

The Natural History and Modern Challenges of the North Atlantic Loggerhead

For generations, sea turtle biologists in the southeastern United States have watched loggerhead hatchlings emerge from their nests and enter the ocean. They are not seen again along those coasts until they reach approximately 50 centimeters (19.69 inches) in length. Archie Carr referred to that interim period as the “lost year,” and for years, we asked the question, “Where do those little loggerheads go?”

At the end of the 19th century, Albert I, Prince of Monaco, was contemplating the reciprocal question from the other side of the sea. On eastern Atlantic research voyages aboard his royal yacht, he asked, “Where do these little loggerheads come from?”

Researchers at the Archie Carr Center for Sea Turtle Research in Gainesville, Florida, U.S.A., answered his query nearly a century later. Prince Albert I speculated that they came from the Caribbean or Florida. Analyzing complementary body size distributions and genetic markers, Archie Carr Center and University of the Azores scientists have demonstrated that the juvenile loggerheads in the eastern Atlantic waters around the Azores are offspring from Florida nesting beaches.

Using computer models of length-frequency distributions, mark-recapture, and skeletochronology, scientists have determined that juvenile loggerheads spend 7 to 12 years in the oceanic stage of their life—making the “lost year” more accurately the “lost decade.”

After the decade in open ocean habitat, these juveniles become resident in the shallower, coastal, neritic waters of the western Atlantic. There they continue to develop for another 20 years before reaching sexual maturity at around 30 to 35 years of age. With the change in habitat, the loggerheads undergo a dramatic shift in diet—from jellyfish in the oceanic ecosystem to hard-bodied crustaceans and mollusks in the neritic waters—and an allometric growth change that results in their characteristically large heads with bone-crushing jaws.

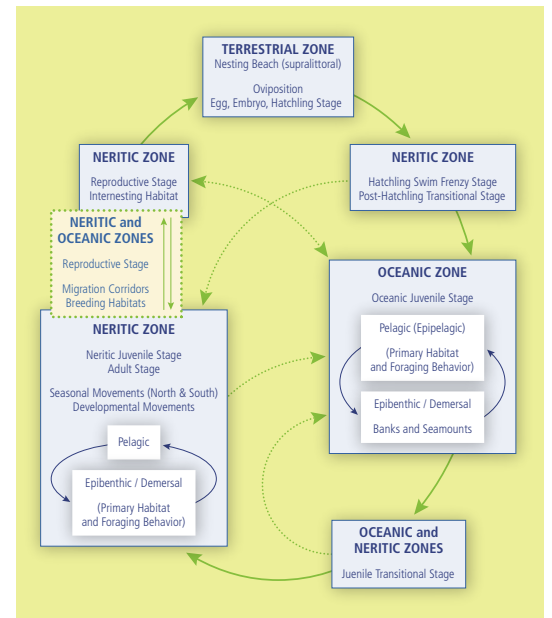
The figure at left illustrates the complexity of the North Atlantic loggerhead lifecycle. A number of technologies such as satellite telemetry, genetic markers, and stable isotopes are helping to elucidate that this lifecycle is not simply a linear passage from one stage to another but one

with numerous points of connectivity. For instance, after juvenile loggerheads recruit to the neritic habitat, individuals may return to the oceanic habitat. Alternatively, some turtles may remain in oceanic habitats throughout their life except during copulation and nesting.

Because the Azores provide an accessible location to study North Atlantic loggerheads, scientists know more about their lifecycle—especially the oceanic juvenile stage—than any other population.

Scientists also understand very clearly that each of the three major ecosystems in the loggerhead’s lifecycle presents major hazards to loggerhead conservation. Nesting beaches suffer from coastal development, erosion, and sea level rise, while threats of drowning in fishing trawls and incidental capture by longline fisheries loom in the turtles’ oceanic and neritic habitats. Efforts are underway worldwide to address these hazards.

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The lifecycle of the North Atlantic loggerhead. COURTESY OF ALAN BOLTEN

Depiction of the marine habitat around Florida, U.S.A. in the North Atlantic as it may have appeared during the Pleistocene Era (approximately 1.8 million to 11,000 years ago). Mural prepared for the University of Florida Museum of Natural History. © MICHAEL ROTHMAN, 2003.



Despite our understanding of its natural history, the northern Atlantic loggerhead is in steep decline. A report released in November 2006 by Florida’s Fish and Wildlife Conservation Commission tells the story clearly: nest counts have declined by 22 percent since 1989. In the past seven years, nesting at Florida’s most important nesting beaches has declined by 40 percent. Ninety percent of loggerhead nesting in the United States occurs in Florida, and the Archie Carr National Wildlife Refuge on Florida’s Atlantic coast is one of the two largest remaining loggerhead aggregations in the world.