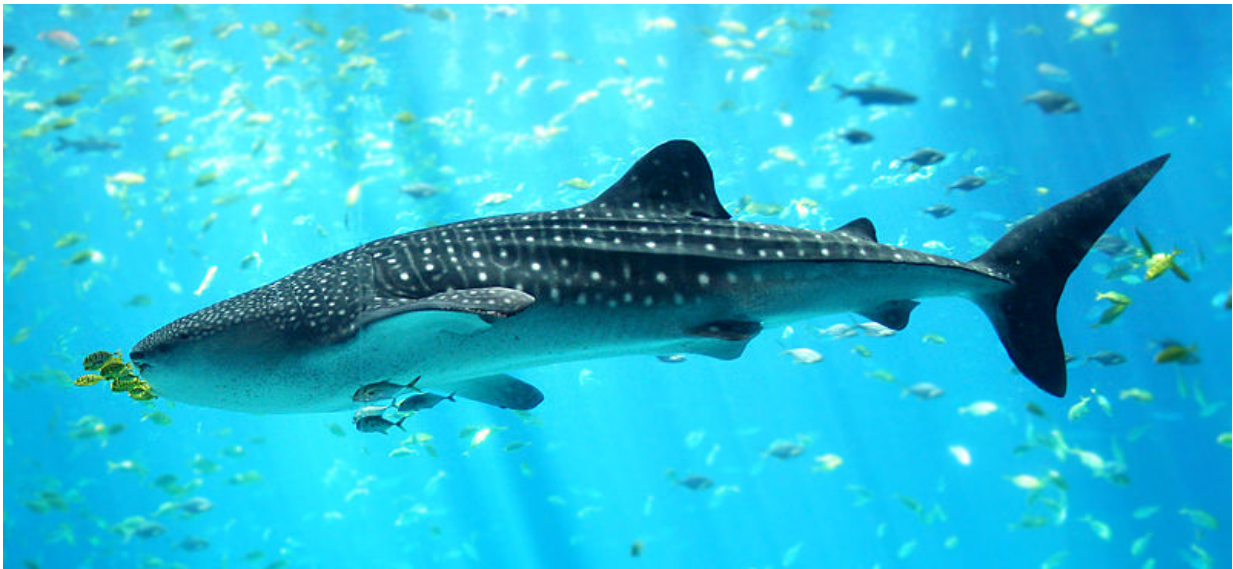


# A population study of whale sharks in the Red Sea reveals unique group dynamics

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Each whale shark has a unique set of stripes and spots, making it feasible to identify individuals at a site. Credit: Zac Wolf via Wikimediacommons

Despite being the largest known fish in the sea, little is known about the world's population of whale sharks. Scientists at King Abdullah University of Science and Technology (KAUST), Saudi Arabia, are conducting ongoing research into the Red Sea's population to determine more about these elusive creatures and inform future conservation efforts.

Whale sharks live predominantly in open seas of the tropics, travelling long distances to feed on plankton. They are known to group together in 'aggregations' at certain times of the year, although the exact purpose for these gatherings is unclear. In the Red Sea, [whale sharks](#) aggregate at Shib Habil, a small reef just off the Saudi Arabian coast, from March to May.

"There are around a dozen aggregation sites scattered across the globe and each one is a small piece in a very large puzzle," says Jesse Cochran of KAUST's Red Sea Research Center, who is working on the project with colleagues, Michael Berumen and Royale Hardenstine, in collaboration with scientists in the US. "Describing and comparing the sub-populations at these sites helps us to figure out how the individual aggregations fit into the species' global ecology."

Each whale shark has a unique set of stripes and spots, making it feasible to identify individuals at a site. The team took hundreds of photographs of the Shib Habil sharks between 2010 and 2015, and then used specialized software to identify 136 individual creatures. This data was used to calculate the 'lagged identification rate' (LIR) for the population.

"The LIR is the probability of re-sighting a shark after a certain time," explains Cochran. "How likely are we to see the same shark after one day? Ten days? A thousand days? Once we have calculated the LIR, we can generate model populations with different characteristics. We then compare the models' hypothetical LIR to the LIR calculated from the data to find the closest fit to describe the population."

The more complex parts of the model provide details on attributes of the population, such as information on an individual's movements and a group's mortality rates, adds Berumen.

The team found that the Red Sea whale sharks were predominantly

juveniles and were transient visitors. Unusually, the aggregation appears to comprise an equal ratio of males and females – other studies on different aggregations have found mainly male sharks.

"Sighting-independent methods, like acoustic monitoring, might help confirm some of these findings and further investigate this apparent sexual parity and integration," says Cochran. "We are pursuing investigations along these lines."

**More information:** J. E. M. Cochran et al. Population structure of a whale shark aggregation in the Red Sea, *Journal of Fish Biology* (2016). [DOI: 10.1111/jfb.13054](https://doi.org/10.1111/jfb.13054)

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