ENTANGLEMENT IN AND INGESTION OF MARINE DEBRIS BY SEA TURTLES STRANDED ALONG THE SOUTH TEXAS COAST

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METHODS

Entanglement

Entanglement data were collected from sea turtle stranding reports submitted to the Sea Turtle Stranding and Salvage Network from Mustang and North Padre Islands, Texas during 1986 and 1987. Data collected included: month and location of stranding, species stranded, curved carapace length of the turtle and type of entanglement.

Ingestion

A general necropsy similar to that described by Wolke and George (1981) was performed on dead sea turtles stranded during 1986 and 1987 on Mustang, North Padre and South Padre Islands, Texas. During necropsy, the curved carapace length and width was measured, sex was determined by external examination of the gonads, the entire digestive tract was removed and all organs were examined for irregularities in an attempt to determine the cause of death of the turtle. The esophagus, stomach and intestinal tract were later opened in the lab. If debris was present, it was removed and its location in the digestive tract was noted. The remaining gut contents were preserved in 10% buffered formalin for later analysis.

RESULTS

Entanglement

A total of 25 (8.7%) sea turtles were found entangled. Entanglement was believed to have been the cause of death in 7 (28%) of these turtles. The remaining 18 (72%) turtles were stranded alive, rehabilitated at the University of Texas Marine Science Institute and with the exception of one permanently injured turtle, were released into the Gulf of Mexico.

Species found entangled included: Kemp's ridley (*Lepidochelys kempi*) (36%), loggerhead (*Caretta caretta*)(24%), hawksbill (*Eretmochelys imbricata*) (24%), green (*Chelonia mydas*) (12%) and leatherback (*Dermochelys coriacea*) (4%). Types of entanglement encountered were by fish-

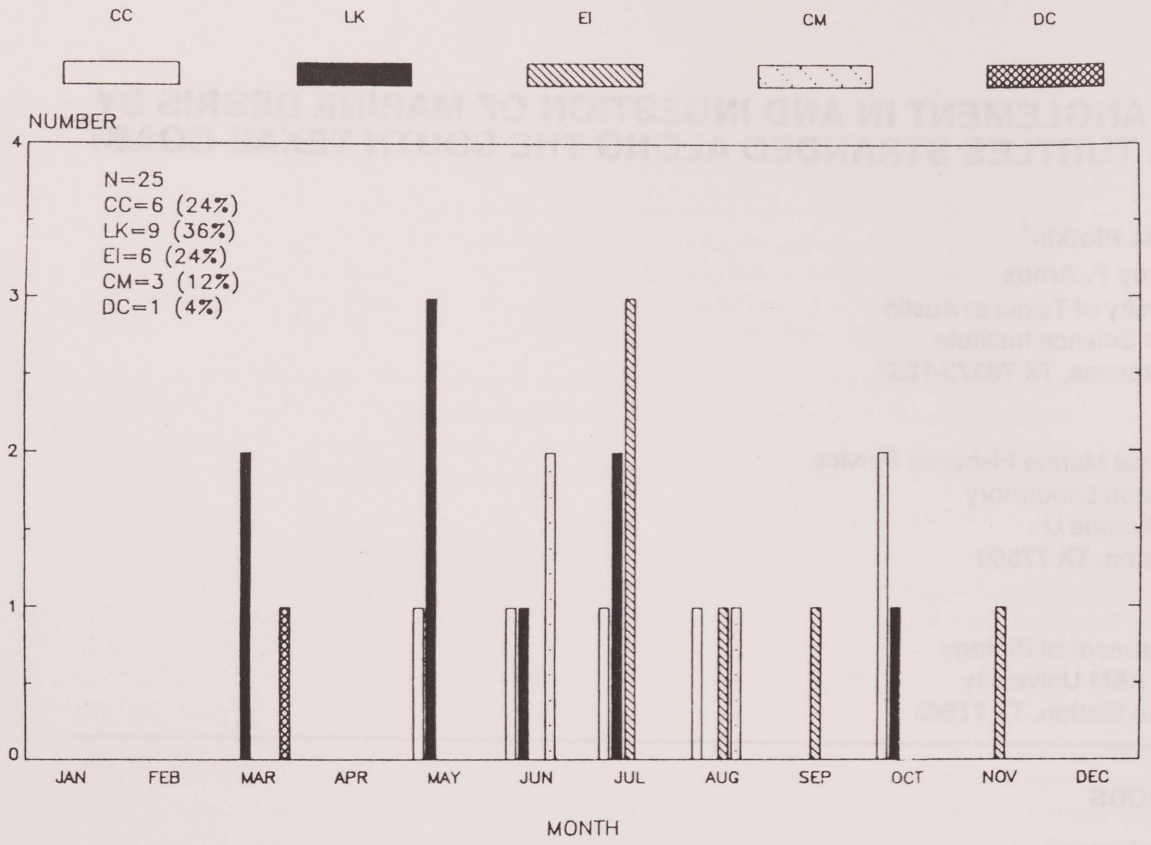

Figure 1. Entangled sea turtles along the south Texas coast, month of entanglement.

ing line/hook (32%), shrimp trawl (28%), onion sack (16%), net/rope (12%), tar (4%), crab trap (4%) and trotline (4%). Entangled turtles were reported from every month with the exception of January, February, April and December (Figure 1). With the exception of the one leatherback, all of the entangled turtles were juveniles or subadults. The mean curved carapace length of entangled turtles for each species were: Kemp's ridley 30.8 cm, loggerhead 59.1 cm, green 24.6 cm and hawksbill 24.3 cm.

