FLOTSAM, JETSAM, POST-HATCHLING LOGGERHEADS, AND THE ADVECTING SURFACE SMORGASBORD

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The eastern coast of Florida, USA, serves as a focal point for loggerhead reproductive effort in the Western Hemisphere and, as such, stages a great dispersal of neonate loggerheads into the North Atlantic. The work discussed here is part of an ongoing study on the dispersal and behavior of neonate loggerheads (Witherington, 1994). The objective of this account is to describe food items ingested by post-hatchling loggerheads captured at sea off Florida.

METHODS

An assistant and I made 12 trips into the Atlantic Ocean off Florida in a 6.6 m motor vessel in search of post-hatchling loggerheads during the hatching season, July through October 1993. Our search targeted areas where there were conspicuous features of convergence zones or where weed lines were present. These areas have yielded post-hatchling loggerheads in previous studies (Witherington, 1994). Sites where turtles were captured in 1993 were 8-35 NM east of Cape Canaveral and Sebastian Inlet, Florida, near the western edge of the Gulf Stream. We idled with our boat along weed lines and fronts, and when turtles were observed, we noted their behavior and surroundings, and captured them with a dip net. We timed our searches and recorded the positions of the captures we made.

We made attempts to determine food items taken by captured turtles by examining oral cavities and/or flushing items from stomachs and esophagi with a sea-water lavage. The lavage apparatus consisted of a 3 mm diameter flexible-vinyl tube and a rubber ear-wash bulb. Discharged items were fixed in 10% buffered formalin to be later examined microscopically. All turtles were active when released at respective capture sites.

RESULTS AND DISCUSSION

We captured 160 post-hatchlings from the areas we searched, approximately one turtle for every five minutes spent searching. Turtles were generally at the surface near patches of *Sargassum*, inactive, and in a tuck position (with fore-flippers flat against carapace) when discovered.

Captured turtles ranged in standard carapace-length straight-line (measured from nuchal to pygal tip) from 40.3 to 56.3 mm, and ranged in weight from 15.5 to 36.0 g. The largest captured post-hatchlings were approximately twice the average weight of a hatchling as it leaves the beach.

We lavaged 50 turtles and obtained macroscopic, discharged items from all but eight. Discharged items were later divided into 43 categories of animal, plant, and synthetic material. The most frequently-found animal material was from jelly animals, predominately medusae and ctenophores (Table 1). Crustaceans were common in samples and were primarily represented by larval shrimp and crabs. There were three species of hydrozoans found, with many colonies still attached to *Sargassum* floats, leaves, or stipes. Two turtles had eaten insects, one buprestid beetle and an ant, winged-sexual. The largest animal found was a 21 mm (greatest length) nudibranch.

The most sobering discovery was the frequency of tar in lavage and mouth samples. At least 34% of the turtles had tar flushed from their stomachs and esophagi, and over half of the turtles I examined had tar caked in their jaws (Table 2). I also found a wide variety of plastics and other anthropogenic material, including plastic sheets (as from plastic bags), plastic chips and strips of various colors, single and multi-filament fibers, caulking material, and vermiculite (Table 2).

In keeping with our behavioral observations, loggerhead post-hatchlings seem to prefer slow-moving or non-moving food items. Their choices seem quite varied, although not entirely indiscriminate. For instance, the most common item in these fronts, *Sargassum*, is not represented in proportion to its occurrence. It may be that *Sargassum* is only taken incidentally. The feeding strategy of post-hatchling loggerheads may be to focus on visually-unique items amongst the *Sargassum*.

Whereas plastic was best represented in stomach lavage samples, tar was best represented in mouth samples (Table 2). It may be that 1) more tar is bitten than is swallowed, 2) tar is more persistent in the mouth, or 3) tar is less easily flushed from the stomach than are other items.

The ingestion of tar and plastics by sea turtles is not a new discovery (Carr, 1987). The evidence presented here is particularly alarming, however, in that such high proportions of a particularly vulnerable life history stage are involved. A close monitoring of this problem and a further elucidation of its effects are warranted.

