5	59 NE	LL	RR	Biologist	RI
" "	NE of Cape Hatteras, NC	ENE of Cape Charles, VA	10.1	109 N	LL	LL	Biologist	RI
" "	S of Fire Is. Inlet, NY	SE of Fire Is. Inlet, NY	<1	14 E	LL	RR	Biologist	RI
" "	E of Bermuda	S of Nantucket Is., MA	13	477 NW	LL	LL	Steven Connett	RI
" "	SE of Montauk, NY	SE of Montauk, NY	<1	31 SE	LL	RR	Steven Connett	RI
" "	S of Montauk, NY	SE of Montauk, NY	<1	7 NE	LL	RR	Steven Connett	RI
" "	S of Martha's Vineyard, MA	SE of Montauk, NY	12	34 W	LL	RR	Steven Connett	RI
" "	SE of Montauk, NY	Cox's Ledge, RI	<1	26 ENE	LL	RR	Steven Connett	RI
" "	S of Martha's Vineyard, MA	E of Block Is., RI	12.5	34 NW	LL	RR	Steven Connett	RI
" "	E of Barnegat Inlet, NJ	SSW of Fire Is. Inlet, NY	<1	20 NW	LL	RR	Steven Connett	RI
" "	S of Nantucket Is., MA	S of Moriches Inlet, NY	1.9	120 W	LL	RR	Steven Connett	RI
" "	S of Nantucket Is., MA	Havana Bay, Cuba	3.5	1,150 S	LL	LL	Steven Connett	RI
" "	Marbella, Spain	Motril, Spain	3.7	72 E	RR	LL	Gordan Bland	Spain
" "	Marbella, Spain	Almeria, Spain	NR	176 E	RR	LL	Gordan Bland	Spain
" "	Marbella, Spain	Motril, Spain	1.3	75 SE	RR	LL	Gordan Bland	Spain
" "	Marbella, Spain	Garrucha, Spain	4.8	187 E	RR	LL	Gordan Bland	Spain
" "	Marbella, Spain	NE Garrucha, Spain	6	185 E	RR	LL	Gordan Bland	Spain
Blue shark	E of Manasquan Inlet, NJ	S of Montauk, NY	<1	97 NE	FS	RR	Steve Pepe	NJ
" "	E of Manasquan Inlet, NJ	S of Fire Is. Inlet, NY	<1	23 SSW	RR	RR	Steve Pepe	NJ
" "	E of Manasquan Inlet, NJ	S of Fire Is. Inlet, NY	<1	20 NNE	FS	RR	Steve Pepe	NJ
" "	SE of Manasquan Inlet, NJ	S of Montauk, NY	1	102 NE	RR	RR	Steve Pepe	NJ
" "	S of Montauk, NY	S of Montauk, NY	<1	1	RR	RR	Al Ristori	NJ
" "	S of Montauk, NY	S of Shinnecock Inlet, NY	<1	31 WSW	RR	RR	Al Ristori	NJ
" "	S of Montauk, NY	Off Cape Hatteras, NC	3.1	350 SSW	RR	LL	Al Ristori	NJ
" "	SE of Fire Is. Inlet, NY	ENE of Cape Hatteras, NC	3	219 SSE	RR	LL	Jeff Schneider	NY
" "	SE of Fire Is. Inlet, NY	SE of Fire Is. Inlet, NY	<1	6 SE	RR	RR	Jeff Schneider	NY
" "	SE of Fire Is. Inlet, NY	S of Shinnecock Inlet, NY	1.5	27 NE	RR	RR	Jeff Schneider	NY
