Movements of thousands of loggerhead turtles 'predictable'

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Loggerhead turtle.

Satellite tracking technology has revealed in detail for the very first time the annual movements of thousands of loggerhead turtles that live off the east coast of the US.

The ten-year study shows that they go back to the same spots year after year.

This means researchers can now say where, to within a few tens of kilometres, the turtles will turn up at any point during the year.

The loggerhead turtle is endangered on the IUCN Red List, which means it's at risk of extinction, so the findings will prove invaluable for conservationists trying to figure out where to focus efforts to protect the creatures.

'This is a massive help for conservation managers – we can now advise quite precisely where they should direct their conservation effort and funding,' says Dr Lucy Hawkes from Bangor University in Wales, lead author of the study. Hawkes completed the study for her PhD at the University of Exeter.

'This is the first time for part of a population that we've been able to compile all tracking data ever collected to generate a picture of what the whole US population is doing,' she adds.

The study was only possible because of recent advances in satellite tracking technology, an increasingly popular approach among marine biologists and bird experts alike.

'Before this technology, we wouldn't have got anywhere near as much detail using traditional techniques,' says Hawkes.

Biologists have tagged a whole range of migratory creatures, such as the great snipe, the ocean sunfish, and Atlantic leatherback turtles, using GPS and satellite tags or tiny tracking devices called geolocators, to find out more about their migratory routes.

But until now, it was difficult to say if the few published tracks that exist really represent the movements of the whole population.

Loggerhead turtle expert Archie Carr was one of the first to try tracking loggerheads from Florida, taking a decidedly novel approach. He glued huge helium-filled weather balloons to the turtles' shells so that he could follow them from the shore.

Together with colleagues at the University of Exeter and the US, Hawkes tracked 68 adult female loggerhead turtles that live off the east coast of the US between 1998 and 2008. The population runs from North

Carolina, to Florida and down to the Gulf Coast and is the world's second largest group of loggerhead turtles.

They found that the turtles tend to stay close to the coast, not venturing beyond the continental shelf. This is because they feed on crabs, lobsters and other crustaceans on the sea floor, which they have to dive down to reach.

Rather than leaving the area during winter, the turtles stay around the coast, but move to warmer waters around Florida.

'This puts them in direct competition with the fishing boats which trawl the bottom of the sea floor,' Hawkes says.

Before this study, researchers couldn't be sure where the turtles went during the winter, so rules surrounding bottom trawling are far less strict during this period, coastal managers didn't think the two coincided.

Hawkes and her colleagues also found that the turtles are 'incredibly predictable,' returning to the same places year after year.

'The big remaining question is whether adult male, juveniles and turtles from the Florida sub-population behave in a similar fashion,' said Dr Brendan Godley from the University of Exeter.

Early results from a study by a different team of scientists suggest they do. If this is true, this predictability means that protecting the world's second largest population of loggerhead turtles shouldn't be too difficult.

The next step for Hawkes would be to combine the data from this study with data on the loggerheads from the Florida beaches to build up a comprehensive picture of the movements of these charismatic creatures.

More information: Lucy A. Hawkes, Matthew J. Witt, Annette C. Broderick, John W. Coker, Michael S. Coyne, Mark Dodd, Michael G. Frick, Matthew H. Godfrey, DuBose B. Griffin, Sally R. Murphy, Thomas M. Murphy, Kris L. Williams, Brendan J. Godley, Home on the range: spatial ecology of loggerhead turtles in Atlantic waters of the USA, Diversity and Distributions, Volume 17, Issue 4, pages 624-640, July 2011, Article first published online: 8 JUN 2011, DOI: 10.1111/j.1472-4642.2011.00768.x