

Better data needed in determining sea turtle population trends

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(Phys.org) —Sea turtle populations may be increasing—or decreasing—but by using the most common method of simply counting nests or nesting females there is no way to know for sure, a University of Florida research team reports in the journal *PLOS ONE* today.

The study suggests that at least some of the optimism regarding sea turtle [population trends](#) in recent years may have been premature.

The team used comprehensive data collected over the last 40 years by the Caretta Research Project on Wassaw Island, Ga., to compare trends in sea turtle abundance based on nest counts and female counts with trends corrected for imperfect detection, which arises frequently when counting mobile, hard-to-monitor wildlife populations, such as [sea turtles](#)

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Imperfect detection is estimated using capture-mark-capture methods. This requires capturing and tagging individual turtles, which are later recaptured. Annual [population estimates](#) are then adjusted for imperfect detection, which provides more reliable estimates of sea turtle abundance.

The Caretta Research Project collects both count and tagging data, which allowed for the comparison.

The team concluded that using data from tagged turtles to correct for imperfect detection avoids erroneous conclusions about population

trends. As a result, past sea turtle assessments in recent decades may need to be reviewed.

"We need to be cautious about interpreting trends," said biologist Karen Bjorndal, director of the Archie Carr Center for Sea Turtle Research.

"We've all been feeling relatively confident that this population of loggerheads was increasing, headed in the right direction, but what this says is maybe we shouldn't be complacent.

"This is a wake-up call for management agencies," said Bjorndal, a distinguished professor of biology.

The study was led by [doctoral student](#) Joseph Pfaller, 30, who has worked with the Caretta Research Project since he was 15. Pfaller knew this was one of the few long-term datasets that would allow for this study. Pfaller and Bjorndal, as well as [biologist](#) Alan Bolten of the Archie Carr Center for Sea Turtle Research, collaborated with Milani Chaloupka of the University of Queensland on the study.

Bolten said a population estimate based solely on counts of nests or nesting females could be misleading. Those counts could increase or decrease without a change in the population. This concern echoes a recent report by the National Research Council.

In recent years, Bjorndal said, population abundance estimates often were based on nest counts because it is easier and less expensive. The nesting of Florida's loggerhead sea turtles has been consistently monitored since 1989, and until 1998, nest numbers appeared to increase. After that, numbers dropped and by 2006 had declined by 43 percent, Bjorndal said.

The new research calls into question the accuracy of those counts and makes a compelling argument for more tagging effort. Six of the seven

species of sea turtles are endangered, so accurate assessments are important. Sea turtles are difficult to monitor because they have lifespans longer than many research projects and wide-ranging migration patterns.

Bolten said Florida has the largest nesting population of loggerhead turtles in the world, and it is the state's responsibility to accurately monitor the loggerhead population as a steward of natural resources.

Pfaller said the results could apply to other species that are monitored with raw count data that are not corrected for imperfect detection. Relying on nest counts for birds, for example, as opposed to banding individuals, could lead to imprecise population counts there, too.

"This has management implications, particularly in censuses of endangered species," Pfaller said. "We need to tag individuals."

Bolten said people are interested in wildlife population trends and always ask him how the [sea turtle populations](#) are doing.

"I guess we don't have the answer," he said.

Provided by University of Florida

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