" "	S of Jones Inlet, NY	SE of Jones Inlet, NY	1.6	6 NE	RR	RR	Joseph Carter	NY
" "	S of Jones Inlet, NY	SE of Shinnecock, NY	3	68 NE	RR	RR	Joseph Carter	NY
" "	E of Brielle, NJ	ESE of Jones Inlet, NY	1	37 NE	RR	RR	Art Colabella	NJ
" "	E of Seaside, NJ	SW of Shinnecock, NY	1.6	54 NE	RR	RR	Art Colabella	NJ
" "	S of Fire Is. Inlet, NY	S of Fire Is. Inlet, NY	<1	14 NE	RR	RR	Joe Sollano	NY
" "	SE of Fire Is. Inlet, NY	SE of Manasquan Inlet, NJ	<1	67 E	RR	RR	Joe Sollano	NY
" "	ESE of Atlantic Bch., NY	S of Cape Hatteras, NC	8.6	375 S	RR	LL	Jesse York	NY
" "	SE of Fire Is. Inlet, NY	S of Shinnecock, NY	1.5	44 N	RR	RR	Jesse York	NY
" "	SE of Fire Is. Inlet, NY	SE of Fire Is. Inlet, NY	11.7	14 W	RR	RR	Henry Urban	NY
" "	SE of Fire Is. Inlet, NY	NE of Corsair Canyon	1.5	336 NE	RR	LL	Henry Urban	NY
" "	E of Montauk, NY	ESE of Norfolk, VA	2	290 SSW	RR	LL	Frank Mundus	NY
" "	S of Shinnecock Inlet, NY	ENE of Oregon Inlet, NC	11.3	285 SSW	RR	LL	Sal Sciarrino	NY
" "	SE of Shinnecock Inlet, NY	SE of Cape Henlopen, DE	5.3	127 SSW	RR	LL	Shaler Carrington	NY
" "	ESE of Fire Is. Inlet, NY	S. of Shinnecock, NY	<1	28 NE	RR	RR	Bob Penn	NY
" "	SE of Block Is., RI	S of Hampton Bays, NY	<1	53 SW	RR	RR	Bill Simpson	RI
" "	SE of Montauk, NY	S of Jones Inlet, NY	24	94 SSW	RR	RR	Adrian J. Maxwell	FL
" "	S of Jones Inlet, NY	S of Moriches Inlet, NY	<1	28 NE	RR	RR	Alfred McCarville	NY
" "	S of Fire Is. Inlet, NY	S of Moriches Inlet, NY	12	20 NE	RR	RR	Jordan Hall	NY
" "	S of Montauk, NY	S of Montauk, NY	24.9	3 SW	RR	RR	Walter Kaprielian	NY
" "	S of Jones Inlet, NY	S of Fire Is. Inlet, NY	<1	57 WSW	RR	RR	Joseph Lom	NY
Blue shark	S of Fire Is. Inlet, NY	S of Moriches Inlet, NY	1.6	17 NE	RR	RR	Robert Hurst	NY
" "	S of Fire Is. Inlet, NY	SE of Fire Is. Inlet, NY	<1	16 E	RR	RR	E. Wilder	NY
" "	SE of Fire Is. Inlet, NY	S of Moriches Inlet, NY	1	21 E	RR	RR	Al Scimeca	NY
" "	S of Shinnecock Inlet, NY	S of Fire Is. Inlet, NY	<1	48 SW	RR	RR	Harry Carter	NY
" "	SSW of Moriches Inlet, NY	S of Fire Is. Inlet, NY	<1	15 SW	RR	RR	Nick Karas	NY
" "	S of Fire Is. Inlet, NY	S of Moriches Inlet, NY	<1	10 W	RR	RR	John DiStefano	NY
