Light sticks may lure turtles to fishing lines

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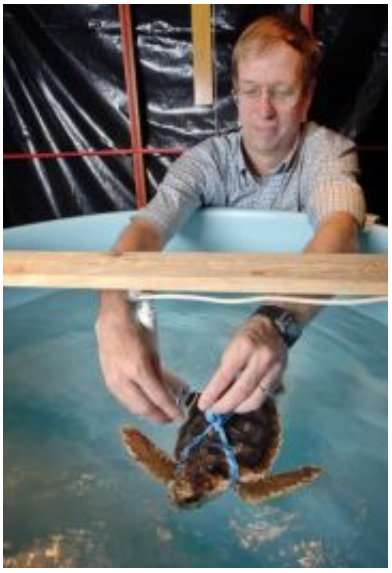

Ken Lohmann, UNC-Chapel Hill professor of biology, with a loggerhead turtle. Credit: UNC-Chapel Hill/Dan Sears

Thousands of loggerhead turtles die every year when they get tangled or hooked in commercial fishing longlines meant for tuna or swordfish. New research suggests a possible reason why turtles swim into the lines. The glowing light sticks that lure fish to longlines also attract turtles, according to a University of North Carolina at Chapel Hill study.

The light sticks used in longline fisheries resemble the disposable plastic tubes popular with children on Halloween. The steady glow draws fish, which then find baited hooks and are caught on the lines. The lights also seem to fascinate turtles, however, which are equally likely to chomp on

fish bait, or get snagged in the hooks and lines.

“Juvenile turtles are indiscriminant eaters and bite nearly everything small that they encounter,” said Ken Lohmann, UNC-Chapel Hill professor of biology and senior author of the study. “Under natural conditions, most small objects floating or swimming through the sea are potential sources of food. But nowadays, with fishing lines, plastic, and garbage in the ocean, biting everything is not such a great strategy.”

The study appears in the May 2007 issue of the journal Animal Conservation. John Wang, a former graduate student at Carolina and now a research associate with the Joint Institute for Marine and Atmospheric Research at the University of Hawaii, was the lead author of the study. Grants from the National Oceanic & Atmospheric Administration (NOAA) and the National Science Foundation provided funding.

The new findings may help fisheries decrease the number of turtles caught on lines, the researchers said. Most longlines deploy their hooks below the depths where turtles usually swim, so shading the lights to direct illumination downward instead of upward might make the lights harder for turtles to see. Similarly, switching to colors that turtles can’t detect very well might also reduce turtle deaths.

All sea turtles are endangered species. A recent estimate published in the journal Ecology Letters suggests 200,000 loggerhead and 50,000 leatherback turtles may die each year in commercial fishery longlines. Total populations have declined in the past 20 years, Lohmann said.

While it’s difficult to separate the impact of longline fisheries from other threats turtles face, researchers say that the loss to longlines is significant because the turtles caught are often adolescents, which die before they have a chance to reproduce. Only about one in 5,000 turtles ever survive

to adulthood. In the past, those lucky enough to last a few years in the ocean could expect a long life and would replenish the population. With the advent of longline fishing, the number of survivors has dwindled. “A lot of turtles that beat the odds and would otherwise have lived long lives are now being caught on longlines,” Lohmann said.

Lohmann, Wang and their team tested loggerhead turtle’s response to light sticks in a large, water-filled tank. Turtles were placed into a soft cloth harness and tethered to an electronic tracking device that monitored their movements. Safely encased in the soft fabric and released in the tank, the turtles swam as if in the open ocean, apparently unaware that they aren’t going anywhere, Wang said.

When glowing light sticks were introduced to the tank, the turtles swam toward them, as if curious about the lights, Lohmann said. The color or type of the light stick did not seem to matter. The turtles paddled toward green, blue and yellow light sticks, as well as toward both plastic chemical lightsticks and newer models based on reusable LEDs.

Both captive-raised and wild-caught juvenile turtles were attracted to glowing light sticks, whether in total darkness or underneath a night sky, Wang said. When the lights weren’t activated, they were unappealing. The experiments were conducted at the National Marine Fisheries Services’ Galveston Laboratory in Texas and at a turtle nesting area in south Florida.

The study needs to be repeated with longlines in the open sea to confirm that light sticks attract turtles under natural conditions in the ocean, Lohmann said. The researchers are also curious to check leatherback turtles for a similar response.

Source: University of North Carolina at Chapel Hill