

Radio-tracking dolphins reveals intimate details about their behavior

February 21 2019



A juvenile bottlenose dolphin plays with seagrass in the Indian River Lagoon.
Credit: HSWRI 2017; A. Fabry 20170131 S150150; NOAA Fisheries permit no. 20377-01.

Using telemetry units in hospitals to monitor patient health is standard practice. Now, a similar approach is proving to be invaluable for dolphins, too. Researchers from Florida Atlantic University's Harbor Branch Oceanographic Institute, Hubbs-SeaWorld Research Institute and collaborators have conducted the most extensive radio-tracking effort of bottlenose dolphins in the Indian River Lagoon (IRL) using radio-telemetry.

Findings from their study reveal new and surprising information about how they use their habitats, how they spend their time, and how they interact with their own species.

A population of bottlenose dolphins (*Tursiops truncatus*) consider the IRL along the Atlantic Coast of Florida their "home sweet home." Yet, little is known about their short-term movements, association patterns, activities, and habitat use—factors that are critical to understanding and managing [animal populations](#). Moreover, these long-lived, top-level predators are impacted by [ecological changes](#) following large-scale environmental shifts including seagrass loss, fish kills and algal blooms.

Although IRL bottlenose dolphins have routinely been monitored via photo-identification surveys, this method only provides an intermittent evaluation. Radio-telemetry—on the other hand—enabled the researchers to consistently observe, track and monitor the dolphins in close proximity over time.

The study, recently published in the journal *Aquatic Mammals*, emphasizes the value of radio-telemetry as an important method to evaluate seasonal ranging patterns and provides essential baseline data on habitat preferences.

For the study, Greg O'Corry-Crowe, Ph.D., co-author and a research professor at FAU's Harbor Branch, Wendy Noke Durden, M.S., lead

author and a research scientist at Hubbs-SeaWorld Research Institute, and collaborators, selected and fitted nine IRL bottlenose dolphins with radio tags in June 2007 and June 2010. Eight were male, one was female, and all of the animals were adult except for one juvenile.

They conducted radio-tracking by boat, with assistance from a Cessna 172 aircraft, and visually located and followed each animal several times per week. Over the course of 122 hours of observation, they compiled a total of 1,390 scan samples.

Results of the study show that these tagged dolphins spent most of their time traveling (53 percent), followed by milling together in groups (27 percent), foraging (17 percent), and socializing (2.3 percent). They also spent a surprising amount of their time on their own for such a famously social animal. The juvenile dolphin spent the most time alone, documented at 72 percent in 2007 and decreasing to 36 percent in 2010.

"The fact that these dolphins seem to have a lot of alone time adds a new dimension to our understanding of the sociality of the Indian River Lagoon dolphins," said O'Corry-Crowe. "It also was fascinating to find that many dolphins have brief encounters with many other dolphins. The tracking approach is really adding a whole new dimension to how we view and ultimately conserve this species."

The researchers found that some dolphins also formed longer associations. Adult males often pair up, but they also found one pair in the company of a female. According to the researchers, it appears that they primarily hang out to forage and eat rather than reproduce.

"Like other social mammal species, bottlenose dolphins exhibit a 'fission-fusion' social association where they hang out in a group or split up during the day. These associations can change frequently in composition and size or remain stable over the years. For example, male bottlenose

dolphins have been known to form male-male alliances that last for years," said Noke Durden. "Our study reveals how dynamic the fission-fusion aspect of dolphin societies can be over short temporal periods, with tagged dolphins having brief associations with a large number of marked and many other unmarked individual dolphins."

Other findings show that only the social interactions and play activity varied by age class, with the juvenile animal spending more time socializing and playing with foreign objects like mangrove seeds and seagrass. The juvenile dolphin's activities changed over time, increasing in time spent traveling and decreasing in time spent milling with other dolphins as it approached reproductive maturity.

Habitat-use patterns varied among the individual dolphins, however, the tagged dolphins predominantly used shallow to mid-depth water. They also foraged and played more in shallow waters compared to other depths. The fewest observations occurred in deep water. Social behavior, however, did not occur significantly more at any of the four water depths categories in the study.

One concern of the researchers is the fact that bottlenose dolphins and other animals consider the lagoon their permanent home, given the recent environmental changes in the IRL.

"Our finding that shallow water habitats are used extensively by Indian River Lagoon bottlenose dolphins, particularly for foraging, indicates that these habitats are likely critical to their health and fitness. Ecosystem changes in the lagoon could significantly impact them," said O'Corry-Crowe.

Likewise, one animal only ranged approximately eight miles over 97 days, while on average [dolphins](#) ranged 17 miles during the course of the study.

"Given recent ecosystem changes in the IRL, fixed habitat utilization is concerning as animals inhabiting areas undergoing significant ecological pressures will need to adapt and or modify ranging patterns or inevitably suffer decreased fitness," said Noke Durden.

Collaborators of the study, "Small-Scale Movement Patterns, Activity Budgets, and Association Patterns of Radio-Tagged Indian River Lagoon Bottlenose Dolphins (*Tursiops truncatus*)," are University of Central Florida; Seven Degrees of Mapping, LLC; Bayside Hospital for Animals; Georgia Aquarium; and Protect Wild Dolphins Alliance.

Provided by Florida Atlantic University

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