" "	S of Fire Is. Inlet, NY	S of Fire Is. Inlet, NY	<1	27 NE	RR	RR	Harold Blair	NY
" "	S of Shinnecock Inlet, NY	S of Montauk, NY	<1	25 NE	RR	RR	William Telesca	NY
" "	S of Fire Is. Inlet, NY	S of Montauk, NY	<1	89 NE	RR	RR	James Schaefer	NY
" "	SE of Jones Inlet, NY	S of Fire Is. Inlet, NY	1.8	19 S	RR	RR	Robert Trapani	NY
" "	SE of Jones Inlet, NY	SE of Block Is., RI	13.3	91 NE	RR	RR	Brooks Graham	NY
" "	SE of Jones Inlet, NY	SE of Shinnecock Inlet, NY	1.9	42 ENE	RR	RR	Charles Berwind	NY
" "	SE of Fire Is. Inlet, NY	SE of Fire Is. Inlet, NY	2.3	2 NE	RR	RR	Lawrence Christie	NY
" "	Oceanographer Canyon	NE of Bermuda	6	410 SSE	LL	LL	Phil Ruhle	RI
" "	S of Montauk, NY	SE of Shinnecock Inlet, NY	<1	25 SW	RR	RR	Dave Willis	CT
" "	SE of Fire Is. Inlet, NY	S of Montauk, NY	25	52 E	RR	RR	Mike Gerrard	NY
" "	SE of Moriches Inlet, NY	S of Jones Inlet, NY	1.7	54 WSW	RR	RR	James Devita	NY
" "	S of Moriches Inlet, NY	SE of Block Is., RI	1.4	81 NE	RR	RR	Waldo Rodriguez	NY
" "	SE of Fire Is. Inlet, NY	SE of Shinnecock Inlet, NY	1	60 NE	RR	RR	Don Zecchini	NY
" "	SE of Fire Is. Inlet, NY	SE of Fire Is. Inlet, NY	<1	2 SE	RR	RR	Lou Clementz	NY
" "	SE of Block Is., RI	SE of Block Is., RI	<1	12 S	RR	RR	Charlie Donilon	RI
" "	SE of Fire Is. Inlet, NY	Off Halifax, Nova Scotia	2.7	522 NE	RR	TN	Robert Winter	NY
" "	SE of Moriches Inlet, NY	S of Montauk, NY	1.1	35 ENE	RR	RR	Tom Cashman	NY
" "	SE of Moriches Inlet, NY	SSE of Moriches Inlet, NY	1.8	5 SW	RR	RR	Arthur Rumph	NY
" "	S of Fire Is. Inlet, NY	S of Shinnecock Inlet, NY	2.3	52 NE	RR	RR	James A. Schaefer	NY
" "	E of Cox's Ledge, RI	SE of Atlantic City, NJ	3	154 SW	FS	LL	Tom Strelan	CT
" "	SE of Moriches Inlet, NY	S of Moriches Inlet, NY	<1	0	RR	RR	Tim Clayman	NY
" "	S of Fire Is. Inlet, NY	E of Chesapeake Bay, VA	3.5	201 SW	RR	LL	J. Smith	NY
" "	S of Fire Is. Inlet, NY	S of Montauk, NY	<1	77 NE	RR	RR	Ray Wittman	NY
" "	S of Fire Is. Inlet, NY	SE of Fire Is. Inlet, NY	<1	22 E	RR	RR	Herman Kornahrens	NY
" "	NR	S of Fire Is. Inlet, NY	NR	NR	NR	RR	NR	
" "	NR	SW of Shinnecock Inlet, NY	NR	NR	NR	RR	NR	
" "	NR	Hudson Canyon	NR	NR	NR	RR	NR	