ACKNOWLEDGMENTS

This study was funded by a grant from the U.S. Air Force to B. Witherington, K. Bjorndal, and A. Bolten, through the Archie Carr Center for Sea Turtle Research, University of Florida, and by grants from the U.S. Fish and Wildlife Service and the Florida Game and Freshwater Fish Commission to the Florida Department of Environmental Protection. J.G. Altman assisted with the field work.

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Table 1. Items discharged from stomachs and esophagi of 50 post-hatchling loggerhead turtles captured in the Atlantic Ocean off Florida.

CATEGORY	NUMBER OF TURTLES
LARGER JELLY ANIMALS AND TENTACLES	20 (40%)
UNIDENTIFIED ANIMAL TISSUE OR OVA	10 (20%)
CRUSTACEANS	9 (18%)
HYDROZOANS	8 (16%)
INSECTS	2 (4%)
GASTROPODS	2 (4%)
TURBELLARIAN FLATWORM	1 (2%)
ACTINID ANEMONE	1 (2%)
SARGASSUM	13 (26%)
OTHER PLANT MATERIAL	4 (8%)
TAR	17 (34%)
PLASTICS AND SYNTHETIC FIBERS	16 (32%)
NO VISIBLE ITEMS DISCHARGED	8 (16%)

Table 2. Incidence of tar, plastics, and other synthetic materials found in samples from gastric lavage and oral examinations of post-hatchling loggerheads.

	LOGGERHEAD POST-HATCHLINGS		
	WITH PLASTICS	WITH TAR	TOTAL EXAMINED
MOUTH EXAMINATION	2 (2%)	53 (56%)	95
STOMACH LAVAGE	16 (32%)	17 (34%)	50
STOMACH OR MOUTH EXAMINATION	18 (17%)	65 (63%)	103

NOAA-TM-NMFS-SEFSC-351

NOAA Technical Memorandum NMFS-SEFSC-351

PROCEEDINGS OF THE FOURTEENTH ANNUAL SYMPOSIUM ON SEA TURTLE BIOLOGY AND CONSERVATION

1 - 5 March 1994
Hilton Head, South Carolina

Compilers:

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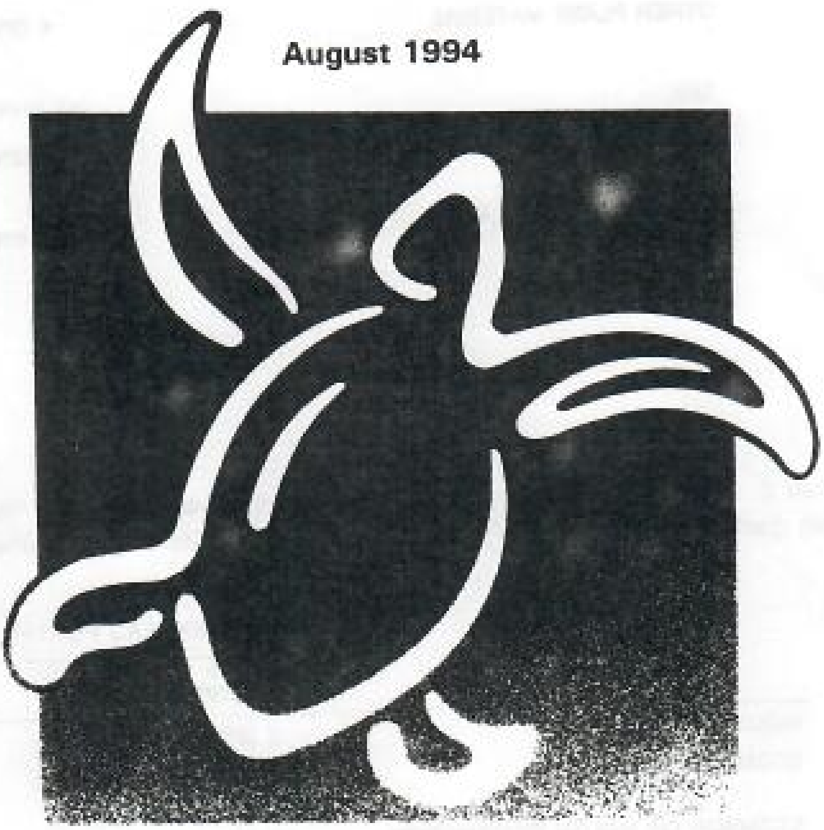
August 1994



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