Ingestion

Marine debris was present in the gut contents of 35 of the 76 (46.1%) turtles necropsied. Ingestion of debris was unquestionably the cause of death of two of these turtles. Of the remaining 33 turtles, it could not be determined with certainty that the debris they had ingested was directly responsible for their deaths. Debris was found in all portions of the digestive tract. It was found in the mouth, esophagus, stomach and intestines and was also seen protruding from the cloaca of a turtle. The actual weight of debris ingested constituted only a small portion of the overall weight of the gut contents in most of these turtles.

All of the species necropsied had ingested marine debris.It was present in 31 of the 66 (47.0%) loggerheads, 3 of the 9 (33%) greens and in the one hawksbill necropsied. Types of debris ingested (and their frequency of occurrence) included pieces of plastic bags (74.3%), pieces of hard plastic (20.0%), styrofoam (11.4%), monofilament fishing line (11.4%), polyethylene beads (8.6%), plastic strapping (5.7%), pieces of balloons (5.7%), pieces of aluminum foil (5.7%), tar (2.8%), glass (2.8%), cardboard (2.8%) and a heat-sealed tab from a beverage can (2.8%). Debris

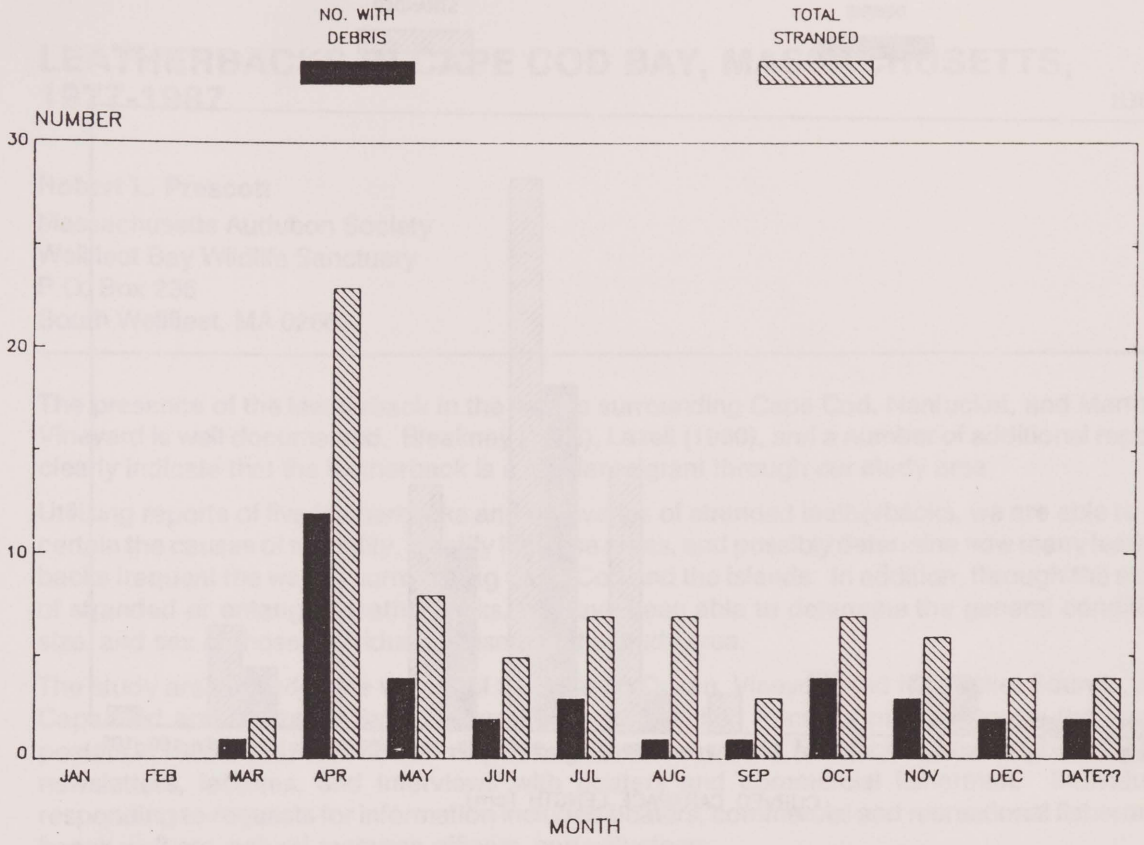

Figure 2. Sea turtles stranded along the south Texas coast, ingestion of marine debris by month.

was ingested by turtles that stranded from March through December (no turtles stranded in January or February) (Figure 2), by juveniles, subadults and adults (Figure 3) and by 46.7% of the female and 46.4% of the male turtles necropsied.