SPECIES	GENERAL LOCATIONS TAGGED	RECAPTURED	MONTHS/ LIBERTY	DIST. & DIR. TRAVELED	CAPTURE METHOD TAGGING	RECAPT.	TAGGED BY TAGGER	RESIDENCE
Sandbar shark	E of Ocean City, MD	NNE of Cape Hatteras, NC	5	158 S	RR	LL	Terry Van Layton	MD
" "	ESE of Manasquan, NJ	E of New Smyrna Bch, FL	7.2	740 S	RR	RR	Jim Powell	NJ
" "	SE of Fire Is. Inlet, NY	E of Bogue Inlet, NC	9.7	405 SW	RR	GN	Charles Berwind	NY
" "	ESE of Charleston, SC	E of Charleston, SC	10.3	4 NE	RR	RR	Rick Stringer	SC
" "	ESE of Cape Hatteras, NC	Delaware Bay, DE	2.2	215 NNE	RR	RR	Jeff Vaughan	NC
" "	Gt. Machipongo, VA	SSE of Panama City, FL	144	1,055 W	GN	RR	Biologist	RI
" "	Melbourne Beach, FL	Islamorada, FL	2.5	210 S	RR	RR	Ron Prieto	FL
" "	Corolla Beach, NC	Delaware Bay, DE	2.5	165 NNE	HS	RR	Edward Lawler	NC
Mako shark	NE of Oregon Inlet, NC	E of Chesapeake Bay, VA	3.7	60 N	LL	RR	Biologist	RI
" "	NNE of Cape Hatteras, NC	Georges Bank	5	499 NE	LL	LL	Biologist	RI
" "	Walker Canyon	ENE of Bermuda	8	509 SE	LL	LL	Steven Connett	RI
" "	Veatch Canyon	E. of Barnegat, NJ	11.6	92 WSW	LL	RR	Steven Connett	RI
" "	N of Yucatan Peninsula	SSW of Mississippi Delta, MS	1.8	247 N	LL	LL	Biologist	FL
Black tip shark	Nassau Sound, FL	Port Canaveral, FL	1.2	132 SSE	RR	RR	James Zimmerman	FL
" " "	Fernandina Beach, FL	Nassau Sound, FL	2	10 S	RR	ST	James Zimmerman	FL
" " "	Miami Beach, FL	E of Jacksonville, FL	<1	216 N	RR	ER	Ron Schatman	FL
" " "	Everglades Park, FL	Everglades Park, FL	1.7	0	RR	RR	Frank McGinn	FL
" " "	Miami Beach, FL	Bimini Is., Bahamas	1.1	46 E	RR	LL	Stan Saffan	FL
Sand tiger shark	Virginia Beach, VA	Cape Hatteras, NC	7.2	121 S	RR	TN	Don Lips	VA
" " "	Delaware Bay, DE	Outer Banks, NC	38.8	267 S	RR	RR	William Garrison	NJ
" " "	Cape Hatteras, NC	Delaware Bay, DE	4	240 N	RR	RR	Berle Wilson	NC
" " "	Great Bay,NJ	SE of Atlantic City, NJ	13.3	13 S	RR	TN	William Figley	NJ
Dusky shark	Miami Beach, FL	Grand Bahama Is.	3.8	81 NE	RR	RR	Stan Saffan	FL
" "	Florida Bay, FL	Florida Bay, FL	11	0	RR	RR	Tom Gritter	FL
" "	Cape Hatteras, NC	E of Cape Hatteras, NC	<1	49 ENE	RR	RR	William Walker	VA
Spinner shark	Miami Beach, FL	E of Boca Raton, FL	<1	36 NNE	RR	RR	Ron Schatman	FL
" "	Fernandina Beach, FL	Fernandina Beach, FL	<1	0	RR	DB	Dyaarl Anderson	FL
" "	Withlacoochie Bay, FL	Withlacoochie Bay, FL	<1	15 ESE	RR	RR	Arnold Weichert	FL
Tiger shark	Homosassa, FL	Crystal River, FL	1.2	15 NE	RR	JF	Carl Black	FL
" "	Fernandina Beach, FL	Jacksonville Beach, FL	<1	14 S	RR	RR	Dan Hoyt	FL
" "	W of Saba Is., B.W.I.	St. Kitts Is., B.W.I.	74.9	40 SE	LL	NR	Biologist	RI
Lemon shark	St. Augustine Beach, FL	Melbourne Beach, FL	5.1	120 SE	HS	RR	Alan Elliot	FL
" "	Florida Bay, FL	Florida Bay, FL	1.5	0	RR	RR	Tom Gritter	FL
Bull shark	Cape Fear River, NC	Cape Fear River, NC	2.7	0	RR	ST	James Moss	NC
Nurse shark	Big Pine Key, FL	Big Pine Key, FL	1	0	RR	RR	Jeff Carrier	FL
Smooth dogfish	St. Augustine Beach, FL	New Smyrna Beach, FL	<1	57 S	RR	ST	John Scholl	FL
Spiny dogfish	SE of Oregon Inlet, NC	Sneads Ferry, NC	118.1	156 SW	TN	TO	Thayer Schaefer	RI
Night shark	Miami Beach, FL	Veracruz, Mexico	5.4	980 SW	LL	HL	Ron Schatman	FL
Silky shark	E of Cape Canaveral, FL	Andros Is., Bahamas	1.5	245 S	LL	RR	Steven Connett	RI
Unident. shark	E of Hobe Sound, FL	E of Juno Beach, FL	3.8	11 S	RR	RR	John Jolley	FL
Swordfish	SW of Mississippi Delta, MS	E of Cape Cod, MA	41.7	1,910 NE	LL	LL	Phil Ruhle	RI

