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MONITORING OF THE INCIDENTAL CATCH OF MARINE TURTLES BY SHRIMP TRAWLERS IN SOUTH CAROLINA - 1980

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INTRODUCTION

High levels of sea turtle mortality experienced on South Carolina beaches during the summer of 1980 and apparently associated with shrimp trawling activity indicated the need for additional information on the catch and mortality rates of sea turtles by shrimp trawlers. This study, initiated in Spetember of 1980, endeavored to provide such information for the latter part of the 1980 South Carolina season.

METHODS AND MATERIALS

Two persons were hired to act as observers on shrimp trawlers in the Rockville, South Carolina area. Trawlers from the Rockville docks work the waters offshore of Kiawah, Seabrook, and Edisto Islands. This area was chosen for the study because it coincided with the area of the state that had experienced the most severe turtle mortality as evidenced by strandings of carcasses on area beaches during the months of June - August and because funding was unavailable for adequate sampling coverage over a wider area. Table 1 indicates the turtle strandings by area and month with areas fished by Rockville fishermen underlined.

Vessels chosen for sampling were all double rigged trawlers greater than 50 feet in length. Nets used by these trawlers ranged form 65 to 90 feet headrope length. Table 2 shows characteristics of the vessels sampled during this study. Cooperation by shrimpers in allowing our observers to observe their trawling activities was strictly voluntary.

Sampling was initiated on 15 September and continued until November 10. One of the observers sampled 4 days/week and the other worked 2 days/week giving 6 day a week coverage during most of the survey period.

Table 1. GEOGRAPHIC DISTRIBUTION OF MARINE TURTLE CARCASSES COLLECTED FROM SOUTH CAROLINA BEACHES IN 1980

Island	April	May 1-15	May 16-30	June 1-15	June 16-30	July 1-15	July 16-31	August 1-15	August 16-31	TOTALS
Myrtle Beach	0	0	1	0	0	1	1	0	0	3
Litchfield Beach	0	0	0	0	1	0	2	0	1	4
Pawleys Island	2	0	0	0	0	0	2	0	2	6
Debidue	1	0	0	0	0	1	3	1	2	8
North Island	5	20	0	2	0	8	2	0	7	44
Sand Island	0	0	0	1	1	4	5	3	3	17
South Island	0	0	0	1	0	5	6	0	3	15
Cedar Island	1	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	1
Murphy	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
Cape Island	6	2	0	0	0	19	7	0	0	34
Raccoon Key	1	3	N/S	N/S	N/S	N/S	N/S	N/S	N/S	4
Bulls Island	1	1	2	0	10	14	7	0	0	35
Marsh Island	1	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	1
Capers Island	2	0	0	0	3	4	N/S	N/S	N/S	9
Dewees	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
Isle of Palms	2	0	0	0	0	2	17	5	0	26
Sullivans Island	N/S	N/S	N/S	N/S	1	1	4	14	0	20
Morris Island	N/S	N/S	N/S	N/S	N/S	N/S	N/S	8	2	10
Folly Beach	N/S	N/S	N/S	N/S	3	6	13	5	1	28
Kiawah Island	1	0	0	13	20	30	47	20	8	139
Seabrook	0	0	0	0	1	2	4	3	0	10
Botany Bay	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
Eddingsville Beach	N/S	N/S	N/S	1	N/S	2	N/S	N/S	N/S	3
Edisto Island	1	0	0	2	12	11	5	0	0	31
Pine Island	N/S	N/S	N/S	N/S	N/S	2	N/S	N/S	N/S	2
Otter Island	N/S	N/S	N/S	N/S	N/S	4	N/S	N/S	N/S	4
Harbor Island	N/S	N/S	N/S	N/S	N/S	8	N/S	N/S	N/S	8
Hunting Island	N/S	N/S	N/S	N/S	N/S	2	N/S	N/S	N/S	2
Fripp Island	0	2	0	1	6	3	2	2	0	16
Pritchards	N/S	N/S	N/S	N/S	N/S	1	N/S	N/S	N/S	1
Little Capers	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	1
St. Phillips Island	N/S	N/S	N/S	N/S	N/S	1	N/S	N/S	N/S	1
Little Capers	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
Bay Point	1	N/S	1	N/S	N/S	N/S	N/S	N/S	N/S	2
Hilton Head Is.	0	0	1	0	5	11	13	6	1	37
Daufuskie Island	N/S	N/S	N/S	N/S	4	N/S	N/S	N/S	N/S	4
Turtle Island	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	N/S	
TOTALS	25	28	5	21	67	142	140	67	30	525

Table 2. Vessel and gear characteristics of Rockville, S.C. shrimp trawlers sampled by on-board observers from 15 September - 10 November 1980.

VESSEL CODE	VESSEL NAME	LENGTH (ft.)	NETS
01	Whirlaway	73	2, 85' - 4 seam
02	Miss Me	51	2, 66' - 4 seam
03	Rebel Lady	60	2, 65'-triple tongue
04	Billy Boy	64	2, 80' - 4 seam
05	Mary Barbara	68	2, 90' - 4 seam
06	Miss Charleston	73	2, 85' - 4 seam
07	Tina Marie	72	2, 80'-mongoose nets
08	Miss Marilyn	70	2, 85' - 4 seam
09	Gulf Dawn	74	2, 90'-mongoose nets
10	Sue Becca	62	2, 70'-mongoose nets
11	Bounty	55	2, 53' - 4 seam

After an intial training session which included introduction to several cooperative shrimpers, observers were responsible for establishing their own contacts and making arrangements for trips. They were urged to make themselves as helpful as possible to the vessel's crew (without getting in the way of potentially dangerous net and door handling) to insure their being able to make additional trips on a sampled vessel. Judging from the cooperation accorded them by the fishermen, it appears that they were very conscientious in this regard.

