DNA in the water could help reveal where endangered manatees live

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As big as they are, Florida manatees aren't always so easy to find.

Aerial surveys used by the state to conduct annual counts have been criticized for sometimes under- or over-estimating the lumbering sea cows and rely on statistical calculations. The expensive flights can't always cover the vast network of canals, springs and coastline that manatees roam seasonally in search of warm water and food. Bad weather can ground them.

But now researchers have found something easier to locate: their DNA.

"It doesn't tell you necessarily how big the population is, but it detects the presence," said U.S. Geological Survey research geneticist Maggie Hunter, who helped developed a marker and was lead author on a paper published this month in the journal Endangered Species Research touting the method.

Like humans, animals shed hair, skin and other parts in the environment, leaving behind a trail of DNA. Tracking that environmental DNA has been used increasingly to find invasive species like Burmese pythons.

In 2015, Hunter and a team of researchers successfully confirmed python DNA in marshes where other efforts to locate the snakes had failed. And while Florida manatees are less difficult to find, getting accurate counts is critical to effectively managing the species. Last year, the U.S. Fish and Wildlife Agency downlisted their status to threatened

from endangered—over objections from conservationists—in part because annual counts reported higher numbers.

But those counts sometimes rely on statistical models. For example, Hunter said counters who surveyed an area of the northern Gulf of Mexico detected no manatees even though her team found their DNA in the water. The DNA can be detected for two weeks to a month.

In addition to locating hard-to-reach places where manatees might congregate, the testing can also pinpoint travel corridors as they move about seasonally. Boat fatalities continue to be a leading cause of death. In 2017, 106 of the 538 fatalities were blamed on watercraft.

DNA testing could also help managers understand how Florida manatees may be expanding their range as rising global temperatures warm the oceans. Florida manatees increasingly have been found in the Florida Panhandle and father north into areas that are more remote or difficult to count.

"Our population has just been conditioned to be around humans. But when they move into the northern Gulf or off the Georgia coast, those animals are typically not quite as friendly," she said, making them harder to find.

Aerial surveys are also expensive and influenced by weather conditions and water visibility.

The method could also be used in places around the planet where manatees are scarcer and resources tighter. A subspecies in Cuba numbers about 100, but next to nothing is known about them. And in Brazil, dark water in the Amazon makes it nearly impossible to find them by air.

"It's very challenging to get into those places and it's very expensive to do any type of aerial survey," she said. "I'm working with someone from Brazil and she's worked there her whole life and never seen Amazonian manatees."