LL-longline; RR-rod and reel; FS-free swimming; TN-trawl net; GN-gill net; HS-haul seine; ST-shrimp trawl; ER-electric reel (commercial); HL-hook & line; JF-jug float; TO-tag only; DB-dead on beach; NR-not reported.

1977 A Record Year – conclusion

Georges Bank in August 1977; a distance of 1,900 miles from where it was tagged nearly 3½ years earlier. This is by far the longest distance recorded for a tagged swordfish and is the first to demonstrate movements of the species from the Gulf of Mexico into the Atlantic. The estimated weight of the fish on release was 25 pounds. When it was recaptured the fish had been bitten in half by a shark but the fisherman estimated its total weight at about 190 lbs. Although very little is known about age and rate of growth of swordfish, an increase of 175 lbs in 3½ years does support preliminary age estimates proposed by Canadian biologist, James Beckett. In this case the tagged fish would have been just about a year old when released and four years old when recaptured.

One final note on swordfish–despite this recovery, almost nothing is known about the interrelationships of the stocks in the Gulf of Mexico, off southeastern Florida, off the northeastern United States, and eastern Canada. We realize what we are asking when we ask you to tag one of the most valuable of all species –but we ask anyway.

Other Sharks (37 recaptures)

The remaining recaptures came from 12 species that were at liberty for up to three years and covered distances up to 980 miles. In this group the longest distance recorded came from a night shark (*Hypoprion signatus*). The shark was tagged off Miami and traveled across the Gulf of Mexico to the vicinity of Veracruz, Mexico. The night shark was once thought to occur along the Atlantic coast only as a stray. Apparently it can be quite common from southeastern Florida to North Carolina in the vicinity of the Gulf Stream. We have had one previous recapture from a night shark that traveled from Cape Hatteras, NC to Cuba.

Recaptures of other sharks last year provided first evidence that blacktip, silky, and dusky sharks travel from the east coast of Florida across the Gulf Stream to the Bahamas. To what extent the sharks from these two areas intermix is unknown, but additional information should be forthcoming from the increasing numbers of shark-taggers who fish in both areas.

Bay Shore (from p. 1) – continued

In 1976 and again in 1977, tournament anglers were asked to participate in a tagging experiment. This recruiting effort was a sharp departure from our past policy of registering only individual fishermen. Even in this model tournament the logistics were complex and, without the full cooperation of top-notch anglers and a large experienced tournament committee, the experiments would not have succeeded.

Results of the 1976 tournament included 230 tagged sharks, with five recaptures to date. In the 1977 tournament, 323 sharks were tagged, of which nine have been recovered.

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TAGGING FILM

A 16mm film demonstrating correct tagging technique is available from our office. Mako Marine Inc. was the main sponsor of the film, entitled "The Boat, the Engine, and the Shark." We have only one copy and ask that you use it carefully and return it promptly. In your request please specify date to be viewed.