Trawl time duration and locations were recorded. Whenever possible a subsample of the finfish by-catch was identified, sorted, and weighed to provide species composition data. This was normally done on the first drag of the morning. All live turtles captured were identified, measured, their condition and revival (if applicable) noted, and then tagged and released. Turtles which came aboard dead or died shortly thereafter were returned to the South Carolina Marine Resources Center where post-mortem examinations were conducted by Tom Murphy using procedures designated by Dr. Wokey D.V.M. Tissue samples and post-mortem reports were sent to Dr. Wokey who is under contract to NMFS to conduct pathology studies on sea turtles.

"Straight-line" carapace measurements were taken using metric tree calipers.

RESULTS AND DISCUSSION

Forty-eight sampling trips were made between 15 September and 10 November 1980. The average trawling day during the fall season in the Rockville area was 7.5 hours of actual drag time. A total of 169 stations (individual tows) were observed during the course of this survey. The average duration of a drag was 128.9 minutes (2.15 hours).

The sampled vessels rarely exceeded 180 minutes on any of their drags.

Thirteen turtles were captured during our survey; 12 loggerhead (Caretta caretta) and 1 Kemp's ridley (Lepidochelys kempi). In addition, two dead loggerhead and one dead Kemp's ridley were obtained from vessels that did not have observers aboard. After their resuscitation attempts failed the captains that caught these turtles agreed to hold them on deck until we could pick them up. These turtles were returned to the Marine Resources Center for post-mortem examination.

Turtle capture per trawl hour was calculated by pooling the capture and effort data for the complete survey period. The value obtained was 0.036 turtles/trawl hour; quite similar to values obtained for this season and area in 1976 and 1977. CPUE values for an area closely coinciding with the present survey area for September and October 1976 were 0.045 and 0.043 turtles/trawl hour, respectively. In 1977 the CPUE value for the same area during September was 0.030 turtles/trawl hour. Characteristics of the captured turtles, trawl times, and release locations are shown in Table 3.

Mortality of the observed turtles was 15.4 percent (2 individuals). One of these turtles was apparently dead when brought aboard the vessel, the other was very weak when captured and died approximately 15 minutes later. We felt this was unusual in that turtles that show any spark of life usually respond to resuscitation techniques or to simply being left on deck for 1 to 2 hours. The rest of the turtles were either landed in good condition or recovered their strength within one hour. It should also be noted that the only mortalities we observed occurred early in the survey period, including those animals that were given to us by vessels without observers aboard. No mortalities were observed

Table 3. Incidental catch turtles taken by Rockville, S.C. shrimp trawlers during on-board observer survey, 15 September - 10 November 1980.

DATE	SPECIES	CARAPACE L&W(st.line)	CONDITION	TRAWL TIME	TAG NO.	RELEASE LOCATION OR DISPOSITION OF CARCASS
9/16/80	*C.caretta*	24.2 x 20.4 in.	Dead	185 min.	All tags with Gainesville Return Address	Post mortem performed
9/22/80	*C.caretta*	25.6 x 21.4	Alive when brought aboard died 15 min. thereafter	118		" " "
10/2/80	*C.caretta*	28.3 x 21.5	Alive	135	14360	32°28'N 80°12'W
10/6/80	*C.caretta*	25.8 x 20.7	Alive	118	14282	32°36'N 80°12'W
10/6/80	*C.caretta*	23.8 x 19.7	Alive	143	14289	32°36'N 80°12'W
10/10/80	*C.caretta*	26.2 x 20.9	Alive	167	14283	32°30'N 80°12'W
10/11/80	*C.caretta*	24.8 x 18.9	Alive	135	14284	32°36'N 80°15'W
10/23/80	*Lepidochelys kempi*	13.0 x 11.8	Alive	149	14355	32°30'N 80°10'W
10/27/80	*C.caretta*	23.2 x 19.7	Alive	124	D2245	32°30'N 80°11'W
Same Drag	*C.caretta*	29.1 x 22.0	Alive	Same Drag	D2240	32°30'N 80°12'W
10/30/80	*C.caretta*	29.1 x 22.6	Alive	107	14352	32°29'N 80 13'W
11/1/80	*C.caretta*	21.2 x 18.1	Alive	96	14357	32°29'N 80 11'W
11/7/80	*C.caretta*	24.4 x 19.3	Alive	102	D2216	32°35'N 80 12'W

or reported after 27 September. It is possible that a decrease in water temperature made the turtles less susceptible to anoxic death as the season progressed.

During the present project sampling continued later in the year than on previous surveys and we found that some turtles do remain in near-shore waters into November. The last turtle captured was taken 7 November. Whether turtles remain inshore this late every year or just when the weather is mild as in 1980 is unknown.

The cooperation that we received from the Rockville shrimpers in allowing us to observe their fishing trips is certainly noteworthy. They were almost unanimous in their concern for the problem of incidental turtle catch and in their resolve to work toward a solution compatible with preserving both the turtle and their livelihood.