DISCUSSION

Sea turtles that were found stranded along the South Texas coast were significantly affected by ingestion of, and to a lesser extent, by entanglement in marine debris. All species found in the area, both male and female, juvenile, subadult and adult were found to have become entangled in or ingested marine debris during almost every month of the year.

Commercial and recreational fishermen and their discarded gear were responsible for the majority of the entanglement incidents. The number of entanglement cases is probably underestimated because quite often commercial and recreational fishermen are reluctant to report these incidents. One interesting note is that all of the turtles caught in shrimp trawls during this study were recovered alive and eventually were released. All had been turned in by the shrimpers who had caught them.

The offshore oil industry, cargo ships, research vessels, commercial and recreational fishing boats and other sea-going vessels are responsible for most of the trash discarded at sea which eventually is consumed by some turtles. Also responsible are the Gulf currents and winds which carry virtually all of the trash dumped into the Gulf of Mexico and to a lesser extent the Caribbean

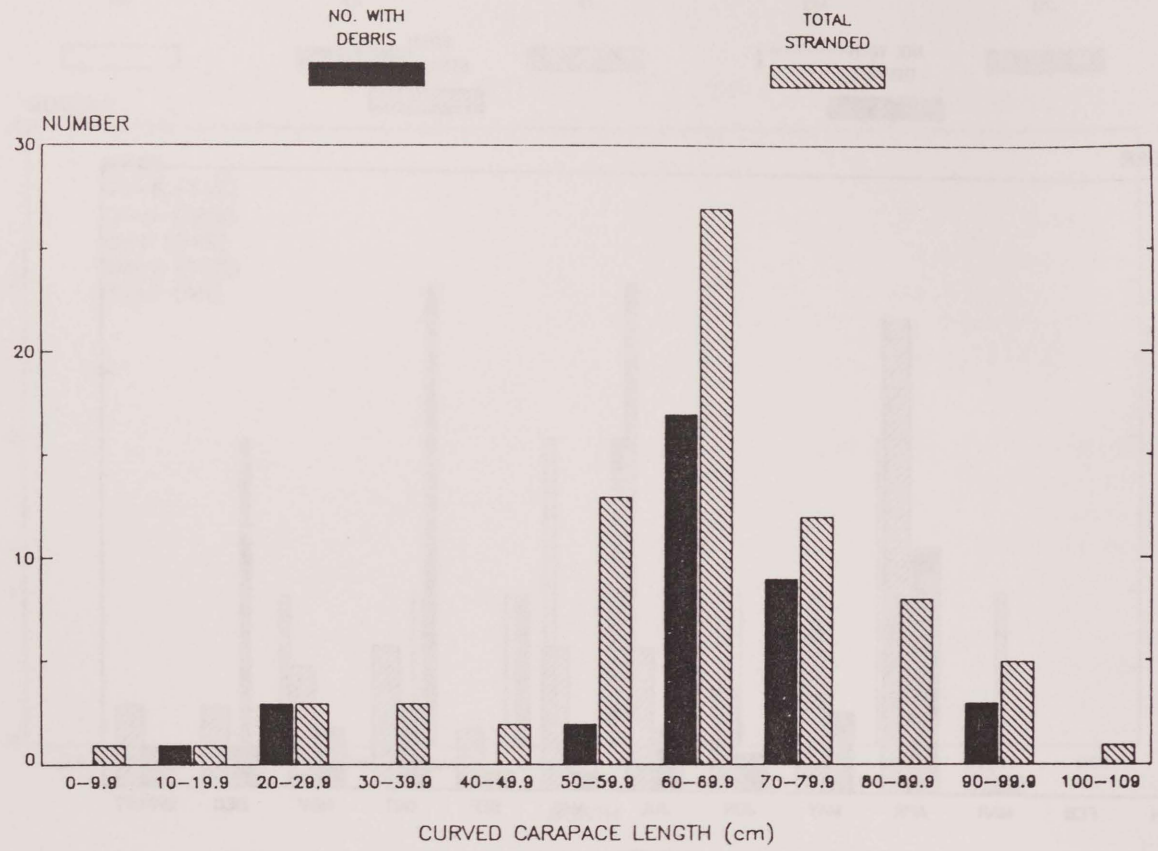

Figure 3. Sea turtles stranded along the south Texas coast, carapace lengths of turtles with marine debris in gut.

to the Texas coast. The probability that a sea turtle, inhabiting Texas coastal waters, will at some time come in contact with debris is quite high.

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