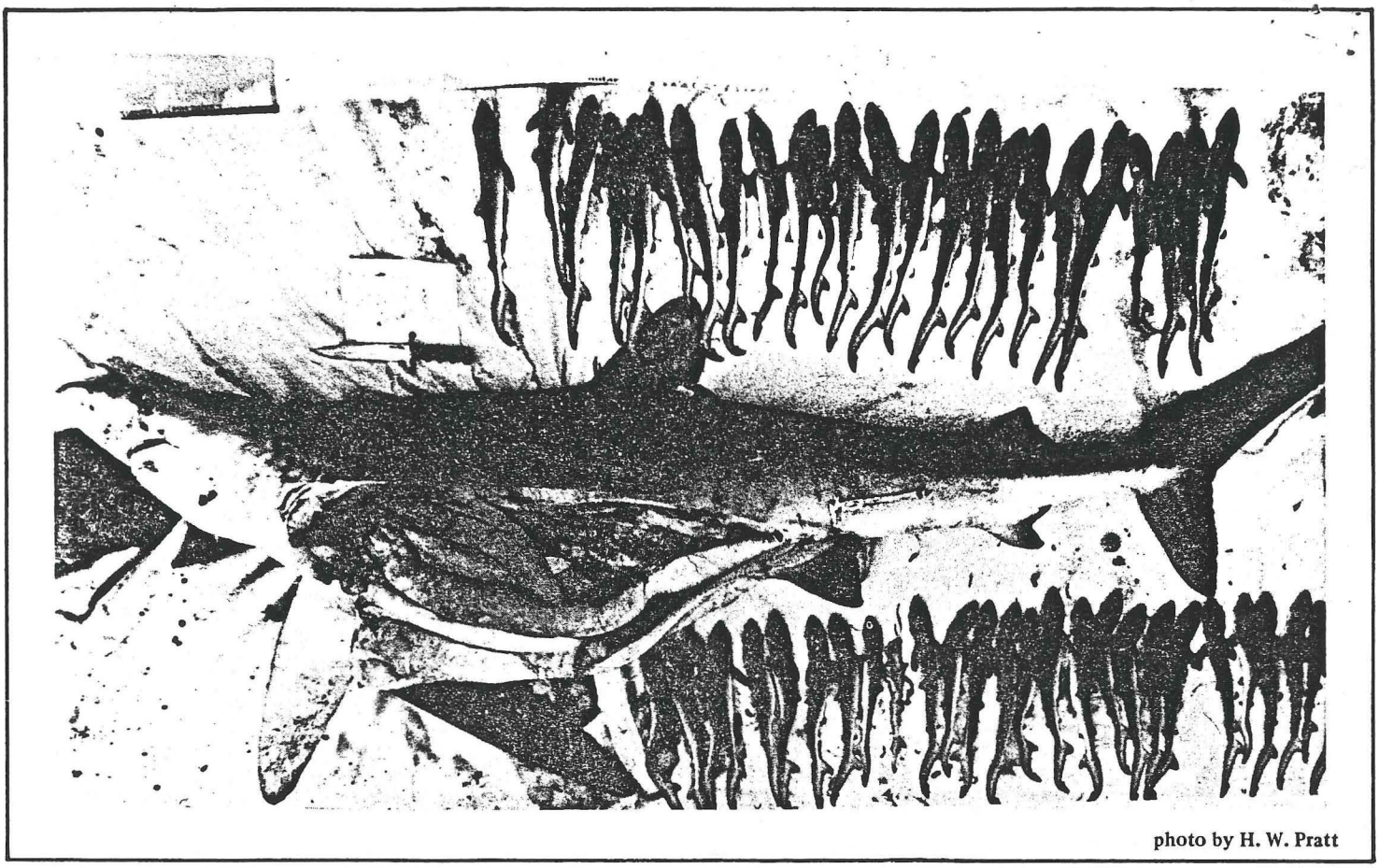

photo by H. W. Pratt

BLUE SHARK REPRODUCTION

At the end of the year, the project completed a study of reproduction in the blue shark, *Prionace glauca* which will be published this year. Little had been previously known of its reproductive habits. Blue sharks caught by longline and sports-fishermen were measured and dissected to investigate the reproductive organs and to describe their sexual cycle.

Blue shark males mature at the length of seven feet. In the mature male, paired testes produce sperm year round. The sperm clumps together into minute packets called spermatophores which are stored in a reservoir near the kidney. Each spermatophore contains hundreds of thousands of individual sperm cells and normally each male stores thousands of spermatophores. Sperm are transferred to the female by copulation through the paired claspers, which are the prominent appendages of the male pelvic fins.

Injected sperm passes through the uterus and into the shell gland where it is stored until the female is ready to self-fertilize in ten to twenty months. Females pass through a subadult phase (6 to 7 feet) when the organs for copulation and sperm storage are developed but the eggs are undeveloped. During this stage the females are bitten by the males as a prelude to copulation. These tooth cuts are present on nearly every female blue shark on the continental shelf from Cape Hatteras to Georges Bank during the summer. Inseminated females than emigrate offshore to self-fertilize the following spring. Blue sharks bear up to 80 fully formed, independent young after 9 to 12 months of gestation.

This brief sketch only hints at the intricacies of shark reproduction. Researchers continue to seek better understanding of this important part of shark life history. Large species of pregnant sharks are seldom examined in detail. We would be pleased to hear from anyone who catches pregnant sharks of the same species that we ask you to tag. Information on the length of the mother, with number, sex ratio, and size of the young would be very helpful. Photographs and a few pups frozen or preserved and sent to us would be invaluable. Pregnant makos and white sharks are very rare and should be re-

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Bay Shore (from p. 5) – continued

These intensive tagging experiments have helped to strengthen the hypothesis that blue sharks migrate inshore from the north wall of the Gulf Stream, following the 60°F isotherm through the general area of Hudson Canyon and into waters between the 15 and 100 fathom curve off northern New Jersey and Long Island. As the shelf water warms in late June and early July most of the population moves eastward to summer off Southern New England and Georges Bank.

While we would like to encourage others to include tagging in their tournaments, we hesitate to do so. Unless a fisherman is an experienced tagger, tournaments are not the ideal environment in which to tag sharks. Highly competitive fishing promotes "gut hooking" of many sharks which will then not survive when released. In addition, we keep a record of every series of tags and we personally assign tag numbers to individual fishermen. It is almost impossible to maintain detailed records during the frenzied activity of a busy tournament. For these and other reasons we rarely send out tags

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Blue Shark (from p. 6) – conclusion

ported by collect telephone (401/789-9326). A specific form is available for recording information on pregnant sharks.

Much of the field research for this work unit was accomplished at the annual Bay Shore Mako Tournament and the Montauk Open Shark Tournament held during the summer on Long Island. Without the help of sportsfishermen, studies such as this would take longer and be more difficult. We greatly appreciate your cooperation and interest in our research.

RESEARCH CRUISES

In 1977 staff biologists conducted three longline research cruises off the northeast coast. The vessels used were a Polish research vessel the R/V *Wieczno*, the commercial vessel *Diane Marie*, and the R/V *Geronimo* (right).

We used the R/V *Wieczno* under a joint international fishery agreement which provides for cooperative research projects between U.S. and Polish scientists. In March and early April of 1977 a longline cruise to the Gulf Stream and continental shelf off North Carolina resulted in the tagging of 108 blue sharks, 74 makos, and 5 swordfish. Two blue sharks and two makos have been recaptured to date.

During the *Diane Marie* cruise off Cape Hatteras in November, the total catch of 238 fish included 198 sharks, 38 swordfish, and 2 bigeye tuna. Of these, 164 sharks (6 species) and 4 swordfish were tagged. The remainder were dead on the line or were brought aboard for internal examinations. During the cruise, a swordfish was tagged with a sonic tag and followed for three days. This experiment, conducted by Dr. Frank Carey of the Woods Hole Oceanographic Institution indicated a well defined diurnal swimming cycle for swordfish with respect to depth. Throughout the night the fish remained near the surface, generally above 120 feet. In the morning (sunrise) it descended to between 1,000-2,000 feet, remained there throughout the day and returned to the surface layer shortly after sunset. The fish was tagged on the edge of the continental shelf east of Oregon Inlet, NC, and moved across the Gulf Stream approximately 120 miles northeast from where it was tagged. Results from this experiment showed diurnal movements of swordfish similar to those recorded in sonic tagging experiments by Dr. Carey off California.

The R/V *Geronimo* conducted several longline cruises along the Atlantic coast from Cape Cod to the Bahamas in 1977. The vessel was made available to us during June for a tagging experiment prior to a major shark fishing tournament at Bay Shore, Long Island. Staff biologist Chuck Stillwell and the *Geronimo* crew tagged more than 150 sharks during a cruise south of Fire Island, NY. Thirteen tags have been returned from this experiment (see discussion on blue sharks).

GIANT MAKOS AT MONTAUK, NEW YORK

We examined two mako sharks, *Isurus oxyrinchus*, in excess of 1,000 pounds that were caught off Montauk last July. The first (below), a 12 ft. 1 in. female, caught on July 17, weighed 1,039 lbs. The second female, caught 11 days later, was 11 ft. 9 in. long. It weighed 1,250 lbs. and contained 80 lbs. of swordfish remains. We estimate the swordfish weighed between 400-500 lbs. Neither female was pregnant. As far as we know, these are the largest makos taken in the Atlantic.

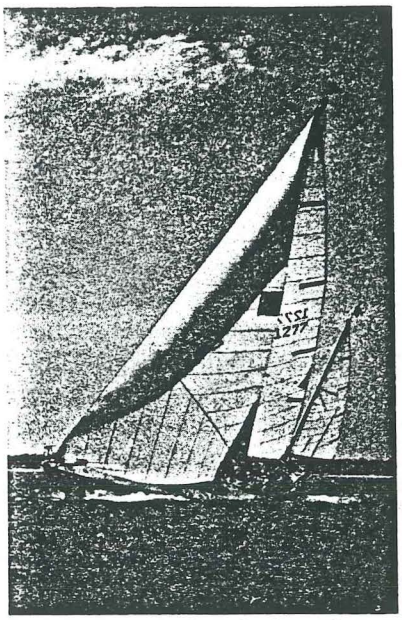

photo by Steve Connett

R/V GERONIMO

The R/V *Geronimo*, a 54-foot yawl operated as a year-round marine science classroom and research vessel by St. Georges School of Newport, RI. Over the past five years Captain Steven Connett and student crews have tagged nearly 900 sharks and have had 31 recaptured.

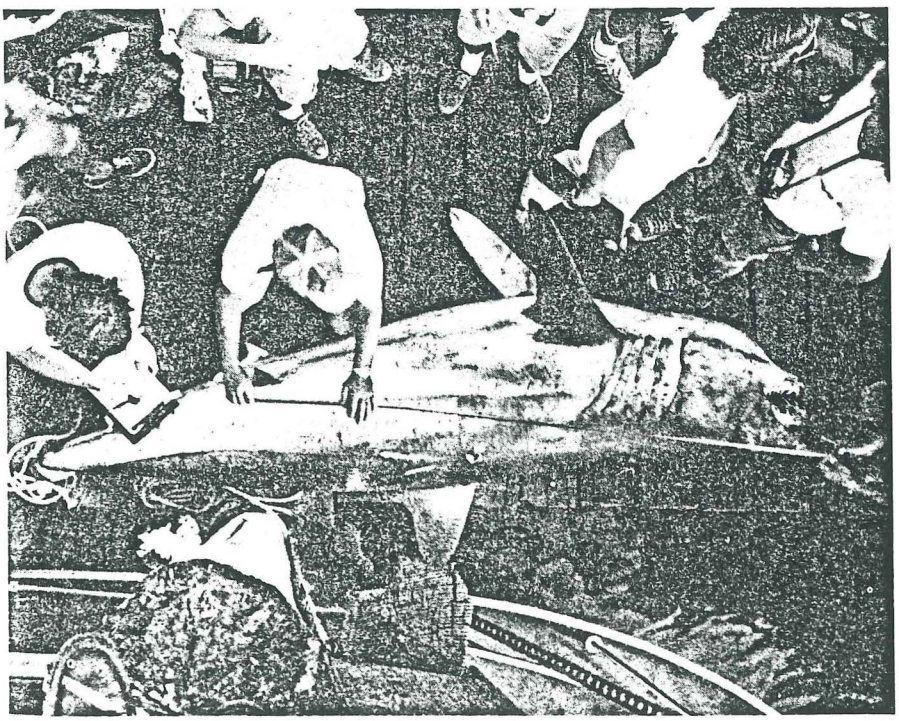

photo by B. Porterfield NYOSL

OUR NEW NEWSLETTER

The distribution of this Newsletter is limited to active participants in our shark-tagging program. We have changed the format primarily because the increase in the number of cooperating fishermen makes it impractical to photocopy the Newsletter as we have in the past. An advantage of the new format is that we can include photographs. Our intent is to provide an annual summary in the winter and updated information in the late spring. As most of you know, tagging is but one part of our program that includes studies of population dynamics, food habits, reproduction, and other elements in the life history of sharks. From time to time we will attempt to provide a brief overview of some of this work such as the article on shark reproduction by H. Wes Pratt in this issue. An important aim of past Newsletters has been to elicit your comments and suggestions. We hope you will continue to give us the benefit of your ideas and your observations on sharks.

Jack Casey
Chuck Stillwell
Wes Pratt

photo by Tom Halavik, NOAA

Bay Shore (from p. 6) – conclusion

to be distributed by someone else. We will gladly send tags to individual fishermen who register with us prior to a tournament. Moreover, we welcome the opportunity to cooperate with tournament officials who wish to incorporate tagging into their tournaments and who contact us well in advance.

Our principal aim is to work with knowledgeable fishermen who can identify sharks and who understand the importance of keeping accurate records. In this regard the Bay Shore Tournament has provided a major contribution to our program.

National Marine Fisheries Service
RR7 South Ferry Road
Narragansett, RI 02882

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